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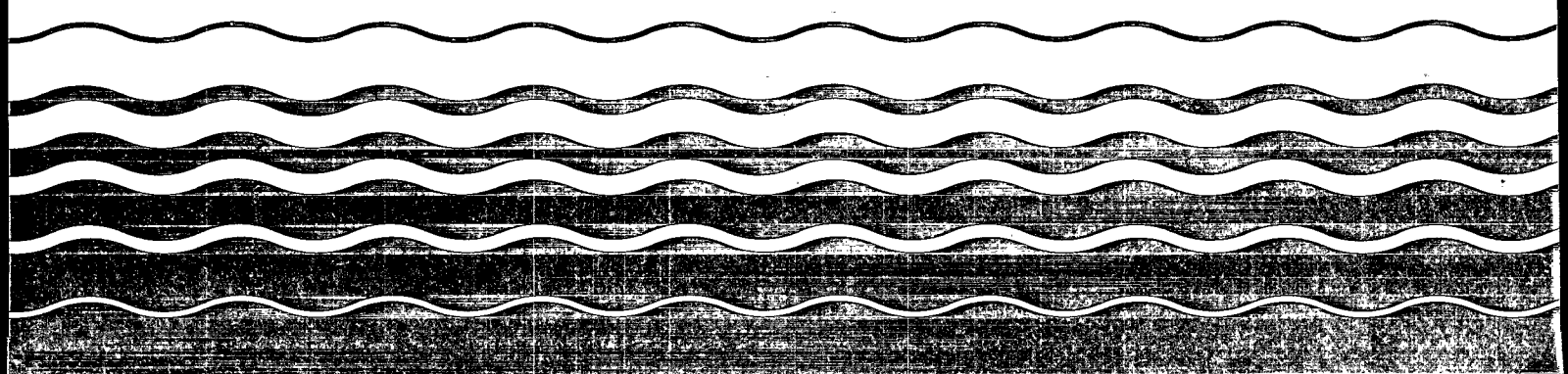
Administrator's Point/Nonpoint Source Trading Initiative Meeting

A Summary



A SUMMARY

Administrator's Point/Nonpoint Source Trading Initiative Meeting

April 27-28, 1992

Durham, North Carolina

SPONSORED BY

U.S. Environmental Protection Agency

HOSTED BY

North Carolina Department of Environment, Health and Natural Resources

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INTRODUCTION

The Administrator's Conference on Trading was designed to broaden general understanding of point/nonpoint source pollution trading. Water quality managers came together to exchange views and impressions on the utility and applicability of pollution trading as a way to meet Clean Water Act goals and promote effective use of water quality management resources.

More than 120 representatives of Federal and State regulatory agencies, agricultural producers and commodity groups, municipal governments, and industry expressed views about the usefulness of trading. A notable element of the conference was the range and diversity of views represented by the participants and their shared commitment to cost-effective water quality management.

Conference participants were asked to identify factors that encourage or discourage trading. They were also asked to suggest ways in which trading could play a larger part in the water program overall and become an integral component of water quality management. Many of the regulatory, administrative, and legal aspects of trading were discussed, as was the need for additional information and education. Finally, participants were asked to suggest specific watersheds where trading programs could be implemented on a pilot basis.

The Conference opened with a plenary session followed by six breakout groups. The conclusions that follow are distilled from the final breakout group reports. All of the actual breakout group products, including the final reports to the plenary session, appear later in this document.

SUMMARY OF MEETING RESULTS

Key Findings

■ ***Trading is an effective tool:*** Trading is a potentially valuable tool for water quality management, but its usefulness has not been fully demonstrated. The merits and drawbacks of various trading programs must be demonstrated and evaluated through a number of pilot projects.

■ ***Trading is not a panacea:*** One of many "tools in the water quality toolbox," trading cannot be uniformly applied nationwide. The applicability and utility of any trading program depend on the water quality problems of a given area and the surrounding institutional infrastructure. Trading is, therefore, site-specific and local in nature.

■ ***Technical issues are real:*** Technical water quality issues help define the usefulness and applicability of trading. Cause and effect water quality data, improved predictive modeling, and definitive information on the effectiveness of controls (particularly nonpoint source BMPs) are all crucial elements that will ultimately determine the role of trading in the water quality program.

■ ***Point/nonpoint source dichotomies are significant:*** The Clean Water Act establishes different program approaches for dealing with point and nonpoint source pollution. Trading programs must recognize these distinctions and be designed to complement the different procedures.

■ ***Education is key to any trading program:*** Facts about trading must be communicated to the public to help them recognize that trading programs are cost-effective ways of meeting existing water quality goals. Education can also be used to promote understanding among various levels of government and demonstrate the value of trading to potential participants.

■ ***Monitoring is essential to a trading program:*** Trades must be monitored to ascertain the effectiveness of individual trades, the amount of load reductions in the targeted pollutant as well as others, and the operation and maintenance of the program itself.

■ ***EPA should issue guidance:*** Conference participants encouraged EPA to issue guidance clarifying the use of trading. Recommendations for this guidance included defining:

- applicability under the current Clean Water Act,
- pollutant types and sources available for trade,

- issues of equity and accountability, and
- the role of trading in relation to existing point and nonpoint source control authorities.

EPA Response

Martha Prothro, Deputy Assistant Administrator, Office of Water, U.S. EPA, presented five key points determined from the presentations:

- The more progress made in overall water quality agenda, the more progress we can make in trading as well.
- EPA is both an educator and facilitator in the trading process. We are working to develop a framework that enables local and State entities to move forward with a trading scheme. We must encourage and document successes.
- Trading is a tool and not a panacea.
- There is a vital need for coalitions. The conference is a great example of what can be accomplished when the public and private sectors join together.
- There were a number of ideas such as accountability and equity that merit further examination. EPA is willing to be a risk taker in these areas.

Suggested Next Steps

EPA should use the information gathered at the meeting to pursue the concept of point/nonpoint source pollutant trading as a viable water quality management tool. EPA should continue to analyze the benefits and implications of trading and promote trading where and when it is appropriate. EPA should continue to collect and share information from pilot projects and look at barriers to trading to find solutions to those barriers. EPA should articulate the Agency's position on trading in the near future.

Breakout Group Conclusions

Group 1

The main factors addressed were

- regulatory,
- legal,
- information needs,
- education, and
- economic considerations.

Regulatory

It is important to determine what EPA's real motive is for getting involved in this issue and to what extent its authority should be exercised. There is some concern that the Agency might use this opportunity to expand its authority without a statutory mandate. Certainly, there is widespread agreement that EPA should be involved in this issue, but we must openly discuss the scope of that involvement.

Legal

After determining the nature of EPA's involvement and the role of other entities in the discussion process, existing laws and regulations must be examined carefully to determine if statutory action needs to be taken. Hopefully, such an overview will minimize possible legal challenges.

Information Needs

To adequately assess the problems with trading, a large amount of data must be collected. This process should involve everyone with an interest in water quality management and trading.

Education

It is especially important that time be spent educating all parties involved. Education is the primary ingredient in implementing any program.

Economic Considerations

The main issue here is equity between point source and nonpoint source issues in terms of cost and control. Cost-saving measures should be a consideration, but so should the idea of spending additional Federal dollars to help more segments of the community move forward with their programs.

Conclusions — Group I

- To become a useful water quality management tool, all aspects of a trading program must be in place. Pilots, tests, and demonstrations must be used to assess and illustrate the applicability and usefulness of trading.
- As a first step, EPA should issue guidance, not a regulation, to get the process moving.

Group II

Major issues of concern:

- credibility of BMP (best management practice) effectiveness;
- inability to measure effects on water quality and establish the market value of the trades; and
- the need to separate nonpoint source control issues from trading issues.

Credibility of BMP effectiveness can be broken down into several layers:

- First, readily accessible information on the fate and transport of pollutants from various land use practices is missing and, therefore, is not making its way to the decisionmakers.
- Second, there is a great deal of uncertainty that the dollars being put into BMPs to meet pollutant reductions are doing the intended job. Results seem to be variable, and it is very difficult to track and measure performance.

Inability to measure effects on water quality and establish the market value of trades.

- A value system must evolve among site-specific users and benefactors as they set quality goals and allocate those goals among point and nonpoint source generators.
- EPA is in the best position to set up broad parameters for a trading program.

The need to separate nonpoint source control issues from trading issues.

- We must be careful not to look at trading program as a panacea for solving water quality problems. Any trading program is dependent on water quality goals that have already been articulated by Congress or through regulations. The real question is: do we want to create a new program under current legislation or see what comes out of the new Clean Water Act reauthorization?

Conclusions — Group II

To specifically address the problems associated with BMP credibility, four recommendations were made:

- Information from existing research needs to be compiled into a useful reference document that includes actual design elements for trading schemes.
- Additional studies must be performed to fill in gaps identified in the reference document.
- A menu of BMP choices must be made available so those who must implement them are given more than one option.
- We need to create a water quality value system at the local level to generate a self-designed market that allows a bottom-up establishment of what values should be used on a site-specific basis.

Group III

The two main barriers are attitudes and uncertainties concerning nonpoint sources. The enabler is cost-effectiveness of the trading tool.

Attitudes and Uncertainties

Various attitudes and uncertainties can adversely affect any trading program. Examples include

- agencies that are limited in their thinking,
- point sources who may think they have done enough,
- agricultural interests who think they are not really the problem, and
- the general public that thinks trading will not work.

Cost Effectiveness of this Tool

After examining the costs and benefits of this tool, it was agreed that an opportunity to save money is an enabler to the program. However, failure to adequately examine costs and benefits is a real barrier.

Conclusions — Group III

- To remove barriers, States need to improve documentation on BMPs because it is critical that they buy into their own BMP programs.
- Monitoring of BMP installation is also needed for point sources to emphasize effectiveness and progress of the programs. Resources should not be wasted on expensive routine monitoring; rather, using planning-level estimates of BMP effectiveness as a measuring rod, the watershed should be assessed at the onset of the nonpoint source management plan and again much later (10-15 years) after significant improvement should be noted.
- A nonpoint source control program is and will be a long-term goal.

