



**Texas State Soil and Water Conservation Board
FY03 CWA Section 319**

NONPOINT SOURCE SUMMARY PAGE

January 2004 – December 2005

1. **Title of Project:** Modeling Atrazine in Seven Texas Watersheds
2. **Project Goals/Objectives:** (1) Collect GIS, landuse, management, and measured data for seven Texas watersheds. (2) Calibrate watershed model to measured flow, sediment, and atrazine. (3) Simulate atrazine load for current conditions. (4) Assume application of BMPs on all cropland, and simulate atrazine load for treated condition.
3. **Project Tasks:** (1) Simulate Atrazine loadings for current and treated conditions in the following watersheds: (a) Lake Lavon, (b) Lake Tawakoni, (c) Richland-Chambers Reservoir, (e) Lake Bardwell, (f) Lake Waxahachie, (g) Lake Aquilla, and (h) the Little River Watershed from the release point of lakes Belton, Stillhouse Hollow, and Granger to the junction with the Brazos River. Program Coordination with Project Participants, (2) Prepare final report for each watershed.
4. **Measures of Success:** Complete simulations of seven Texas watersheds to show effects of BMPs on atrazine loading; Reduction in atrazine loading to rivers and lakes.
5. **Project Type:** Statewide (); Watershed (X); Demonstration ()
6. **Waterbody Type:** River (X); Groundwater (); Other ()
7. **Project Location:** Aquilla Reservoir (segment #1254); Little River (segment #1213); Bardwell Reservoir (segment #0815); Lake Waxahachie (segment #0816); Lake Lavon (segment #0821); Richland Chambers Reservoir (segment #0836); Lake Tawakoni (segment #0507).
8. **NPS Management Program Reference:** State of Texas Agricultural/Silvicultural Nonpoint Source Management Program, February 2000
9. **NPS Assessment Report Status:** Impaired (X); Impacted (); Threatened (X); Other ()
10. **Key Project Activities:** Hire Staff (); Monitoring (); Regulatory Assistance (); Technical Assistance (); Education (); Implementation (); Demonstration (X); Other – watershed modeling (X)
11. **NPS Management Program Elements:** Milestones from the “1999 Texas Nonpoint Source Pollution Assessment Report and Management Program”, which will be implemented include: (1) Coordinating with Federal, State, and Local Programs (2) Committing to technology transfer, technical support, administrative support and cooperation between agencies and programs for the prevention of NPS pollution.
12. **Project Costs:** Federal (\$158,400); Non-Federal Match (\$0); Total Project (\$158,400)
13. **Project Management:** Texas State Soil and Water Conservation Board Cooperating entities: Natural Resources Conservation Service-Water Resources Assessment Team, Blackland Research & Extension Center.
14. **Project Period:** 2 years from start date

Modeling Atrazine in Seven Texas Watersheds
Texas State Soil and Water Conservation Board
FY2000 CWA Section 319(h)

WORK PLAN

1/1/04 - 12/31/05

Problem/Need Statement:

Atrazine has been detected in seven Texas watersheds at levels that are cause for concern. Since 1999 the TSSWCB has been implementing BMPs through Water Quality Management Plans to help reduce this concern. The purpose of this project is to predict, using a watershed model (SWAT), the effects of applying BMPs on atrazine loadings to streams, rivers, and lakes in these watersheds.

Data on measured atrazine loadings, especially where BMPs have been implemented, is limited. Therefore, a watershed model, calibrated to available measured data, is the best tool for use in predicting the effects of BMPs on atrazine loadings. Modeling results can be used to support cost-share funding of BMP application.

General Project Description:

The proposed project will consist of using computer models and geographic information systems (GIS) to simulate the effects of applying best management practices on Atrazine loadings in seven Texas watersheds. The seven watersheds are (1) Lake Lavon, (2) Lake Tawakoni, (3) Richland-Chambers Reservoir, (4) Lake Bardwell, (5) Lake Waxahachie, (6) Lake Aquilla, and (7) the Little River Watershed from the release point of lakes Belton, Stillhouse Hollow, and Granger to the junction with the Brazos River.

The Soil and Water Assessment Tool (SWAT) will be used to quantify the effects of applying BMPs on atrazine loadings to streams, rivers, and lakes in each watershed. The SWAT model will be calibrated and validated to measured flow, sediment, and Atrazine concentrations, where measured data is available. The Natural Resources Conservation Service (NRCS) Water Resources Assessment Team (WRAT) located at the Blackland Research and Extension Center (BREC) will conduct the model simulations.

