

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

Quarter no. 4 From 7/01/04 Through 9/30/04.

**I. Abstract**

Project efforts during the fourth quarter involved two separate efforts. Administratively, TWRI worked with TIAER and TSSWCB to finalize and submit the project QAPP to EPA for approval. While the delay in QAPP submission did preclude technology implementation and evaluation, the delay was fortuitous in that one of the selected technologies, "Removal of Phosphorus by Struvite Precipitation", withdrew their application for participation in year one. Therefore, TCE had adequate time to contact and set up on-site visits with the third ranked technology, "Phosphorus Removal by Chemical Precipitation and Geotube<sup>®</sup> Dewatering".

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

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

*Subtask 1.1: Identification of potential technology providers. TCE, TWRI, TFB, dairy industry representatives, EPA Region 6, TSSWCB, TCEQ, BRA, NRCS, and TAES 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. Due to inadequate funds, the "Struvite" technology withdrew their application to participate in evaluation efforts during year one.
- b. TCE contacted Mr. Vic Johnson of General Chemical Corporation to invite the third ranked technology, "Geotube", to be demonstrated during year one evaluation.

**35% 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). TCE, 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. TCE personnel met with "Geotube" technology personnel, Mr. Vic Johnson and Mr. Tom Stephens, and the Triple X Dairy proprietor, Mr. Wayne Moermen, on 9-22-04. Triple X Dairy is located south of Comanche on Hwy 16 within the Leon River Watershed. Mr. Johnson and Mr. Stephens took initial samples of dairy waste to determine necessary ratios of alum and polyacrylamide for P reduction in the effluent. See figure 1.

**30% Complete**

**Figure 1: Preliminary testing for implementation of Geotube technology at Triple X Dairy in the Leon River Watershed.**



*Geotube personnel mix dairy effluent with experimental ratios of alum and polyacrylamide polymer to bind with P in effluent.*



*Dairy effluent reacts with alum and polyacrylamide polymer and as a result, separates into solid and liquid layer.*



*Dairy effluent mixture filtered through Geotube<sup>®</sup> material and filtered water collected to determine amount of P reduction achieved.*



*Residual solids within Geotube<sup>®</sup> material following filtration and P binding.*

*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. No progress to report at this time.

**0% Complete**

*Subtask 1.4: QAPP preparation and field data collection and analysis. TCE will prepare the DQO and QAPP, and 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 2006)*

The following actions have been completed during this reporting period:

- a. Following several QAPP revisions and numerous comments exchanged between SWFTL and TWRI, project management reevaluated budget allocations and testing needs for the samples and determined that all laboratory analysis will be conducted by the TIAER Laboratory. To ensure adequate information is obtained while staying within budget means, TCE determined to analyze all samples for P parameters, every other sample for N parameters and every third sample for metals content.
- b. Sole utilization of TIAER required an additional rewrite of the QAPP.
- c. TWRI submitted final draft to TSSWCB on 9-21-04.
- d. TWRI received comments from TSSWCB and submitted final QAPP to EPA on 10-1-04.

**90% Complete**

*Subtask 1.5: Develop reports and outreach education materials. TCE in cooperation 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. Submitted Year 1, quarter 4 report to TSSWCB on 10-15-04

**40% Complete**

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

The delay in QAPP submission was the only issue of concern during quarter 4. Following the decision to solely utilize the TIAER Laboratory, the QAPP process was expedited and the document was submitted to EPA within the present quarter as projected. Both technologies are eagerly waiting to begin and will initiate operation and sampling as soon as the QAPP is approved.

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

The following will be accomplished during the coming quarter:

- a. Receive approval of project QAPP from EPA.
- b. Selected technologies will be implemented following QAPP approval.
- c. Once technologies reach optimum operation efficiency, sample collection and analysis will commence.
- d. Project personnel anticipate advisory committee members will be able to view technologies on dairy sites and review preliminary data during next quarter.