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THE NORTH CAROLINA SEDIMENTATION CONTROL PROGRAM

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INTRODUCTION

The North Carolina Erosion and Sediment Control Program began in 1974 following the 1973 passage of the Sedimentation Pollution Control Act (SPCA or Act) by the North Carolina General Assembly. Since it's beginning, the program has received continued support from the legislature through amendments which have broadened the authority of the Act and strengthened its performance standards and enforcement provisions. This Act established the Sedimentation Control Commission (Commission) and authorized it to develop and administer a comprehensive State Erosion and Sedimentation Control Program. The Commission is composed of representatives from industry, academia, state and local government, and various environmental groups and is charged with:

1. adopting and amending rules;
2. establishing specific erosion and sedimentation control standards; and
3. encouraging and assisting local governments to adopt their own erosion and sediment control ordinances.

The Act also directed the Department of Environment, Health, and Natural Resources (DEHNR) to provide staff to the Commission. The Department's Division of Land Resources, Land Quality Section, provides a staff of approximately 27 who work with other state and federal agencies on water quality and other environmental issues. At present, there are 40 local programs which provide their own staff.

THE ACT

The SPCA is performance oriented legislation which establishes four Mandatory Standards. These standards form the framework around which state and local programs have evolved. The Act is intended to allow continued development in the state while simultaneously preventing sedimentation damage to public waters.

These Mandatory Standards are:

1. a buffer zone must be established around lakes and natural watercourses;
2. sufficient measures must be provided to retain sediment on-site during land-disturbance and groundcover sufficient to restrain accelerated erosion must be provided following completion of construction or development;
3. cut and fill slope angles must be sufficient to ensure stabilization by vegetative or other means; and

4. an erosion and sedimentation control plan must be submitted and approved before a land-disturbing activity begins which will uncover more than one contiguous acre.

The bottom line of these standards is that sediment must be retained on-site during a project and the site must be adequately stabilized following completion of the project. The plan requirement is intended to establish what methods, measures and/or structures will be needed to comply with the standards. The plans also establish how surface stabilization and maintenance will be accomplished.

The Act also specifies penalties for violations of these standards and administrative rules. The penalties fall into two categories, Civil Penalties and Criminal Penalties. Civil Penalties may be up to $500 per day for all violations other than starting a land-disturbing activity without an approved plan and up to $1000 for starting without a plan. Criminal penalties may be up to 90 days imprisonment and a $5000 fine at the discretion of the court. The SPCA also provides injunctive relief so that compliance orders may be obtained from the courts. Civil relief may also be sought by private citizens seeking damages.

THE ADMINISTRATIVE RULES

Historically, the public and special interest groups have been an integral part of the development of this program, from the original enactment of the Act and adoption of the Rules through subsequent amendments and rule-making hearings. Public opinion is often sought and public support for the program is high. The Commission maintains a Technical Advisory Committee to recommend and develop program policy and administrative rules.

The Commission has adopted rules to further define and interpret the Act. These rules set the design standards used to meet the criteria of the Act and establish maintenance criteria for measures, practices and structures used to control erosion and sedimentation.

THE PROGRAM

The Sedimentation Control Program is administered by a regional engineer and staff in each of seven regional offices. The regional offices are responsible for the review and approval of erosion control plans, inspection of land-disturbing activities and the initiation of enforcement for violations of the Act. The program is coordinated by a Sediment Control Specialist and an Assistant Sediment Control Specialist in Raleigh, N.C. They provide guidance, technical assistance and coordinate enforcement and education programs.

The state program has historically been funded entirely through state appropriations and the local programs through local appropriations. Recently, the General Assembly authorized the Commission to begin charging a fee for the review and approval of plans. This money will be used to partially fund the program. Staff and resource funding for the program has

never been at the level needed to adequately carry out the intent of the Act. Because of revenue shortfalls and budget constraints this year's, program funding has been significantly reduced.

The Commission has a very active Education Committee which recommends and develops education projects. The education program is funded from civil penalties assessed for violations of the Act. Some of the accomplishments of the education program are:

1. erosion and sediment control manuals;
2. instructional videos;
3. public school education programs;
4. public service announcements and public information;
5. research; and
6. technical workshops and conferences,

ISSUES

Cooperation with other agencies

In general, the program has enjoyed good cooperative agreements with certain state and federal agencies. However, violations of the Act by state or federal agencies and other operational problems have underscored problems of communication, questions of jurisdiction, agency turf battles, coordination, and available resources" A prime example is wetland regulation. Of particular concern is sovereign immunity concerning federal compliance with state law.

Evaluation of program efficiency

A recent evaluation of the program indicates that there is a need for a reliable method to objectively assess program benefits versus costs. It is strongly recommended that additional efforts be devoted to this need.

Prosecution of violations

The experience of this program has shown that legislation can provide "teeth" to enforce violations, and the courts have been supportive in many cases. The degree of that support has been somewhat dependent upon the interpretation of the court. Civil penalties are primarily punitive after-the-fact and their deterrent effect is somewhat questionable. Injunctive and criminal proceedings can involve lengthy time delays. While these can be effective for certain violations, enforcement may also benefit from a more immediate sanction or economic incentive such as stop work orders, surety bonds or revocation/denial of other approvals or permits required.

ORANGE COUNTY'S EROSION CONTROL PROGRAM

Credit: Warren Faircloth, Erosion Control Supervisor, Orange County Planning and Inspections Department, Hillsborough, North Carolina.

INTRODUCTION

Orange County is located in north central North Carolina. The County has experienced a surge of growth and construction in the past decade because of its desirable location. Easy access from Interstates 40 and 85 and its proximity to the Research Triangle Park and the medical centers and other facilities at Duke University and the University of North Carolina at Chapel Hill has generated much of this growth. This growth and demands on the available water supply has demonstrated the value of the county's water resources and the danger uncontrolled soil erosion poses to it.

The purpose of Orange County's Soil Erosion and Sedimentation Control Ordinance (Erosion Control Ordinance) is to regulate land-disturbing activities and prevent sediment pollution and damage to property. The Ordinance is performance oriented; e.g., visible sedimentation must be retained on-site. Additional measures can be required when an approved erosion control plan fails to meet this objective even if the approved measures are properly installed and maintained. Prevention rather than remedial action is emphasized.

Enforcement is achieved by regulating land-disturbing activities, requiring protection of streams and property regardless of the area disturbed, and requiring submission and approval of an erosion control plan if the disturbance will exceed 20,000 square feet. Responsibility for compliance belongs to the person financially responsible for the land-disturbing activity. In most cases, the landowner or developer, not the grading contractor, is responsible.

BACKGROUND OF PROGRAM IMPLEMENTATION

Local concern over water supplies and water quality extends back several decades. The droughts and water shortages of the 1950's resulted in actions to protect local watersheds as well as regional ones downstream of the County.

Early efforts to both increase and protect the water supply were initiated by the Orange Soil and Water Conservation District. The District helped construct Lake Orange, a reservoir and flood prevention structure above Hillsborough, the county seat. The District also worked with farmers in the watershed to install soil conservation practices, and initiated and partially funded construction of three sediment retention structures to protect the reservoir from sediment accumulation and loss of storage volume. The District also participated in a program to install conservation practices on Orange County cropland to protect a reservoir to be built in an adjacent county.

Adoption of State Legislation

In 1973 the North Carolina State Legislature passed the Sedimentation Pollution Control Act to address erosion and sediment damage resulting from land-disturbing activity. The State is responsible

for enforcement, but the Act allows local governments to administer it with the approval of the Sedimentation Control Commission. To be approved, a local ordinance has to be adopted that is at least as strict or stricter than the Commission's Model Ordinance. To ensure that the ordinance is enforced, local programs are evaluated by the North Carolina Department of Environment, Health, and Natural Resources. The State can assume control of a program if the local Ordinance is not being enforced.

The Board of County Commissioners adopted the Erosion Control Ordinance in December 1975. A public hearing was held to receive comments, and hearings have been held for subsequent amendments to the Ordinance. Initially, the County depended upon assistance from the Soil and Water Conservation District for enforcing the erosion control plan requirements of the Ordinance, since their experience with agricultural erosion control was beneficial in starting the new program. Eventually, responsibility was assumed by the Planning Department, and staff was hired to administer the Ordinance. Presently, the Ordinance is administered by the Erosion Control Division of the Orange County Planning and Inspections Department.

Interest in Enforcement Heightened

Sedimentation in two lakes dramatically demonstrated the potential for damage from erosion on unregulated land-disturbances. Eastwood Lake, a 60-acre lake in a residential community, was severely damaged by sediment from urbanization of the watershed and construction of a school athletic field. University Lake, the main water supply reservoir for the towns of Carrboro and Chapel Hill, lost significant storage volume as a result of agricultural erosion and urbanization in the watershed. A lawsuit by the owners of Eastwood Lake and the loss of water to towns already severely effected by droughts resulted in stricter enforcement of the Ordinance and increased awareness of the threat that sediment and other pollutants pose to the County's water resources. Sedimentation in these two lakes also demonstrated the limitations of voluntary erosion control programs and the need for a strong regulatory program to prevent similar occurrences in the future.

Erosion Control and Water Quality

The County's erosion control program is not a complete watershed protection strategy; it is one component of a comprehensive program incorporating several ordinances. Erosion control includes the following components: (1) restraining soil erosion; (2) retaining sediment on-site during construction; (3) providing permanent stabilization; and (4) protecting on-site channels from increased runoff velocity due to development. Additional water quality regulations are contained in the Zoning Ordinance and Subdivision Regulations; they address other effects of development such as pollutants in runoff from impervious surfaces. Among the requirements are: stream buffers; retention of protective vegetation along stream banks; limiting impervious surfaces that are the source of pollutants and increased runoff; and ensuring that on-site waste disposal systems are safe and reliable.

In addition to enforcing local regulations, County staff maintains contacts with local, State, and Federal agencies concerning other water quality issues. These contacts concern uses which these agencies regulate: landfills; wetlands; and land-disturbances under State jurisdiction.

RESPONSIBILITY FOR COMPLIANCE

The Ordinance places responsibility on "the person financially responsible:" the developer or person that has financial or operational control, or the landowner or person in control that has allowed

or benefited from the land-disturbing activity. While contractors may have an agreement to perform the clearing and grading and implement the approved erosion control plan, they are not liable to the County for violations.

There are several practical reasons for this placement of responsibility for violations. There may be several contractors and subcontractors on large sites: one for clearing, another for grading, another for installing storm drains, and so on. Which one would the enforcement authority charge the violation to? Although a contractor is hired to physically disturb the soil, they usually have no control over or input into the design of the development or erosion control plan. Therefore, they cannot be responsible for any failures or damages caused by an ill-conceived site plan or an inadequate erosion control plan. A contractor may fail to fulfill a contract to implement the erosion control plan, but it is the responsibility of the owner/developer to supervise their agents to ensure that compliance is achieved.

To properly document responsibility, a notarized *Statement of Ownership and Financial Responsibility* is required with an application for erosion control plan approval. Both mailing and street addresses of the person responsible must be given. If not a resident of North Carolina, the applicant is required to retain the services of a North Carolina agent and include their name and address on the form. The purpose is to have someone in the state to receive inspection reports and notices of violation and to enable the use of alternate means of delivery if certified mail is not accepted.

