

Repairing the Chattahoochee: The Dirt 2 Technical Panel Completion Report

**A Summary of the Work, Findings, Recommendations,
and History of the
Erosion and Sedimentation Control Technical Study Committee**

Published by the
Chattahoochee-Flint Regional Development Center
Franklin, Georgia
July 2001

Table of Contents

EXECUTIVE SUMMARY: BUILDING METRO ATLANTA'S ECONOMY BY BUILDING SYSTEMS TO PREVENT EROSION.....	INSIDE COVER
DIRT 2: MEMBERS, MESSAGE, AND MISSION	3
EROSION AND SEDIMENTATION CONTROL TECHNICAL STUDY COMMITTEE (DIRT 2) MEMBERS.....	3
PROJECT CONSULTANTS.....	4
THE MESSAGE: LESSONS LEARNED AND RECOMMENDATIONS FOR REPAIRING WATER QUALITY IN THE CHATTAHOOCHEE	5
COMPUTER MODELING	7
COST/BENEFIT ANALYSIS.....	9
OUTREACH AND TRAINING FOR PUBLIC INVOLVEMENT	10
PRINTED AND VIDEO MATERIALS	12
LITERATURE REVIEW	13
FINAL PRODUCTS: AND WHERE TO FIND THEM	14
PROJECT ORGANIZATION AND ADMINISTRATION.....	15
APPENDIX A: POLICIES TO PREVENT EROSION IN ATLANTA'S WATERSHEDS: ACCELERATING THE TRANSITION TO PERFORMANCE (THE NAPA REPORT).....	18
APPENDIX B: "EROSION PREVENTION AND SEDIMENT CONTROL COMPUTER MODELING PROJECT: EXECUTIVE SUMMARY"	57
APPENDIX C: SCOPE OF WORK.....	93

Dirt 2: Members, Message, and Mission

Erosion and Sedimentation Control Technical Study Committee (Dirt 2) members

(* indicates Project Management Advisory Committee member)

Gene Barber*

Owner, Gene Barber Contracting, Inc.
representing Greater Atlanta Homebuilders
Association

Sally Bethea*

Executive Director,
Upper Chattahoochee Riverkeeper
advocacy of good water quality

Mike Breedlove*, RLA, FASLA

President
Breedlove Land Planning
representing Georgia Chapter of the ASLA

Alice Champagne*

Water Protection Specialist
Upper Chattahoochee Riverkeeper
advocacy of good water quality

Ben Dysart*, Dirt 2 chair

President,
Dysart & Associates, Inc.
management consulting services

Phil Freshley*

Owner, LandTec Southeast
registered soil scientist

Larry Hedges*

Program Manager,
Non-point Source Program, Water Protection Branch
Georgia Environmental Protection Division

Dana Heil*

Environmental Specialist
Georgia Transmission Corporation
statewide electric and gas utility providers

Vince Howard*

Environmental and Regulatory Coordinator
Georgia Transmission Corporation
statewide electric and gas utility providers

Terry Hughey*

President,
AcuSense, Inc.
environmental activist

Earl Jenkins*, PE

retired Program Mgr, Urban Water Resources
State Soil and Water Conservation Commission

Bill Jorden*, PE

Senior Vice-President, HDR/W.L. Jorden, Inc.
consulting engineer
representing Consulting Engineers Council

Charles Kastner*

West Cobb Building Supply
Homebuilders Association of Georgia

James Magnus*, CPESC

Asst. State Construction Engineer
Georgia Department of Transportation

Karim Shahlaee*, CPESC

Program Manager, Urban Water Resources
State Soil and Water Conservation Commission

Tom Sills*, AICP, Dirt 2 Project Manager

Planning Director
Chattahoochee-Flint Regional Development Center

Robin Snell*

President, E.R. Snell Contractors, Inc.
representing Georgia Highway Contractors
Association

Terry Sturm*, Ph.D., PE

Professor of Civil and Environmental Engineering
School of Civil and Environmental Engineering
Georgia Institute of Technology

Helen Preston Tapp*, AICP

Planning Director, Jordan, Jones & Goulding
formerly Executive Director,
Gwinnett Council for Quality Growth

Wayne Woodall*, CPESC

Development Inspections Manager
Planning and Development Department
Gwinnett County

Wesley Woolf*, Esq.

Director, Deep South Office
Southern Environmental Law Center
advocacy of good water quality

Dennis Billew

Development Consultants Group, Inc.
representing Gwinnett Council for Quality Growth

James Dean

Conservation Agronomist
USDA Natural Resources Conservation Service

John Godbee

Manager, Environmental Engineering
Union Camp Corporation

Frank Green

Staff Forester, Water Quality Wetlands BMP
Georgia Forestry Commission

Lisa Hollingsworth, P.G., AICP

Former CFRDC Planning Director

John McEvoy

Conservation Engineer
USDA Natural Resources Conservation Service

Bill Segars

Georgia Cooperative Extension Service
University of Georgia

Project Consultants

PROJECT ADMINISTRATION

Chattahoochee-Flint Regional Development Center
P.O. Box 1600
Franklin, Georgia 30217
706-675-6721
Tom W. Sills, AICP, Project Administrator and
Editor of Completion Report

SYSTEM COMPUTER MODELING

Computer Modeling Consortium
2073 Lakeside Drive
Lexington, Kentucky 40502-3016
Tel. 859.269.1947
Dr. Richard Warner, Ph.D., Project Manager

