

# **UTCA NPDES Stormwater Phase II Technology Transfer**

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## **Executive Summary**

UTCA Project No. 04112 was successfully concluded on April 30, 2005 and the objectives of the project were met. This project developed a NPDES Phase II Stormwater Compliance and Best Management Practices manual and four short courses tailoring the transportation industry needs in the area of Phase II training, outreach and permit requirements. The audience included environmental engineers, civil engineers and designers, project scientists and project engineers, state regulators, biologists, architects, and related transportation stakeholders such as developers whose activities directly impact DOT Phase II permit.

The courses and the manual focused on developing and communicating common sense and low cost strategies for stormwater pollution control at the local level. Also, the courses promoted an understanding of how the use of best management practices by transportation workers directly affects their “after-work” life through awareness of the impact of poor runoff management on fishing, hunting, recreational activities, etc. This manual was specifically adapted to transportation related aspects of stormwater. A summary manual was produced, and targeted to stormwater management for Alabama highway construction projects. The manual is available online at <http://unix.eng.ua.edu/~rpitt/Class/Erosioncontrol/MainEC.html>, or a may be obtained from the project Principle Investigator (PI).

An advisory committee was formed, and three meetings were held to gather input on the content and logistics of the workshops. Mr. Chad Christian and Mr. Joe Robinson of the Tuscaloosa Department of Transportation (TDOT) and Mr. Sonny Richardson from the Alabama Homebuilders Association (AHBA) consulted on the development of the course material and gave practical expertise on permitting issues to the course participants.

The PIs collaborated with the UTCA technology transfer coordinator, Dr Steven Jones, who was initially at the University of Alabama in Birmingham, but moved to UA by the last year of the project. Dr. Jones provided an e-mail list of potential workshop participants, advertised the course through the UTCA Signal newsletter, and handled awarding of professional development hours (PDHs) awards for course participants.

Four workshops were taught at the University of Alabama (UA) and at the Weeks Bay Reserve in Baldwin County, with a total of 89 participants. The courses were very well received as reflected in the positive course evaluations and comments. It is the opinion of the PIs that the project was a resounding success.

## **Section 1.0 Introduction**

### **1.1 Objectives**

There were two major objectives for this project. The first objective was to develop a National Pollution Discharge Elimination System (NPDES) Phase II Stormwater Compliance and Best Management Practices Manual specifically adapted to transportation related aspects of Phase II, and to produce a summary guide for stormwater management for Alabama highway construction projects. The manual would be distributed during training course conducted by this project, available online, and available in hard copy distributed through UTCA.

The second objective was to develop instructional materials, in addition to the manual developed in the first objective 1, that could be used to teach four workshops on Phase II Management for the Alabama Department of Transportation (ALDOT) and for transportation related stakeholders throughout Alabama.

### **1.2 Background Information**

A 1985 Environmental Protection Agency (EPA) report called “America’s Clean Water – The States’ Non-point Source Assessment 21” states that construction site runoff was a major cause of impairment. Furthermore, the 1996 national “Water Quality Inventory Report to Congress” indicted that diffused non-point sources carried by stormwater runoff were the nation’s leading cause of water quality impairment.

To address this, the EPA Office of Wastewater Management promulgated the final rule for the NPDES Phase II Stormwater Program on October 29, 1999. The Phase II rule covers smaller urbanized areas than the Phase I rule, and it applies to construction sites that disturb one to five acres of land.

The Phase II rule is based on pollution prevention through the implementation of Best Management Practices (BMPs) rather than the attainment of water quality standards, to control polluted stormwater runoff. Six different minimum control strategies have been identified for use in the Phase II stormwater program:

- Public education and outreach on impact of stormwater
- Public involvement and participation
- Illicit discharge detection and elimination
- Construction site stormwater runoff control
- Post-construction stormwater management in development
- Pollution prevention/ good housekeeping of municipal operations

The Phase II emphasis placed on developing common sense, low cost strategies for stormwater pollution control at the local level.

In Alabama alone, 46 communities are impacted under the Phase II regulations. ALDOT constructions activities within these areas were directly impacted by the new regulations, along with transportation-related construction personnel who had not previously been required to comply with stormwater runoff regulations. Construction workers typically had no idea of why or how to comply with Phase II regulations. This project addressed that need and provided training and educational resources.