ENFORCEMENT PROGRAM

The Ordinance emphasizes protection of property regardless of the area disturbed. The person responsible must take reasonable measures to keep sediment on-site and must permanently stabilize the disturbance. Enforcement action can be taken against violations of these provisions. Disturbances that are less than 20,000 square feet do not require erosion control plan approval or a grading permit because they are less likely to cause off-site damage. Erosion control plan approval is required when the disturbance will exceed 20,000 square feet. An erosion control plan can be required when several contiguous tracts (each less than 20,000 square feet) are developed as a unit. The combined disturbance of these adjacent tracts is more likely to cause damage.

Exclusions

Certain activities are excluded by State statute from local control: agriculture; sites under State jurisdiction (Department of Transportation projects, government projects, utilities with power of eminent domain, and mining); and forestry activity.

ADMINISTRATION OF ORDINANCES

The County's Erosion Control Ordinance applies to the entire county, including the municipalities of Carrboro, Hillsborough, and Mebane but not the Town of Chapel Hill. The County has an agreement with these towns to enforce the Ordinance within their boundaries. Chapel Hill has its own ordinance, adopted in September 1986, because part of its jurisdiction is in another county. Chapel Hill's Ordinance is essentially the same as the County's, and is enforced by the County's staff through an administrative agreement.

MANAGEMENT AND ENFORCEMENT STRATEGY

The Division's strategy is active involvement, beginning with an initial application review during the development approval process. Involvement does not wait until just before construction starts when an application for erosion control plan approval is submitted. This strategy is intended to prevent problems and violations and to ensure success of the purpose of the Ordinance, not just exercise its enforcement and administrative provisions.

Cooperation with Other Agencies

Accomplishing this strategy involves working with local planning departments in reviewing preliminary development proposals and site plans. One purpose is to determine if an erosion control plan would be required and to remind the owner/developer that approval is required before beginning construction. The most important purpose is to determine if there are design elements that conflict with erosion control requirements (for example, overdeveloping the site and leaving inadequate room to accommodate sediment-trapping devices). The developer and designer are informed of problems that must be addressed during the initial design process so that a site plan does not conflict with erosion control standards even though it may meet other land-use ordinance requirements.

Consultations are encouraged during initial stages of design to discuss the site, proposed development, and erosion control requirements. This helps designers by informing them of erosion control requirements and showing them techniques and devices they may be unaware of. Such discussions are encouraged before making a formal submittal to save the designers time and money. These meetings also initiate communication between staff and responsible parties that should be maintained throughout construction.

EROSION CONTROL PLAN REVIEW PROCESS

Orange County has adopted its *Soil Erosion & Sediment Control Manual* as the standard for designing erosion control plans. The Manual incorporates research, accepted practice, and staff's experience with successes and failures over many years. It is meant to be a "cookbook" for use by a variety of professionals with varying degrees of expertise and includes information, examples, illustrations, and instructions on erosion control devices and techniques.

The standards in the Manual are minimum design standards, not a substitute for performance requirements. The intent is to insure consistency in plan design and presentation and the design and use of individual devices.

The Review Process

Plans must be submitted to the Erosion Control Division at least 30 days before the anticipated start of construction, and work cannot begin until the plan is approved. If the Division does not respond to a complete plan (plan, application, statement of ownership, and fees) within 30 days the plan is considered to be approved and the applicant can start work.

The plan can either be approved, denied, or approved with either conditions, modifications, or performance reservations. Denial of the plan or approval with conditions, modifications, or performance reservations can be appealed. In responding to the plan the reviewer gives the designer an opportunity to respond to comments and concerns in order to open discussions and negotiations that will result in a plan that can be approved.

Fees

The erosion control program is funded by local taxes and fees. No State or Federal funds are used. There are separate plan review and grading permit fees based on the size of the disturbance and intensity of development. Classifications of development intensity are: rural, urban, and intense urban. Current fees per disturbed acre are:

Plan Review - $95 rural, $155 urban, and $225 intense urban
Grading Permit - $205 rural, $390 urban, and $580 intense urban.

The development intensity classifications are an attempt to prorate fees based on the amount of time involved in reviewing plans and inspecting the site. Higher density usually means more time and effort are required.

The fees charged are an attempt to recover the cost of operating the program. Elected officials and the County administration have always supported the program, and lack of funds has never been a serious hindrance to its implementation. The Division has three full time staff, and approximately 80% of their time is spent on erosion control.

For the past four years an average of 62 sites have been permitted each year, ranging from small, rural subdivisions roads to major shopping centers and multifamily housing projects. Approximately 90 to 110 active sites are under construction at any given time.

SITE INSPECTION PROCEDURES

A preconstruction conference with erosion control personnel, the person financially responsible, and the grading contractor is required before construction begins. This meeting is essential to get off to a good start by reviewing the erosion control plan since the contractor may never have seen the approved plan or not know what is required. It is also an opportunity for erosion control personnel to meet face to face with those involved in the project and know who to contact when the need arises. By discussing the plan before work begins, expectations can be emphasized and potential problems worked out.

Site inspections involve walking over the site, checking for compliance with the approved plan, seeing if the devices are installed and maintained correctly, and determining if the plan is performing to retain sediment on site. If problems are found, the inspector will attempt to contact someone on-site to point out deficiencies and request corrective action. A site inspection report is completed as a record of the visit, a copy is left on-site, and one is mailed to the person financially responsible. Follow-up inspections are made to determine if requested corrective action has been taken.

For the past four years an average of 5,744 inspections have been performed each year. The goal is to inspect each active site at least once a week and more often if necessary. After completion of a project, follow-up inspections are made to ensure success of permanent measures, particularly the survival of permanent vegetation.

VIOLATIONS OF THE ORDINANCE

Violations are defined as initiating a land disturbance without the necessary approvals and permits, failure to follow the approved erosion control plan, and failure to observe other standards and

requirements in the Ordinance such as retaining sediment on-site and providing ground cover within a certain number of days.

Enforcement Tools

The Ordinance contains several effective provisions to quickly bring violations into compliance. Stop work orders and revocation of the grading permit are the strongest and most effective provisions. When they are used, all work on the site must stop, including building construction. It has been the Division's experience that the threat of these actions and the ability to shut down the site are more effective in maintaining compliance than actually taking enforcement action.

Other enforcement provisions include penalties and legal injunctions. Fines are $1000 (and double permit fees) for failure to submit an erosion control plan, and $500 per day for other violations with each day counted as a separate violation. Penalties and injunctions have rarely been used because of the effectiveness of other enforcement provisions and the delays for the procedures to assess and collect fines. The expectation is that staff will use persuasion and other available means as much as possible and use legal action as a last resort.

Notice of Violation

With the exception of the stop work order and penalty for not submitting a plan, a Notice of Violation must be sent by certified mail to the person financially responsible before taking enforcement action. The Notice must state the violation and specify actions to correct it, give a reasonable deadline for achieving compliance, and warn that failure to bring the site into compliance will result in enforcement action. If the violation is not corrected and penalties are assessed, assessment begins the day the Notice is received by the person responsible.

In an effort to solicit voluntary corrective action during their inspections, staff will point out, either through personal contact or an inspection report, failures or situations that could become a violation. If these warnings are ignored and a Notice of Violation is required, then the deadline for compliance will usually be short since the person responsible should have foreseen the problem and initiated corrective action; in addition, they have already been given notice through personal contact or an inspection report that a problem existed.

ISSUES AFFECTING ORANGE COUNTY'S PROGRAM

Design of Sediment Basins

Experience reviewing erosion control plans and witnessing their implementation showed the need for local standards to improve the efficiency of sediment basins. Accepted practice was to design basins for the volume of sediment generated from each disturbed acre in a year, regardless of the total drainage area. The volume could be reduced if accumulated sediment was removed more often: if removed every 6 months, volume could be reduced by 50%; if removed every month, it could be reduced by 92%; and so on. This practice was used to manipulate the space required for the basin without considering the effect on trapping efficiency, which was already poor. Anticipating a design that proposed sediment removal every day and a 99% reduction in volume, standards requiring minimum surface area and length to width ratio were adopted for consistency and to establish a reasonable and attainable efficiency.

Sediment-trapping Efficiency

The Ordinance does not include a measurable standard (such as turbidity) of water quality; it simply requires preventing damage to streams and property and retaining "visible sedimentation", a vague standard. Research into sediment basins considered whether it was possible (and practical) to retain all sediment on-site. Capturing silt and clay particles from concentrated runoff would require a surface area as high as 25% of the disturbed area or greater where off-site runoff mixes with sediment-laden runoff. Research also found that increasing the size several times would only improve efficiency a few percent; however, larger basins would also increase the disturbed area, resulting in additional erosion with the loss of existing protective vegetation. The resulting standards are an attempt to balance efficiency with these practical constraints.

Two important lessons were learned in compiling the standards for sediment basins. (1) It is impossible to continue traditional construction practice of clearing large areas and expect to successfully filter sediment from runoff. The runoff volume that must be treated is too large and silt and clay particles are too small to be captured without using huge basins that occupy valuable real estate. (2) The use of sediment-trapping devices must be coupled with actions to prevent erosion and sediment generation by completing construction quickly and stabilizing disturbed areas. Applying these lessons requires the use of innovative erosion control techniques to reduce runoff into sediment basins so that huge surface areas are not required combined with planning and execution of construction to limit soil exposure to as short a time as possible.

Potential Problems with Differing State and County Standards

Having stricter County standards creates a potential conflict with sites under State jurisdiction, since their standards are less strict. State standards are guidelines, whereas the County's are requirements that specify which devices can be used, where use is acceptable, and design and construction standards. Problems arise when developers, designers, or contractors are accustomed to less restrictive State standards, and mistakenly assume the County's requirements are the same, do not read the fine print in the plan, and are surprised at the construction sequence and size of devices.

Taking of Land for Erosion Control Purposes

Area for sediment-trapping devices must be accounted for in designing the site plan, just as space for setbacks, providing access and parking, and other land-use requirements must be provided. Development to maximum potential cannot be accomplished at the expense of damage to streams and adjacent property. Careful planning can eliminate permanent loss of space for temporary devices by locating them in parking lots and areas to be landscaped or by using permanent detention basins as temporary sediment ponds. The erosion control manual gives suggestions and examples of how to accomplish this.

Other Issues In Achieving Compliance

1. Erosion Control plan designers are seldom involved during implementation of their plan and not available to address problems that inevitably arise during construction. The contractor often has no technical support other than erosion control personnel. As a result, designers do not see the plan implemented and miss the opportunity to learn from success and failure. The person financially responsible should provide needed technical assistance; in addition, the contractor should provide competent supervisory personnel to see that devices are built properly. For some difficult sites in Orange County, a condition of approval requires the developer to retain the services of an engineer to provide technical support.

2. Traditional methods of clearing, grading, and construction must be revised to be more sensitive to the environment. Construction must be planned and executed to limit the time of exposure, reducing erosion and sediment generation, rather than relying exclusively on inefficient sediment-trapping devices.

3. The contractor should request a copy of the approved erosion control plan and be sure the bid is based on it, not on a preliminary version that was revised before it was approved. Compliance is more likely if the contractor knows erosion control requirements in advance and is prepared for the cost.