Group IV

Main areas addressed:

- administrative;
- technical/scientific; and
- resource issues.

Administrative

EPA should develop a framework to facilitate trading and minimize potential barriers, such as

- compromise of enforcement authority to achieve reductions, and
- interstate differences in water quality management programs, as well as watersheds, that cross political boundaries.

There are two differing points of view:

- trading must be achieved through local initiatives with minimum interference; and
- EPA has an obligation to ensure that water quality standards are achieved expeditiously.

A balance must be struck between these two views.

Technical/Scientific

These concerns were divided into three areas:

- The need for monitoring systems and data on land use, BMPs, and other sources on the watershed.
- A need to establish cause and effect relationships by developing model linkages based on specific watersheds and calibrated to local conditions and data.
- BMPs need to be adapted to local conditions, both evaluated and applied.

Resource Issues

EPA, as well as local and State entities, must be encouraged to maintain a level of expertise on trading.

- A framework needs to be developed to accomplish this objective and promote and guide trading. The initial framework should include a Federal role and must contain an educational element.

Conclusions — Group IV

- Trading is a valid, viable concept, although it may not be generally applicable in all water quality management situations.
- EPA seems to be defining a new role in nonpoint source pollution management; the discussion about point/nonpoint source trading begun at this conference should continue.

Group V

Six major elements were discussed:

- Trading is only a tool to be used to address point and nonpoint source pollution. It has merit and drawbacks.
- Will trading work? Before implementing a national policy, pilot projects should be undertaken and evaluated.
- A trading program would be a long-term commitment and must have adequate funding upfront and throughout the program to assure that data necessary to demonstrate the effectiveness of trading are collected.
- Communication between interested parties is critical.
- Federal agencies must coordinate with the State agencies to share databases and information.
- Accountability is key to ensuring that BMPs are implemented and truly successful.

Conclusions — Group V

- The implementation of BMPs should be left up to the local conservation districts and the publicly owned treatment works (POTW).
- Loading reductions should be the responsibility of the POTW. Action taken should focus on placing the burden on the point source.
- Requirements should be put in the permit that outline steps to be taken if loading reductions or goals are not reached.

Group VI

Four main areas were addressed:

- legal;
- administrative policy;
- technical; and
- education/public relations

Legal

Establishment of a regulatory baseline is essential for starting a successful trading program. The question is: when a new control technology is developed, what is the responsibility of the point source system to apply that new technology when they currently have a trading program underway? Rules are needed to establish trading regions.

Administrative Policy

Trading opportunities should continue to be explored as a policy option, and EPA should encourage States to develop programs by offering technical assistance and cost-sharing options. More funds should be directed to nonpoint sources.

Technical

Specific information is needed on the effectiveness of BMPs and when and where to employ them. A technically defensible ratio should be developed to make sure that point sources are getting their money's worth.

Education/Public Relations

The emphasis should be on local involvement—getting the communities and States in the program. A policy statement from State water quality agencies and EPA supporting the concept of trading is key to ensuring that point and nonpoint sources support this new structure.

Conclusions — Group VI

- More funding needs to be available for modeling and research efforts related to BMP effectiveness. Without good information on their effectiveness, BMPs will be a weak link in any trading scheme.
- EPA should publish guidance to help States and smaller units deal with the different aspects of a trading program. Such guidance is critical to continuing the program.

General Session Presentations

The Administrator's Point/Nonpoint Source Trading Initiative was intended to begin the process of forging a new national agenda on trading and the use of economic forces and incentives to abate water pollution. To this end, speakers in the opening General Session addressed the trading issue from practical, and again, multiple points of view. They represented the farms and the cities, the environmental advocates, and the Federal, State, and local governments.

■ **Geoffrey H. Grubbs,** ***Director of the Assessment and Watershed Protection Division, Office of Water, U.S. EPA,*** emphasized that this conference represented the deep, personal investment of EPA Administrator William K. Reilly in the belief that economic forces and incentives bear great potential for long-term pollution abatement and cleanup. The linchpin of the Clean Air Act, trading offers a whole set of new approaches and devices that offer opportunities for the Clean Water Act.

■ **William W. Cobey, Jr.,** ***Secretary, North Carolina Department of Environment, Health, and Natural Resources,*** citing the relatively new experience of his own State with trading, described three major benefits of the Tar-Pamlico project: (1) it brought together many diverse groups; (2) it has produced significant economic benefits, including funds that may be used to cost-share agricultural BMPs; and (3) the project has highlighted the significance of nonpoint source pollution and its control.

■ **Robert H. Wayland, III,** ***Director, Office of Wetlands, Oceans and Watersheds, U.S. EPA,*** discussed the three pillars central to EPA management: strategic planning, quality management, and pollution prevention. He drew upon EPA's water pollution statistics to illustrate that trading has the potential to become a pollution prevention mechanism. And he pointed out that, as EPA enters its third decade, the myriad of environmental needs must be met even more effectively and efficiently.

■ **Steve Tedder,** ***Water Quality Section Chief, Division of Environmental Management, North Carolina Department of Environment, Health, and Natural Resources,*** described the Tar-Pamlico Experiment in trading from the water quality/BMP standpoint. An implementation strategy to address nutrient-stressed waters, Tar-Pamlico represents an evolution from the regulatory stance to an innovative market-based approach.

■ **Malcolm Green,** ***General Manager, Greenville Utilities Commission, North Carolina,*** gave the commission's perspective on how trading worked in the Tar-Pamlico project. Pointing out the State's basin-oriented approach to water quality management, he expressed the concept of trading as an innovative, cost-effective approach that can be applied to both air and water.

■ **Steve Levitas,** ***Director, North Carolina Environmental Defense Fund,*** explained how coalitions can be built to contribute to such projects as the Tar-Pamlico scenario. In describing the process of diverse groups coming together in what has become an efficient, economic water quality management process, he said the divergent points of view contributed to the evolving strategy for solving the basin's pollution problems.

■ **Mark Luttner,** ***Special Assistant to the Deputy Assistant Administrator, Office of Water, U.S. EPA,*** discussed how trading has worked in various national models, citing statistics from projects in various basins. He emphasized several factors that must be present to make trading work: (1) clear and significant savings for point sources; (2) consensus among all the parties affected; (3) self-sufficiency for the project; (4) flexibility to adapt to changing conditions; and (5) implementation mechanisms in place.

To encourage open exchange within the discussion groups, widely varying viewpoints were presented by panelists exploring the barriers and opportunities to trading. They included:

■ **John Burt,** ***Associate Deputy Chief, USDA Soil Conservation Service,*** cautioned that agricultural interests should be involved early in the trading process. The agricultural community will be interested in the concept, particularly when the incentives are appropriate, the technology is practical and cost-effective, and the uncertainties are settled by involving the agricultural interests.

■ **Diane Cameron,** ***Natural Resources Defense Council,*** reiterated the need to involve all stakeholders early — especially the farming community — before initiating the trading process. The trading concept can work and be cost-effective if managed properly by informed participants on a consensus basis.

■ **Judy Olson,** ***Secretary, National Association of Wheat Growers,*** spoke of reasonable approaches to the shared goal of protecting water quality. She concurred with the concept of involving all concerned in the initial stages and emphasized the value of trading as a market-based alternative to regulation.

■ **Ken Kirk,** ***Executive Director, Association of Metropolitan Sewerage Agencies,*** brought the point source viewpoint to this panel. Representing a highly regulated segment of society, he spoke to the point of taking great care to make trading work — to measure its progress and establish its value step by step.

APPENDIX A

NATIONAL MEETING:

Administrator's Point/Nonpoint Source Trading Initiative

April 27 – 28, 1992

Sheraton Inn University Center

Durham, North Carolina

Sponsored by

U.S. Environmental Protection Agency

Hosted by

North Carolina Department of Environment, Health and Natural Resources

FINAL AGENDA

Conference Goal and Objectives

Goal

To broaden a general understanding of point / nonpoint source pollution trading and promote its acceptance as an integral component of water quality protection.

Objectives

1. Identify programmatic, technical and legislative factors that facilitate — or discourage — trading;
2. Develop cooperative action plans to address technical, legislative and programmatic barriers;
3. Develop recommendations for supportive activities by EPA, including guidance, policies, regulations and legislative proposals; and
4. Identify, *if possible*, specific waterbodies that could serve as pilot opportunities for trading.

