SOLOMONS FORUM WHITE PAPER

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SOLOMONS FORUM II WHITE PAPER

SEDIMENT AND EROSION CONTROL IN THE CHESAPEAKE BAY DRAINAGE BASIN

What is a Solomons Forum?

A Solomons Forum is a mediated policy dialogue on environmental issues organized by the University of Maryland System, Center for Environmental and Estuarine Studies, Chesapeake Biological Laboratory, and the Coastal and Environmental Policy Program of the University of Maryland System. The purpose of the Forum is to bring together people with diverse viewpoints and a common concern for improving the environmental quality of the Chesapeake Bay region.

This document is a summary of the discussions and conclusions from the Second Solomons Forum on sediment and erosion control held on October 31st and November 1st, 1991 at Chesapeake Biological Laboratory, Solomons Island, Maryland. At this meeting the use of incentives for sediment and erosion control, needed changes in the planning and land use process, enforcement issues, and technical aspects of sediment and erosion control in the Chesapeake Bay and its drainage basin (with special emphasis on southern Maryland) were discussed. Drs. Eileen M. Setzler-Hamilton and Walter R. Boynton, Chesapeake Biological Laboratory, organized the Forum and Ms. Claudia Liebler was the facilitator.

Ground Rules

The goal of the Second Forum was to provide fruitful, meaningful exchange of views on this important environmental issue. We believed this could best be accomplished by creating a meeting environment that was conducive to the expression of the participants' true thoughts and feelings, and to the *creative formulation of new approaches to problems*. To create and maintain this intellectually productive environment, several ground rules were agreed upon by the participants. These ground rules were also used in the first Solomons Forum.

1. Developing creative ideas and building agreement. While participants have different points of view, it is most productive to identify areas of agreement and at the same time stimulate creativity. This was accomplished by "brainstorming". Each person in the group suggested an idea. Many creative ideas were encouraged and listed. The group evaluated each item, and starred the most viable ideas that had the greatest support of the group. Complete consensus was not required. If there were strong minority views, these were identified.

2. Not for attribution. Discussions held at the meeting will not be subsequently attributed to a

specific individual or group. This allows free expressions of ideas.

3. Individuals participate, not organizations. At this Forum, individuals were primary and the organizations they represented secondary. Participants' views represented their own professional judgement and experience, not the positions of their organizations.

4. Equal time for all views. All participants were encouraged to voice their views. Ensuring the expression of all members' views was the responsibility of the meeting's facilitator. The goal was to provide an intellectually safe environment for all viewpoints, not just those of the most talkative person.

Summary of Findings from the First Forum

The First Solomons Forum on sediment and erosion control was held on November 3rd and 4th, 1988 and April 13th and 14th, 1989 at Solomons, Maryland and May 8th, 1989 at Annapolis, Maryland. General recommendations from the First Forum were:[1]

1. Develop water quality standards and criteria for sediments.

2. Implement a watershed approach for sediment control.

3. Develop detailed sediment budgets by drainage basin, watershed, and subwatershed as an information tool to clarify the relative contributions of various land use activities.

4. Enhance educational programs to increase awareness of sediment and erosion control problems, programs, and practices.

5. Encourage predesign site visits in order to make the plans work with nature.

Goals and Timing of the Second Forum

With the commitment and hard work of all participants we wished to achieve the following results from the Second Forum:

Goals

1. Review accomplishments since the first Forum.

2. Assess new information on the impact of sediments, sources of sediment to the Bay, and issues related to regulation and enforcement.

3. Develop creative ideas and recommendations on incentives, planning and land use changes, enforcement, and technical aspects of sediment and erosion control.

Recent economic and political events indicated that it would be appropriate to convene a Second Solomons Forum in the fall of 1991, which was held October 31st-November 1st, 1991.

Recent Issues

1. Growth has continued at a rapid pace in all of Southern Maryland with consequent widespread changes to the formerly rural landscape. This is an appropriate time to focus on sediment and erosion control issues in Southern Maryland and determine what aspects are working and what needs to be improved.