## **Section 2.0 Project Development**

### **2.1 Advisory Panel**

The first step in the project was to assemble a group of knowledgeable individuals to guide the project. The following individuals served in the role:

- Dr. Pauline Johnson, UA Department of Civil and Environmental Engineering (CE)
- Dr. Robert Pitt, UA Department CE
- Dr. Steven Jones, UAB Department CE (and during the project transferring to the UA Department of CE)
- Mr. Chad Christian, Tuscaloosa Department of Transportation
- Mr. Sonny Richardson, Alabama Homebuilders Association

Members of the advisory panel were consulted on the development of the course material and gave practical advice about permitting issues to the project team and the course participants. They were also helpful identifying target participants, guest speakers and course content.

### **2.2 Workshop Materials and Resources**

#### ***2.2.1 Manual Development***

This project developed a manual and four short courses tailored to the transportation and construction industry needs in the area of Phase II training, outreach and compliance with the EPA regulations for stormwater discharge permit. The audience included environmental engineers, civil engineers and designers, project scientists and project engineers, biologists, architects, and related transportation stakeholders like developers whose activities directly impact the ALDOT Phase II permit process.

The courses and the manual focused on developing and communicating common sense and low cost strategies for stormwater pollution control at the local level. However, the seminar was meant to provide an understanding of how best management practices by transportation workers directly affect their “after work” lives and to promote awareness of the impact of poor runoff management on recreational activities such as camping, fishing, hunting, etc.

#### ***2.2.2 Presentations/Presentation Materials***

The workshops were based on PowerPoint presentations (which may be obtained from the project PI) and group discussions. Some of topics covered in the course follow:

1. Introduction to stormwater runoff and impacts of construction stormwater management
2. The use of Revised Universal Soil Loss Equation (RUSLE)
3. Channel and slope stability
4. Sedimentation practices at silt fences and sediment pond

5. Introduction to BMPs
6. Practical issues relating to BMPS, like suitability and applications
7. Regulations and compliance

At each workshop, the presentation materials were provided to each participant at the beginning of the workshop.

### 2.2.3 Invited Speakers

Two practitioner speakers were invited to participate in the workshops: Mr. Sony Richardson and Mr. Skip Ragsdale. Invitations were also extended to agency experts to participate in the workshops: Mr. Derik Houston, Ms. Lindsay Lassiter and Mr. Brian Sanford of the Alabama Department of Environmental Management (ADEM). Additional information about the invited speakers and their presentation topics is shown in Table 2-1.

**Table 2-1: Invited speakers**

<b>Tuscaloosa Workshops I &amp; II:</b>
<ul style="list-style-type: none"> <li>▪ Skip Ragsdale (Sunshine Supplier, Inc.): Practical Issues relating to Best Management Practices: Suitability and applications</li> <li>▪ Sonny Richardson (Alabama Home Builders Association): Introduction to Best Management Practices</li> <li>▪ Derik Houston (ADEM Montgomery Branch): Regulations and Compliance</li> </ul>
<b>Weeks Bay Workshops:</b>
<ul style="list-style-type: none"> <li>▪ Lindsay Lassiter (ADEM Mobile Branch): Current and emerging stormwater regulations</li> <li>▪ Brian Sanford (ADEM Mobile Branch): Compliance an permits</li> </ul>

## 2.3 Workshop Advertising and Attendees

The workshops were advertised via email and the UTCA “Signal” newsletter to potential participants in Dr. Jones database. The registration was offered via email, regular mail, phone or fax. Attendees were allowed to pre-register and pay onsite.

A total of 89 participants attended the four seminars (35 participants at Tuscaloosa and 54 participants at Weeks Bay Reserved). About 85% of the Tuscaloosa attendees and 90% of the Weeks Bay participants recommended more workshops. The course evaluations document revealed that participants were satisfied with the information received (87-88% score), and instructor quality received good grades (90-92% satisfaction).



## **Section 3.0 Workshops**

### **3.1 Organization**

This portion of the report transmits, in outline form, the key information about the organization and conduct of the course.

- 1) Candidates for attending the course were identified using the existing database developed by Steven Jones during UTCA projects 03217 and 04213.
- 2) Advertisement of the seminar:
  - a. The course brochure included the course outline, seminar benefits, registration options and workshop dates and locations; it was emailed to candidate attendees.
  - b. The same brochure was published in the March 2004 edition of the UTCA “Signal” newsletter by Dr. Steven Jones.
- 3) Registration procedure for the seminar:
  - a. Registration was accepted via mail, email, fax or phone
  - b. Participants were allowed to pre-register and pay onsite
  - c. Payment was accepted by check or cash
- 4) Cost of registration:
  - a. Full day registration was \$25 including course materials, lunch and refreshments
  - b. Half day registration was \$10 including course materials and refreshments
- 5) Evaluation of the course, instructors and manual
  - a. Evaluation sheets were distributed to attendees for each workshops

### **3.2 Schedule**

One of the deliverables of this project was four workshops, developed and taught in two locations: Tuscaloosa in March of 2005 and Fairhope in April of 2005

### **3.3 Workshop Benefits**

The project educated participants on the impacts of their actions from both professional and social points of view. It imparted an understanding the direct effect of their activities on bodies of water, and the liabilities associated with non-compliance with the new regulations relating to stormwater management. It is anticipated that this will result in fewer violations of the Phase II regulations.