Sunday evening, April 26

3 – 8 p.m. ***Registration*** . . . . . *Foyer of The Greenbrier Ballroom*

6 – 8 p.m. ***Informal welcoming reception*** . . . . . *The Greenbrier Ballroom C and D*

Monday, April 27

7:30 - 8:30 a.m. ***Continental Breakfast*** . . . . . *2nd Floor Balcony*

8 – 8:30 a.m. ***Registration*** . . . . . *Foyer of The Greenbrier Ballroom*

General Session . . . . . *The Greenbrier Ballroom A–B–C*

8:30 – 8:45 a.m. **Call to Order** — Geoffrey H. Grubbs, *Director, Assessment and Watershed Protection Division, Office of Water, U.S. EPA*

8:45 – 9:00 a.m. **Welcome** — William W. Cobey, Jr., *Secretary, North Carolina Department of Environment, Health and Natural Resources*

9:00 – 9:30 a.m. **The Entrepreneurial Spirit** — Robert H. Wayland III, *Director, Office of Wetlands, Oceans and Watersheds, U.S. EPA*

9:30 – 10:30 a.m. **The Tar-Pamlico Experiment**

- **Approach and design.** Steve Tedder, *Water Quality Section Chief, Division of Environmental Management, North Carolina Department of Environment, Health and Natural Resources*
- **Practical consequences.** Malcolm Green, *General Manager, Greenville Utilities Commission, North Carolina*

10:30 – 10:45 a.m. ***Break***

10:45 – 11:45 a.m. **A National Approach**

- **Effective coalition building.** Steve Levitas, *Director, North Carolina Environmental Defense Fund*
- **Alternative national models.** Mark Luttner, *Special Assistant to the Deputy Administrator, Office of Water, U.S. EPA*

11:45 – 1:00 p.m. ***LUNCHEON*** . . . . . *The Brightleaf Ballroom E–F*

- ***Welcome.*** E. Stallings Howell, Jr., *Chief, Wetlands, Oceans and Watersheds, U.S. EPA Region IV, Atlanta*

1:00 – 2:45 p.m. **Barriers and Opportunities**

- **Incentives for agriculture.** Gary Margheim, *Deputy Chief for Programs, Soil Conservation Service, USDA*
- **Can the environment benefit?** Diane Cameron, *Senior Research Associate, Natural Resources Defense Council*
- **Can farmers benefit?** Judy Olson, Secretary, *National Association of Wheat Growers*
- **Can POTWs benefit?** Ken Kirk, *Executive Director, Association of Metropolitan Sewerage Agencies*

2:45 – 3:00 p.m. ***Break***

3:00 – 5:00 p.m. ***BREAKOUT SESSIONS***

- Breakout Session #1 . . . . . *Conference Room 2002*
- Breakout Session #2 . . . . . *Conference Room 2003*
- Breakout Session #3 . . . . . *Conference Room 2004*
- Breakout Session #4 . . . . . *Conference Room 2005*
- Breakout Session #5 . . . . . *The Brightleaf Ballroom G*
- Breakout Session #6 . . . . . *The Brightleaf Ballroom H*

5:00 – 5:30 p.m. **Interim Status Reports** . . . . . *The Greenbrier Ballroom A–B–C*

5:30 p.m. **Adjourn**

6:00 p.m. ***Social hour*** . . . . . *Poolside – Atrium*

Tuesday, April 28

7:00 – 8:00 a.m. ***Continental Breakfast*** . . . . . *2nd Floor Balcony*

8:00 – 10 a.m. **Breakout groups reconvene** *(same rooms as listed above for Monday)*

10:00 – 10:15 a.m. ***Break***

GENERAL SESSION . . . . . *The Greenbrier Ballroom A-B-C*

10:15 a.m. – Noon **Breakout group presentations and discussion**
CHAIRPERSON: Martha G. Prothro, *Deputy Assistant Administrator, Office of Water, U.S. EPA*

Noon – 1:00 p.m. **Synthesis, commitments and closing remarks**
CHAIRPERSON: Martha G. Prothro, *Deputy Assistant Administrator, Office of Water, U.S. EPA*

1:00 p.m. **Adjourn**

ACKNOWLEDGMENTS

This group of people deserve special recognition for their instrumental role in developing this conference:

Robert H. Wayland III, *Director, Office of Wetlands, Oceans and Watersheds, U.S. EPA*

Geoffrey H. Grubbs, *Director, Assessment and Watershed Protection Division, U.S. EPA*

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APPENDIX B

NATIONAL MEETING:

Administrator's Point/Nonpoint Source Trading Initiative

April 27 – 28, 1992
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APPENDIX C

BREAKOUT GROUP I DISCUSSION

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Worst Outcomes

- Show how little I know about water.
- Won't have open communication between point source and nonpoint source contributors.
- Won't answer questions.
- Ken Kirk's prediction about paperwork would come true.
- Plane crash situation; we won't learn.
- If everyone doesn't speak up.
- If the agenda developed here does not reflect all opinions.
- If we discover contracting errors.
- If recommendations have no practical applications.
- No recommendations for market incentives in water program.
- If EPA uses this agenda exclusively in making decisions.

- Private industry excluded from market-based programs.
- Won't be able to say what I'm supposed to say.
- Won't know the answer to "Why are we here?"
- If *Inside EPA* quotes me — while I'm wearing two hats.
- If group fails in its task.

Best Outcomes

- We find trading can be a win/win situation for all parties.
- We realize the promise that point/nonpoint trading holds — and its benefits for agriculture.
- We learn more about trading so we can better relate to constituents.
- We broaden trading to be a permitting option in the future.
- All parties will get a better understanding of the concept.
- We increase understanding of the power of trading for environmental protection and find risk-takers to advance and demonstrate market incentives.
- We will work cooperatively with agricultural agencies to maintain long-term conservation practices.
- We will have an open and honest exchange of views and be able to translate them into a new consensus in meeting environmental challenges.
- We will explore administrative and institutional issues associated with trading — is it worth the administrative risks?
- We will be able to administer trading to the satisfaction of the States, POTWs, and other affected parties.
- We will learn enough about procedures and process to implement the concept.
- We will gain enough knowledge to educate constituents and begin cooperative actions.
- Participating in the group is an outcome if we get reactions to the report.
- We will continue to identify management tools and efficient mechanisms to achieve water quality goals.
- We will gain new, transferable insights.

Barriers/Opportunities — Brainstorm List

- Suspicion of hidden agenda.
- Questions about accuracy of identified sources of pollution.

- Questions about data reliability.
- Complexity or size of watershed.
- Ability to measure success that is technically and politically acceptable.
- Improve water quality.
- Education process required for cooperation.
- Adequate enforcement mechanisms.
- Need to periodically evaluate progress.
- Potential expansion of enforcement and compliance actions without statutory authority.
- Complexity of technical issues.
- Identification of water quality problems and sources may be incomplete.
- Potential for cost savings.
- Liability associated with nonattainment.
- Different goals of various parties involved.
- Absentee landlords.
- Lack of clarity of different parties.
- Long-term reliability of nonstructured BMPs.
- Point source dischargers unwilling to pay for nonpoint source controls.
- Institutional resistance to innovative tools.
- Inflexibility of existing laws and regulations — legal.
- Need for site-specific information on BMP effectiveness.
- Inability of point sources to meet water quality goals by themselves.
- Political climate.
- Need to involve all parties.
- Chance for everyone to obtain mutual objectives.
- Is there a lack of government resources to oversee.
- Inability of parties to accept responsibility.
- Accurate data needs.
- Economic climate that would encourage more cost savings.
- Lack of incentives for nonpoint sources to participate.
- Reauthorization of CWA that precludes trading.
- Need to address intermediate transfers.
- Potential freeing up resources for other societal needs.
- How to address need for continued economic growth.
- Rate payer support.

- Creation of unstable market.
- Limited focus on trading.
- Questions about private property rights.
- Real or perceived inequities of bearing the cost.
- Existing command control mentality that we are working with/under law.
- Opportunity to focus on costs and benefits.
- Need to have a tool to address a large number of various discharges.
- Nonpoint source dischargers unwilling to pay for nonpoint source control.
- Annual variability in loads.
- Absence of success stories.
- Land use controls.
- Legal challenges.
- Risk of a perceived subsidization.
- Education.

SUBGROUP 1: Regulatory/Legal Issues Regarding Implementation

ACTION PLAN

1. **Address suspicion of "hidden agendas."**
   - Agree that overall objective is improvement of water quality and meeting water quality standards.
   - Without abdication of private property rights and/or excessive land use controls.
2. Once above is accomplished, **identify barriers/inconsistencies in existing laws/regulations,** then
   - amend statute and revise regulations to
     - — remove barriers,
     - — clarify objective to promote or encourage implementation of trading, and
     - — clarify enforcement and compliance mechanisms (i.e., document chain of responsibility for contracts, agreements, penalties, sanctions).
3. If above are successfully accomplished, **legal challenges could be minimized.**
4. Determine who will be responsible for implementing, regulating, and monitoring these programs. The question, "who?" should be linked to each stage of the action plan.

- EPA, States, national trade associations, locals, public/environmental interest groups through public education, working groups, and public meetings.
- All of the above.
- Regulatory agencies and legislators.
- Regulatory agencies.
- All parties or no parties.

LIST OF ISSUES

- Inflexibility of existing laws and regulations.
- Suspicion of hidden agendas.
- Adequate enforcement mechanisms.
- Potential expansion of enforcement and compliance actions without statutory authorization.
- Reauthorization of CWA that precludes/promotes trading.
- Questions about private property rights.
- Liability associated with nonattainment.
- Land use controls.
- Legal challenges.

GROUP FEEDBACK ON ACTION PLAN

- As part of clarifying enforcement mechanisms: add innovative enforcement/sanctions; not traditional penalties.
- Question: What are the hidden agendas? Hard to argue with goal of improving water quality. Hidden agenda may be related to who is responsible for improving water quality.
- Hidden agendas potentially — in transfers of responsibility. Many think there are hidden agendas.
- Address hidden agendas through open process.
- Agendas not hidden — goal is geared toward improving water quality; just finding a different way of getting there.
- But is there authority now in CWA?
- Is this approach unique?
- There are two existing programs, and two that will begin.
- All parties in above programs have agreed to trade. If trading is required, people will be wary.
- Is role of Agency to say this is what we should do — or to present it as an opportunity, possible tool?
- When does guidance become GUIDANCE?

SUBGROUP 2: Information Needs

ACTION PLAN

A. What needs to be done?

B. To develop opportunities

C. Who?

— State

— Federal

— Point Source

1. Problem Assessment
   - * 3 A. Collect data
   - * 4 B. Share existing information
   - * 7 C. State, Federal, private, local sector
   - * 10
   - * 12

2. Implementation
   - * 5 *10 A. Demonstration pilot projects
   - * 1 *13 B. Information/education process
   - * 2 C. Private sector and State/local, Federal overview
   - * 8 (targeting B., B. reflecting on A)
   - * 2

3. Evaluation
   - * 5 * 10 A. Monitor — experimental design
   - * 1 * 13 B. All parties agree on goals (water quality, land treatments)
   - * 2 C. Large State role, but all parties, local government
   - * 4
   - * 6
   - * 7

ISSUES

1. Long-term reliability of structural BMPs.
2. Need for site-specific information on BMP effectiveness.
3. Questions about accuracy of identified sources of pollution.
4. Questions about data reliability.
5. Complexity or size of watershed.
6. Need to periodically evaluate progress.
7. Accurate data needs.
8. Opportunity to focus on costs and benefits.