2. There has been increasing impetus for regional or state-wide land use planning. In 1991 the Maryland General Assembly defeated the "2020 Plan,"[2] a state-wide program for growth management and environmental and resource protection. However, the 1992 Maryland General Assembly passed the Resource Protection and Planning Act of 1992.[3] This act requires that the comprehensive development plans of local jurisdictions include a sensitive areas element which addresses streams and stream buffers, 100-year flood plains, threatened and endangered species habitats, and steep slopes. Local jurisdictions have the sole authority to determine the level of protection for these sensitive areas. The act requires local jurisdictions to update their comprehensive plans every six years and to adopt the sensitive areas element by 1997. Local jurisdictions also are required to implement the following visions in their comprehensive plans:

- Concentrate development in suitable areas;
- Protect sensitive areas;
- In rural areas, direct growth to existing population centers;
- Make stewardship of the Chesapeake Bay and the land a universal ethic; and
- Conserve resources and reduce resource consumption.

3. Two and one-half years have passed since the First Forum. It is time to re-examine the recommendations made in the First Forum White Paper and see what progress, if any, has been made in their implementation.

Participants at Second Forum

Representatives from local governments of Anne Arundel, Calvert, Charles and St. Mary's Counties, the environmental community, Federal and State government, the scientific, agricultural, and developer communities participated in the Forum. Participation was by invitation only. This was done to keep the group relatively small (24 participants) and with a representative mixture of viewpoints in order to take full advantage of each participant's knowledge of the issues.

The Second Erosion and Sediment Control Forum used the recommendations of the First Forum as a starting point. Major topics discussed included the following: Management and Planning Changes, Enforcement, Incentives, and Technical Aspects. These topics were chosen by Forum participants prior to the Forum. Forum participants chose the discussion group in which they desired to participate with the stipulation that each group be balanced in its make-up. As a result of this initial planning and feed-back from Forum invitees, the Second Forum on erosion and sediment control was more focused in its agenda. The Forum had greater input from the four county governments in the southern Maryland region, and from the agricultural community.

Summary of Forum Recommendations

1. Educate local elected officials, private citizens, and the regulated community on the importance of controlling erosion and reducing sediment losses. Sensitize the public on both the scope of sediment loss problems and available means of addressing these problems.

2. Require sediment and erosion control planning at the beginning of the development process. Focus on designing development to *prevent* sediment loss instead of the engineering approach to *control* sediment losses.

3. Adopt written, standardized guidelines throughout the State to assist designers, consultants and engineers in formulating sediment and erosion control plans.

4. Aggressively enforce existing State sediment and erosion control laws and regulations. Finance local enforcement efforts through increased user fees.

5. Allow permanent agricultural tax assessments on lands which have had an agricultural assessment for a specified minimum period of time by one owner.

6. Work toward regional watershed management. Phase construction disturbance activities instead of having all soil disturbances occur at the same time.

Small Group Discussions

Major findings of the four discussion groups, and recommendations of the Forum participants on these discussion topics are presented in the following section.

I. Management and Planning Changes

Questions:

1. What changes are needed in the existing regulatory scheme and management? What are the policy implications of these changes?

2. What changes are needed for Southern Maryland relative to sediment and erosion control?

3. What areas are most in need of protection and how can they be effectively protected?

4. How appropriate is a regional approach? How might it be formulated?

Major Findings

Two predominant themes emerged relative to erosion and sediment control efforts. First, a better understanding of existing programs and program effectiveness needs to be developed. Second, erosion control issues must be considered early in the planning phase of development. Both the public and local and State officials must be sensitized to the scope of watershed erosion and sediment control problems and what individuals and groups can do locally and regionally to address these problems. "**Conservation**" tours for

local and State officials and the interested public are an excellent way of educating citizens on both the scope of sediment control problems and means of addressing these problems.