#### ***3.3.1 Workshop I Benefits***

Participants acquired the following knowledge and technical tools during the workshop:

- Low cost strategies for stormwater pollution control

- Methods to comply with EPA requirements for stormwater discharge permits for transportation construction activities
- Knowledge of which construction sites require a permit, and identification of who is responsible to obtain permits
- Guidelines for acceptable stormwater management programs at highway construction sites

**3.3.2 Workshop II Benefits**

The second workshop imparted the following skills and tools to participants:

- Achieve maximum water quality by implementing the most cost effective BMPs
- Identify sources of erosion and sediment at construction sites and ways to control them
- Learn to use RUSLE (Revised Universal Soil Loss Equation) to predict erosion from local construction sites

Each seminar attendee was awarded 0.3 Continuing Education Units (CEUs) or 3.0 Professional Development Hours (PDHs). The certificates were issued by Dr. Jones.

**3.4 Workshop Evaluations**

Each participant completed a course evaluation sheet for each workshop. The following samples of results provide an overview of the acceptance of the workshops. Additional details may be obtained from the PI or the main office of UTCA.

**3.4.1 Tuscaloosa, Workshop, March 24, 2005**

As shown in Tables 3-1 and 3-2, course participants were strongly satisfied with both workshops conducted in Tuscaloosa. The satisfaction with the quality of the presenters was particularly high.

**Table 3-1 Tuscaloosa Workshop I: permitting and compliance**

Name	% Satisfaction with Quality of Presenters	% Satisfaction with Quality of Presentations
Instructor A	91	85
Instructor B	88	84
Instructor C	84	81

**Table 3-2 Tuscaloosa Workshop II: site design**

Name	% Satisfaction with Quality of Presenters	% Satisfaction with Quality of Presentations
Instructor A	91	88
Instructor B	76	76

### 3.4.2 Weeks Bay, Fairhope, AL: April 15, 2005

The evaluations for the Weeks Bay workshops were similar to the Tuscaloosa workshops, with strong approval of both the instructors and the workshop presentations. This is displayed in Tables 3-3 and 3-4. During the workshops at both sites, the academic presenter's scores were slightly higher than the scores for the invited instructors.

**Table 3-3 Weeks Bay workshop I: permitting and compliance**

<b>Name</b>	<b>% Satisfaction with Quality of Presenters</b>	<b>% Satisfaction with Quality of Presentations</b>	<b>% Satisfaction with Quality of Information</b>
Instructor A	92%	91%	87%
Instructor B	89%	87%	87%

**Table 3-4 Weeks Bay workshop II: site design**

<b>Name</b>	<b>% Satisfaction with Quality of Presenters</b>	<b>% Satisfaction with Quality of Presentations</b>	<b>% Satisfaction with Quality of Information</b>
Instructor A	90%	88%	88%

## **Section 4.0 Conclusion**

This project directly addresses the technology transfer objective of UTCA and the high priority topic of Phase II stormwater training. Four workshops were presented as part of this project: an introductory morning session dealing with Phase II stormwater regulations and compliance, followed by a more technical afternoon session covering construction site effective design. Both of the objectives for the workshops were accomplished. About 90 percent of the participants recommend such workshops to be held in the future. This is a demonstration that the seminars were successful.

This project produced a summary guide for stormwater management for Alabama highway construction projects and included a series of four workshops to review the regulations and needed control. An Internet site containing the course material was prepared by Dr Pitt and was updated and hosted at:

<http://unix.eng.ua.edu/~rpitt/Class/Erosioncontrol/MainEC.html>

This project successfully continued the series of four construction site erosion control workshops previously developed as part of UTCA project 00233 – “Erosion and Sediment Control for Highway Construction.” They were presented in the Guntersville and Birmingham offices of ALDOT in December 2002.

## **Section 5.0**

### **References**

R.W. Beck, Inc., Designing and Implementing an Effective Stormwater Management Program – Proposed Stormwater NPDES Phase II Regulations, EPA cooperative agreement CX826291, for the American Public Works Association (APWA), September 1998

CWA 305(b) Water Quality Inventory and Impact of Stormwater Contamination