4. Contractors responsible for implementing the plan must take initiative to inspect measures for failures or maintenance instead of waiting for erosion control personnel to point out these problems. After completion, the developer should provide follow-up inspections of permanent devices and stabilization to ensure success and prevent future erosion.

5. Although indirectly related to erosion control, disposal of debris (trees, stumps, demolition debris) from site clearing is becoming more difficult. Because land-fills discourage this type of material (because of the volume taken up) and the high fees charged, some contractors resort to illegal dumping, often in rural locations. These dumps create additional environmental hazards, erosion being a minor one compared to the hazardous materials that are often put in these illegal dumps. The use of chippers in some areas provides a partial solution to this problem. The chips can be recycled as mulching material or sold for wood pulp where there are markets for this material.

CONCLUSION

The implementation of Orange County's erosion control program demonstrates that an effective erosion control program can be successfully implemented and accepted by developers and grading contractors who are most directly effected by its requirements. To ensure that the program is both accepted and effective, enforcement staff is actively involved in the review of development proposals, combining the cooperation and technical assistance usually found only in voluntary programs. Together with the enforcement powers of a regulatory program, this provides an effective enforcement strategy. This approach to enforcement is reflected in the County's *Soil Erosion & Sediment Control Manual,* an effort to combine educational material on erosion control techniques and devices with a set of comprehensive standards and requirements. Experience with enforcement shows that tools other than lengthy prosecution through the courts can be more effective in preventing sediment pollution; compliance is promoted by having the authority to stop work if other means of persuasion fail. A key component of this enforcement strategy is periodic inspections to ensure that plans are followed, maintenance is performed, the approved plan is successful in retaining sediment on-site, and initiative is taken to address problems before violations occur.

CALIFORNIA'S RESPONSE TO WATER QUALITY AND LOGGING ACTIVITIES

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In California, the State Water Resources Control Board and the Regional Water Quality Control Boards (appointed by the Governor) have the authority and responsibility pursuant to the State Porter-Cologne Act and the Federal Clean Water Act to promulgate Water Quality Management Plans (Basin Plans) which set forth objectives for restoring, enhancing and maintaining the quality and beneficial uses of the State's waters, to promulgate regulations and policies to attain these objective and to administer these regulations and policies to ensure that waste discharges, including those from silvicultural activities, do not degrade the quality and beneficial uses of the State's waters.

The State Board of Forestry through the State's Forest Practice Act has the authority to regulate timber operations on state and private lands. The Department of Forestry and Fire Protection has the authority to enforce all regulations adopted by the Board of Forestry.

The State Water Resources Control Board has the authority and responsibility pursuant to Section 208 of the Federal Clean Water Act to designate appropriate management agencies for implementing certain provisions of Water Quality Management plans and to certify 208 Water Quality Management Plans which incorporate Best Management Practice (BMPs) for control of nonpoint sources of pollution, including silvicultural land uses.

The State Water Resources Control Board, through a Management Agency Agreement (MAA) has designated the Board of Forestry and the Department of Forestry and Fire Protection as water quality management agencies for timber operations on nonfederal timberlands.

The following are state statutes that direct California's efforts in protecting water quality and reducing sediment production.

Porter-Cologne Act (PCA)

The Porter-Cologne Act sets forth objectives for restoring, enhancing and maintaining the quality and beneficial uses of the State's waters, gives state and regional water quality boards the authority to promulgate regulations and policies to obtain the above objectives and to administer the regulations.

Forest Practice Act (FPA)

The FPA authorizes the Board of Forestry to adopt regulations to cover all aspects of timber operations and provides for regulations to adequately control soil erosion to protect soil resources, forest productivity, and water quality. The Act also provides for regulations that will control timber operations which will result or threaten to result in unreasonable effects on the beneficial uses of water. The regulations contain provisions for minimizing damage to stream beds and banks, controlling construction of log landings and roads in or near watercourses, control of sediment into watercourses, placement of drainage facilities, soil stabilization treatments, and long-term maintenance of skid trails, roads and their erosion control devices.

California Environmental Quality Act (CEQA)

CEQA is similar to the National Environmental Protection Act (NEPA). All state approved projects must go through environmental review and a project will not be approved if it will have a significant adverse impact on the environment unless there are overriding concerns that make the project of higher priority.

Water Quality Management Plan

California's Water Quality Management Plan for control of nonpoint source pollution from timber operations on nonfederal timberlands consists of an agreement between the State Water Resources Control Board, the State Board of Forestry, and the Department of Forestry and Fire Protection, the FPA and its regulations and the process for approving Timber Harvest Plans. The public was fully involved in the development of the Water Quality Management plans.

The forest practice regulations are intended to be preventative in nature. Timber operators are prohibited from putting anything into watercourses in quantities deleterious to the beneficial uses of water.

In addition, there are specific erosion control measures to be taken like waterbars with specific spacing on roads and skid trails, prohibition of tractor operations on slopes over 65 percent and specific vegetative buffer strips on each side of watercourses. All practices must meet the intent of the FPA and the specific water quality basin plan objectives.

A timberland owner who wants to harvest timber must have a Registered Professional Forester prepare a timber harvest plan. The plan is submitted to CDF where it goes through an interdisciplinary review. The review team consists of representatives from CDF, the Regional Water Quality Control Board and the Department of Fish and Game. All actions of the review process are open to the public for their input. All significant issues raised must be addressed in writing.

After the plan is approved, CDF inspects the timber operations during and after active operations. Water Quality and Fish and Game may attend these inspections. They may also appeal to the Board of Forestry CDF's decision to approve the plan.

Both Water Quality and Fish and Game have the responsibility to enforce their own regulations or prohibitions that prevent sedimentation and pollution of water quality. Neither will act on timber operations unless they feel that the CDF has not acted to enforce their own regulations.

Violations of the forest practice rules are misdemeanors with fines up to $1,000 and six months in jail. Violations of Water Quality basin plans are dealt with through civil remedies. The Water Quality Control Boards may issue cleanup and abatement orders and waste discharge prohibitions.

As a part of the Management Agency Agreement guidance documents will be developed or improved guidance documents for determining potential significant adverse effects of cumulative effects, road construction techniques, and methods for identifying and evaluating erodible and unstable slopes, near stream geologic and hydrological conditions, and near and in-stream biological conditions.

The MAA provides for continued development and upgrading of training and education programs for foresters, timber operators and agency personnel. Interagency procedures between the reviewing agencies is addressed through memorandum of understanding. The agencies do not always see eye-to-eye on resource issues.

The private sector is encouraged to develop and implement voluntary procedures that will protect water quality, such as adopting policy statements regarding environmental protection, training of employees and improving self-policing within the industry and professional associations of persons who repeatedly violate environmental protection policies.

The key to any pollution control plan is a monitoring program to determine how you are doing in protecting the resource. California's first monitoring was done by a team of four professionals looking at 100 timber harvest plans. No quantitative data was taken. The four professionals used their expertise in determining whether regulations were complied with and the significance of any degradation. The forest practice rules are being modified to reflect the results of this monitoring effort.

The Board of Forestry and CDF, in conjunction with the State Water Resources Control Board are developing a long-term program to evaluate the effectiveness of the forest practice rules in protecting water quality from the impact of timber harvesting activities. The public has been invited to provide information on specific streams, lakes or other bodies of water that are thought to be affected by logging and tree planting. At this time no specific monitoring techniques have been developed.

The funding for enforcing the provisions of the WQM plan comes from the state's general fund or special funds like the Cigarette and tobacco tax. Federal grants have played a small role in some of the research and monitoring that has occurred.

Issues

1. In California at least three agencies have the legal authority to enforce laws that prevent depositing material into the states waters. These are CDF, WQ and DFG. Many of the laws are overlapping and can cause jurisdictional problems. The best example of this is when there is a violation of the forest practice regulations, CDF will issue a Violation Notice or Citation with corrective actions if necessary. Water Quality can and have come in and required clean-up and abatement procedures or issued waste discharge requirements. To combat this the timber industry has regulations passed that would exempt timber operation conducted under the provisions of the Forest Practice Act from waste discharge requirements if EPA approved the state Water Quality Management Plan as being best management practices under Section 208 of the Clean Water Act.

Even though EPA has not approved the WQM plan, there have been few waste discharges placed on timber operations in the last few years.

The CDF and Regional Water Quality Boards are in the process of completing a Memorandum of Understanding that will lessen the friction created by having more than one agency responsible for water quality.

2. California regulations are designed to be preventive. However, there is a conflict on whether they can be if they don't contain more measurable standards in them. Water quality personnel are usually engineer types and are more comfortable with measurable standards. The forestry community is not so comfortable with them. The issue becomes one of how strict of a standard such as compaction of road surfaces and fills is necessary to achieve the water quality objectives. In California, the Board of Forestry has chosen not to go to strict standards but prescribes practices that will achieve acceptable end results.

3. In California the regulations prescribe practices that if done correctly should achieve water quality objectives. Would it be simpler to just prescribe the objectives we want to meet, such as limiting water temperature increases to 5 degrees above preharvest levels instead of requiring the timber operator to leave 50 percent of the shade canopy? The timber operator would devise his/her own methods of preventing degradation of water quality. It sure could reduce the expense of printing the large volumes of regulations we have now.

VIRGINIA NON-REGULATORY FOREST WATER QUALITY PROGRAM

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Background

In the mid 1980's, citizens of Virginia became very concerned about water quality. Daily media attention to water quality issues such as pollution regulations, oil spills, groundwater contamination, water rationing, fish kills and wetlands loss, etc. have made clean water a major issue throughout Virginia, as well as nationally.

The public's awareness of the causes of water pollution is growing. Forest management activities, especially logging, are often viewed as a major cause of muddy streams, although they are actually only a small portion of the overall non-point source pollution problem. Logging is very visible and can contribute to erosion and sediment in streams if not done using proven conservation measures called Best Management Practices (BMP's). BMP's are mostly common-sense operating procedures that will minimize soil erosion and protect water quality during forest management activities.

Forestry is the only major industry that is not regulated by the Virginia Sediment and Erosion Control Law. Because of this unique situation there is increased scrutiny for possible mandatory regulations. A survey of logging operations in 1987 showed that less than half of the logging sites checked had used adequate BMP's to protect water quality. With greater awareness by the public, the forest industry must effectively use BMP's on a voluntary basis, or a regulatory BMP program will be imposed by the State or Federal government. The experience in other states which have implemented regulatory BMP programs is that they are burdensome, expensive and not cost-effective. Landowners, loggers, and foresters must all take responsibility to see that BMP's are used during forestry activities.

Federal, state and inter-state regulations have had the greatest influence on development of water quality programs in Virginia. First came the re-authorization and strengthening of the Federal Clean Water Act and the EPA requirement for state clean water plans. In 1980, the legislatures of Virginia and Maryland established the Chesapeake Bay Commission to plan programs from a legislative perspective that would restore and protect the Chesapeake Bay. In 1987, the Chesapeake Bay Agreement was signed. This agreement made among the states of Virginia, Maryland, Pennsylvania, the District of Columbia, the EPA representing the Federal Government, and the Chesapeake Bay Commission, set forth specific goals and priority commitments in the areas of: Living Resources; Water Quality; Population Growth and Development; Public Information, Education, and Participation; Public Access; and Governance.