The best erosion and sediment control measures involve good planning and land use programs. We need to direct growth to appropriate areas and away from sensitive and open space areas. Priority areas for protection include forests and agricultural lands, open space, streams and wetlands, steep slopes and highly erodible soils, especially adjacent to sensitive areas. Note: Some participants felt that the legal definition of a "sensitive area" does not adequately cover all items of concern.

Planning for erosion and sediment control is needed early in the subdivision design process. Erosion and sediment control and other natural resource issues must be considered when deciding on density and site layout. Sediment control facilities need to be integrated with other features of the site; i.e., wetlands, flood plains, tree preservation, and public safety issues. State and local agencies must work together. We must treat the source of the problem instead of relying on engineering solutions downstream. It is cheaper to prevent soil erosion than to clean it up.

Currently there is a lack of real understanding of erosion and sediment control for development sites. Most people involved in the process only consider engineered sediment control structures such as sediment traps or basins. Of equal or greater importance is erosion control during construction, i.e. greater use of seeding and mulching to stabilize temporary "dirt piles," and permanent stabilization after the project is completed. Sediment control plans consider all these issues, and need to be properly designed, constructed and enforced. Proper application is paramount. Designers, contractors and inspectors must become expert and proficient in this regard.

Presently, much reliance for sediment control is on the use of engineered structures after the site is laid out. Engineered structures are much less than 100% effective (estimated at 40-60%) require extensive maintenance and cannot be as effective as sensitive site design. The "engineering structures" approach should not dominate the planning process. If a problem is not created, control structures are not needed or can be reduced.

Existing erosion and sediment control regulations must be enforced. County planners must spend more time in the field. In order to recover costs, counties need to charge fees for some of the technical consulting and review they undertake.

The priority of decision-making must be changed so that environmental values are on par with economic values. "Should" must be changed to "shall" in regulations, i.e., early planning **shall** be required rather than "should" be required.

II. Enforcement

Questions

1. What changes are needed in existing enforcement procedures? What are the policy implications?

2. What are the relative merits of state vs. local enforcement? Which works best?

3. What enforcement procedures need to be streamlined? How can this be accomplished?

4. What strategies can be developed for implementing local enforcement in light of decreasing budgets?

Major Findings

A more proactive role in erosion and sediment control needs to be taken through the combined efforts of education and aggressive enforcement of existing State and local laws [4,5,6,7,8,9] and regulations. Local elected officials need to support local enforcement efforts. This can be best accomplished by effective education directed toward elected officials, the general public and the regulated community demonstrating the benefits of reducing sediment run-off. An effective education program would help to increase the number of jurisdictions which adopt and enforce local programs. The most effective erosion and sediment control programs are those with adequate resources operated by local governments.

Substantial penalties for violators need to be implemented throughout the State. Violations of Maryland's sediment control, sediment pollution, and storm-water management laws decreased at the State level by 14% from FY-88 to FY-90 as use of State civil penalties increased from 10 cases involving $24,750 in FY-88 to 86 cases totaling $158,160 in FY-90.[10]

Strong local enforcement efforts need to be financed through increased user fees. Anne Arundel County successfully funds local enforcement of their erosion and sediment control program through user fees.

Needed Changes and Policy Implications

Cumulative impacts of land-disturbing activities on sediment loads to local streams and creeks are important. Exemptions from local and State sediment control plans should be eliminated for activities which disturb less than 5,000 square feet of soil, and single-home sites on greater than two acres. Current State law only exempts those grading activities that disturb less than 5,000 square feet of land area **and** disturb less than 100 cubic yards of earth. Thus most land disturbing activities are covered by State regulations and the problem may be lack of adequate enforcement. Calvert County has already eliminated the exemption for single-home sites.

There was strong consensus that education of both local elected officials and citizens on sediment and erosion control issues is needed. Elected officials, citizens, and contractors need to be aware of problem areas which cause large sediment losses. The number of tons of sediment prevented from entering local waterways by current regulations needs to be documented and then given widespread publicity. If new erosion and sediment control regulations are being considered, the local community must be aware of the number of additional tons that could be saved with the proposed regulations, and what that retained soil represents in terms of environmental protection and money saved.