9. Need to have a tool to address a large number of various discharges.

10. Annual variability in loads.

11. Identification of water quality-based problems and sources may be incomplete.

12. Absence of success stories.

GROUP FEEDBACK

- Was there any discussion on the need for more fundamental research? Are the tools and technology that exist adequate?
- There always needs to be more research on data collection methods.
- Costs/benefits: if we want a basinwide effort, we need to break out goals and set priorities (limitations on resources); then we can look more carefully at costs/benefits. This requirement results in ranking alternatives (i.e., costs/benefits analysis goes beyond data).
- Are there any requirements for nonpoint sources?
- There are no Federal regulation requirements, but some State requirements.
- There are regulatory programs under USDA. There are incentives in the Farm Bill.
- There are some State regulatory programs — States have authority.
- There is threat/fear for agricultural community. Agricultural community needs to take advantage of existing programs.
- Ranchers and farmers have tremendous incentive to put BMPs and other management ideas in place. Programs are very well received. But there are cost restraints. Need to overcome economic barriers.
- Need to include cost of not doing BMPs and other management techniques in cost/benefit analysis.
- A lot of this is education.
- The audience is receptive. Farmers want to do what is right for the environment, but they also want demonstration of nonpoint problem.
- Want proof of benefits — proof that a difference will be made. This requirement implies education and demonstration.
- How can we get parties to commit if don't have absolute demonstrations (e.g., Boulder Creek — cost savings)?
- Need increased transfer of information and information on relationships between activities and environmental results.
- How long does it take to educate the farmer? Why do nonpoint sources need special treatment and special education?

SUBGROUP 3: Economic Considerations

ACTION PLAN

- Ensure equity between point sources and nonpoint sources in controls and costs.
  - — National/State – laws/regulations.
  - — Education and economic analysis to show cost savings.
  - — State – analysis.
  - — Locals – education.

LIST OF ISSUES — ECONOMIC CONSIDERATIONS

- Creation of unstable markets.
- How to address need for continued economic growth.
- Potential freeing up of resources for other societal needs.
- Potential for cost savings.
- Land use.
- Economic climate that encourages cost savings.
- Lack of incentives for nonpoint sources to participate.

ADDITIONAL ISSUES — EQUITY/RESPONSIBILITIES

- Inability of point source to meet water quality goals by themselves.
- Real or perceived inequities of bearing costs.
- Nonpoint source dischargers unwilling to pay for nonpoint source controls.
- Economic climate that would encourage more cost savings.
- Lack of incentives for nonpoint sources to participate.
- Rate payee support.
- Absentee landlords.
- Point source dischargers unwilling to pay for nonpoint source controls.

GROUP FEEDBACK — ECONOMIC CONSIDERATIONS

- Are the players always POTWs (point source) and agricultural (nonpoint sources)? The community can be broader; it depends on location and problems.
- There are industries (and food) that are tied into POTWs — some dealt with through pretreatment (not trading).
- Scope gets complicated with more players — economic analyses and other issues become more complex.

- Discussions in group have applied to broader approach that brings in other entities. (What about abandoned mines?)
- Is there anything to be said about the fact that a lot of money was transferred from government to State to contract point source dischargers (e.g., in 1970s)?
- Point source community highly regulated — local governments now expend great amounts of resources.
- Nonpoint source dischargers are now regulated, but are not getting the same level of assistance.
- Add incentives to national/State regulations.
- How important is equity compared to overall cost savings? Costs eventually get passed on to public in all cases. Is least cost more important than equity?

SUBGROUP 4: Institutional Issues

ACTION PLAN

EPA TO DO

1. Law
   - — Guidance
   - — Legislative initiatives
   - — Legal analysis — Clean Water Act issues
   - — Empowerment
   - — Policy statements regarding expectations
2. Organizational role of EPA articulate structure/culture of watershed protection approval step up
   - — Pilots
   - — Basin organization
   - — Education "resistance to change"
   - — Success stories
3. Implementation
   - — Promote risk taking
   - — Promote consensus/collaborate negotiations
   - — Guidance/publications
   - — National regulations
   - — Pilots
   - — MODELS (USA, Europe)
   - — Momentum/trends
   - — Federal/State/local/regulated

4. Education buy-in
    - — National associations educate/involve
    - — "Tool kits" for locals
    - — Put expectations in check/establish
5. Win-win
    - — Promote consensus-building skills
    - — Change of approach

LIST OF ISSUES — INSTITUTIONAL

Institutional resistance to innovating tools:

- Inflexibility of existing laws and regulations.
- Suspicion of "hidden agendas."
- Complexity or size of watershed.
- Ability to measure success (technically and politically).
- Cooperative education is required.
- Need to periodically evaluate progress.
- Need to address intermediate transfers.
- Chance for parties to attain mutual objectives.
- Limited focus on trading (with nutrients).
- Complexity of technical issues.
- Goals of involved parties.
- Tool to address large number of discharges.
- Lack of clarity regarding roles.
- Political climate.
- Need to involve all parties.
- Lack of government resources for oversight.
- Existing command and control climate.

GROUP FEEDBACK

- Everyone needs to be involved in all action items (not just the EPA).
- Basin organization includes all parties and institutional structures. Coordination among agencies and parties is implicit — "Basin Culture."
- Oversight/Enforcement — this approach requires cultural change. Need institutional changes. How will this be enforced?
- Guidance should address above issue of enforcement and also needs to clarify the role of the EPA.

- Enforcement: program is driven by economics. If approach doesn't work on basin-by-basin basis, at least cost, then old ways will emerge. This is enforcement mechanism — cost savings.
- For farmers — penalty could be paying money with interest.

CONCLUSIONS

- Potential to be a viable tool:
  - — Needs further assessment
  - — Pilot studies, tests, demonstrations
  - — Not to be mandated yet — if so how?
- Cautious optimism

IMPROVE WATER QUALITY

- Inability of point sources to meet water quality by themselves.
- Opportunity to focus on cost and benefits.
- Annual variability in loads.
- Complexity in technical issues.
- Limited focus on trading (nutrients).
- Complexity or size of watershed.
- Improve water quality (topic not covered in detail).

SOCIAL/POLITICAL ACCEPTANCE

- Narrow-focused.
- Suspicion of hidden agenda.
- Land use controls.
- Different goals of various parties.
- Political climate.
- Chance for different parties to achieve mutual objectives.
- Inability of parties to accept responsibility.
- Risk of perceived subsidization (topic not covered in detail).

POTENTIAL PILOT WATERBODIES/CONTACTS

- Cushing, OK (Cottonwood Creek) — Russ Dutnell
- McAlester, OK (West Plant) — Russ Dutnell
- Chehalis, WA — Scott Boettcher
- Spokane River, WA — Scott Boettcher
- Puyallup, WA — Scott Boettcher
- Westchester County Drainage of Long Island Sound — Rick Balla

GROUP FEEDBACK

- Good identified barriers and concerns that need to be addressed.
- Fleshed out questions — will find answers to communicate back.
- Going well.
- Hopeful that what we've done will help EPA come up with alternative permitting option.
- Progress going well; fleshed out questions, concerns, and opportunities. Good backdrop for moving forward.
- Starting to see agenda for further action; group members are positive about process.
- Good about process; on way to developing "what to do" solutions.
- Nothing new here.
- Consensus-building process makes us feel good, but it remains to be seen if questions will be answered.
- A lot of work ahead (for EPA), but there's a structure in place for it.
- Anxious to hear what group accomplished.
- Different perspectives are interesting.

BREAKOUT GROUP II DISCUSSION

GROUP MEMBERS

Debra Whitall, facilitator
Robert Alpern
Diane Cameron
James Cox
Steve Eldredge
John Hosemann
Roger Schecter
Greg Jennings
Greg Kosarian
Judy Olson
Mark Pfefferle
Dave Stawick
Geoff Grubbs
Trevor Clements
Peggy Michell
Bill Funderburk
Jim Greenfield
Frank Tursi

Worst Outcomes

- We don't listen to each other and process falls apart.
- We can get a real good idea or concept for pollution trading (PT) but have too many controls (in setup). Don't think we should regulate first.
- We won't successfully understand.
- I fear we won't get beyond the surface rhetoric.
- People with good ideas won't get a chance to express them.
- This could be another good idea to put on the shelf — if it doesn't get integrated.
- It won't take place.
- People will walk away from the meeting not knowing about PT.
- We'll develop a Cadillac version of a trading policy applicable to a few places but not to all — showcase watersheds that won't get translated to all the watersheds that need work. Need more dialog and meshing of our goals.
- We won't address ourselves to the common themes on trading.
- We'll have great ideas but neglect finances.
- Have to keep in mind there are a lot of policy issues.

- We may not be smart enough or strong enough to think through financial, political, and technical stuff to get where we want to go.
- People won't speak candidly about whether it's a good or bad idea because EPA seems to be going down this road already.
- A potentially good idea may be turned against major urban centers because they're easy to control and easy targets.
- I fear that higher ups will decide rather than those doing the polluting — for example, farmers own the property they are polluting.