Public perception and influences are the same in Virginia as in other states - that's a "given". So - what's different? First, each state has a different administrative structure. The changes in Virginia's governmental structure since 1970 reflect increased emphasis on environmental concerns in Virginia.

1966 Creation of the State Air Pollution Control Board, which in 1988 was reorganized under the Department of Air Pollution Control.

1968 Broadening the authority of the Marine Resources Commission to regulate and protect all marine resources.

1970 The Council on the Environment was established by Executive Order to coordinate inter-agency environmental programs and issues resolution.

1972 The Division of Water Resources and the State Water Control Board were consolidated, thus broadening their authority.

1986 The Department of Waste Management was created.

1988 The Chesapeake Bay Local Assistance Department (CBLAD) was created by statute under the Chesapeake Bay Preservation Act. This department's major activities are to provide financial and technical assistance to local governments concerning land use, development, and water quality protection. The Department works with local governments to ensure that comprehensive plans and zoning ordinances reflect the objectives of the Chesapeake Bay Preservation Act. The Chesapeake Bay Local Assistance Board has developed its regulations which will be administered by local governments. Because of the commitment of the DOF and industry to address the forestry water quality issue through a voluntary BMP program, CBLAD agreed to allow a two year period to evaluate the effectiveness of the voluntary approach. If DOF water quality goals are not met, CBLAD will require regulatory BMP's.

1988 Erosion and sedimentation regulations were strengthened leaving only agriculture and forestry exempt.

The second way Virginia differs from other Eastern states in the Bay watershed area is that forestry continues to rank either #1 or #2 in the manufacturing sector of Virginia's economy. In fact, in Virginia, the Department of Forestry (DOF) is under the Secretary of Economic Development. However, DOF works closely with the Secretary of Natural Resources and the agencies under that Secretariat. Virginia's forestry is unique from the other states that make up the Chesapeake Bay watershed in that it is both a natural resource and a back-bone of our state's economy.

It is the only industry in Virginia whose resource base and industrial base extend to every county in the state. Of the Old Dominion's 25.4 million acres of land, 15.4 million, or 61% are commercially productive woodland. There are an additional half million acres of woodland recreational areas.

A third way in which Virginia is different is that fairly strong state lobbying efforts have been developed supported through PAC moneys and the effective lobbying efforts of woodland owner associations and trade organizations including agriculture. We have demonstrated that the non-regulatory approach through BMP's is the most cost effective way of addressing the non-point source pollution problem created by forestry activities.

A forth way Virginia differs from other states is in the degrees of cooperation between industry and the Department of Forestry. These two groups tend to work in harmony with mutual respect for the mission of the other.

Department of Forestry Action

In July 1988, the Virginia Department of Forestry (DOF) recognizing that quality water is an integral component of the forest resource, adopted the position that the agency's main priority would be the protection of water quality, second only to wildfire suppression, while maintaining a high level of silvicultural activities. Goals and objectives were established that would reduce sedimentation to the Chesapeake Bay from silvicultural sources 40% by the year 2000 in accordance with the 1987 Chesapeake Bay Agreement. These goals and objectives were incorporated into the Forestry Nonpoint Source Management Plan required by US EPA in compliance with the Clean Water Act as amended. The Department of Forestry is the lead agency for the Forestry Nonpoint Source Management Plan with the Virginia Division of Soil and Water Conservation (DSWC) being the lead agency for the State Nonpoint Source Management Plan as required by the Clean Water Act through US EPA. Progress in control of nonpoint source pollution resulting from forest management activities is reported annually by DOF to DSWC for the state report to US EPA.

To achieve voluntary compliance with the use of BMP's in Virginia, the State Forester established a Forestry Task Force for Water Quality. The 25 members of this Task Force were leaders from forest industry, consulting foresters, Virginia Tech Cooperative Extension Service, Lumber Manufacturers Association, and Virginia Forestry Association. The Task Force had responsibility to oversee the statewide BMP effort and recommend adjustments and emphasis items for the DOF water quality program. It also provided an opportunity for direct industry involvement in the program and fostered ownership in and support for the program.

In the Fall of 1988 the State Forester met directly with more than 200 local forest industry leaders at eight meetings statewide to review the DOF position on water quality, to point out the urgent need to implement BMP's and to gain commitment and support from industry leadership at the grassroots level.

Water Quality - BMP Program Strategy and Activities

The DOF in cooperation with the Task Force developed a program consisting of a four-part strategy: awareness, education, evaluation, and pride.

Awareness was accomplished through 30 local meetings held throughout Virginia from December 1988 to March 1989. These meetings, attended by 1,900 loggers, foresters, landowners, and allied government agency representatives were funded by forest industry and arranged by local DOF personnel, assisted by local industry foresters. This "grassroots" approach provided an opportunity for local DOF foresters to explain the threat of regulatory BMP's and the DOF program activities to gain cooperation from forest industry, loggers and landowners.

The second part of the strategy, **education**, began with the explanation of BMP's at the meetings. Four videos and five publications on the use of BMP's have been produced. However, the most effective education has taken place on the ground, one to one, between logger and the local DOF or forest industry forester who evaluates the BMP's on harvesting operations. In addition, eight field demonstrations showing correctly applied BMP's have been held throughout the state in 1989 and twenty more are planned for 1990.

DOF foresters are using BMP's in all DOF controlled operations and making specific BMP recommendations when preparing Forest Management Plans for landowners. The BMP Handbook was revised and updated with a special pocket sized edition produced for loggers. The DOF has implemented a complaint response process to provide the public the opportunity to express concerns about specific harvesting operations and to assist the DOF in monitoring the program and in taking corrective action when needed. The Association of Consulting Foresters and regional logger associations are cooperating to gain widespread acceptance of BMP's as standard operating procedures.

Evaluation is the most costly, and perhaps the most critical part of the four-part strategy. In 1988 the DOF forest hydrologist position was established. He evaluated base-line data for soil erosion resulting from silvicultural practices and prepared a report on regional estimates of soil erosion and sedimentation from forestry operations.

DOF has implemented a BMP inspection program to evaluate the use of BMP's on all logging jobs larger than five acres. Training sessions for DOF and industry foresters in the use of the inspection forms have been held. When possible, inspection reports are being reviewed on site with the logger, timber buyer and landowner. Data from these inspections is used for the water quality evaluation program designed to determine the general condition of forest waters and the effects of forestry BMP's on forest water quality. A report of the first year evaluation data identifies specific practices, loggers and geographic locations where improvements in the application of BMP's are needed. Funding has been approved by the 1990 General Assembly for DOF to implement a water quality assessment system which would include development of water models, logging site evaluations and water quality sampling at selected sites.

The DOF's commitment of agency funds and manpower to conduct on-site BMP evaluations of harvested tracts across the state is perhaps the key to Virginia's voluntary BMP program having a real chance to be successful. These evaluations will serve as a "report card" for the logging industry in Virginia. No one likes to receive a bad report

card, and the forestry community and citizens of Virginia are depending on the **pride** of the logging industry or peer pressure to provide the motivation necessary to ensure voluntary compliance with BMP's.

Short-term Objectives Accomplished

The 18 short term objectives for 1989 were all accomplished as described in the preceding paragraphs. These included:

1. Establish water quality as a top priority for DOF
2. All DOF controlled operations use BMP's
3. Enforce law requiring removal of logging debris from streams
4. Make specific BMP recommendations in Forest Management Plans
5. Conduct logger training in BMP use
6. Develop base line erosion data
7. Inspect logging operations for BMP's and evaluate inspection data by tract, logger and practice
8. Conduct training for foresters from all sectors
9. Establish Water Quality Task Force to oversee programs
10. Develop good logger recognition program with forestry association
11. Develop Memorandum of Understanding with consultant foresters and industry
12. Use media to promote public awareness of program
13. Employ Forest Hydrologist to direct program
14. Review need for harvest site registration
15. Gain cooperation from logger associations
16. Concentrate efforts to reach landowners prior to timber sale
17. Develop network with other agencies and organizations
18. Develop complaint response program

Other major accomplishments 1988-90 included:

- Revision and update of Forestry BMP Guidelines including a new section on non-tidal wetlands with review and input by DOF and representatives from forest industry, allied agencies, and environmental protection groups and woodland owner association

- Board of Forestry approved a recommendation that reforestation cost share payments be dependent on the application of BMP's on reforestation projects

- DOF staff and Task Force representatives worked closely with the Chesapeake Bay Local Assistance Department (CBLAD) staff during the development of criteria to be used in implementing the new Chesapeake Bay Preservation Act. Because of the commitment of the DOF and industry to addressing the forestry water quality issue through a voluntary BMP program, CBLAD agreed to allow a 2 year period to evaluate the effectiveness of this voluntary approach before considering requiring BMP's through regulations

- Wetlands Roundtable appointed by the Governor to address the wetlands issue and make recommendations on programs and legislation, supported the DOF program and recommended that other state agencies promote similar voluntary compliance programs where possible

Long Term Objectives 1990-2000

Eight long term objectives have been set with projects and activities implemented to accomplish the following:

1. **Require BMP's to qualify for reforestation cost-share payments**

   Issue - If landowners are benefitting from government cost-share payments it is reasonable to require that they practice accepted BMP's as a means of resource protection just as they would be required to adhere to wildfire prevention measures or reforestation standards.

   Accomplishments - approved in 1989 by Board of Forestry

2. **Increase personnel and resources**

   Issue - The DOF by making water quality a priority forest management activity estimated that the additional field activities necessary to evaluate logging operations for correct use of BMP's and install necessary BMP's on other silvicultural activities would increase work load by 10-20%. In order to maintain other necessary programs and do an effective and efficient job implementing the water quality improvement programs, an increase in personnel and resources will be needed.

   Accomplishments - 1989 General Assembly approved 20 additional positions but due to current budget reductions, positions have not been filled

3. **Develop notification system to DOF by timber buyer prior to harvest**
   Issue - With limited personnel and resources, valuable time is being wasted tracking down harvesting operations in order that BMP evaluations can be completed. If timber buyers notify DOF of harvesting plans then more efficient coordination of BMP installations and evaluations can be made.

   Accomplishments - various notification systems being conducted on trial basis

4. **Examine merits of new financial incentive programs**
   Issue - Provide incentive for loggers, consultant foresters, timber buyers and landowners to install and maintain BMP's. Without cooperation from all segments of the forest users community, the program would not be successful.

   Accomplishments - under review by staff

5. **Support research to develop and improve streamside management zone specifications**

   Issue - SMZ's are recognized as one of the most effective BMP's for trapping runoff before entering flowing waters, yet there continues debate over appropriate

width under various conditions such as slope, soil types, vegetation, etc. More research is needed to develop practical specifications in order to recommend more effective SMZ use.

Accomplishments - cooperative projects initiated with USDA Forest Service, Virginia Tech School of Forestry and other interested agencies and organizations

6. **Study the need to require BMP's for Alternate Management Plans**

Issue - If a forest landowner harvests a pine stand (minimum 10% pine) the Virginia Seed Tree Law requires the leaving of seed trees, pine reforestation or a DOF approved Alternate Management Plan (AMP). The impact of AMP's on water quality where BMP's are not used is unknown. Information is needed to determine if BMP's need to be required when an AMP is granted.