Monitoring of sediment inputs to streams and subwatersheds is needed. Private citizens should be encouraged to assist with this monitoring. Results need to be brought to the public's attention in terms they can understand. Scientists should identify the kinds of sediment loss data that local governments could utilize. They need to work with local governments to develop funding sources.

Problems with Currently Regulated Activities

Participants agreed that in some instances there is misuse of single lot standard sediment and erosion control plans for an entire subdivision. Standard plans are intended for *singular* minor type projects, and should not be used in subdivisions. The cumulative effects of erosion and sediment loss from construction of a subdivision need to be addressed instead of trying to solve the problem piecemeal by permitting erosion and sediment control strategies designed for single lots.

There was great concern that in some instances local enforcement agencies don't have control over the approval process. Participants strongly agreed that we need to stop apologizing for enforcement efforts. The law does not have to be palatable - it just has to be enforced!

Field inspectors should be allowed some discretion in making minor field modifications without a lot of red tape and plan review requirements. A minority of participants strongly felt that the responsible party should inspect the project daily for compliance. The responsible party should be accountable for correcting violations on-site and held responsible so the project is always in compliance. A philosophy change is also needed by some inspectors. Inspectors should expect to find projects in compliance instead of indicating what compliance corrections are needed. Finally, some participants felt regulations need to require that building sites be staked out prior to inspection.

Streamlining Enforcement Procedures

Local and State agencies should coordinate development project application procedures. Single source approval is desired by applicants. Counties should take the initiative to pass project applications internally among all local agencies required for approval instead of making the applicant do all the running from office to office. Some counties already do this and the practice should be encouraged.

Some participants felt there should be a reward system for those applicants with good compliance

records and good sediment and erosion control plans (ideas included: fast-track review, reduced inspection, and bond exemption). Others were concerned that such preferential treatment smacked of favoritism. All agreed that serious penalties (license revocation and jail) should be imposed on repeat offenders.

Strategies for Implementing Local Enforcement

User fees should fund local implementation of State sediment control regulations. User fees successfully fund these activities in parts of the State; this funding source should be utilized throughout the State.

III. Incentives

Questions:

1. What changes are needed in existing regulatory schemes and management? What are the policy implications?

2. If various incentives could be implemented, which would be most important?

3. What would the likely impact of these incentives be on inspectors, contractors, and others?

4. How well would these incentives work in Southern Maryland? Which, if any, would need tailoring?

Major Findings

Current erosion and sediment control programs are working, but some fine tuning is needed. Local political support is essential for the success of any program. The extent of both local political and financial support varies throughout the State. In some areas local (county) government may not be able to provide adequate enforcement due to local political pressure. How to ensure that enforcement appeals remain within ordinance guidelines is a problem. Likewise, both the review process and enforcement procedures vary from county to county.

Written plan preparation guidelines are needed to assist consultants and engineers in designing erosion and sediment control plans for all land-disturbing activities. Currently MDE, Sediment and Stormwater Administration, Anne Arundel and Calvert Counties have written guidelines. These guidelines should be standardized throughout the State, and provide sufficient detail in all areas of plan preparation.

Stronger enforcement procedures for violations of agricultural conservation plans and pollution violations are needed. The Maryland Department of the Environment (MDE) has one inspector to investigate all State agriculture complaints. Procedures currently exist in the State regulations to determine violations. These procedures include significant input from the local Soil Conservation District. However, when it is clear that a violation has occurred and that corrective measures were not instituted, MDE needed the legal authority to enforce erosion and sediment control regulations through the assessment of fines or other penalties. The 1992 Maryland General Assembly gave MDE this legal authority.[11]

Adequacy of Current Regulatory Program

There was real concern about the current status of sediment control inspections at the local level. The State would like to see the counties assume responsibility for these inspections. Currently Charles and St. Mary's Counties are inspected by the State (MDE, Sediment and Stormwater Administration), Anne Arundel County has local delegation and Calvert County has partial local delegation. From the counties' point of view, erosion and sediment control is a state-mandated program; therefore program costs and inspections are the State's responsibility. From the State's perspective, the erosion and sediment control program protects local tributaries and streams from sediment inputs. In some areas county government may not be able to provide adequate enforcement due to local political pressure. How to ensure that enforcement appeals remain within ordinance guidelines is a problem.