IDENTIFICATION OF OVERALL COSTS AND BENEFITS

National Academy of Public Administration
1120 G Street, NW, Suite 850
Washington, DC 20005-3821
Tel. 202.347.3190
www.napawash.org
Richard A. Minard, Jr., Project Manager
With the Green Mountain Institute for Environmental
Democracy
Montpelier, Vermont 05302
www.gmied.org
Ken Jones, Ph.D., Research Director

PRINTED MATERIALS/VIDEO FOR PUBLIC INVOLVEMENT

Burst Video/Film, Inc.
P.O. Box 5354
Atlanta, Georgia 31107
Tel. 404.875.2824
Fran Burst-Terranella, Project Manager

OUTREACH/TRAINING FOR PUBLIC INVOLVEMENT

Georgia Center for Continuing Education
University of Georgia
Athens, Georgia 30602-3603
Tel. 706.542.6639
Richard C. Field, Ph.D., Project Manager

LITERATURE SEARCH

Woolpert LLP
8731 Red Oak Boulevard, Suite 101
Charlotte, North Carolina 28217-3958
Tel. 707.525.6284
www.woolpert.com
Bill Spearman, Project Manager

TECHNICAL PANEL EXECUTIVE SUMMARY

Richard A. Minard, Jr., Editor
Bow, New Hampshire, 03304

TECHNICAL PANEL COMPLETION REPORT

Tom Sills and Richard A. Minard, Jr., Editors

The Message: Lessons Learned and Recommendations for Repairing Water Quality in the Chattahoochee

Most developers in the metropolitan Atlanta region still treat erosion prevention and sediment controls as an afterthought, an on-site expense to be minimized. Conventional practice assumes that “mud happens.” As long as the developer buys an erosion-control plan and installs a few basic containment devices—silt fences and the like—he has been deemed worthy of a permit to pollute and effectively granted permission to transfer his costs to others. That paradigm must now give way to the proven systems approach.

The “Dirt 2” Committee, formally known as the Erosion and Sedimentation Control Technical Study Committee, presents in this report a summary of its technical work, its findings, and its recommendations. The panel strongly urges the adoption of a new paradigm for growth in the metro Atlanta region.

Old Paradigm: Mud Happens

- Maximize construction footprint while minimizing the functioning buffers
 - Clear the entire site of all vegetation
 - Direct all sediment-laden surface flows to one or a few discharge points
 - Purchase an “erosion-control plan” (that no one expects to perform) merely to secure a building permit, then implement the plan only as and if forced to do so
 - Discharge most or much of the eroded soil from “control measures” to streams
 - Don’t evaluate performance in protecting off-site streams
- *Expectation and result: mud in the water and increased costs for downstream property owners, businesses, and towns; eroded respect for all those responsible for protecting the quality of the waters of the state*

New Paradigm: Meeting Performance Targets

- *Integrate* the design of erosion prevention and sediment control *systems* into the total project effort that are expected to *perform* to specified levels
 - Implement and maintain the systems, monitor their performance, and adjust them as results indicate
 - Clear the site in phases to minimize exposed soils
 - Encourage water to soak into the site; discharge water over wider areas through functioning stream buffers and at numerous points
 - Use greenspace buffers; maximize use of vegetation on site to trap sediments and water before it leaves the site
- *Result: little or no mud in the water; water quality protected; no costs transferred to off-site downstream private property owners, businesses, and towns; a process that works and a basis for respecting and trusting all involved parties*

Dirt 2 has been working extensively with site planners, design professionals, and contractors to make them aware of how they can achieve good results like those at the site of the new Big Creek Elementary School in Alpharetta, Georgia. The Committee has offered a training course, produced a video, and published reports rich with the information developers and contractors need to improve their performance. Developers and public officials will find Dirt 2’s *A Development Guide to Risk Management and Cost Control* particularly helpful.

Because most people assume that mud just “happens”—and because that attitude makes business-as-usual easier for some—changing construction techniques and cleaning up Georgia’s streams will take a concerted public and private effort. Market forces will continue to encourage developers to cut corners on environmental protection and transfer greater costs to others downstream unless the region’s leaders—and public agencies—redirect those forces to produce public benefits.

The Dirt 2 Committee has concluded that a suite of public and private actions are required to accelerate the transition to the proven new paradigm. We make the following recommendations, addressed to each of the players who can make the biggest difference in attaining the public’s goals.

The Environmental Protection Division of the Georgia Department of Natural Resources (EPD):

EPD is responsible for implementing the new federal stormwater pollution permit system that applies to all developments in Georgia involving more than five acres of land. That authority gives EPD enormous leverage over how developers will approach erosion prevention and sediment control. EPD needs to do three things to lead and accelerate the transition to performance:

Approve only those EP&SC plans that you expect to perform. Because the systems approach used at Big Creek has redefined the true state-of-practice, insist that all projects use a comparable systems approach that integrates site design, erosion controls, and the sequencing of construction activities. Insist that those plans achieve performance levels that will protect streams and downstream properties.

Enforce the new permits vigorously. The new permit system requires a series of licensed professionals involved in projects to certify that their work complies with the permit and state standards. That system can work efficiently, but only if EPD guarantees its integrity by exposing false certifications and deterring fraud.