Accomplishments - under review by staff

7. **Use base-line data to monitor and evaluate accomplishments**

Issue - The 40% sediment reduction goal was set by the 1987 Chesapeake Bay Agreement water quality requirements. A reasonable goal was determined to be the most effective way to monitor and document progress. The intermediate goals for 1991 and 1995 allow for early assessment of progress and determination of need for program changes.

Accomplishments - Sedimentation reduction goals are:
-by 1991 - 10%
1995 - 30%
2000 - 40%

8. **If sedimentation reduction goals are not met, the State Forester will draft and submit appropriate legislation for mandatory BMP's for silviculture activities**

Issues - The State Forester determined that if the forestry community did not cooperate to fully implement BMP's to meet the established sediment reduction goals then the State Forester should draft and submit the appropriate legislation to meet the program goals, rather than regulations being drafted by groups unfamiliar with forestry practices.

Accomplishments - monitoring and evaluation program has been implemented with periodic reports on progress in sediment reduction being prepared. The results of this monitoring program will be used to determine if significant progress is being made with the non-regulatory program.

The Future

The following remarks regarding the future of a non-regulatory water quality program in Virginia were made in March, 1989, at the Forestry Issues Forum at the Virginia Tech School of Forestry by Nelson T. Flippo, Chairman of the Virginia Board of Forestry.

"The future freedom to conduct unregulated forestry operations in Virginia depends at this point almost solely on the success of the BMP program now being promoted by DOF, the trade organizations, professional foresters, Virginia Tech School of Forestry, industry and also by the ultimate course of the Chesapeake Bay Local Assistance Board.

The question of whether regulation will come will depend upon the cooperation and commitment by the entire forestry community. If BMP's are taken seriously by those who work in the forests, we will probably be able to continue with a non-regulatory program. If the current approach does not work, the State Forester has promised, with the concurrence of the Board of Forestry, that he will draft and ask to have submitted legislation that will make compliance with BMP's a statutory requirement in Virginia. The future of the forest industry is riding on a good performance by those who work in the forests, and you may rest assured we are being watched very closely. We need to move swiftly and decisively to improve the public's perception of forestry, because politically in Virginia, we are witnessing a dramatic shift of the voting strength to the urban areas. This situation is expected to move more in the same direction during the 1990 legislative re-apportionment.

I would like to close with a quote from a book entitled Ecology Wars written by Ron Arnold. This quote came from a section entitled 'You got the trees, we got the votes'."

> And if you rural loggers think the industry doesn't need your help, let me remind you of California state senator Bill Green of Los Angeles' Watts district, who warned: "Your activities may be rural, but your problems are urban. You have the trees, but we have the votes.
>
> Your problem is what my constituents think you are doing in the woods, accurate or inaccurate." This industry's finest ought to let them know how it really is, so, loggers, get off your axe and tell it your way.

In Conclusion

James W. Garner, State Forester of Virginia commented, "We in forestry have a responsibility to do our part to enhance and protect the quality of water that starts in the forests of Virginia. If we don't act responsibly, and do the Best Management Practices on our silviculture and harvesting operations, then we will face regulatory measures that are going to be expensive and burdensome. The landowners, the industry and all of the forestry community need to cooperate and act responsibly to use Best Management Practices where they're needed on a voluntary basis so that we don't have to be regulated in the future. With proper management and the use of Best Management Practices, we can enjoy the economic benefits of the forest resource and still maintain the environmental amenities that go with it and that will meet the needs of the Commonwealth and ensure a quality resource for our future generations."

SEDIMENT MANAGEMENT PROGRAM FOR MINING IN COLORADO

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INTRODUCTION

In 1858, gold was found in Cherry Creek near the present site of Denver, Colorado. Within a year, more than a thousand miners were swarming the foothill streams in search of gold. Placer deposits were worked by diverting part of the stream through a sluice box and washing the alluvial sands and gravel from the gold by gravity separation. The miners would dig to bedrock or until the gold played out. The effect of sedimentation downstream on water quality, aquatic organisms and channel stability was not of paramount concern to the miners at the time.

Today the potential for mining activity to adversely impact land and water resources is generally acknowledged. Legislation and regulatory programs have been implemented at the state government level to address this concern in Colorado. The Mined Land Reclamation Division (MLRD) is the agency designated with the responsibility to insure reclamation of lands disturbed by mining. A description of this regulatory program for mining and reclamation in Colorado, with an emphasis on the sediment management aspects of the program, is provided in this paper.

LEGISLATIVE HISTORY

Mining has been a significant part of the history and economy in Colorado since the early days. Following the gold rush, population increased as did the demand for metals and coal production for electric-power generation. Aggregate mines were developed near urban areas and metal mines were active in the mountainous part of the state. Conflicts between mining and other land uses were not considered significant enough to warrant legislation before 1969.

In 1969, the Colorado General Assembly passed the first legislation regarding the reclamation of lands disturbed by mining. "The Colorado Open Pit Land Reclamation Act" applied only to the surface mining of coal. Performance standards required grading of spoil pile peaks and ridges to a width of at least 15 feet. No topsoil salvage was required. A 1-year permit and bond (not to exceed $100 per acre) were required for all new mining areas.

In 1973, aggregate quarries and open-pit sand and gravel mines were added under "The Colorado Open Mining Land Reclamation Act." Reclamation standards for quarries were limited to stabilization of disturbed areas as necessary to prevent landslides, floods and erosion. Minimum standards for backfilling and grading, protection of water resources, disposal of toxic materials and the revegetation of coal and gravel mines were more specific than the earlier law. The statute passed in 1973 included a 5-member decision-making Board, 5-year permits, elimination of the $100 per acre limit on bonds, and a requirement that local government approval be obtained on land-use issues prior to application for a mining and reclamation permit.

In 1976, the first comprehensive reclamation law was enacted and entitled: "The Colorado Mined Land Reclamation Act." The major provisions of that law have not been changed up to the present day. The major additions to the 1973 law included: 1) all hardrock minerals, 2) surface facilities at underground mines, 3) extension of permit terms to "life of the mine," 4) requirements for prospecting, 5) application and bonding requirements for small versus large mines, 6) administrative procedures for enforcement, 7) a 7-member multi-interest Board appointed by the Governor, and 8) substantial additions to performance standards. The Minerals Program within MLRD operates under the Colorado Mined Land Reclamation Act.

In 1979, the legislature adopted the "Colorado Surface Coal Mining Reclamation Act." This law was enacted in response to the federal Surface Mining Control and Reclamation Act (SMCRA) adopted by Congress in 1977 (PL 95-87). Colorado passed regulations which were at least equivalent to those of the Department of the Interior, Office of Surface Mining (OSM) and obtained primacy of the coal program . The 1979 statute removed coal operations from the 1976 act and established more specific performance standards, application requirements, and inspection schedules for coal mines. The Coal Program within MLRD operates under the Colorado Surface Coal Mining Reclamation Act.

A provision under SMCRA allows for an Abandoned Mined Land Program to expend funds on hazards and serious environmental problems created by mining before 1977. Colorado has reclaimed most of the abandoned coal mines and is working on hazard abatement at hardrock mines. The Inactive Mine Reclamation Program at MLRD operates under this provision of SMCRA.

In 1988, the legislature passed Senate Bill 162 which removed the requirement for local government approval prior to submitting a reclamation permit application. Land-use approval to conduct mining is still required in most areas of Colorado. Thus, local government approval and a reclamation permit must both be obtained prior to mining.

The Water Quality Control Division (WQCD) of the Colorado Department of Health is the primary water quality management agency in Colorado. Legislation was passed in 1989 which had particular importance for the relationship between WQCD and MLRD. Senate Bill 181 requires the MLRD, as an implementing agency, to establish points-of-compliance where discharges to state waters from mining activities must meet water quality standards and classifications. Surface waters in Colorado have previously been classified and standards have been established. Ground water in alluvial and confined aquifers have not yet been classified. Numeric standards for selected organics and radionuclides have been established for ground water statewide but standards for conventional pollutants have not been assigned. Nonpoint sources (NPS) occurring as runoff and as diffuse sources would appear to come under the state waters definition referenced in SB 181, although there is some uncertainty on this point. The MLRD will be working with the Water Quality Control Division to develop rules for the implementation of this legislation.

In summary, legislation has been passed in Colorado which requires all types of mines to reclaim the lands they have disturbed. Voluntary programs have become mandatory. Performance standards have become more explicit. The legislature and Board have developed the statutory and regulatory mechanisms to insure reclamation of all mined lands in Colorado.

The legislation enacted for regulating coal and mineral mining have similar goals in protecting water quality to areas downstream of mining sites. The sediment control provisions differ in the extent to which engineering design standards have been specified in the regulations. The mineral regulations set forth performance standards and only a few specific design standards. The coal regulations have many design standards in addition to performance standards. Both programs are considered preventative rather than remedial in that each requires a definition of the sediment control plan at the time of permit application and prior to any disturbance of the site. The Inactive Mine Reclamation Program is entirely remedial in nature as only abandoned mines qualify for funding under this program.

Minerals Program

The Mined Land Reclamation Act sets forth four (4) provisions with direct application to water quality and sediment control under Section 116(7):

(c) Acid-forming or toxic-producing material that has been mined shall be handled in a manner that will protect the drainage system from pollution;

(g) Disturbances to the prevailing hydrologic balance of the affected land and of the surrounding area and to the quality and quantity of water in surface and ground water systems both during and after the mining operation and during reclamation shall be minimized;

(h) Areas outside of the affected land shall be protected from slides or damage occurring during the mining operation and reclamation;

(i) All surface areas of the affected land, including spoil piles, shall be stabilized and protected so as to effectively control erosion and attendant air and water pollution.

These performance standards are general in nature but can be interpreted quite broadly depending on the level to which they are applicable and are addressed.

The major sediment control issues at mineral mines include sedimentation of rivers downstream of placer and in-stream gravel mines, erosional stability of quarry benches, revegetation of mill tailings, and long-term integrity of soil covers placed over refuse piles and recontoured slopes. Revegetation is the ultimate sediment control at mine sites.

Each mine is unique in its design as is the environmental setting in which each occurs. The inclusion of sediment control structures in the mine plan, including upland diversions, collection ditches, sediment ponds, check dams, slope erosion control, and reconstructed channels is site-specific and based largely on slope gradients of the mine site. Other factors including local precipitation regime, soil type and vegetative cover must also be considered. The sizing of these sediment control structures can be variable dependent on the duration of the mine life and the level of risk assumed acceptable. Most operators are willing to include additional erosion control treatments when a solid rationale for their inclusion is stated by the regulatory agency.

Coal Program

The coal program is very specific as to the design of sediment control structures at coal mines. Design standards are specified in the regulations for temporary diversions, sediment ponds, spillways, culverts and permanent reconstructed channels. A statement of probable hydrologic consequences from the proposed mining activity is made by the applicant and used in developing a basinwide cumulative hydrologic impact assessment by the regulatory agency.

Studies have been conducted to evaluate the performance of sediment basins (Skelley and Loy, 1979; Ward et al., 1977; Williams and Keo, 1979). The sediment pond design standards are technology-based and may not achieve performance standards (Anderson and Briggs, 1979; Skelley and Loy, 1979). Runoff from a specified size of storm event is defined as the design standard, but the proportion of runoff volume requiring detention for a specific length of time is not specified. A distinction between the primary and emergency spillway is referenced in the regulations, but whether these can be combined in a tiered arrangement was for a time uncertain. These examples illustrate the difficulty in prescribing a technology-based approach and the advantages of performance standards in establishing regulations.

