

Evaluating Water Quality Best Management Practices for Reservoirs in North Central Texas

Texas Water Resources Institute
FY 03 Federal Appropriated Funds
Project # X7-9764801-0

Quarter no. 2 From 1/8/04 Through 4/7/04

Progress in Meeting Project Milestones and Output Commitments

Task, Deliverables, and Schedules

The Texas Water Resources Institute (TWRI) along with the Texas A&M University Spatial Sciences Laboratory (SSL), Alan Plummer Associates, Inc. (APA) and Espey Consultants, Inc. (EC) have been diligently working to complete project deliverables. Project efforts during the second quarter focused upon modeling activities. The SSL and EC have collaborated on efforts to interact SWAT and QUAL2E models to predict loadings within Cedar Creek Reservoir. APA has been working to obtain data from wastewater treatment plants within Cedar Creek and Eagle Mountain Reservoirs and input this data into an Access database. TWRI has developed a Web site containing water quality information, specifically related to project efforts, for scientist and the general public.

In looking forward to the next quarter, SWAT and QUAL2E modeling activities should be completed and WASP 6.1 modeling should be underway thereby giving us a clear understanding of sediment and nutrient flow within the Cedar Creek reservoir and watershed. At this point work can begin on looking at and developing BMP scenarios to correct these measures.

The status of tasks, milestones and deliverables will be defined using the following terms:

Pending	Work has not started on the deliverable
Initiated	Work has started
Completed	The objectives were achieved and deliverables are finished
Deferred	Work has started, but further action is delayed pending other information, the completion of another objective, staff restraints, etc.
Ongoing	Work will continue throughout the term of the contract

Task 1 SWAT Modeling

Due Date	Status	Deliverables
1/1/04	Initiated	1. Complete model calibration and validation for Cedar Creek
4/1/04	Initiated	2. Development of Watershed databases
7/1/04	Pending	3. Development and Evaluation of Different BMP strategies for Cedar Creek Watershed
1/1/05	Pending	4. Calibration and validation for Eagle Mountain Watershed
9/1/05	Pending	5. Development and evaluation of different BMP strategies for Eagle Mountain Watershed
9/1/05	Pending	6. Development of ArcGIS/ArcHydro interface for SWAT and WASP
9/1/05	Pending	7. Development of interface for using NEXRAD weather information for SWAT

Comments:

- The Spatial Sciences Lab (SSL) in cooperation with Blackland Agricultural Research and Extension Center continue to calibrate and validate the SWAT model for Cedar Creek Reservoir. Unexpected delays have occurred with regard to modeling activities in making parameters for the varying models compatible. The process has further been hindered as specialists are in the process of updating the 2001 land use map of the study area using satellite imagery to make the model as up-to-date as possible. This deliverable is 80% complete.
- SSL has been in contact with state and federal agencies (TCEQ, TRWD, NRCS, USGS) to obtain GIS data for the watershed database. The Access database, once complete, will contain information on land use, soils, elevation, weather and watershed delineation data. This deliverable is 25% complete
- Development and evaluation of specific BMPs cannot occur until modeling work is complete.

Task 2 In-Stream and Reservoir Modeling

Due Date	Status	Deliverables
4/1/04	Completed	1. Development of In-stream modeling (QUAL2E) for Cedar Creek Watershed
10/1/04	Initiated	2. Development of Reservoir Modeling (WASP 6.1) for Cedar Creek Reservoir
10/1/04	Pending	3. Development and Evaluation of Different BMP strategies for Cedar Creek Reservoir
1/1/05	Pending	4. Data Collection for Reservoir Modeling (WASP 6.1) for Eagle Mountain
7/1/05	Pending	5. Development of Reservoir Modeling (WASP 6.1) for Eagle Mountain Watershed
9/1/05	Pending	6. Development and Evaluation of Different BMP strategies for Eagle Mountain Watershed

Comments:

- QUAL2E modeling has been completed and coefficients have been submitted to the SWAT modeling team.
- Currently working on developing the five-year hydrodynamic portion of WASP 6.1 for Cedar Creek Reservoir and the five-year water quality database to be used for calibrating the model.

Task 3 Study of Wastewater Treatment Plants

Due Date	Status	Deliverables
7/1/04	Initiated	1. Development of a Database for Wastewater Treatment Plants in Cedar Creek and Eagle Mountain Watersheds
10/1/04	Pending	2. Assessment of Impact of Wastewater Treatment Plants (point source discharges) for Cedar Creek and Eagle Mountain Reservoirs
4/1/05	Pending	3. Development of a Database for Wastewater Treatment Plants in the Richland-Chambers Watershed
7/1/05	Pending	4. Assessment of Impact of Wastewater Treatment Plants (point source discharge) for Richland-Chambers Reservoir

Comments:

- The database architecture has been completed and 95% of the data has been installed into the Access language database. All wastewater treatment plants have been visited on both Cedar Creek Reservoir and Eagle Mountain Reservoir.
- Process diagrams are 30% complete and will be added to the database datasets. Process evaluations with future limits will be started by the middle of April. Cost estimates for all process recommendations shall be added after the completion of evaluations.

Task 4 Administration

Due Date	Status	Deliverables
1/5/04	Completed	1. Write QAPP
1/7/04	Completed	2. Quarterly Progress Reports
4/7/04	Completed	
7/7/04	Ongoing	
10/7/04	Ongoing	
1/7/05	Ongoing	
4/7/05	Ongoing	
7/7/05	Ongoing	
10/7/05	Ongoing	3. Final Report

Comments:

- TWRI created a one-page fact sheet providing an overview of the project, including objectives, components and collaborators. The fact sheet identifies project needs and goals and will be used to gain stakeholder involvement and publicize project activity.
- The institute created an Internet Web site specifically for the North Central Texas Water Quality Project. The Web site can be accessed at the following address: <http://nctx-water.tamu.edu>
- On February 11, 2004 project participants met at Cedar Creek Reservoir to present the status of deliverables and discuss objectives for the upcoming quarter.

Problems or Obstacles Encountered and Remedial Actions Taken

The research team has had difficulty in adapting the SWAT and QUAL2E models. The challenge has been in establishing compatible parameters and coefficients for the varying models. Numerous meetings occurred both by teleconference and in person to postulate possible solutions. Great strides have been made by the modeling team to configure an accurate up-to-date model, which patterns both the watershed and the reservoir simultaneously for nutrient and sediment loading. SWAT-QUAL2E modeling should be completed in the near future.

Work Planned for Next Quarter

Task 1: SWAT Modeling

Final calibration and validation of the SWAT model with input parameters from QUAL2E. Finish gathering and inputting data for the watershed database. Begin looking at BMP strategies to reduce nutrient, sediment and pollutant loadings of Cedar Creek Reservoir.

Task 2: In-Stream and Reservoir Modeling

Development of reservoir modeling WASP 6.1 for Cedar Creek Reservoir

Task 3: Study of Wastewater Treatment Plants

Begin evaluating impacts that wastewater treatment plants and their discharges have on water quality of Cedar Creek and Eagle Mountain Reservoirs.

Task 4: Administration

TWRI will continue working with TRWD, SSL, EC and APA in moving forward with project deliverables and reporting its progress on a quarterly basis. Efforts will be made to publicize the project and raise awareness of water quality issues within the study area. Furthermore, TWRI will work to secure additional funding for this project as additional federally appropriated funds are not available at this time.