There is a perception that the agricultural community is not being regulated or enforced at the same level as urban (construction) activities. Part of the problem lies in two misconceptions about the expected outcome of conservation planning and the implementation of Best Management Practices (BMPs). Conservation plans and BMPs are designed to: 1) reduce soil erosion rates to a level where there is no loss of

long-term productivity; i.e., the rate of soil replenishment exceeds or equals the rate of soil loss, and, 2) prevent off-site impacts "under normal (average) rainfall conditions." The potential for off-site impact from any disturbed area is dependent upon several factors; time of year (frozen or unfrozen ground), rainfall intensity and duration, soil type, and the level of compaction (newly disturbed/plowed versus compacted surface). When a conservation plan is developed, it takes into account rainfall (intensity, duration, and frequency), the soil conditions (type and slope) and the crop rotation. It is designed to reduce the average soil loss over the life of the crop rotation to an acceptable level. That level, measured in tons of soil lost per acre, translates into approximately .002 inches of soil lost over each cropfield acre. A sudden intense storm, especially right after spring plowing, could increase this rate substantially.

Erosion rates in developing urban areas are much more severe in terms of sediment volume lost, than erosion rates on land in agricultural production. Excessive erosion on agricultural land may be 10 tons per acre whereas erosion rates in excess of 100 tons per acre may be common on developing urban acreage. Urban erosion control measures are designed to balance the need to control erosion against the practicality of implementation. Current urban erosion control practices, *when installed properly*, are 50-60% effective, far less than a fully implemented conservation plan.

Several Forum participants felt that voluntary erosion and sediment control measures in the agricultural sector did not work. This issue was the most controversial, with no consensus of opinion. There were two distinct points of view. Some felt that agriculture was not being regulated, and was a contributing factor to nutrient and sediment problems in the Bay. Others saw agriculture as essentially doing things right. They felt additional regulations were unnecessary and would be counterproductive since they would not lead to a significant reduction in off-site impact below what was being achieved through voluntary measures. Additionally more regulations would impact the ability of the agricultural community to remain a viable economic force within Maryland. Currently the local Soil Conservation District (SCD) attempts to resolve agriculture-related complaints. Participants felt that the local SCD was the best agency to evaluate such complaints.

Some participants wanted soil conservation and water quality plans required for all agricultural activities. The State currently requires (1991) soil conservation and water quality plans for all agricultural activities in Critical Areas. The State has targeted implementation of soil conservation and water quality plans for agricultural activities in priority watersheds, though implementation of such plans is voluntary. However, current staff levels make it impossible for all agricultural enterprises within the Bay area to implement conservation plans even if landowners request them. Requests for conservation planning assistance in Southern Maryland currently exceeds the ability of the limited Soil Conservation District staffs.

Some Forum participants strongly felt there is some improper land use under the guise of farming. The most serious problems may involve only 5% or less of the agricultural community. These may include absentee landlords, and small, part-time farmers who are farming marginal lands. Often these farmers do not have the financial resources to upgrade their farming practices; i.e., switch from tobacco to truck farming of vegetable or other speciality crops. Most low acreage high revenue crops require adequate water at precise times during their growing cycle to ensure a marketable crop. The unreliability of sufficient rainfall and the normal high summer temperatures make the need for irrigation mandatory for successful entry into the specialty crop arena. Operators of small farms (the average farm size in Calvert County is less than 40 acres) cannot afford costly irrigation of fields.

Forum participants generally agreed that any agricultural violator refusing to address an obvious erosion and sediment control problem should be subject to some form of regulation. Recent law changes provide MDE with the regulatory authority to enforce compliance.