Best Outcomes

- All participants speak out regarding trading.
- Set priorities.
- Identify options for trading systems.
- Everyone will speak freely — and everyone will listen — regardless of who we represent.
- Set up a network and schedule for resolution of key issues.
- We come away with the first two steps accomplished — we can all agree we have a set of watersheds that need to be addressed — point/nonpoint trading might be a good idea; no one source of pollution takes responsibility but all sources take responsibility.
- A clear understanding of where the agreements and disagreements lie. Not get all jumbled together.
- Candid, open discussion.
- A clear idea of what trading is.
- Identifying all the players and their roles and how to keep people involved in positive role.
- Walk away with more open minds than we had when we came in.
- How to convince point source dischargers that this is valuable to them.
- Develop demonstration project.
- Need something ongoing — agree to nonpoint question — answer scientific questions — ownership — discipline and trading.
- Need solid science on who's polluting what.
- We need some science about site pollution.

Barriers and Opportunities — Brainstorm List

- Barrier — what is trading?
- Problems are multiparameter — single parameter concerns me.

- Effective means for point source cooperation.
- Blending of the different technical roles.
- A lack of public involvement — people may feel they're being worked on rather than being worked with.
- Concept is very broad — get a handle on what it is and what's been done with it.
- Nonpoint and point sources are contributing — definition of point and nonpoint — who's got ownership?
- How do you bring both parties to table and fairness/equity?
- Trading will end up masking the effects of urbanization and, if not done in a sensitive way, enabling urbanization and its effects.
- Issue of credibility — point and nonpoint runoff — predictable effectiveness.
- Great opportunity to move to cost-effective program.
- Liquidity — best done on watershed basis. Are there enough participants in that watershed?
- Real need to find additional capital to pay for water.
- Present mindset.
- Inappropriate focus on point sources.
- Problem of moving standards, data, qualities — need standards for these and technology.
- Atmospheric vs. hydrologic sources.
- Habitat restoration needs to be recognized.
- Differentiate between sources (problems) and what's a trading issue.

Issues

- Trading schemes ignore upland and upstream effects in favor of management in the very end (estuaries) — Chesapeake Bay protected at cost to wetlands, uplands habitat, and other issues. Am against it, if trading is at this cost.
- What's the best way we can protect and restore this watershed?
- Market and values will eventually work this out — broaden to include all values.
- What do we mean by a basinwide plan? Need a better definition.
- We may be defining trading through too narrow a focus.
- Today we have a worldwide context and trading around the clock.
- Identify objectives — are we forgetting about this aspect — have opportunity of using basinwide plan to get at these priorities and goals.
- Can the market give us more habitat protection — yes, if broadly defined — no, if narrowly defined.

- If we ever got to a discussion of water-trading values, we'd have made a big step.
- The integrative process will eventually deal with these things.
- Stormwater runoff — trade-offs in Maryland — very difficult.
- Agriculture — last remaining bastion of pollution — need to think about nonpoint source.
  - If we purify the sector, we make progress.
  - The broader the base at the bottom, the better chance this has to work.
  - Agriculture needs to ask "are they harming anyone — killing anyone?"
- Nonpoint and point trading — the ability to measure contribution is a real problem.
- Establishing the value of what you're trading.
- Giardia cysts and cryptocysts on the farm. Data, standards are not there yet. Chlorine doesn't even get at them. We're just at the beginning of understanding.
- Recreation, mining, and other sources of pollution

Summarizing

- Equity and getting runoff polluters to the table.
- How do you create value, market — create priorities and hierarchies?
  - Appropriateness of the trading process.
  - Once you have this list, then you have subquestions.
- If I have a value, but I don't know how to market that value, that's inappropriate.
- We're here to hear what differing views are and how to mesh them.
- What's been done and what it really is? Track record.
- Trading as a concept is a value if it will solve more environmental problems at lower costs.
- What about getting the same kind of gains under current regulatory laws at lower cost?
- Current gains only recognized in better water quality.
- The issues are broader than water quality.
- Urban area wetlands need to be considered, too, in relation to water quality.
- Should we limit to water quality?
- $40 billion in source treatment?
- Regulating freshwater at lower costs.

- Should we talk . . . . [about] public health.
- Chemistry is not a good substitute.
- Problem: are living resources important in Chesapeake Bay and chemical resources?
- If you have a multiparameter basin plan and a fuzzy chemical plan, numerical goals win out — fuzzy values lose.
- If you maintain the health standard of the water but improve water for the fish, those resources will come back.
- No longer see or make a connection between water quality and living system.
- Most important thing we can do is to define the problem. Until we've done that, we're just giving in to majority vote.
- Do we want to go back to the group saying these are the problems we see or do we want to say this is what we see as what to do about these problems?
- What are values and how do we create a market?
- Not only what waterbodies but also what kind of pollutants should be considered?
- Is there a need for statutory change?
- Key issues are 10, 18, 22, and 24.
- How to determine what has a value?
  - — Credibility of BMP effectiveness
  - — Separate trading from nonpoint source control issues.
  - — How to create value and market — ability to measure.

Brainstorming Writeouts

(Please note: asterisks (*) denote number of votes given to each topic.)

- Define trading: lay/politician.
- Multiparameter problem.
- Effective means for point source cooperative.
- Reconcile technical and regulatory Issues. *
- Lack of public involvement.
- No track record.
- Define ownership of point and nonpoint source. *
- Equity and getting nonpoint source people to trade. *
- Enabling urbanization and masking its effects. ***
- Credibility of BMP effectiveness. ******* #1
- Move to use more cost-effective BMPs.

- Liquidity: enough participant facilitation.
- Need for additional capital to finance BMPs. **
- Mindset. *
- Changing standards. **
- Atmospheric vs. hydrologic sources. **
- Habitat restoration has to be recognized. *
- Separate trading from nonpoint source control issues. ***** #2
- Minimizes upland effects.
- Opportunity for basin planning. ***
- NP/NP trading — on narrower base — this is the worse case, the problem.
- Inability to measure — establish the value of what you are trading. ******** #3 combined with (24)
- Other contributors — recreation — silviculture — chronological — water quality gains under current regulatory framework at lower cost.
- How to create value? Market? *** #3 combined with (22)
- Kind of pollutants considered for trading. *
- Need for statutory change. ***.

SUBGROUP 1 — Discussion

- Claim credibility — menu of choices — don't force options.
- Begin at local level — let locals identify problems — take first shot at options for correction.
- State and local pick up on finances — feed down to local level — partnership for implementation.
- Waterbodies — more of a generic need.
- What about resources needed to do evaluation?
- State source of evaluation along with EPA and others.
- Should some of the trading money be traded off for this?
- I don't think so. Real reductions are your ultimate goal.
- Could post-reduction be part of the trading process?
- Maybe they have to document that they made their claims in trading process.
- What size watershed?
- The larger the watershed — deal with urbanization — look to controlled watersheds — small to moderate watersheds so you can track them.
- Forest Service has rules of thumb.

- 8 to 10 thousand acres.
- Can test beyond edge-of-field but not so far that we lose control.
- Looking at ways to improve our modeling capabilities.
- Work done at North Carolina State and at Wisconsin.
- As a group we don't know what has been done and what hasn't. Need to get the word out (on what's already been done).
- Need to know why results in different areas and States are different from one another.
- Each watershed unique.
- Will modeling help? Yes, we think so.
- Deal with what data you have, consider what you need, and begin to work from there.
- Coastal plain of Piedmont — extrapolate.

SUBGROUP 2 — Discussion

- Still some problems between source issues and trading issues.
- Generic, nonpoint issues vs. trading issues.
- Someone at center needs to be in touch with wide variety.
- Facilitate change — go talk to these people to see how they handled problem — largely informational to get trading off the dime.
- We need a two-step approach.
  - — Identify regulatory goals — must be understood
  - — Then you can begin putting together market values and setting up structures — trading not panacea to problem.

SUBGROUP 3 — Discussion

- Been working on trading for as long as I've been in water quality.
- Create a value system that evolves from trading — generate on-site among the users and benefactors — privatization.
- Quality goal of some kind — allocate goal among point and nonpoint coalitions.
- Consider impact of both on- and off-site pollution.

GROUP 1 — Issue 10

Barrier: Credibility of BMP effectiveness

- Lack of readily accessible information on the fate and transport of pollutants from various land use practices, particularly on a watershed scale as opposed to edge-of-field.
- Uncertainty that dollars put into BMPs to meet equivalent pollutant reductions will actually result in targeted reductions.
- Others: Feasibility — "one-size-does-not-fit-all" administrative effectiveness to ensure that BMPs are in place and length of time BMPs are effective.

— What needs to be accomplished to remove barriers?

a) Need to aggregate information from existing research and compile into useful reference. If already done, then need to get the word out.

b) Perform additional studies to fill gaps identified during the compilation of existing information, particularly "before and after" studies on the watershed scale (warning: be sure to account for all land use activities during study, not just on BMP implementation areas).

c) To maintain credibility with those having to implement BMPs, provide for a menu of BMP choices; try not to force one option.

— Who needs to do it?

a) Needs to be a partnership of local conservation districts with State and Federal agencies:

ROLES:

Local district: Opportunity to identify known problems or discuss those presented to them from outside agencies and take first shot at which direction needs to be taken to address the problems (i.e., types of BMPs, feasibility). Input and shape direction.

State and Federal: Fund and perform additional studies as needed to develop technical information base. Mechanism for technology transfer, feed information back down to local level.

Technical research and information transfer.

Partnership in implementation: equal say in strategies.

— Pilot waterbodies? Generic need; apply to any waterbody that meets other trading criteria.

GROUP 2 — Issue 18

- Confusion between problems that are inherent in addressing nonpoint source pollution (regardless of approach), e.g., establishing goals, monitoring enforcement, and those limited to trading, e.g., institutions to facilitate trades.
- EPA to provide guidance to those considering trades:
  - — More specific guidance needed to clarify distinctions.
  - — A clearing house function.
  - — Facilitate exchange between those who have done trades and those interested in trade networking.

GROUP 3 — Issues 22 and 24

- Have been working in environment trading for 50 years. What we want to do is create a value system to allow bartering and generate a self-designed market. Privatization.
- Need to define a water quality goal.
- Need to allocate per watershed point vs. nonpoint — on-site vs. off-site benefits.