Require frequent electronic reporting of monitoring results. The federal permit requires developers to monitor stormwater runoff during construction and to report the results monthly to EPD. The permit gives EPD the authority to require more frequent reporting, however, and to specify the format of that reporting. EPD should require developers to post monitoring results on an EPD web page within a day or two of a storm. That nearly instantaneous information would help EPD—and the general public—see which developers and contractors are capable of managing a site and actually protecting the environment and the rights—and property—of those downstream. That information should discourage corner cutting and bring economic rewards to developers, designers, and contractors who do a good job.

The Georgia General Assembly:

Strengthen EPD and the economy; reduce the large financial costs now transferred to the general public. EPD can do its job well only if the Georgia Legislature enables it. The Legislature will need to ensure that EPD has the qualified staff required to rigorously review the development permit applications and to effectively enforce them on the ground. The Legislature may have to lead the investments in enhanced water-quality monitoring and web-based reporting that will make a performance-driven system work. Ultimately, the Legislature will determine how aggressively EPD pursues cleaner water for Georgians. Because the net cost to developers of improving their performance is so low, and the economic and environmental gains resulting to the general public are so high, the Legislature's choice should be simple and clear: Be aggressive! Support this win-win-win solution!

Counties, Communities, and State Agencies:

Contract for performance. Government agencies at every level in metro Atlanta should follow the Fulton County Board of Education's lead and insist that any public construction project be designed and implemented so that mud *doesn't* "happen." Government agencies should write their bid specifications to ensure that only competent, committed firms compete, and then write their contracts to reward strong performance and penalize sloppiness or actions that result in failure to perform.

Site-Designers, Licensed Professionals, Contractors, and Owners of Commercial Sites: *Learn the new techniques.* All those who make a living developing land should learn how simple it is to do the job right, simultaneously protecting the environment, providing better value to their clients, and reducing their own liability exposure. Professional associations should teach the well-recognized state-of-practice techniques to their members and help EPD expose any irresponsible members who would make the entire industry or profession look bad.

General Public: *Insist on action.* No longer tolerate the "mud happens" attitude—from anyone. Let your local and state representatives know that you expect them to lead the transformation to a system of development permits that actually perform and that will reduce the costs you and your fellow Georgia citizens and taxpayers end up paying for water, electricity, and municipal services. Protect your property and your property's value. Insist on beauty, on environmental integrity. And if that isn't enough, join the region's public-interest, neighborhood, or environmental organizations that are results-oriented and committed to clean water, a healthy sustainable economy, fairness, and the rights of citizens, consumers, homeowners, and taxpayers.

Computer Modeling

Element Advisory Committee Chair: Terry Sturm

Element Advisory Committee Members: Ben Dysart, Phil Freshley, Vince Howard, Karim Shahlaee, Bill Jordan

A. Specific Tasks of the Computer Modeling Element Advisory Committee

Dirt 2's Computer Modeling Element Advisory Committee (EAC) had the responsibility of building and testing the core of the new construction paradigm. After a rigorous consultant-selection process ending in April 1998, the committee commissioned a consortium effort led by Dr. Richard Warner of the University of Kentucky to assess the problems and possible solutions related to erosion and sedimentation control in runoff from construction sites in the Chattahoochee River Basin, particularly in the Atlanta metro area.

B. Guiding Assumptions: how the results were accomplished, and the conclusions to be drawn from the effort

At the outset of the project, the committee and Dr. Warner developed a set of guiding principles that included the following:

- (1) Existing erosion control practices were considered totally inadequate at the time for a variety of reasons, but of specific interest to the EAC was that computer modeling tools were not used in erosion control designs in Georgia. Rather, "design" consisted of selection of a set of controls (or more often just a ring of silt fence around the site) from the Georgia Erosion and Sedimentation Manual (the "Green Book") with no idea of their subsequent performance. In some instances, it seemed that the primary purpose of such efforts was to minimize cost to the owner without any real expectation of controlling erosion. This approach tied the hands of design professionals. In addition, inadequate inspections and a lack of direct responsibility assigned to the owner or contractor formed a recipe for disaster in terms of poor water quality in the receiving waters due to uncontrolled discharges from a large number of construction sites. Even earnest efforts by some contractors to control erosion were, in some cases, misinformed and unsuccessful. *In this climate, it became imperative that a computer modeling tool that could assess the performance of a system of erosion controls be developed.*
- (2) Resistance to the use of computer models and distrust of the results from such models was perceived to be a problem in obtaining widespread acceptance of such tools. Although most design professionals readily accept stormwater computer models for design of storm sewers and stormwater detention basins, the same is not true in Georgia for computer models that include sedimentology of erosion control measures, even though some exist and are used in other states. Hence, it was decided by the EAC that *a series of construction sites representing commercial, residential, and linear (highway) developments should be monitored and computer model runs be made to assess current erosion control methodologies.* In addition, computer simulation scenarios were requested for these three types of construction sites to illustrate the incorporation of innovative controls to obtain the best quality effluent possible.
- (3) One of the most difficult problems identified in applying a computer modeling tool to assess performance of erosion control measures is the widespread use of turbidity as the regulatory performance standard, while computer algorithms for modeling performance produce estimates of suspended sediment concentrations. The relationship between the two is necessarily site-specific because of the influence of the particle size distribution on the relationship as well as several other factors. Therefore, the scope of work included *the development of such a relationship between turbidity and suspended sediment concentrations that could be used for the specific soils in the piedmont region of Georgia, especially in the Atlanta metro area.*
- (4) The EAC recognized that a number of innovative erosion control technologies were available but not being used on construction sites in Georgia. These included, for example, vegetative buffers, multi-chamber sediment basins, and staged construction. The RFP stressed, accordingly, *the introduction of state-of-practice technologies and evaluation of their effectiveness by the modeling contractor to improve the range of options available to the design professional.*
- (5) Even with the data collected from the commercial, residential, and linear sites and the application of the computer model to these sites, it was recognized that *a full demonstration site was needed in which the computer model could be used to design the erosion control plan that would then be implemented and*

monitored to assess its performance. The EAC felt strongly that all points of discharge from the site should be monitored during the entire construction period, and that this monitoring should be done by automatic samplers rather than by obtaining grab samples.