Some participants also voiced concern about the siting of illegal land fills that accept off-site rubble or land clearing debris for profit, and sand and gravel pits on lands zoned for agricultural usage. This is a problem in some counties. Courts have ruled that such operations cannot be regulated under Sediment and Erosion Control Ordinances because lands zoned for agricultural usage are exempt from these ordinances. The Maryland Department of the Environment (MDE) and the delegated jurisdictions needed and recently were granted enforcement authority over such activities.

Incentives Wish List

The topic of incentives fostered lively discussion. The following incentives were most favored by participants.

• Provide development incentives for creative planning and design; i.e., a density bonus for clustering, leaving more of the area in open space, and/or protecting or increasing buffers. A potential problem is; Who determines whether a development plan is creative or not? What criteria are to be used and who determines these criteria?

• Make better use of the range of enforcement "tools" needed to ensure compliance; i.e., bonds, higher fines, stop-work orders, and withholding building permits. If penalties are high enough, there will be compliance with erosion and sediment control regulations. Use of these enforcement tools varies throughout the State. However, a better way to insure compliance is to give recognition to those contractors, developers, and farmers who have exemplary records in erosion control and avoiding sediment loss. Currently recognition is given only to large projects; recognition is needed for exemplary small scale developers (five houses or less) as well.

• Provide written guidelines to assist consultants and engineers in designing erosion and sediment control plans for all land-disturbing activities. Currently Calvert County has the most comprehensive written guidelines. These guidelines should be standardized throughout the State, and provide sufficient detail including sequencing of construction. Such guidelines would help eliminate problems associated with plan design and submission.

• Change the criteria for agricultural land assessment to allow a permanent agricultural tax assessment on lands which have had an agricultural assessment for a specified minimum period of time by one owner. If the land is sold or subdivided (officially recorded as a subdivision with the county) State law allows the recapture of three years of taxes at the new rate. Currently 20% of the acreage must be in agricultural production in order for the property to retain agricultural assessment. This has led to short term lease arrangements with intensive crop rotations (continuous row crops). Many of these leased lands provide marginal yields, and often are wet, or highly erodible (former tobacco fields). Formerly these areas usually had small fields of tobacco on the sandy, well-drained sites, often on lands with slopes of 6-9%. But in today's economic situation, these lands would be leased for small grain production. In order to make some profit, additional acreage would be planted since it is not economically feasible to plant small isolated fields in corn or soybeans. A change in the criteria for assessing agricultural land would allow those least able to farm, i.e., widows and retired farmers, the ability to keep their agricultural assessment without forcing them to open up presently idle lands for cultivation or to maintain marginal (highly erodible) fields in production. This change in policy would reduce potential agricultural erosion and would reduce the time the county spends each year verifying that a farming operation meets current agricultural assessment criteria. Since these lands currently have an agricultural assessment, changing assessment criteria would be revenue neutral.

• Provide MDE with the regulatory authority to enforce compliance with agricultural conservation plans. This enforcement would follow existing regulatory procedures outlined within the State's 208 Agricultural Plan (1979). Note: The 1992 Maryland General Assembly provided MDE with this regulatory authority.

• Require the implementation of an agricultural conservation plan and a Resource Management System to receive an agricultural tax assessment. Funding for most conservation plans and Best Management Practices (BMPs) which comprise the Resource Management System is provided by State and Federal government on a cost share basis. There would be an implementation problem as the Soil Conservation Districts (SCDs) do not have adequate personnel. Farmers on waiting lists for assistance in designing conservation plans and a Resource Management System and those awaiting the availability of cost share funds to implement the often expensive BMPs that comprise the Resource Management System should not be denied agricultural tax assessments. Some Forum participants suggested that development of conservation plans might be on a contractual basis with review and approval by the SCDs. Others felt the money would be better spent in providing adequate funding to the SCDs.