BREAKOUT GROUP III DISCUSSION

GROUP MEMBERS:

Ron Boatner, facilitator
Dave Leston
Randall Benn
Louise Wise
Richard M. Kashmanian
Dana B. Ott
James Gardner
Eugene Lamb
Ralph Cantral
Stuart Schwartz
Robert Zimmerman
Arthur Ashendorff
Mitchell Griffin
Beth McGhee
Jim Cummings
Bobbye J. Jones

Worst and Best Outcomes

- Too much disagreement about trading initiative/spill over into point source area.
- Total chaos/more cost sharing.
- Point source focus thinking: too strong/more decentralized focus — nonpoint focus.
- Waste of time; no listening/good answers to questions.
- Oversimplified outcome; rosy picture/source tradeoff.
- Miss benefits of big picture/Get view of big picture.
- Big report gets put on the shelf/ideas of widespread application.
- Too rosy impression/identification of shortfalls in ultimate report.
- Polarization/questions get answered — especially about watersheds.
- Additional delay/new ideas; moving forward even without all the answers.
- EPA gets too rosy picture/clarification of meaning.
- Thinking that this will work everywhere/accept concept.
- Disincentives/arrival at least cost solutions.
- Conference waste of time/productive.
- Layers of bureaucracy.

Barriers and Opportunities — Brainstorm List

(Key: **B for barrier; E for enabler**; asterisks indicate priority to group)

- Proving BMPs difficult; lack of quantification of BMPs. *** (B)
- Initiative allows people to pollute. (B)
- Water quality problem is one that people identify with. (E)
- NPS — lack of positive communication. (B)
- Historical attitudes. (B)
- Perception that point source has footed bill for too long. (B)
- Technical data on the table for everyone to see. (E)
- Contradictory objectives. (B)
- Without total maximum daily load (TMDL), the process set-up cost is too high and borne by point source. (B)
- Scientific certainty of TMDL. (B)
- Absence of loading limits (TMDL). (B)
- Funding. (B)
- TMDL process itself. (B)
- Traditional attitudes of agriculture. *** (B)
- Changing attitudes. (E)
- Opportunity to quantify BMP benefits. (E)
- Dual management tool (protect water quality and promote growth). (E)
- Inappropriate standards for point source. (B)
- Variability in water quality standards. (B)
- Potential for saving money means voluntary interest. *** (E)
- Elevate public knowledge of existing NPS management options and programs. *** (E)
- We have reached the point where the amount we spend on point source doesn't make the difference it used to — now it's time for nonpoint to take over a bit; it will be beneficial to spend money now on nonpoint.
- Greater gain environmentally for dollars spent. *** (E)
- Cooperation. (E)
- Cooperation. (B)
- Lack of variability in water quality strides for NPS. *** (B)
- Suspicion of innovation. (B)
- Something different than regulations. (E)

- Flexibility. *** (E)
- Changing attitudes (agencies and locals). (E)
- Uncertainty /controllability of NPS. *** (B)
- Existing statutes; what is the baseline? (B)
- Facilitates BMP implementation. (E)

Organize, Summarize Data, and Set Priorities

(Based on participant vote)

- Attitudes = most important.
- Flexibility = Barriers and Enablers.
- Cost/Benefit.
- NPS uncertainty.

Group Work Assignment: Four Questions

- What needs to be done to remove the barrier or enhance the enabler?
- Who needs to do it?
- List pilot waterbodies.
- Prepare five-minute report for presentation.

SUBGROUP 1 — Discussion

ATTITUDES

Barriers:

- Agricultural attitude — "We're not the problem."
- Agency attitude:
  - — Thinking only it can fairly deal with problems.
  - — Refusal to let go of traditional programs.
- Point source attitudes — feel they've done their share.
- General public attitudes:
  - — Suspicions
  - — Lack of knowledge
  - — Unsure it will work
  - — Perception of agriculture

Solutions:

- Foster cooperation — Who: everyone
- Use Watershed management to bring all stakeholders together . . . then use stakeholders to sell peer to peer the trading concepts *(on pilot basis) — Who: EPA, USDA, shared participation, constituent groups, NACD, AS & WPCA, NASDA, and others.
- Educate and promote watershed trading to national constituencies by building on national watershed committees (e.g., EPA and interagency group) as appropriate; don't be too rosy — Who: national local levels.
- Provide knowledge.
- Educate public about trading concepts from national level:
  - — Develop education program.
  - — Distribute public education document on information in Mark Lutner's report.
  - — Put articles into newspapers (e.g., *Washington Post*).
- Training workshop — use hypothetical situations to teach.

SUBGROUP 2 — Discussion

NONPOINT SOURCE POLLUTION UNCERTAINTY

Barrier:

- Nonpoint sources of pollution are inherently variable: spatially, temporally, and in magnitude. This makes regulating NPS and quantifying the control of NPS more difficult. In turn, this lessens the confidence of both the regulators and the public in the ability to formulate effective NPS management plans.

Solution:

- Educational opportunities exist by improving documentation about available and accepted BMP performance. This documentation should address targeting BMPs to the right problem; for example, parameters that are controlled and effective placement (locating BMPs in the watershed).
  - — **Who:** This documentation needs to be developed on a State basis, although some "grouping" of States could occur. Need the States to "buy in" to a set of BMPs.

  EXAMPLES:

  - — 319 Programs listed BMPs — need to be revisited by States.
  - — CZMA guidance too general and uneven.
  - — Florida just published a nice document, but it lacked performance data.

Barrier:

- Extensive routine compliance monitoring drains resources that could be more effectively used in implementing NPS controls. The high variability of NPS loadings makes routine monitoring less useful than for point sources.

Solutions:

- Use planning-level estimates of BMP effectiveness as a "measuring rod." Carefully assess the watershed at the onset of a focused NPS management plan, but don't do it again until after a significant improvement has been noted. See lessons learned from the Rural Clean Water Program. This strategy would be more successful if the State will "buy in" on BMPs.
- States need to keep a geographic database of BMP installations to be able to track compliance and compute benefits. Followups are needed by the regulators to ensure that the BMPs are implemented.

WATER BODIES — POSSIBILITIES FOR PILOT TRADING:

Simplicity —

- Lakes — phosphorus.
- Lakes that have a history of good data.
- Existing infrastructure.
- Point source.
- Nonpoint source.
- Impaired.
- Smaller watershed (+) or (-).
- Historical data.
- Willingness to proceed (decision that all this will be presented to the large group by one member of each subgroup).

SUBGROUP 3 — Discussion

COST/BENEFIT

Barrier:

- Identifying specific water quality problems

Solutions:

- Inventory current point and nonpoint source pollution — Who: sources; States/basin management.
- Identify control strategies.
- Quantify costs of control for each — Who: consortium of sources.

- Quantify nutrient (pollutant) reduction — Who: consortium; State/regulators.
- Quantify/qualify ancillary benefits and control methods — Who: consortium.
- Develop matrix of comparative costs/benefits — Who: consortium; State/regulators.
- Offer matrix to point sources (Menu) — Who: State/EPA approval.
- Track effectiveness of costs/improvements — Who: consortium; State/regulators.

CONCERNS

Is this conference giving us just another watershed planning guide? Is this any different from what we've done in the past? What's new?

- We have new people and groups involved this time.
- EPA is taking new approach here; now concentrating on watershed and targeting solutions.
- Focusing on point source and nonpoint source now rather just point source.
- New Source of funding.

BREAKOUT GROUP IV DISCUSSION

GROUP MEMBERS:

Ron McCormick, facilitator
Steve Bugbee
Mahesh Podar
Daniel Palmer
Donald Brady
Allison Taylor
James Gardner
Margie Carriger
Jim Meek
Karen Fidler
James Shell, Jr.
Corbin Darling
Loreen Robinson
Linda Hubbard
Bill Griffith
James Jones
Roland Geddes
Jim Turner
Tom Augspurger

Worst Outcomes

- Hurt the profit of the farmer.
- Poor communication .
- Problem that isn't solvable.
- Substituting trade for direct involvement.
- Trading that might result in a degradation of water quality.
- Miss practical solutions.
- Innovative idea that does not fly.
- Opportunity lost.
- Localized water quality impacts being traded off so that overall degradation increases.
- Local regulations not capturing local concerns.
- People from different institutions not being able to think without institutional barriers.
- Premature criticism before anything is done.

Best Outcomes

- Let the flowers bloom.
- Identify overall objective.
- Realization of many sources of degradation.
- EPA provide adequate resources — both financial and manpower — to help it along.
- Farmers be included.
- Provide momentum for non-command and control program.
- Learn from each other.

Advantages and Limitations

- What is the best choice? Trading becomes the acceptable tool to meet State and local goals.
- Meet water quality objectives at cost-saving approach.
- Concrete ways to let the flower bloom.
- Getting agricultural community and other nonpoint source people plugged in.
- Make wise decisions; come up with better ways to measure nonpoint source pollution progress.

Products

- List of factors — barriers/opportunities — recommendations for supporting activities.
- Action plans.
- List of pilot waterbodies.

Barriers and Opportunities — Brainstorm List

BARRIERS:

- Perception of increased workload for programs.
- Lack of accurate predictive models.
- Demonstrated ability to show results to the public.
- Lack of sensitive monitoring data and interpretation to public.
- Narrow limits, enforcement, and legislative barriers.

- In the absence of TMDL, permit must achieve water quality standards without mechanism for enforcing nonpoint source controls under CWA.
- Insufficient financial resources.
- Making process too complex and considering it an art.
- Liability to point source industry; lack of incentive for point source to pay the bill; amend Clean Water Act to allow equitable distribution of cost — both nonpoint and point.
- Coordinate across State laws.
- Inadequate technical assistance/BMPs in place — farmers can support.
- Enhanced difficulty in determining compliance.
- Lack of data; impact on the land; system to manage it; money to buy and use system.
- Lack of resources to manage personnel and money.
- History is a barrier/we may not need a nationally managed program but to encourage local projects such as Pamlico; think small as well as big.
- Lack of trust by people being regulated.
- Determining cause and effect.
- Not addressing agronomic practices.