- (6) Previous research showed that rudimentary relationships between performance of sediment basins and cost could already be developed by computer modeling. Accordingly, based on many discussions, suggestions, and presentations before the full Dirt 2 Committee, *the Computer Modeling EAC required the successful modeling contractor to develop performance vs. cost relationships for a wide range of erosion control measures.* This was intended to be an important product of the EAC effort in that it would provide *quantitative* information on an appropriate *system of controls* for a particular site that could be linked to both *cost and performance.*

Dr. Warner's full report—and the summary and overview that follows here—demonstrates that the contractor not only met the rather ambitious goals of the modeling EAC but exceeded them on many fronts. However, the nagging question of “Is the problem solved?” remains. Certainly, for the first time, a quantitative computer modeling tool is now available for designing erosion and sedimentation control systems in the same way that design professionals currently design stormwater control systems on a routine basis. Furthermore, the development of stormwater permits by EPD with real regulatory “teeth” provides incentives for acceptance of the new methodology offered by Dirt 2. Whether the new methodology will come to be routine remains to be seen, so one of the most important follow-up efforts is to encourage its use among design professionals. One of the ways to accomplish this would be to offer three-to-four-day continuing education courses on the new computer methodology in the Atlanta metro area. In addition, the word needs to be disseminated to policy and decision-makers, which is a goal that other parts of this report are intended to accomplish. Finally, there are technical limitations to the methodology developed, as Dr. Warner delineates in his final report. Nevertheless, it should no longer be acceptable for developers or builders to offer excuses for not evaluating the expected performance of erosion and sedimentation control designs.

Future research and applications related to the Dirt 2 effort are foreseen for the development of sediment TMDLs in Georgia and for the possible revision of current erosion and sediment control regulations. One aspect of the sediment TMDL problem is to measure the existing sediment load in the stream, and the other is to assess the nonpoint source contributions to the total sediment load. The computer modeling technology that has been developed can be adapted to quantify the contributions of construction sites to the total sediment load. In addition, as outlined in the executive summary, the combination of stormwater regulations and sediment and erosion control regulations into a single law would be highly desirable because of the close relationship between the two. At the same time, however, the design storm of interest may be different in the two cases, and future regulations should address this issue.

Additional work is needed in developing effective monitoring plans for measuring the sediment discharge from construction sites. The new stormwater permit requires samples that are really only isolated grab samples that do not give the full picture of the unsteadiness of stormwater events. In addition, it is not just peak concentration of sediment that matters to the biological integrity of the stream, but also total event and seasonal sediment load that contribute to destruction of aquatic habitat due to deposition. Future work should focus on developing receiving stream water quality standards that account for both sediment concentration and load, and that establish critical durations of stormwater events that are most harmful to fish and aquatic invertebrates.

Cost/Benefit Analysis

Element Advisory Committee Chair: Wesley Woolf

Element Advisory Committee Members: Ben Dysart, Michael Breedlove, Vince Howard, Robin Snell, Gene Barber, Dennis Billew.

A. Specific Tasks of the Cost/Benefit Analysis Element Advisory Committee

The EAC purpose was to produce a study of the costs and benefits of technically effective and cost-effective erosion prevention and sediment control systems as well as the sort of systems that are more typical in current use. A wide array of costs were to be addressed in the study including factors such as those incurred on-site and downstream, both direct and indirect. The analysis would also distinguish among those costs borne by affected developers, property owners, and the community as a whole. Where possible, costs were to be enumerated as specifically as possible. In other cases, an order of magnitude measurement was to be achieved. To accomplish this purpose, the EAC did the following:

- Locate firms capable of doing the research and report using a national search
- Issue RFQ and follow-up with RFP to responsive firms
- Contract with a firm to conduct the study
- Review and approve draft report
- Approve final version of report

B. Guiding Assumptions: how the results were accomplished, and the conclusions to be drawn from the effort

- In January 1999, the EAC began a nationwide search to locate firms capable of doing the above research. Out of seven firms furnished the RFQ, two responded.
- The EAC developed a formal Request for Proposals that was issued in August 1999 to the two respondents from the RFQ process.
- The EAC received a proposal from the National Academy of Public Administration (NAPA). The proposal suggests a study that would summarize the key findings of the Technical Panel, and those of an economist who would be selected and managed independently by the EAC to conduct a qualitative and quantitative analysis of costs and benefits associated with EP&SC systems. The Academy would then examine the policy options for reducing erosion and controlling sedimentation. The agreement reached in November 1999 included a request for assistance from the Dirt 2 Panel in securing the services of an economist to develop the cost information. The EAC and Dirt 2 PMAC and the Academy were unable to secure the services of an economist. Negotiations stalled.
- The EAC and Dirt 2 PMAC rethink the project and determine that the on-site costs part of the effort would be better left to the modeling contractor to complete. The policy paper was to emphasize the off-site costs associated with soil erosion practice and identify policy options for choosing and implementing sedimentation and erosion control strategies. A detailing of the benefits was not deemed as productive a use of the project resources and so was dropped from the report requirements. A new agreement to write the report is reached with key staff at NAPA in September 2000.
- Draft report is reviewed by the EAC and Dirt 2 Panel PMAC and approved December 2000.
- Final report is approved January 2001 by Dirt 2 Panel PMAC.

