

**Texas A&M AgriLife  
Texas Water Resources Institute**

**Improving Water Quality by Developing, Implementing and  
Field Testing Innovative Methods  
FY 03 CWA 319(h)  
TSSWCB Agreement No. 03-10**

Quarter no. 20 From 7/01/08 Through 9/30/08

**I. Abstract**

Work conducted during this quarter has focused on the completion of the final reports for the Turfgrass demonstration and the demonstration conducted by Ozona Environmental LLC. The Turfgrass report has been completed and is now being published. The Ozona Environmental report has been reviewed and returned to the author for further editing prior to publication. A fact sheet on the EnviroLink demonstration was developed this quarter and placed on the project website. All demonstrations are now complete and finalizing the reports will result in the completion of the project.

**II. Overall Progress and Results by Task**

**TASK 1: Demonstration and Evaluation of New Technologies**

*Subtask 1.1: Identification of potential technology providers. Texas AgriLife Extension Service, TWRI, TFB, dairy industry representatives, EPA Region 6, TSSWCB, TCEQ, TDA, BRA, NRCS, and Texas AgriLife Research will identify and select promising technologies represented by willing technology providers. (month 1 thru 3)*

The following actions have been completed during this reporting period:

- a. Year one projects have been completed. Fact sheets and reports have been completed and are currently posted on the TWRI website for everyone to access at:  
<http://twri.tamu.edu/project-info/NewTechnologies/>
- b. Year two technologies have been initiated:
  - 1) “Demonstrate and Evaluate the Use of Technologies to Reduce Animal Waste Pollution” proposed by EnviroLink (Greeley, KS) has been implemented at the Sherwyn Wood Dairy. Sampling for this demonstration concluded in June.
- c. Year three technologies have been selected:
  - 1) The final demonstration chosen will be conducted by Ozona Environmental LLC. Their demonstration will use a proprietary bacterial enhancement to treat the lagoons.
- d. Supplemental Demonstration:

As a result of rising sample analysis costs and the lack of submitted proposals, the project workplan was amended to allow for the demonstration of planting turfgrass on soils supplemented with residual material from a Geotube<sup>®</sup>. This demonstration will be

conducted in a laboratory setting at Texas A&M and will cost less than the demonstration of a sixth technology. This demonstration will evaluate the changes in physical and chemical changes between soil and soil with added Geotube<sup>®</sup> residual material, evaluate turfgrass responses when grown on soil and soil with added Geotube<sup>®</sup> material, and evaluate leaching losses of nutrients and dissolved organic carbon under the varying scenarios. Sampling funds not used for this demonstration will be used to cover the increased sampling costs for the remaining technology demonstrations.

### **100% Complete**

*Subtask 1.2: Identification of dairy cooperators in the North Bosque watershed area that use a flush system and lagoons to remove, store, treat, and land-apply effluent (manure and process-generated wastewater). Extension, TSSWCB and TFB will identify dairy operations willing to participate in these demonstrations. (month 1 thru 3)*

The following actions have been completed during this reporting period:

- a. The year one technologies were implemented at the following dairies:
  - 1) “Ecoloclean” – OSVE Dairy (proprietor – Mr. Bert Velson), Bosque Watershed.
  - 2) “Geotube” – Triple X Dairy (proprietor – Mr. Wayne Moermen), Leon Watershed.
- b. The year two technologies have chosen the following dairies to apply their technology:
  - 1) “EnviroLink” - Sherwyn Wood Dairy (proprietor – Sherwyn Wood) Bosque watershed.
- c. Year three technology has chosen the following dairies to apply their technology:
  - 1) “Ozona Environmental” – Wild West Dairies (proprietor – Geoff Vandenieuwegiessen) Bosque River watershed.

### **100% Complete**

*Subtask 1.3: On-site installation and start-up of the six pilot-scale technologies to be demonstrated. Technology providers will carry out the task of equipment transport, on-site installation, set-up, and start-up. With permission from the cooperating dairy owner/operator, the technology provider will prepare the site to install and operate the system for demonstration. (First installation by August 2003, last installation 6 months before the end of the 3-year project)*

The following actions have been completed during this reporting period:

- a. The demonstration by Ozona Environmental has been completed.

### **100% Complete**

*Subtask 1.4: QAPP preparation and field data collection and analysis. Extension will prepare the DQO and QAPP (August 2003 to August 2004)*

- a. No activity to report at this time.

### **100% Complete**

*Extension will collect samples from raw and treated effluent and resulting sludge. One of the evaluation tasks will be to analyze the sludge or by-product remaining after raw material treatment for P stability (August 2003 to May 2007)*

The following actions have been completed during this reporting period:

- a. Sampling is complete for the Ozona Environmental, LLC project.

**100% Complete**

*Subtask 1.5: Develop reports and outreach education materials. Extension in cooperation with TWRI will produce educational brochures and publications on effectiveness of this innovative technology. Quarterly and final reports will be prepared and submitted in a timely manner.*

The following actions have been completed during this reporting period:

- a. TWRI submitted the year 5, quarter 4 report to TSSWCB on October 1, 2008.
- b. The first draft of the Ozona Environmental demonstration has been completed and reviewed. Edits are being made to the report and it is anticipated that it will be completed next quarter.
- c. The Turfgrass demonstration report has been completed and is in the process of being published. Upon publication, it will be posted to the project website.
- d. A fact sheet for the EnviroLink demonstration was completed this quarter and posted to the project website.

**98% Complete**

*Subtask 2.1: Texas AgriLife Research will establish demonstration plots and procure materials to set up the demonstration plots.*

The following actions have been completed during this reporting period:

- a. All demonstration plots have been set up. This task is now complete.

**100% Complete**

*Subtask 2.2: Texas AgriLife Research will conduct analysis of physical and chemical properties of Geotube residuals.*

The following actions have been completed during this reporting period:

- a. All samples of residual Geotube material have been collected and have been analyzed to determine their physical and chemical properties. This task is now complete.

**100% Complete**

*Subtask 2.3: Texas AgriLife Research will assess the effects of Geotube residues on turfgrass and soil physical, chemical, and biological properties.*

The following actions have been completed during this reporting period:

- a. Sampling and analysis have been completed on the demonstration plots. Results about the effects of the Geotube residue on turfgrass growth will be included in the final report for this task.

**100% Complete**

*Subtask 2.4: Texas AgriLife Research will evaluate leaching losses of nutrients and dissolved organic C.*

The following actions have been completed during this reporting period:

- a. Residual samples collected after the demonstration has been evaluated to determine the amount nutrient losses during the demonstration. This task is now complete.

**100% Complete**

*Subtask 2.5: Texas AgriLife Research will conduct statistical analysis on samples collected and will draft a final report that summarizes the results of the demonstration.*

The following actions have been completed during this reporting period:

- a. All required statistical analyses have been completed.

**100% Complete**

### **III. Related Issues/Current Problems and Favorable or Unusual Developments**

- a. A presentation summarizing the demonstration of the Ozona Environmental LLC technology was presented in Rhode Island at the ASABE annual meeting on June 29 thru July 2, 2008.
- b. The report on the EnviroLink demonstration was converted into a refereed journal article and accepted in the *Transactions of the ASABE* and has been entitled "Efficacy of microbial treatment to reduce phosphorous and other substances from dairy lagoon effluent."

### **IV. Projected Work for Next Quarter**

The following will be accomplished during the coming quarter:

- a. Work will continue on the final report for the Ozona Environmental demonstration. Once completed, results from all demonstrations will be combined into a project final report.