OPPORTUNITIES:

- Enabling legislation to get the nonpoint sources on board.
- Who contributes/ diminishing returns on point source controls.
- Flexibility to State and local governments.
- Focus on watershed/basin approach.
- Potential for win-win for nonpoint and point sources.
- Flexibility for industry.
- Address all sources.
- Opportunity for equitable solutions.
- Coalition builder bottom-up.
- Added benefit of soil and water conservation.
- Increase of habitat conservation.
- Historic inability to conserve water quality; now it is time to try something new — trading is a new approach.

SUBGROUP 1 — Discussion

TECHNICAL/SCIENTIFIC BARRIERS:

- Lack of monitoring data on which to make trading decisions and drive models.
- Lack of predictive models to demonstrate cause and effect relationships.
- BMPs must be locally tailored to be effective.
- Needs GIS system/data tracking system.

OPPORTUNITIES

- Budget should include price of education of system.
- Better localized models (watershed models) calibrated with local data.
- Research is needed (local universities).
- Model needs to consider all elements.
- Watershed-specific modeling.
- Local agricultural extension people work on development of models.

SUBGROUP 2 — Discussion

ADMINISTRATIVE:

- Promote nonpoint/point trading.
- Coordinate involvement across State lines; extent to which top-down approach is taken will be the extent to which trading does not happen. Federal government involvement is needed, so we can come to an agreement.
- EPA come up with framework to minimize barriers; top-down approach and down-top approach balance; enforcement mechanism is needed to result in improved water quality.
- Mechanism to make sure that trading does occur; increase controls.

SUBGROUP 3 — Discussion

RESOURCES:

- Lack of trust in community.
- Framework to work a system.
- Expertise from EPA and State.
- Public acceptance and involvement.
- Unrealistic expectations.

- Federal presence that needs to back off later.
- Federal role to be a catalyst for cooperative effort.
- EPA and State level contacts where information can be retrieved.

COMMON TERMS FOR ALL GROUPS:

- Framework.
- Minimum requirements.
- EPA guidelines.
- Facilitator.
- Enabler.
- EPA catalyst.
- Technical assistance.

MEETING OF BOTTOM UP AND TOP DOWN:

- Pilot suggestions.
- Potomac river basin.
- 3 States involvement.
- 40% nutrient reduction.
- Disadvantage large complex system.
- Susquehana River Basin.
- James River Basin.
- Chesapeake Bay.
- Transparencies.
- Rearrange order.
- Administrative.
- Technical/scientific resource.

ADMINISTRATIVE:

EPA should develop framework to facilitate trading, minimize potential barriers, such as

- compromise of enforcement authority to achieve load reductions,
- interstate differences in WQ management programs, and
- inflexible command — control approach.

Need to find a balance between:

- Trading achieved through local and State initiative with minimal Federal role. The greater the Federal role, the less trading.
- EPA obligated to ensure WQS achieved: minimum requirements, oversee implementation.

TECHNICAL/SCIENTIFIC ISSUES:

- Monitoring systems and data:
  - — Need intensive upfront basin — specific monitoring.
  - — Land use data for all sources.
  - — Postimplementation monitoring.
- Establish accurate cause and effect relationships.
  - — Develop model linkages.
  - — Watershed-specific models.
  - — Calibrate with local conditions.
- Adapt BMPs to local conditions.
  - — Research at the local level.

RESOURCES THEME:

- To encourage local/State to work with EPA to create a level of expertise.
- Develop framework to promote and guide trading.

FRAMEWORK

- Initial red role as a catalyst and resource.
- Need for education of regulated community and public at large for acceptance of trading.
- Continuing level of expertise and resources local/State/Federal.

BREAKOUT GROUP V DISCUSSION

GROUP MEMBERS:

Bruce Pewitt, facilitator
Cynthia Dougherty
Carol Ann Siciliano
John Veil
Everett Zillinger
Stuart Freudberg
Maryann Gerber
David Smith
Sharon Bailey
Les Mahagan
Jeannine Kenny
Don Blackburn
Frank Humenik
Ray Palmquist
Randy Dodd
Callie Childress
Randy Kramer
A.T. Rolan
Doug Rader
Terry Hammond

Best and Worst Outcomes

- Best outcome would focus on trading; Worst would polarize the group.
- Best would be that trading would be useful; Worst would be to think trading not useful at all.
- Best would accomplish objectives and gain national perspective; Worst would not accomplish anything.
- Best would be an open, honest discussion; Worst would be to not be open.
- Best would understand how trading applies to nonpoint; Worst would limit trading to nontoxic pollution.
- Best outcomes would apply to permits, e.g., learning how to apply in DC/Metro area and for nonpoint and point source programs; Worst would be excessive impediments to implementation.
- Best would be to learn how to address all pollutant sources; Worst would be not to agree.
- Best would be increased understanding of requirements to make trading work, understanding obstacles, and overcoming them; Worst would be to lose this opportunity to make it work.

- Best would be to learn nutrient training and get perspective of different agencies represented; Worst would be no accomplishment.
- Best would be not to lead to more litigation, find solutions that everyone can buy into eventually; Worst would be to leave here polarized, discouraged.
- Best would be to identify barriers; Worst would be no accomplishment.
- Best would be to identify barriers (e.g., laws, institutions, cultural drawbacks), promote ecological approach to watershed management; Worst would be not to succeed at this task.
- Best would use trading as catalyst for wetlands protection; Worst would be . . .
- Best would be to stick to management approach instead of permit approach; Worst would be not to give trading time to work before introducing national legislation.
- Best would be to learn from air quality trading lessons.
- Best would be to find practical solutions; worst would be if third party objects to procedures.

Barriers and Opportunities — Brainstorm List

Barriers (B): lack of trust between regulators, point and nonpoint source dischargers. (1)

Opportunity (O): nonpoint sources include more than agriculture (i.e., water). (5)

- Downstream doesn't want to contribute to upstream costs. (3) (B)
- Ensuring accountability, assuring that nonpoint source controls work. (8) (B)
- Liability if controls don't work, need public support, balance between monitoring and modeling. (6) (B)
- Lack of information and good information on which programs were successful and which were not. (5) (B)
- Farmers don't have incentive to control (gains from trading are unclear). (1) (B)
- Equity; asking nonregulated agencies to work with regulated agencies, cost share assist may not fully fund BMPs. (3) (B)
- Better document/study nonpoint source problem. (1) (O)
- Best Management Practices (BMP) are extremely costly (1 million per farm) and farmers can't afford it. (1) (B)
- Increases money for BMP implementation. (9) (O)
- Assume that trading works to reduce nutrient loads. (B)
- Uncertainty over loads reduction and difficulty in showing water quality effect. (B)
- Achieve real improvements in reducing loads of other pollutants (i.e., sediments, pathogens, fecal). (5) (O)
- Difficulty in identifying impacted area. (B)

- Hard to design monitoring program for nonpoint sources. (B)
- Opportunity to build trust between parties represented here, develop more innovative solutions, enhance creativity. (O)
- Administrative difficulties in managing these BMPs. (B)
- Cost. (B)
- Multiple agencies. (B)
- Not enough point source discharges to buy meaningful levels of reduction. (B)
- If it is toxics you are trying to eliminate, trading won't be very helpful.
- Poor understanding of natural sources. (1) (B)
- Avoid improper transfer (i.e., ground water and surface water). (B)
- Look at total water resource. (8) (O)
- Air sources contribute to water pollutants, possible air water trading. (1) (O)
- Save money. (8) (O)
- Bring people together to address common concerns/empowering people. (6) (O)
- Pollutant transport and trading. (3) (O)
- Evaluate possible nonpoint to nonpoint trading. (3) (O)
- Influence authorization. (O)
- Possible local "hot spots". (B)
- Nonpoint sources/nonpoint source trades difficult. (B)

SUBGROUP 1 — Discussion

BARRIER — Lack of Good Information/Documentation

- Source identifications (actors: dischargers, State, EPA, city, county, USGS, agricultural agencies, watershed groups)
- BMP effectiveness (actors: agricultural agencies, agribusiness, government)
- Document existing nonpoint source Controls (actors: program participants, Federal/State/local agencies)

SOLUTIONS

- Improve:
  - — monitoring/remote sensing
  - — data analysis
  - — modeling
  - — demonstration projects
  - — allow time for BMP to work/fail
  - — collect information on BMP effectiveness from other States

- Monitor:
  - — individual trades for effectiveness
  - — load reductions
  - — reductions in other pollutants
  - — surface/ground water effects
  - — operation & maintenance

SUBGROUP 2 — Discussion

OPPORTUNITY — Look Holistically at Entire Watershed

- Characterize ecological resources and stresses in watershed
  - — AG/rural
  - — air
  - — urban
  - — natural
- Model/determine pollutant fate/transport
- Evaluate alternative trading models

SOLUTIONS

- Collect and evaluate information on watershed basis (actors: State, EPA, USDA, USGS)
- Develop a system of integrating data bases
- Upstream, downstream data) (GIS?)
- Develop/validate watershed model
- Standardization and ease of database query/retrieval
- Capability (user friendly)

Group asks: "Is this effort really worth it? Is trading going to be cost effective?"

SUBGROUP 3 — Discussion

ISSUES

- Are trading programs viable?
  - — pilot projects (Federal funding)
  - — criteria (EPA and States)
  - — identify sites
  - — consider other trading partners

- Acountability
  - — how to write permits (place dual limits in permit) point source is responsible for accountability
  - — Third-party contractors to implement
- Trust
  - — coalition

GROUP OBSERVATIONS

- Group needs to be more frank about issues and practicality (i.e., if management wants to know what group really thinks, why didn't it ask the question, "Is trading worth it?").
- If this program is for real, it's going to be a long-term commitment . . . trading is not necessarily the end-all answer but could be a useful tool to get to where we want to be.
- A five to ten year pilot is necessary to really show results (want budget to come from Congress)
- Don't need to rewrite Clean Water Act to include trading across the board . . don't want to mess with the law.
- Do we want to move toward a watershed approach and then decide whether trading is right for that watershed?
- Do we fear the technical tasks involved in a watershed approach?