A uniform requirement was in effect for a number of years which specified that the runoff from all disturbed areas must be routed through sediment ponds. There has always been some concern with the universal requirement for sediment ponds (del Rio, 1981; Kearney and Bergstrom, 1981). If runoff from disturbed areas can be treated without ponds, or no treatment is actually required to meet effluent limits, it would appear the requirement for ponds is excessive. The universal requirement for sediment ponds has recently been rescinded.

One coal mine in Colorado proposed an alternate method of sediment control to the use of ponds during the reclamation phase of the project. This proposal was to install shallow depressions at intervals on the hillslope which were designed to fill with sediment at about the same time vegetation would become fully established. The initial results from this alternate sediment control practice are encouraging but cannot be evaluated at present as insufficient time has elapsed to provide conclusive results.

Another aspect of sediment control is management of rills and gullies. Oftentimes a quantitative criteria is established in permits which will define acceptable depth of gullies. In the arid west, gullies are a natural landform in some geomorphic regions. Recent studies have been conducted in Colorado to identify effective treatments (Agnew and Humphries, 1990) and to evaluate the various factors which may contribute to erosional instability of hillslopes and valley floors on reclaimed mine sites (Elliott, 1989; Elliott, in press).

Inactive Mine Program

A remedial program also exists at MLRD. The Inactive Mine Reclamation Program has safeguarded over 2,000 mine openings since 1980. An inventory of 15,000 inactive mines exists statewide. Most of the 32 abandoned surface coal mines have been reclaimed. A program has been developed to finance repairs of damage due to coal mine subsidence. Recently the program has become involved in cooperative projects with the Water Quality Control Division under funding provided by Section 319 of the Clean Water Act (PL 92-500 and PL 98-217). Section 319 is also known as the nonpoint source program and supports

demonstration projects on different technologies to treat runoff or other diffuse sources of water pollution. Colorado was the first state to submit a nonpoint source assessment report to the U.S. Environmental Protection Agency (EPA) in 1988 (Colorado Department of Health, 1988).

There are currently two (2) completed and four (4) planned 319 demonstration projects at inactive mine sites in Colorado. Most of these involve passive treatment of acid mine drainage and tailings reclamation. Lime additions using hydropower pumps, constructed wetlands, adsorption media using peat, zeolites, and other treatment media are proposed. In addition to passive and active treatment, the measures identified in the statewide NPS management plan included: run-on controls, infiltration barriers, runoff and erosion controls, mine waste removal, drainage stabilization, bulkhead seals, air seals and mine atmosphere controls and protection of unstable areas.

GUIDELINES

Guidance documents which include specific criteria on design of structures, alternate methods and materials, and recommendations on useful reclamation techniques have certain advantages and disadvantages. The disadvantage is that guidelines have a tendency to become de facto regulations although they are not intended as such. This limits or brings into question innovative techniques and procedures. The advantage, of course, is that interested persons can determine the minimum requirements specified in guidelines or simply follow the recommendations and be assured of timely approval of applications. The MLRD has issued guidelines in the past on recommended procedures for collection of baseline hydrologic information at coal mines, and guidelines for the design, construction and operation of cyanide-leaching gold operations. The usefulness of guidelines appears related to the requirement for timely direction on a new or complex technical issue. If the guidelines are allowed to evolve, they can continue to be useful. No specific guidelines for sediment control have been developed by MLRD.

ENFORCEMENT

Inspections and enforcement are an integral part of the regulatory programs. About 40 percent of the violations in the coal program are related to drainage and sediment control. During an inspection, if a violation of a statutory provision, regulation or permit condition is noted, an enforcement action is taken. In the coal program, a notice of violation (NOV) is written in the field, and cease and desist order issued if there is imminent harm to the health and safety of the public or potential for serious environmental harm. In the minerals program, only the Board can find a violation at a public hearing on the matter. A cease and desist order can be issued in the field for an illegal mineral operation. In both programs, corrective actions to fix the violation are mandated by Board order and civil penalties are assessed.

If the mine operator fails to comply with a cease and desist order, the Board may request the attorney general to bring suit for a temporary restraining order, a preliminary injunction, or a permanent injunction to prevent a continued violation of the order. If an operator fails to comply with the terms of a Board order, the permit may be revoked and the bond forfeited. The MLRD is then responsible for hiring contractors to complete the reclamation with monies secured by the bond. If the bond amount is insufficient, the Board may bring suit for additional compensation.

FUNDING

Funding for the fiscal year 1990 is described below for the three (3) program areas within MLRD. Sources of funding and expenditures are noted as well as number of full time employees. A discussion of funding adequacy is provided.

Minerals Program

The minerals program is supported from general funds appropriated by the Colorado legislature. No federal funds are involved. An application fee is required and depends on the size of the operation. These range from $125 for a 10-acre operation to a maximum fee of $2,000. About 130 new applications are received each year. Annual fees ranging from $50 for small operations and $350 for large operations are paid by the operator each year. There are a total of about 2,000 permitted operations of which about 40% are government-operated and exempt from fees. Fees currently support only one-half of total program funding of $430,000. The current staffing level of 10 employees is considered inadequate to fully meet program objectives.

Coal Program

The coal program is currently funded at approximately 1.2 million dollars. No fees are collected. Federal funds are available at 100 percent for coal mines entirely on federal land, and 50 percent for those on private land. For Colorado, this results in a 83/17 federal-to-state match ratio. There are 61 coal mines in the state of which 29 are currently in production. The current staffing level of 25 employees is adequate to support the program requirements.

Inactive Mine Reclamation Program

The funding for this program has been derived from a reclamation fee paid to the federal treasury by the coal mining industry. This fee is scheduled to terminate in 1992, however, an extension is currently being considered by the U.S. Congress. Approximately 1.5 million dollars in construction funds were awarded to Colorado last year. Funding of $760,000 for administration was adequate to support 12.5 full time employees.

INTERGOVERNMENTAL RELATIONS

The MLRD, as a state agency, promotes cooperation among local and federal agencies as well as public interest groups and the mining industry. At the time of permit application, referrals are made to city and county governments in which the proposed operation is located, the board of supervisors of the local soil conservation district, the Colorado Division of Wildlife, the Colorado Division of Water Resources, the Colorado Water Quality Control Division, and the Colorado Air Pollution Control Division. Where appropriate, other state agencies are contacted including the Colorado Geological Survey, Hazardous Materials and Waste Management Division, Radiation Control Division, Parks and Recreation Division, State Land Board and State Historic Preservation Office.

Federal agencies are notified when proposed mines or prospecting operations are to be located on federal lands. Individual memorandums of agreements have been developed with the Bureau of Land Management and the U.S. Forest Service which assigned the MLRD as lead agency for permitting and bonding purposes.

The U.S. Army Corps of Engineers is notified of potential dredge-and-fill (404) actions related to mining. No direct interaction occurs between MLRD and the EPA. The MLRD refers operators to the best management practice (BMP) requirements of the Clean Water Act applicable to gold placer mines (Section 440.140).

Another area of intergovernmental relations includes sites under the Comprehensive Environmental Response and Compensation Liability Act (CERCLA) (PL 96-510). Colorado was one of the first states to file under the National Resource Damage Suit (NRDS) provision under CERCLA. Six (6) CERCLA sites in Colorado are old mining sites. MLRD provides technical assistance to the Department of Health on reclamation aspects of these NRDS sites.

Future regulatory programs may involve additional need for intergovernmental cooperation. Colorado is active in the Western Governor's Association (WGA) in advising EPA on proposed Strawman regulations to address mine waste under the Resource Conservation and Recovery Act (PL 94-580). Amendments to the existing federal act are expected. A clear definition of federal/state jurisdiction will be necessary to reduce overlap in these programs.

The EPA has also proposed regulations under the Clean Water Act for the control of stormwater contaminants. Mines would be considered industrial facilities and may be regulated under this program. The WQCD is currently developing regulations for stormwater control at the state government level.

PUBLIC PARTICIPATION

The enactment of legislation has increased the opportunity for involvement by the public in the reclamation process. This is because no opportunity existed previously without the enabling legislation. The level of public involvement is difficult to judge but it appears to be increasing in recent years.

The major pathways for public involvement include submission of objections on permit applications and complaints on active operations. Citizen complaints are a high priority concern and these usually prompt an inspection of the mine. All meetings and permit files are open to the public. Citizens can also take legal action in the courts if they feel the Board or MLRD has failed to act in accordance with the law. Petitions for rulemaking, petitions for declaratory orders, and requests for participation in bond release hearings are other pathways for public participation.

Two of the possible reasons that participation by the public is limited or not fully utilized is the complexity of the scientific issues and the complexity of the regulations. The amount of time and money required to become fully involved in a mining issue are also related to the level of participation.

SUMMARY

The regulatory programs for reclamation of mine sites in Colorado have been developed over a number of years. Sediment management is an integral part of the requirements to be addressed during mining and upon reclamation. The success of this program benefits the mining industry, the public and most importantly the environment.

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PROGRAM DESCRIPTION
BUREAU OF LAND MANAGEMENT
IDAHO STATE OFFICE

Prepared for the Panel Discussion
at the
Fifth Federal Interagency Sedimentation Conference

Credit: Karl Gebhardt, Hydrologist/Environmental Engineer

PROGRAM DESCRIPTION

A. The Bureau of Land Management (BLM) manages over 12-million acres of land in Idaho. This responsibility has been termed "multiple use management" by the Federal Land Policy and Management Act (FLPMA). The BLM must plan for the wide use of natural resources while assuring that the soil, air, and water resources are properly cared for. The lead responsibility for water quality management within the BLM rests with the Soil, Water, and Air Resources Program (SWA). The SWA program establishes recommended policy and procedure and interfaces with other resource management programs within the BLM (such as forestry, grazing, mining, recreation, etc.). The lead water quality management agency in Idaho is the Idaho Department of Health and Welfare, Division of Environmental Quality (DEQ). Within the DEQ, the Water Quality Bureau (WQB) and the Hazardous Materials Bureau (HMB) have the largest impact on water quality management. In Idaho the BLM has established several cooperative programs with the state of Idaho dealing with water quality management. BLM funds a full-time state of Idaho employee within the HMB to guide BLM in its everyday activities concerning hazardous waste management. Recently, a BLM employee was placed on a full-time appointment with the WQB to guide the development of a nonpoint source water quality management program. This effort will lead the BLM and state to a partnership for nonpoint water quality management involving the development and evaluation of best management practices for grazing management as well as other programs.

B. The BLM's authority and responsibility for water quality management is included in FLPMA, the Clean Water Act (CWA), Resource Conservation and Recovery Act (RCRA), Comprehensive Environmental Response Liability and Compensation Act (CERCLA), and numerous executive orders and memoranda of understanding.

C. The BLM is funded through federal appropriation to the U.S. Department of Interior. Funding has generally been inadequate to conduct monitoring of water quality and land use activities.