C. Limits Faced by the EAC

- The report faced many hurdles during its conception. Determining which firms would be capable of doing the work was challenging as was securing their interest in the project once they were contacted.
- The Dirt 2 Panel PMAC was flexible. A willingness to move some of the internal site economic cost study to the modeling element proved beneficial. Also, the EAC was flexible in the hiring of key personnel once they were identified. Additional funding was also made available to accomplish the end result.

Outreach and Training for Public Involvement

Element Advisory Committee Chair: Philip D. Freshley

Element Advisory Committee Members: Michael Breedlove, Alice Champagne, Dana Heil, Vince Howard, Terry Hughey, Wayne Woodall, Wesley Woolf.

This element (Element 5) of the Dirt 2 Project conducted outreach and training sessions to share the guidance documents, video and results of the modeling and demonstration elements. The work cost approximately \$37,500.

A detailed request for proposals (RFP) was developed by the committee and sent to a list of private and government firms in Georgia identified by the committee as having the administrative and technical expertise to handle the materials and logistics. Two organizations, the University of Georgia Center for Continuing Education (UGACCE) and W.K. Dickson Co. of Atlanta responded with acceptable proposals. The proposals were evaluated by committee members and the PMAC. Both organizations had experience in training associated with erosion and sediment control and water quality issues. UGACCE was selected based on cost and facility resources. The work began in December 2000 and was completed by March 2001.

A. Specific Tasks of the Outreach and Training Element Advisory Committee

1. A computerized audio-visual presentation on the Dirt 2 effort was developed by Richard Osorio and Dick Field of UGACCE to complement the video and printed materials developed in Element 4.
2. A detailed presentation of the modeling and demonstration project results was developed by Dr. Richard Warner of the Surface Mining Institute for presentation to practitioners.
3. Six technical training sessions for practitioners were advertised and conducted in the Upper Chattahoochee region from Monday, February 5, through Thursday, February 8, 2001. The venues were: the Coweta County Extension Service in Newnan; Southern Polytechnic State University in Marietta; the Fulton County Extension Service in Dunwoody; and the Gwinnett County Parks Activity Building in Norcross. Some 140 practitioners attended with about two-thirds from the private sector. About half the attendees were consulting engineers.
4. Two informational sessions were conducted for the general public the following week at the Gwinnett Civic Center in Lawrenceville and Southern Polytechnic State University in Marietta. Approximately 30 people attended. The attendees included citizens with environmental interests, students, contractors, developers, and representatives of government.
5. At both informational and technical sessions, copies of the printed materials were distributed and the video shown in addition to the presentation by UGACCE. The technical sessions were conducted by Dr. Warner, the primary investigator for modeling and design.
6. To provide a resource for future training, the technical presentation by Dr. Warner was videotaped in the studio at UGACCE and submitted to the Dirt 2 Committee.

B. Guiding Assumptions: how the results were accomplished, and the conclusions to be drawn from the effort

The technical presentation video, in combination with the audio-visual presentation and the video and printed materials from Element 4, constitute a training library that can be mixed and matched to tailor future training sessions to a wide range of interest groups (e.g., the general public, policy makers, and design professionals). The goal of the Dirt 2 committee was to provide an easy to use and flexible information and training resource that clearly frames erosion prevention and sediment control issues in the context of cost-effective practice and the significant improvement in water quality that is reasonably attainable. It is our consensus that this has been achieved.

The practitioner sessions were well received and fairly well attended, but the turnout for the public meetings was lower than expected. We attribute this primarily to the short advertising period. Element 5 was limited in its outreach effort by the amount of time allotted to the task. The task was necessarily limited to the time between the completion of Element 4 and the expiration of the grant. It should be noted that the people who did show up were strongly motivated and interested. However, the effort will continue through the library of resource materials produced.

Each session was conducted with the assistance of Tom Sills, planning director of the Chattahoochee-Flint Regional Development Center and at least two members of the Dirt 2 Committee to handle question and answer sessions and assist in moderation and administration of the sessions.

The sessions were held during the same period that the GA NPDES General Permit for Stormwater from Construction Activities was being implemented by EPD. The practitioners seemed to understand the Dirt 2 work as a technical aid for compliance with NPDES, while some of the public participants were unable to separate the two. In future presentations, we suggest that the presenter draw a clear distinction between the technology and the law as it currently stands to avoid some of this confusion, especially for the lay public.

With respect to economics, it was noted by more than one participant from the construction industry that the cost/benefit is different for small projects. More specifically, that the extra professional time and material expense for innovative design and practice may constitute a larger percentage of the site development cost for small projects (those less than 10 acres) as opposed to larger projects such as Big Creek. This may be true to some degree due to economies of scale. The Dirt 2 analyses do not deal with this explicitly. However, the committee's consensus over the last few years is that we should not compare innovative practice to poor or minimal practice. The appropriate comparison is standard practice (properly designed and implemented) to innovative practice. In this context, it is our opinion that the cost difference is not as great as some developers and contractors may think, even for smaller projects.