GIS and measured data will be collected for each of the watersheds. It is anticipated that most of the data will have a scale of 1:24,000 with a 30-meter resolution. Examples of GIS data that may be used are SSURGO (Soil Survey Geographic) and CBMS (Computer Based Mapping System) soils, USGS NLCD (National Land Cover Dataset) landuse, and the USGS 30-meter resolution digital elevation model (DEM). Measured precipitation and temperature will be collected from National Weather Service climate stations for input to SWAT. Measured stream flow will be collected at USGS stream gage stations, and measured sediment will be obtained from reservoir owners/operators, or the Texas Water Development Board.

Within each watershed, information on typical crops and management practices (e.g. tillage, atrazine application rate and timing) will be obtained from local NRCS and SWCD field offices. Existing cropland BMPs (e.g. terraces, waterways, buffers) will be determined from field office records. SWAT inputs will be adjusted to accurately represent existing conditions and management.

After collecting all available data for a watershed, the SWAT model will be calibrated to measured stream flow, sediment, and atrazine. If measured data is not available for a particular watershed, calibration will be performed in nearby watersheds, and the same SWAT input adjustments will be used in the watersheds with no measured data. After calibration, the existing condition will be simulated for a 30-year period to determine atrazine loading to the lake.

To simulate the treated condition, BMPs, which may affect atrazine runoff, will be assumed applied on all cropland. Appropriate adjustments will be made to SWAT inputs, and the same 30-year period will be simulated. Model outputs for the existing condition and treated condition will be compared to determine the effects on atrazine loading to the lake or stream.

A final report for each watershed will be prepared.

Tasks, Objectives, Schedules, and Estimated Costs:

TASK 1: Watershed Simulations

Costs: \$158,400 (Federal); \$0 (Non-Federal Match); \$158,400 (Total)

Objective: Model the effects of BMPs on atrazine loadings to lakes and rivers in seven Texas watersheds.

Subtask 1.1 Lake Aquilla Simulations (\$15,800). (Start Date: 1/2004; Completion Date: 3/2004)

Subtask 1.2 Richland-Chambers Reservoir (\$37,000), Lake Bardwell (\$5,000), and Lake Waxahachie (\$5,000) Simulations (completed concurrently). (Start Date: 4/2004; Completion Date: 10/2004)

Subtask 1.3 Lake Lavon Simulations (\$23,800). (Start Date: 11/2004; Completion Date: 1/2005)

Subtask 1.4 Lake Tawakoni Simulations (\$23,800). (Start Date: 2/2005; Completion Date 4/2005)

Subtask 1.5 Little River Simulations (\$48,000). (Start Date: 5/2005; Completion Date: 12/2005)

Deliverables:

- Final report for each watershed.

Coordination, Roles and Responsibilities:

Participating organizations and agencies along with their roles in this project include:

- **Texas State Soil and Water Conservation Board** – Project Lead – Work with and assist as needed local SWCDs in collecting data on crops, typical land management, atrazine applications, existing BMPs, and planned BMPs in each watershed.
- **Natural Resources Conservation Service-Water Resources Assessment Team** – Collect GIS and measured data, and simulate current and treated conditions for each watershed to determine effects of BMPs on atrazine runoff and loading.

Public Participation:

This is an internal TSSWCB project with the NRCS-WRAT. This project will provide estimates of the beneficial effects of BMPs on atrazine runoff and loading in the selected watersheds. TSSWCB will provide technical assistance to landowners in these seven watersheds for implementation of WQMPs with reductions in atrazine loading determined by modeling.

Measures of Success:

- Complete simulations of seven Texas watersheds to show effects of BMPs on atrazine loading

Reference to Project in the NPS Management Program:

Category: Agriculture

Milestones

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BUDGET

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Object Class Category	Federal Funds	Non-Federal Match	Total
1.Personnel:	0	0	0
2.Fringe Benefits:	0	0	0
3.Travel:	0	0	0
4.Equipment:	0	0	0
5.Supplies:	0	0	0
6.Contractual:			
NRCS-WRAT (modeling)	\$158,400	0	\$158,400
7.Construction:	0	0	0
8.Other Direct Costs:	0	0	0
9.Total Direct Costs:	\$158,400	0	\$158,400
10.Indirect Costs:	0	0	0
11.Total Project Costs:	\$158,400	0	\$158,400