FINAL PRESENTATION

- It's a huge job . . . need lots of data, money, time
- Keep exciting initiatives going
  - — do BMPs work?
  - — encourage States to address water quality problems
- Coordinate between Federal agencies . . . need to start working together to gather data
- Encourage coalition building

MAJOR POINTS

- Trading is only a tool, not an end in itself, to improve the effectiveness of water quality programs.
- Will trading work?
  - — assess through pilot project (Start in 5 pilot projects that need Federal funding)
- Requires long-term commitment.
- Coalition building should be emphasized.
- Better interagency coordination is needed (e.g., information collection and sharing).
- Accountability will be key (e.g., does participant actually do BMP and was BMP effective?).

BREAKOUT GROUP VI DISCUSSION

GROUP MEMBERS

Cindy Ricks, facilitator
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Bruce Zander
Christopher Novak
Amy King
Christine Wallace
John Baker
Julie Rome
Cam Wheeler
Anne Coan

Best and Worse Outcomes

WORST

- People won't listen to each other; disjointed thought; won't clarify; people will posture and be narrow in their approach; egos will interfere.
- No focused recommendations to EPA.
- We won't focus on the problem in our discussions.
- Some historic antagonisms between groups represented here may block the opportunities for success.
- Lack of focus; inability to reach consensus.
- Not be able to frame issues.
- Personal fear — not be able to understand trading concept.
- Freeze to death.
- That we make bad assumptions about what the nonpoint source problems really are. Then we'll be worse off 10 years from now.
- Conclude that there is no future for trading.
- People will be turned off by the unanswered questions.

- Prematurely conclude that trading does not have substantial promise/role in water management programs of the future.
- That no conclusions are reached; therefore, we'll have no story to tell.
- That we don't come up with innovative approaches.
- That we wouldn't realize trading's potential.

BEST

- Everyone would express their opinions freely.
- State all opinions, complete brainstorming today.
- Recognition that point source and nonpoint source differ.
- That our group will contribute to the atmosphere and opportunity for continuing dialogue.
- Take one step forward in answering some of the questions.
- Increase understanding.
- Identify one or two significant issues.
- That this group's outcome will serve as an inspiration to a watershed to undertake trading.
- Intelligent, rational discussion.
- Better understanding of trading so can take advantage of opportunities.
- Identify opportunities and barriers.

Barriers and Opportunities — Brainstorm List

- Level playing field — regulatory/technological baseline for point and nonpoint source trading.
- Equal responsibility: quid pro quo responsibility for both point and nonpoint sources prior to starting a trading program.
- Lack of information on the water quality impact of some BMPs.
- Water quality issues are usually multifaceted — cross-pollutant; trading needs to deal with trading between multiple pollutants and multiple water quality objectives.
- Enforcement and liability need to be addressed: if one party fails to abide by the trading agreement, how do you enforce? Accountability.
- Point source may think that nonpoint sources are being treated differently (fairness).
- Perception that prohibition on growth or economic activity may occur.
- Trading program needs to be integrated with other regulatory programs.
- Old vs. new growth barriers, a trust issue.

- Define private sector.
- Need to understand all the facets of nonpoint source.
- To allow growth and maintain water quality.
- Identification of nonpoint sources.
- What is the measure of compliance by nonpoint source: what parameters do you use to determine effectiveness.
- Administer on local level.
- Opportunity to explore performance-based compliance rather than parameter-based.
- Watershed basis.
- Develop defensible trading ratio.
- Double-jeopardy for point source: may buy nonpoint source credit but a year later still have to put in tertiary treatment.
- No incentive for new control technologies — is EPA considering movement away from technology-based requirements?
- How are States going to be able to issue permits that on their face do not meet water quality standards — therefore, a statutory barrier.
- Practical vs. legal requirements of CWA: baseline requirements may be a barrier because minimum requirements have already been published
  - — practice (nonpoint source) vs. baseline requirement (point source).
  - — current trading schemes require technology.
- Trust among the parties is an opportunity.
- Getting people to buy into uncertainty.
- Limited resources (State, local, Federal).
- Timeframe: nonpoint source approach needs more time to meet water quality standards than point source — farming practices take more time to produce results.
- The possibility to target limited-resource farmers that might not be able to afford implementing needed practices.
- Target water quality problems/contributors.
- Organize nonpoint source interests.
- Trading examples could serve as catalyst to go further in addressing nonpoint source in general.
- Urban nonpoint sources need to be involved — must determine who the stakeholders are.
- Need to define private sector interests.

SUBGROUP 1 — Discussion

LEGAL CONSIDERATIONS

- Regulatory baseline requirements to enable trading (level playing field)
  - — Examine whether nonpoint source baseline should be prerequisite to trading.
  - — Should common terminology for point source/nonpoint source control requirements be established? Performance or technology based? (Examine)
  - — Examine how to establish equivalency between PS and NPS (what are trading ratios?)
  - — Should additional point source requirements be deferred in lieu of more stringent nonpoint source requirements?
  - — Examine role of stormwater permitting and relationship to PS/NPS baseline.
- Point/nonpoint source enforcement issues (responsibility of each discharger)
  - — Is point source liable if nonpoint source fails to perform
    - i. Is Clean Water Act change needed?
    - ii. Can (should) individual landowners be held liable?
  - — Examine monitoring, reporting, and data management necessary to evaluate nonpoint source compliance?
  - — Can different point source/nonpoint source compliance schedules be allowed?
  - — What form of permitting/contract should be used to enforce nonpoint source commitments?
- Role of point source/nonpoint source stakeholders when technology/water quality standards improve/tighten.
  - — Examine ways to equalize responsibility of point source/nonpoint source.
  - — How to prevent new BAT from deterring point source participation in trading?
  - — How to issue point source permits that do not (by themselves) meet water quality standards?
  - — EPA should examine barriers in Clean Water Act.
  - — Are regions approaching permits consistently?
  - — Examine barriers to cross-pollutant trading.
  - — Evaluate incentives for resource restoration/enhancement (pollutant to wetland trading).
- What rules are needed to establish trading regions?
  - — How can consistency be encouraged?
  - — How to address fairness re: inclusion of new stakeholders (dischargers).
  - — Define area large enough to provide trading opportunities but small enough to verify water quality benefits.

SUBGROUP 2 — Discussion

ADMINISTRATIVE, POLICY, AND ECONOMIC CONSIDERATIONS

- Trading should continue to be explored as a possible policy option.
- Encourage the establishment of technical assistance and cost-sharing programs for NPS water quality improvement.
- Direct funding efforts to nonpoint sources.
  - — research into BMPs development and effectiveness
  - — research into relative contributions of different types of activities
  - — develop models for establishing defensible trading ratios
- EPA needs to develop a guidance framework that tells States or smaller units to describe in their program how they will handle the following:
  - — How to quantify NPS contributions and reductions vs. the currently more quantifiable point source contributions and reductions.
  - — Integrate the many programs into the whole trading scheme. BMPs, wetlands protection, and CZMA to simplify and coordinate implementation.
  - — Develop methods to monitor compliance with the contract provisions and identify enforcement mechanism for noncompliance with the contract. Who is liable for noncompliance must be identified.
    - i. Who will enforce noncompliance?
    - ii. Develop a penalty structure and framework that is commensurate with the violation.
  - — Encourage local involvement and as much local administration as possible. Resources to these local administrative units are needed. Encourage innovative ways to get those dollars. Adequate technical assistance needs to be met.

SUBGROUP 3 — Discussion

EDUCATION AND PUBLIC POLICY

- Barriers reviewed as opportunities
  - — Local involvement
  - — Economic development
  - — Equity — responsibility is not evenly distributed. This remains a barrier.
- Action plans
  - — Legislation: identification of explicit legal barriers to the concept of trading and attempt to modify laws. Involve the EPA.
  - — Policy: seek strong policy statements from EPA that endorse concept of trading.

— Education: educate the public as a whole by publishing success cases to illustrate the flexibility of trading schemes, importance of involving stakeholders early in the process, education for interaction.

— Public Policy:

i. EPA and States providing seed money and technical assistance.

ii. Get the government involved, announce grants.

iii. Public participation is a key element using a network of communications on all levels (public meetings, committees).

SUBGROUP 4 — Discussion

TECHNICAL CONSIDERATIONS

- Lack of quantifiable information on BMPs
  - — Need to measure actual nutrient production
    How: Develop methods
    Who: States, EPA, USDA, Land Grant Universities
  - — Need cost information
    How: Develop a database from existing sources
    Who: States, EPA, USDA, Land Grant Universities
  - — Need for priorities among NPS contributions
    How: Through modeling
    Who: States, EPA, USDA, Land Grant Universities
  - — Need more information on effectiveness of BMPs
    How: Field demonstrations
    Who: States, EPA, Forest Service, and agricultural services
- Develop method for determining the baseline (TMDL) for watershed.
  - — Measure/model background conditions
  - — Determine role of natural landscape
  - — Determine role of natural processes and landscape (hydrology, climate, geology)
    Who: State environmental agencies
- Develop method to determine success in terms of water quality improvements (ecological, chemical, and physical).
  Who: State environmental agencies
- Develop technically defensible trade ratios to meet water quality objectives
  Who: State agencies with technical guidance from the EPA
  How: using information gathered in II.
- EPA needs to develop a technical guidance manual
  - — Phased approaches (maybe, maybe not)
- In future, address trading between water quality objectives and between parameters.

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