IV. Technical Aspects

Questions:

1. What changes are needed in existing regulatory schemes and management? What are the policy implications?

2. What are the most effective sediment control devices and practices?

3. Where and when would be most appropriate to use these devices?

4. What are some ways of incorporating innovative technologies into the State regulatory structure?

Major Findings

Improve efficiencies of sediment basins and other devices to retain sediment on-site from 50% (current estimate of efficiency) to 75-80%. Various techniques to accomplish this include:

Increase sediment basin size. Use baffles to reduce flow rates through the basin to allow time for sedimentation.

Construct two-stage outlets in sediment traps to regulate dry de-watering storage. Slow de-watering release rates allows for water retention during times when sediment settling rates are greatest and delays discharge into the receiving stream until after the natural peak flow of the stream has occurred. The dry storage which results would allow 0.5 inches of runoff/watershed acre to be accommodated from the next rainfall event before any water is displaced from the basin.

Phase construction activities in a region/watershed instead of having all soil disturbances in an area occur at the same time. Participants realize this approach would create scheduling and enforcement problems. Some participants felt phasing is unrealistic because various jurisdictions within a watershed would not be able to equitably apportion between who could and who could not build within a particular time frame. They felt phasing would create a regulatory nightmare for scheduling. Others suggested that the goal of phasing might be achieved by requiring phasing within individual, larger, i.e. greater than 20 acres, construction projects. However, this is an important goal and we need to begin work to achieve this goal. Likewise, phase soil disturbance activities on a construction site. Better control sediment loss on-site by stabilizing disturbed soil areas, phasing grading and vegetation removal so there is a minimum of exposed soil, and utilizing buffers around earth disturbing activities.

Correct existing sediment and erosion control problems in established developments by ensuring the proper maintenance and inspection of existing stormwater management structures; assessing the effectiveness of existing structures; and instituting a retrofit program in existing developed areas that have inadequate facilities. Retrofit programs should encourage "soft" structures, i.e. artificial wetlands and terracing pools whenever possible.

Properly maintain and retrofit failing sediment control structures in areas under construction. Sediment control structures must be checked on a regular schedule, especially after each rain event, to ensure proper working order. This includes:

- Restoring sediment traps to their depth design (clean out sediment);
- Replacing damaged or rotten straw bales;
- Checking silt fence lines, removing excess sediment and repairing areas of torn fence or broken stakes; and
- Reseeding areas where initial seeding did not germinate.

Work towards regional watershed management. Construct and/or update sediment budgets for entire watersheds. Establish discharge rates relative to impact on water quality, carrying capacity of watershed, stream, etc. There is historical precedent for regional watershed management; i.e., Washington Area COG, Interstate Commission on the Potomac River Basin, Patuxent River Basin.

Footnotes:

[1] Sediment and Erosion Control in the Chesapeake Bay Drainage Basin. Solomons Forum White Paper. CEPP-SF 89-01, Aug. 1989. Chesapeake Biological Laboratory, Solomons, MD 20688-0038, 8p.

[2] Maryland General Assembly, 1991. House Bill 214: Maryland Growth and Chesapeake Bay Protection Act.

[3] Maryland General Assembly 1992. House Bill 1195: Economic Growth, Resource Protection, and Planning Act of 1992.

[4] Annotated Code of Maryland, 1990 Replacement Volume, 1991 Supplement. Environment Article Sections 4-101 through 4-116.

[5] Code of Maryland Regulations (COMAR), 26.09.01.01 through 26.09.01.10

[6] 1983 Maryland Standards and Specifications for Soil Erosion and Sediment Control

[7] Anne Arundel County Grading and Sediment Control Ordinance.

[8] Calvert County Erosion and Sediment Control Ordinance.

[9] Grading and Sediment Control Ordinance for Charles County, Maryland.

[10] Maryland Department of the Environment, Sediment and Stormwater Administration, Compliance Program, July, 1991.

[11] Maryland General Assembly, 1992. House Bill 795: Sediment Pollution Control Agricultural Land Management Practices.

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October 31 - November 1, 1991

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* Invited but unable to attend.