Overall we found the materials produced understandable, easy to use and well received by both practitioners and the public. The publications and videos are suited for stand alone presentations but may be even more useful as a session that is part of larger conferences, symposia, and training courses. The publications are already being requested by leaders in the erosion and sediment control industry outside of Georgia as well as regulators in other states. We recommend the materials are made available at reasonable cost on a region-wide basis for at least a couple years. The technology and practice is relevant to most of the humid regions of the Eastern U.S.

Printed and Video Materials

Element Advisory Committee Chair: Ben Dysart

Element Advisory Committee Members: Larry Hedges, Vince Howard, Jim Spotts, Tom Sills.

A. Specific Tasks of the Printed and Video Materials Element Advisory Committee

The Printed Materials/Video Element Advisory Committee was charged with producing a “common sense guidance booklet” and then incorporating the findings of the rest of the Dirt 2 study into the Developer’s Guide and video for use in the outreach and training portions of the project. In order to accomplish these tasks, the EAC had to do the following:

- Produce with members of the Dirt 2 Technical Panel a booklet entitled, “*Erosion Prevention and Sediment Control in Georgia: A Developer’s Guide to Risk Management and Cost Control*”
- Secure professional services to update the *Guide* and to produce a short training video that incorporates the lessons learned from the computer modeling and demonstration efforts of the Dirt 2 Panel
- Review drafts and final edits of the printed material and video production

B. Guiding Assumptions: how the results were accomplished, and the conclusions to be drawn from the effort

The initial production of the Guide was completed by the Dirt 2 Panel in December 1997 using the resources of the CFRDC staff to typeset and produce it. The Guide was distributed widely as a deliverable of Phase I of the entire Dirt 2 effort.

In December 1999, the PMAC issued a Request for Qualifications to a broad array of firms in the film production industry using a listing of such firms from the Tele-Film South internet web directory (now Oz Online, at <http://www.telefilm-south.com/>), an advertisement in the local news media, and word-of-mouth referrals. Four firms responded to this RFQ.

The four firms were sent a follow-up Request for Proposals in February 2000. Questions regarding the RFP were invited and responses were furnished to all recipients. Three bonafide proposals were received.

Based upon the responses received and a review of the PMAC, the contract for printed material and video production was awarded to Burst Video/Film, Inc. in March 2000 in the amount of \$55,000. The contract called for production of both the printed *Developer’s Guide* and a short (approx. 8 minutes) training video.

Drafts of the booklet and video were produced during the summer and fall of 2000. The PMAC reviewed and separately approved each document in draft form before authorizing videotaping and further production of a final version. The Dirt 2 Panel approved the final version of the video in January 2001. The completed *Development Guide* was approved in February 2001.

C. Limits Faced by the EAC and Recommendations for Additional Effort

The chief problem faced by the EAC was in producing sufficient copies of the documents in time for their use in the outreach and training efforts undertaken by Dirt 2 in February. As a result, drafts of the final booklet without the illustrations were presented participants upon their arrival at the workshops. These participants received a final version of the booklet by mail upon its publication.

The delay was in large part due to the timing of the deadline for final editing and production of the materials. The computer-modeling element was given an extension of time to complete its work thereby delaying the reporting of that element’s results in the printed material and video. The bulk of the editing of the video and of the booklet took place during the holiday season, which left few members of the EAC available for the task.

The decision to produce Internet-accessible versions of the Dirt 2 Panel’s work came after the initial contract was signed. The production of Acrobat Reader files was, however, accomplished at a minor additional cost to the initial contract.

Literature Review

Element Advisory Committee Chair: James Magnus

Element Advisory Committee Members: Phil Freshley, Vince Howard, John McEvoy

A. Specific Tasks of the Literature Review Element Advisory Committee

The Dirt 2 Literature Review Element Advisory Committee undertook the following specific tasks:

- Drafted, revised and sent out Statement of Qualifications for the literature review.
- Reviewed the submittals from respondents and developed a short list.
- Drafted, reviewed and sent out Request for Proposals.
- Reviewed the submittals from respondents and selected Woolpert to perform the literature review.
- Interviewed employees of Woolpert and provided guidance as to the direction the literature review should head and provide insight into the thinking of the Dirt 2 committee and the response that was anticipated.
- Reviewed draft submissions of the literature review and made recommendations on how to better group and present the information, pointed out areas that additional information is needed, and questioned the differences between full documentations and abstracts.
- Reviewed the final version of the literature review. Determined it would better serve the committee, CFRDC, and anyone else interested in this information if the review was placed in CD-ROM format.
- Completed contract with Woolpert and CFRDC made final payment on receipt of hard copies of the literature review and copies of the CD-ROM.