D. BLM's soil, air, and water program is just beginning to accommodate nonpoint source pollution management. This year for the first time, we will be sending many of our mangers and specialists to training specifically designed for nonpoint source management. BLM us beginning to place more emphasis on nonpoint source pollution management. The BLM's "Riparian/ Wetlands Strategy for the 90s" establishes the strategies for an active nonpoint source pollution control program. Emphasis has been on administering land-use activities through mitigation measures and stipulations. Compliance has been a problem but is improving. BLM in Idaho does not have enough personnel to supervise livestock grazing and mining activities. We are working closely with the State in developing suitable practices, monitoring techniques, and feedback mechanisms. The BLM relies heavily on standards and procedures developed by state regulatory agencies, particularly for mining activities where the BLM's authority is limited. Where violation of water quality standards are suspected, the State WQB personnel are notified. Water quality problems related to toxic substances have been effectively dealt with through the State HMB's RCRA program.

E. The involvement of the state of Idaho has been discussed above. The cooperation between agencies is outstanding.

F. At the state level the public was very involved with the development of the nonpoint water quality program. The federal agencies, particularly the BLM, were very involved with public meetings, participation on technical advisory committees and other committees, and in the preparation of various water quality meetings and conferences.

SOME SUGGESTED LEGAL AND/OR INSTITUTIONAL ISSUES TO CONSIDER

A. How should the effectiveness of the program be measured? The program should examine problem ares that currently exist and monitor the progress that is made to improve the water quality. Activities having the potential to impact water quality should be closely monitored to determine if the applicable best management practices are effectively applied and whether or not their objectives are met.

B. Can design criteria for management practices be developed that are adequate to meet water quality or other performances standards? Yes and no. The State of Idaho in cooperation with the BLM is currently developing a system to classify stream segments to help determine the effectiveness of best management practices for various activities. Once developed, this system will help identify those activities and practices that are incompatible with certain types of streams.

OTHER ISSUES

One of the most difficult areas to deal with is mixed ownerships. Mixed ownerships are a problem for planning nonpoint source control on a watershed basis. Communication, coordination, and cooperation with all parties are essential for success. Where impacts occur, the operator is often the only individual who can correct problems. Where remediation is required, the flexibility of the regulator may determine the extent of remediation or if it occurs at all. A very real threat we face is having financially unstable operators choose bankruptcy (or fleeing) rather than resolving problems.

STATE CONTROL AGENCY - AGRICULTURE

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INTRODUCTION

The control of sediment from agricultural areas in Wisconsin is the responsibility of several governmental units. Sediment control can be viewed in two basic categories, namely soil erosion and nonpoint source pollution.

Soil erosion control is the responsibility of the Wisconsin Department of AGriculture, Trade and Consumer Protection (DATCP). The soil erosion control program administered by DATCP is aimed at achieving "T by 2000". The primary emphasis of using a "T" standard relates to soil productivity.

Wisconsin's Nonpoint Source Water Pollution Abatement Program

The Wisconsin Department of Natural Resources is responsible for administering the Nonpoint Source Water Pollution Abatement Program. Known as the "Priority Watershed Program", sediment control is viewed in the context of sediment delivery to waterbodies. The Priority Watershed Program does not use "T" values as an indicator of sediment delivery to waterbodies. Through the development of the Wisconsin Nonpoint Source Model (WIN model), the DNR prescribes field control based on sediment delivery rather than the Universal Soil Loss Equation.

Legal Authorities

Legal authority to control agricultural sediment loss is found in both DNR and DATCP's enabling legislation. (Chapters 144 and 92, Wis. Stats. respectively). Neither program is regulatory in nature with the exception of the "bad actors law" which allows limited regulation of any nonpoint source of pollution. The Wisconsin soil loss legislative authorities relate to either the voluntary cost-sharing approach found in the Priority Watershed Program or the use of "cross-compliance" in the DATCP's administered Farmland Preservation Program.

In 1987 the Wisconsin Legislature enacted Wisconsin Act 297 which created a limited regulatory component for the control of nonpoint sources of pollution. The Act (Ch. 144.025(u) & (v)), allows the Department to order the abatement of any nonpoint source of pollution as defined under the statutes. Cropland erosion and construction site erosion is considered a nonpoint

source of pollution. To date, no agriculturally related cases have been pursued. However, a construction site case and a case involving severe erosion of a ski hill are pending.

Funding Sources

Both DATCP's and DNR's programs are funded with state general purpose revenues. In recent years, federal funds under the Clean Water Act have supplemented the Priority Watershed Program, however these funds are not passed through to land owners for the purpose of control site specific sediment control problems.

Currently the Nonpoint Source Program's annual budget is $6.4 million/year. Currently there are 40 Priority Watershed Projects in various stages of implementation or planning. Table 1 shows the total acres of cropland under contract which is being managed for sediment delivery control. Historically, the percent of cropland related best management practices of the total nonpoint source program practices has declined due to a large increase in animal waste control practices being installed.

Table 1

Practice	Acres Contracted	Acres Installed
Contour Cropping	2610	1056
Strip Cropping	24833	13747
Minimum Tillage	7123	2946
No Till	940	283
Reduced Tillage	2078	399

DATCP's Soil and Water Resources Management Program's annual budget is approximately $3.4 million/yr. In 1991, approximately $1.2 million will be allocated to the soil erosion and Farmland Preservation Program.

Program Objectives

The Nonpoint Program concentrates on remedial actions necessary to control existing sediment loading problems. Funds are targeted to fields which exhibit high sediment delivery to waterbodies regardless of "T" values. In other words, a field which is attaining "soil erosion" goals (by ostensibly meeting a "T" standard) may still be contributing sediment to a stream or lake which is impairing or threatening a beneficial water quality standard. Conversely, a field which is not meeting "T" may be ineligible for funding if that field, due to it's location within the hydrologic and topographic regime, is not contributing it's soil loss to waterbodies.

DATCP's programs are also remedial in nature. However, DATCP programs do emphasis soil erosion control to meet soil productivity standards.

These programs are not inherently contradictory. In fact, DNR promotes the attainment of "T" as analogous to "categorical treatment" standards in the point source program. Ideally, the Priority Watershed Program should only focus on fields which have met "T" but require additional treatment (or perhaps retirement from production) to meet water quality goals.

State funding of these various programs is not sufficient to meet either "T by 2000" goals or the "fishable - swimmable" goals of the Clean Water Act. As noted in Figures 2 and 2, large geographic areas of the state are either not meeting "T" or are not covered in a Priority watershed Project area.

The Priority Watershed Program is a comprehensive nonpoint source water pollution abatement program. A watershed plan is prepared which evaluates the water resources objectives to be achieved, quantifies the pollutant loading using several different models, and determines the necessary pollutant reduction levels to achieve the desired water quality goals.

Technical Standards

In agricultural areas, most "Best Management Practices" used are defined through the Soil Conservation Services Field Office Technical Guide. However, the statutes allow DNR and DATCP to develop "alternative best management practices" if other structural or nonstructural measures are required.

The Nonpoint Source Program addresses both urban and rural nonpoint source pollution. The DATCP program's concentrate on agricultural areas and are not targeted necessarily to "project" areas since broad based funding of all counties is stressed. Soil erosion and sediment delivery components of both programs also are based on SCS's technical standards. However, for urban areas the DNR has produced a technical document which is designed for construction site erosion activities.

Program guidance is primarily found in an administrative rule (Chapter NR 120, Wisconsin Admin. Code). Extensive public participation is used to develop the code or subsequent revisions. In 1987 an advisory committee was jointly appointed by DNR and DATCP to assist in the development of rule revisions

for both agencies. The committee was comprised of representatives from a broad array of groups ranging from farm organizations to environmental groups.

Following the development of the administrative rules, additional program development is accomplished through extensive, formal interaction with the Wisconsin Association of Land Conservation Employees (WALCE). WALCE represents county Land Conservation Department staff who implement both DNR and DATCP programs as well as federal soil erosion program sin conjunction with SCS and ASCS.

Recently a "6-Way Memorandum of Agreement" between DNR, DATCP, SCS, ASCS, FmHA and the University of Wisconsin - Extension was signed which outlines a framework for cooperation among the signatories in all aspects of nonpoint source pollution control in Wisconsin. Of primary concern is the need to agree to state priorities when federal "Water Quality Initiative" funding is made available through USDA. The federal funds will be used to supplement state initiatives.

Competing priorities have caused considerable tension between DNR and SCS. In particular, SCS involvement in "water quality" has caused some concern related to duplication of efforts and focus. It is hoped that the MOA will solve these past concerns by bringing the parties together prior to decisions being made on USDA water quality funding. SCS has provided significant support of the Priority Watershed Program and will remain a strong partner in agricultural water quality issues. However, it is necessary for USDA to recognize state water quality agency primacy if disputes over responsibilities and roles is to be avoided.

Summary

Wisconsin has a strong tradition in nonpoint source pollution control. Sediment control is one of several issues which is addressed by DNR and DATCP in their respective programs. Emphasis on program coordination and cooperation has resulted in strong working relationships between the two state agencies. Recent conflicts with USDA agencies has been addressed in a positive manner by the negotiations conducted in preparing the Memorandum of Agreement.