B. Guiding Assumptions: how the results were accomplished, and the conclusions to be drawn from the effort

- The assumptions of the literature review EAC was to have a review conducted of data, articles, academia, and other publications to provide information in two areas
- To determine if there is information or data that already exists that will support the committee's computer modeling effort and to provide any relevant data to that effort
- To determine the types of information that exist in the areas of outreach and training that will be useful to the committee when modeling is complete
- To determine if there are methods of controlling erosion and sedimentation that are the current state of practice that will achieve water-quality requirements

Final Products: And Where to Find Them

The Dirt 2 project has developed a rich and varied set of materials to guide policy and practice in erosion prevention and sediment control. Copies of all of the following materials, including the videotapes, are available upon request to:

The Chattahoochee Flint Regional Development Center
P.O. Box 1600
Franklin, GA 30217
E-mail: cfrdc@cfrdc.org Phone: 706-675-6721 or 770-854-6026

The written documents are also scheduled to be available at the Center's website: www.cfrdc.org

“Building Atlanta’s Economy by Building Systems to Prevent Erosion”

- a brochure summarizing Dirt 2’s analysis, findings, and recommendations, 2001 (included with the Completion Report as the Executive Summary)

“Technical Panel Completion Report”

- edited by Richard A. Minard, Jr., and Tom Sills, Chattahoochee-Flint Regional Development Center, Franklin, Georgia, 2001
- a volume describing the entire Dirt 2 project: its members, mission, and message; its management; and its key products

“Policies to Prevent Erosion in Atlanta's Watersheds: Accelerating the Transition to Performance”

- policy paper by the National Academy of Public Administration, 2001
- also available at www.napawash.org

“Erosion Prevention and Sediment Control Computer Modeling Project”

- by Dr. Richard Warner, Surface Mining Institute, Lexington, Kentucky, June 2001

“Erosion Prevention and Sediment Control Computer Modeling Project: Executive Summary”

- by Dr. Richard Warner, Surface Mining Institute, Lexington, Kentucky, June 2001

“Erosion Prevention and Sediment Control in Georgia: A Developer’s Guide to Risk Management and Cost Control”

- booklet produced by Burst Video/Film, Inc., 2001

“Getting the Dirt on Clean Streams: Straight Talk on Preventing Erosion”

- video by Burst Video/Film, Inc., 2001

“Reducing the Cost of Development: Improving Water Quality in Georgia”

- printed copy of Power Point presentation produced by the University of Georgia Continuing Education Center, 2001

“Storm Water, Erosion Prevention and Sediment Control System: An Example at the Big Creek School Site”

- printed copy of Power Point presentation by Dr. Richard Warner of the Surface Mining Institute of Lexington, KY, 2001

“Design of an Erosion Prevention and Sediment Control System: An Illustration of a Paradigm Shift”

- video of Dr. Richard Warner presentation to practitioners conducted in February 2001
- produced by University of Georgia Center for Continuing Education, 2001

“Dirt 2 Literature Search”

- CD-ROM developed by Woolpert, LLC, 1998.

Project Organization and Administration

A. Project Management

The Chattahoochee-Flint Regional Development Center (CFRDC) is the administrator for the funding of the Dirt 2 Technical Panel study. The CFRDC is charged under the contract with providing administrative and fiscal accounting services to the Technical Panel in the conduct of its work. This includes organizing the meetings, assisting in the setting of agendas, developing and implementing the selection process for consultants, reviewing work performed under the contract, and processing invoices for payment with the Environmental Protection Division of the Georgia Department of Natural Resources (GA-EPD) as grantor agency.

To achieve the desired results from the contract, the following steps were taken:

- The Chair of the Dirt 2 Technical Panel immediately secured additional members from the private sector to add more balance to the membership of the Technical Panel.
- Funding of the Dirt 2 Technical Panel efforts was secured through a grant to the Chattahoochee-Flint Regional Development Center from the Chattahoochee Downstream Basin Assistance grant program of GA-EPD.
- CFRDC appointed one of its senior staff to serve as Project Administrator.
- The Project Administrator worked with the Dirt 2 Technical Panel to update the scope of work to accomplish the aims of the Panel's charge from the Lieutenant Governor within the budget provided.
- Sub-committees were established about the different elements of the work scope. These sub-committees (referred to as Element Advisory Committees, or EACs) were organized to operate under a chairperson. Each chairperson was also a member of, and would report back to, the Project Management Advisory Committee, or PMAC. The PMAC was composed of all EAC chairs plus the Chair of the full Dirt 2 Technical Panel, representatives of GA-EPD and the Georgia State Soil and Water Conservation Commission, and the CFRDC staff serving as Project Administrator. The work of the panel was to be accomplished through the use of these sub-committees.
- Each work element was conducted through the use of consulting services. A standard practice of contacting numerous potential candidates by way of Requests for Qualifications, followed by selective issuance of Requests for Proposals and interviews with the top respondents was adopted by the Dirt 2 Technical Panel.

The following factors greatly contributed to the project's success:

- The Chair of the Dirt 2 Technical Panel was instrumental in bringing a consensus approach to governance of the Panel's activities. The Chair also exhibited a strong focus on the charge made to the Technical Panel as the former Lieutenant Governor commissioned it. This allowed progress to be made with all parties being in common agreement as to the outcomes to be sought. Votes on key issues were avoided.
- The core membership of the Dirt 2 Technical Panel remained essentially intact through the five years of the project, demonstrating a great deal of commitment and dedication on behalf of the voluntary membership.
- Regular meetings were established to maintain project momentum and focus. As the project continued, these meetings of the Dirt 2 Element Advisory Committee Chairs occurred monthly. All meetings of the PMAC were open for any member of the Dirt 2 Technical Panel to attend and contribute.
- The Regional Development Center provided stable operating guidance throughout the life of the project. This project took five years to complete though it was initially expected to take only two. There were key project personnel changes at the Center during the third year of the project as well.
- The GA-EPD as grantor agency was flexible during the course of the project. Four project extensions and two project budget amendments were allowed by GA-EPD. CFRDC was able as project administrator to make necessary changes within the project budget to accommodate changing needs and circumstances.