FIGURE 1 - SOIL EROSION RATES IN WISCONSIN

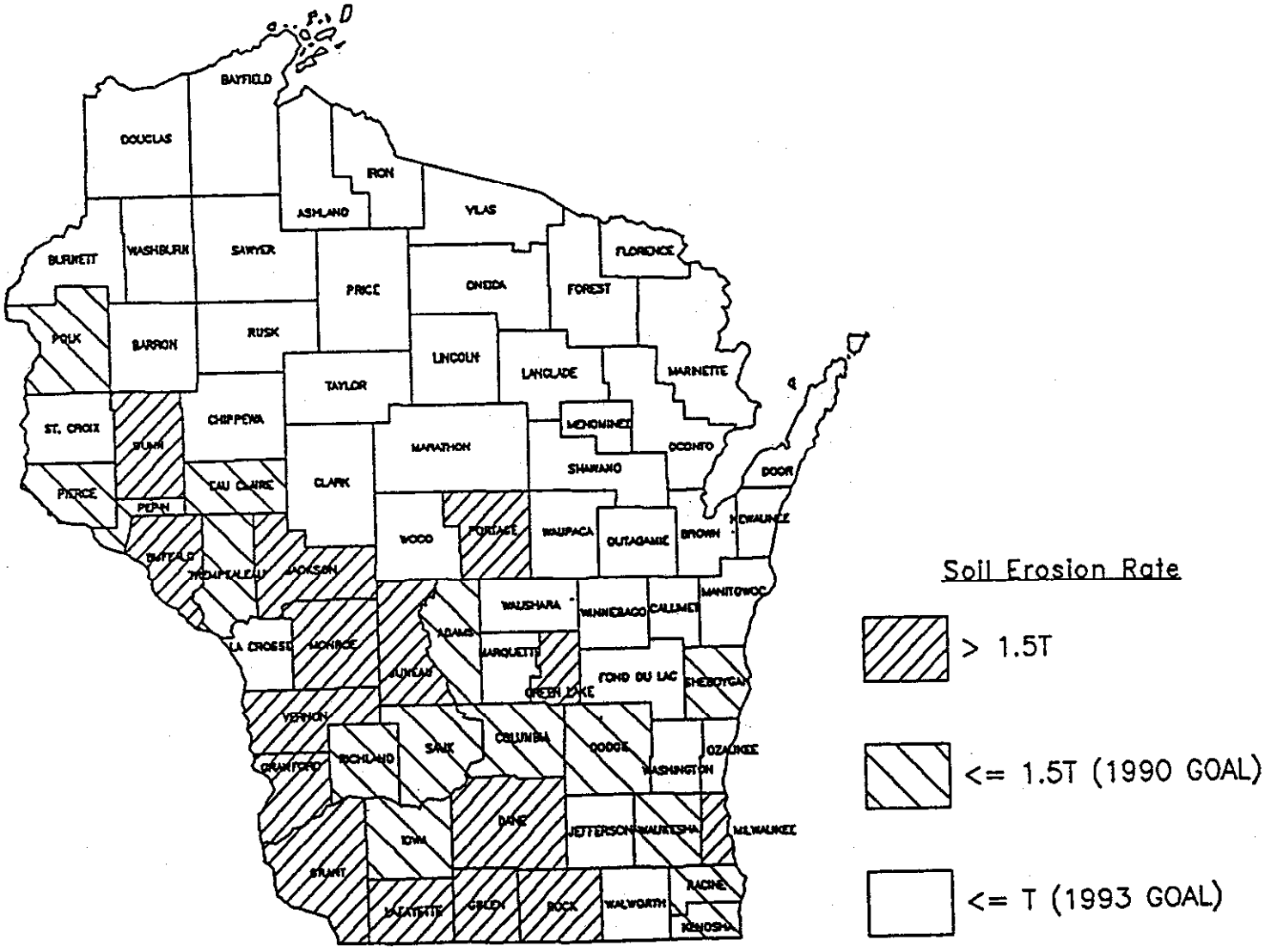
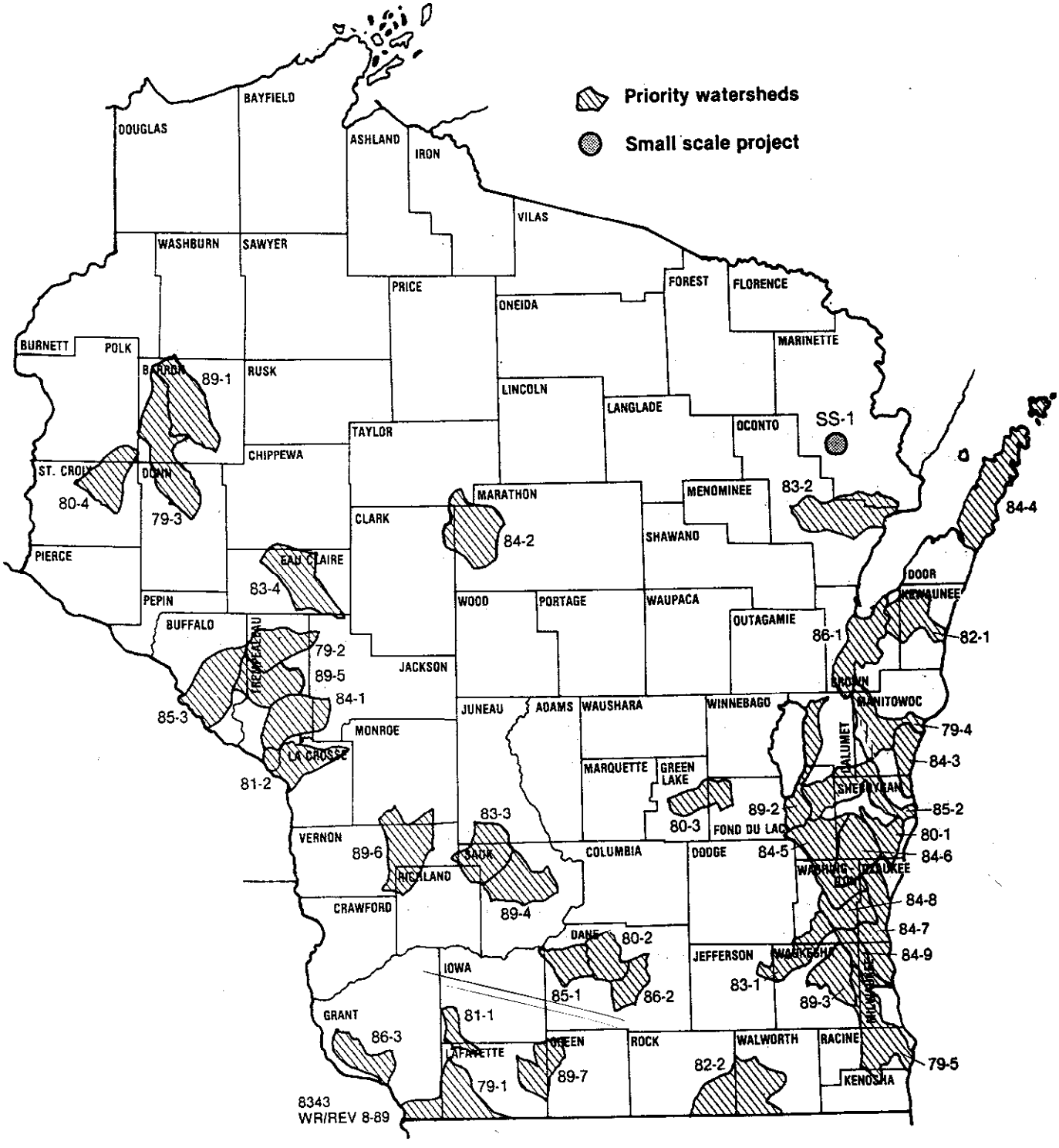


FIGURE 2

Priority Watershed Projects in Wisconsin 1989



PRIVATE SECTOR EXPERIENCE WITH SEDIMENT CONTROL REGULATION

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In the United States, the driving force behind the practice of erosion control has been the concern, starting at the federal level, over the quality of the nation's waterways and reservoirs. This concern has resulted in federal laws enacted with the intent of restoring and maintaining the environmental integrity of the waters of the United States.

During the 1970s, strong U.S. support of environmental improvement resulted in the adoption of a group of strong environmental protection laws. These laws have resulted in significantly increased environmental expenditures by both government and the private sector. Congress enacted the Resource Recovery Act (RCRA) in 1970 to address the problem of waste dumps, the Clean Air Act (CAA) in 1970 to deal with ambient air pollution and amendments to the Federal water Pollution Control Act in 1972 to reduce discharges of pollutants to our natural waterways.

Since passage of the amendments to the Federal Water Pollution Control Act (now called the Clean Water Act), U.S. businesses, government, and individuals have spent billions of dollars on water pollution control. Many of these efforts have been regulated under the National Pollution Discharge Elimination System (NPDES) program, which was aimed at municipal wastewater treatment plants and discharges of industrial wastewater, and the pollution control methodologies have been focused on treatment-based controls. As a result, the water quality in many streams and lakes has improved, but in most cases little more has been done than to prevent further degradation. However, this is a significant achievement considering the increases in industrial production, agricultural output, and population that have occurred since 1972.

During the late 1970s studies such as the Nationwide Urban Runoff Program (NURP) determined that nonpoint sources of pollution were making significant contributions to the nation's water quality degradation problems. These nonpoint sources include urban runoff, agricultural runoff, abandoned

mine drainage, and atmospheric washoff. As a result, new federal regulations aimed at control of nonpoint source contaminants have been promulgated. Under these regulations, sediment is treated as a contaminant because of the large range of environmental impacts of suspended solids (turbidity) and transported sediment on water bodies.

Implementation of the Clean Water Act and the new aspect of the NPDES program aimed at stormwater quality control, has been relegated to various federal and state agencies for administration, including the EPA, U.S. Army Corps of Engineers and the state fish and game departments. The permitting process for direct encroachments into streams or wetland environments has stringent requirements and is strictly regulated. The control of sediment as a nonpoint source pollutant, however, is much more variable in its regulation. Sediment control is generally relegated to the local level, and the existence of local regulatory programs is not consistent in the U. S. While some areas have strict local programs, other areas have none or have no effective means of program enforcement.

Local regulatory programs to implement and enforce sediment control measures should include four key elements: (1) an erosion and sediment control ordinance, (2) erosion and sediment control plans, (3) a manual of standards and specifications, and (4) means of enforcement. The ordinance should create a framework for regulation and provide the legal basis for enforcement. It should require applicants for grading permits to submit plans for erosion and sediment control and should define the process for reviewing, approving and enforcing those plans. Because the ordinance must be applicable to a number of difference conditions, it must be a flexible document. It therefore should not contain technical details likely to change over time or that are better determined on a case-by-case basis. These details should instead be included by reference to a manual of standards and specifications.

As required by the ordinance, a plan should be submitted for each project describing measures for erosion and sediment control on the construction site. The control measures specified must be of an appropriate type and size to accommodate predicted runoff and sediment yield from the site and should be designed according to the standards and specifications prescribed in the manual.

The manual, referenced in the ordinance, should contain standards and specifications for proven, effective procedures for constructing, operating and maintaining erosion control measures. It should be continuously revised to incorporate new data and technological developments, thereby enabling the ordinance to keep pace with technology without legislative revision.

The ordinance, with the required erosion and sediment control plans, and referenced manual of standards and specifications, would provide the legal basis for enforcement. Failure to install the required measures or to meet standards would constitute a clear violation of permit requirements. The ordinance would also establish procedures for reporting violations and the fines and penalties that may be imposed. The job of the local site inspector would be to see that all requirements of the ordinance are enforced on the site. Guidelines should be established to help him or her obtain developer compliance and deal with violations.

During the past 18 years, the importance of sediment control has come more to the forefront of the public's interest as well as the government's. As a result, this area has seen considerable change in sediment control practices as well as in the technology to evaluate the effectiveness of the management programs. The focus of control strategies has shifted from treatment-based systems to source controls, or preemptive systems.

Source controls of sediment range from on-site erosion control systems to stormwater hydrograph modification. An effective preemptive program also includes an administrative component, such as public education about protection of our natural waterways.

Development of the optimal management program involves a process of selecting a combination of regulatory, administrative, and structural controls. Control of other nonpoint source pollutants can be accomplished through the same management program as the sediment control program. It requires the evaluation and selection of the most appropriate regulatory, administrative, and structural controls and then development and implementation of the overall management program. Water quality standards should be the explicit goals of those programs.

Private sector experience with sediment control regulation indicates that:

(1) Programs for erosion and sediment control have to mandatory and enforceable.

(2) Preventative approaches have to take precedence over remedial approaches.

(3) Regulatory agencies must be knowledgeable and consistent in their monitoring, inspection and enforcement of approved erosion and sediment control plans.

(4) If environmental or water quality goals are not being achieved even though approved plans are being properly implemented, then the regulatory requirements should be adjusted and applied uniformly to permit applicants.

(5) Sediment management and enforcement responsibilities are currently assigned to different agencies which have different prime objectives. An overall Erosion and Sediment Control Task Force should be formed at the state level to provide direction to the various agencies having erosion and sediment control responsibilities so that water quality objectives are addressed consistently.

NOTE: This is the last page of Volume 2 of the Proceedings for the 5th Federal Interagency Sedimentation Conference.

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