B. Project Budget

Project Element	Final Project Budget
Computer Modeling	\$215,000
Literature Review	13,360
Cost/Benefit Study	25,000
Demonstration Site	0
Print Materials/Video	55,000
Outreach/Training	40,000
Technical Report	10,000
Administration	41,640
TOTAL	\$400,000

C. Project Mission Statement

The Erosion and Sedimentation Control Technical Study Committee (“Technical Panel”) was convened in 1996 to focus on how to meet soil-erosion-related water-quality standards in the most cost-effective manner. Those standards were established by the recommendations of an earlier scientific panel assigned the task of evaluating the erosion measurement standard defined by the Georgia Erosion and Sedimentation Act.

The overall goal of the Technical Panel is to identify and promote control systems that logically and most effectively—considering both technical performance and cost to all parties—prevent erosion and control sediment *before* it can leave a site and damage the quality of off-site state water and downstream users and property owners. The Technical Panel has elected to deal with the full range of site evaluation and planning, *project management practices*, and *erosion prevention and sediment control techniques* which are appropriate and effective to protect the quality of state waters from erosion and sedimentation produced by land-disturbing activities associated with residential and commercial construction and linear projects such as roads and utilities.

The Technical Panel’s work was accomplished in two phases. *Phase I* developed a set of practical *common sense guidance* and lessons learned from both successful and unsuccessful experience of diverse and knowledgeable practitioners that can help others move toward erosion prevention and sediment control systems that:

- are protective of in-stream water quality;
- minimize soil mobilization at the source;
- are usable and enforceable;
- are both cost effective and technically effective;
- allow desirable development to occur with such practices; and
- are equitable, reasonable, and fair to all parties.

An overriding goal is to produce valuable and credible guidance on soil erosion and sediment control measures that actually perform and results in their use by decision-makers such as owners and financiers as well as practitioners involved in land disturbing activities such as design professionals, regulators, inspectors, installers, and contractors.

Phase II of the Technical Panel's work will determine *how best to attain the in-stream turbidity standard recommended by the Scientific Panel*. Phase II will consider the technical effectiveness of the full range of control technology and planning options, whether it can be implemented by regulators, and the resultant performance levels and associated costs of such systems.

D. Project History

- 1993 Senate Stormwater Study Committee, established by SR 252 and led by then Lt. Gov Pierre Howard, determines that there is insufficient technical knowledge to update GA E&S Act.
- Identified two Study Areas:
1. Academic Panel to recommend water-quality standards (Dirt 1)
 2. Technical Panel to identify current techniques and develop new techniques to meet standards (Dirt 2)
- 1995 Dirt 1 report completed in January 1995: recommended an instream standard of 25 NTU for storms of magnitude of less than or equal to the 10-year event, subject to change with further research
- In 1995 SB 375 modified E&S Act to have water-quality standard that limits water-quality changes due to construction to less than 25/10 NTU increase in *downstream* flows (warm water/trout streams) unless valid BMPs are in place and functional
- 1996 Dirt 2 begins in 1996 with goal of identifying/developing techniques to attain these standards in a cost-effective manner.
- 1997 In March, Dirt 2 obtains \$400,000 funding for research on “Cost Effective Erosion Prevention and Pollution Control Systems” from a grant from EPD’s Chattahoochee Basin Downstream Assistance Grant Program administered by the Chattahoochee-Flint Regional Development Center (CFRDC). The Scope of Work identifies six work areas, 1) literature search, 2) computer modeling of EP&SC techniques, 3) identification of overall costs and benefits to parties, 4) produce printed material and video for public outreach, 5) conduct outreach and training activities, and 6) technical panel completion report.
- 1998 Literature search is conducted under contract with Woolpert, LLC.
- Dirt 2 Panel contracts with Computer Modeling Consortium of Lexington, Kentucky, to conduct the computer modeling of EP&SC systems.
- 2000 In January, the Fulton County Board of Education agrees to allow Dirt 2 Panel to demonstrate new approaches to EP&SC systems at the construction site of Big Creek Elementary School in Alpharetta, Georgia.
- In March, the Dirt 2 Panel contracts with Burst Video/Film, Inc., to produce the printed materials and video for training purposes.
- The National Academy of Public Administration agrees to study the policy options available for improving EP&SC implementation in Georgia and, in particular, the Chattahoochee River basin. The contract is signed September.
- State NPDES permit goes into effect in August, incorporating the SB375 standards into the Federal Law.
- In December, the University of Georgia Center for Continuing Education is hired to conduct outreach and training workshops for practitioners and lay public and to produce material for presenting the information to policy makers.
- 2001 Dirt 2 research largely complete by late 2000, culminating in final reports issued early 2001.
- Dirt 2 training and outreach effort conducted in February with six workshops for practitioners, 2 for the lay public.
- The Dirt 2 Technical Panel Completion Report is submitted to the Georgia Department of Natural Resources in May 2001.

Appendix A: Policies to Prevent Erosion in Atlanta's Watersheds: Accelerating the Transition to Performance (The NAPA Report)

The cost/benefit analysis and policy white paper commissioned by Dirt 2 from the National Academy of Public Administration follows in full.

Appendix B: “Erosion Prevention and Sediment Control Computer Modeling Project: Executive Summary”

A summary of the key findings and work performed under the computer modeling element of the Dirt 2 study by Dr. Richard Warner of the Surface Mining Institute, Lexington, Kentucky

Appendix C: Scope of Work

The following pages reprint the original document framing the scope of work for the Dirt 2 project.