Fourteen Mile/Bakers Creek Watershed Implementation Plan

FINAL DRAFT

Fourteen Mile/Bakers Creek Watershed Implementation Plan

Prepared for:

Big Black, Tennessee-Tombigbee River Basin Team
Mississippi Department of Environmental Quality

Developed by:

Fourteen Mile/Bakers Creek Watershed Implementation Team

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I. EXECUTIVE SUMMARY

Fourteen Mile/Bakers Creek Watershed was identified as a priority watershed by the Big Black, Tennessee-Tombigbee River Basin Team. Fourteen Mile Creek is listed on Mississippi's 303(d) list of impaired waters for biological impairment due to Sediment Nutrients, Low Dissolved Oxygen (DO), Organic Enrichment and Fecal Coliform. Bakers Creek is listed on the 303(d) for Fecal Coliform. The Mississippi Soil and Water Conservation Commission, Hinds County Soil and Water Conservation District and USDA Natural Resources Conservation Service felt a great impact on water quality could be made in this watershed. MSWCC submitted a proposal to apply best management practices to address the sedimentation issue on agricultural lands. That proposal was selected for funding by MDEQ and a contract was awarded to MSWCC. Under that contract, MSWCC is required to assemble a Watershed Implementation Team to address other issues and concerns within the watershed and write a Watershed Implementation Plan.

The key natural resource problems in this watershed are sedimentation and nutrient loading. The Watershed Implementation Plan has the goals of reducing the sediment and nutrients entering the streams and creeks in the watershed, and removing the impaired segments of streams and creeks in the Fourteen Mile/Bakers Creek watershed from Mississippi's 303(d) list of impaired waterbodies. To help solve this problem, one of the management actions is to implement a 319 water quality project on the agricultural lands within the watershed. The targeted area for this project is the cropland and pastureland in Hinds County that lie within the watershed boundaries. This is a three year project that began in 2007 and will end in August 2010. The groups that will be implementing the management action of reducing the sediment loading are the Hinds County Soil and Water Conservation District, Natural Resources Conservation Service, and the Mississippi Soil and Water Conservation Commission. The Hinds County Soil and Water Conservation District and the Natural Resources Conservation Service can be contacted at 601-965-5682 ext. 3 for information and assistance about this management action.

Table 1.1 Fourteen Mile/Bakers Creek Management Action Plan

Goal	Who	What	Where	When	Contacts
Reduce sediment and nutrient loading, achieve narrative standards for sediment loading, and Fish and Wildlife Support designated use	MSWCC, USDA NRCS	Continue existing programs and projects related to farmer education, BMP implementation, and habitat conservation	Entire watershed	2007-2010	Mark Gilbert, MSWCC 601-354-7645 Rogerick Thompson, NRCS 601-824-4601
	Local Landowners and operators	Critical Area Planting Grade Stabilization Structures Pasture Planting Filter Strips Fencing Diversions Terraces	Entire Watershed	2007-2010	Local landowners

II. VISION STATEMENT

The vision of the Fourteen Mile/Bakers Creek Watershed Implementation Team is to improve and/or protect the quality of water in streams and creeks by reducing sediment and nutrient transporting and enhance recreational land uses in the watershed.

III. MISSION STATEMENT

The mission of the Fourteen Mile/Bakers Creek Watershed Implementation Team is to educate landowners on new and innovative best management practices, land use planning methods and implementing the appropriate Best Management Practices that will result in the enhancement and conservation of all the natural resources in the watershed.

IV. WATERSHED IMPLEMENTATION TEAM

Members of the Watershed Implementation Team for the Fourteen Mile/Bakers Creek Watershed include as follows:

Mark Gilbert- Mississippi Soil & Water Conservation Commission (MSWCC)

Patrick Vowell- Mississippi Soil & Water Conservation Commission (MSWCC)

Jeff Wilson- Mississippi Soil & Water Conservation Commission (MSWCC)

Andy Whittington- Mississippi Farm Bureau Federation (MFBF)

Ronn Killebrew- Mississippi Department of Environmental Quality (MDEQ)

Ann Porter- Mississippi Department of Environmental Quality (MDEQ)

Rogerick Thompson- Natural Resources Conservation Service (NRCS)

Lynn Porter- Hinds County Soil & Water Conservation District (SWCD)

Peggy McKey- Landowner

Jacqueline Cannada- Landowner

Cindy McNair- Landowner

Glen Holmes- Landowner

Clifton Reed- Landowner

Rosa Pittman- Hinds County SWCD Commissioner and Landowner

David Barton Jr- Land Operator

Wyvette Robinson- Hinds County Soil and Water Conservation District (SWCD)

Phillip Mikel- Hinds County Soil and Water Conservation District (SWCD)

Richard Cox- Hinds County Soil and Water Conservation District (SWCD)

Shane Stocks- United States Geological Survey (USGS)

Donetta-McCullum-Weatherspoon- Mississippi Department of Environmental Quality (MDEQ)

V. WATERSHED DESCRIPTION

Fourteen Mile/Bakers Creek is located in the central to southwestern portion of Hinds County, Mississippi (Figure 5.1) (MDEQ 2006). There are 163,019 acres located within the watershed boundaries. The towns and cities located in this watershed include Clinton, Raymond, Learned, Bolton, and Edwards. Economic conditions that influence this watershed include farming, commodity prices, costs in planting and growing cotton and increased tillage to plant soybeans which causes increased runoff.

The historical events that affect the culture of the watershed include old Civil War battlefields, Mississippi College (oldest college in Mississippi), and using conventional tillage methods when planting crops. The land uses in the watershed include 56,188 acres of pastureland (34.5%), 43,547 acres of forestlands (26.7%), 23,023 acres of cropland (14.1%), and 8,521 acres of urban and other (all together 5.1%). Figure 5.2 shows the land uses in the Fourteen Mile/ Bakers Creek watershed. There have been several significant changes in land use in this watershed in the last 20 years. The major change that has occurred is urbanization. In addition to urbanization, other changes have occurred including the types of crops being planted due to increased expenses and the conversion of cropland and pastureland to forestland.

The soils in the watershed include Loring-Memphis, Memphis-Loring, and Memphis-Natchez soils. The geology of the watershed is Catahoula Formation of the Tertiary Epoch. Fourteen Mile/Bakers Creek watershed is located in the Mississippi Valley Loess Plains, Mississippi Alluvial Plains, and the Southeastern Plains ecoregions. About 1.5% or 2,524 acres of the watershed are wetlands.

Other named creeks in the watershed include Bitter, Terrell, Hamilton, McDonald, Snake, Turkey, Jackson, Smith, Lindsey, Little Bakers, and Fleetwood Creeks. There are no state or federal parks, wildlife management areas, national forests or other significant management areas located within this watershed.

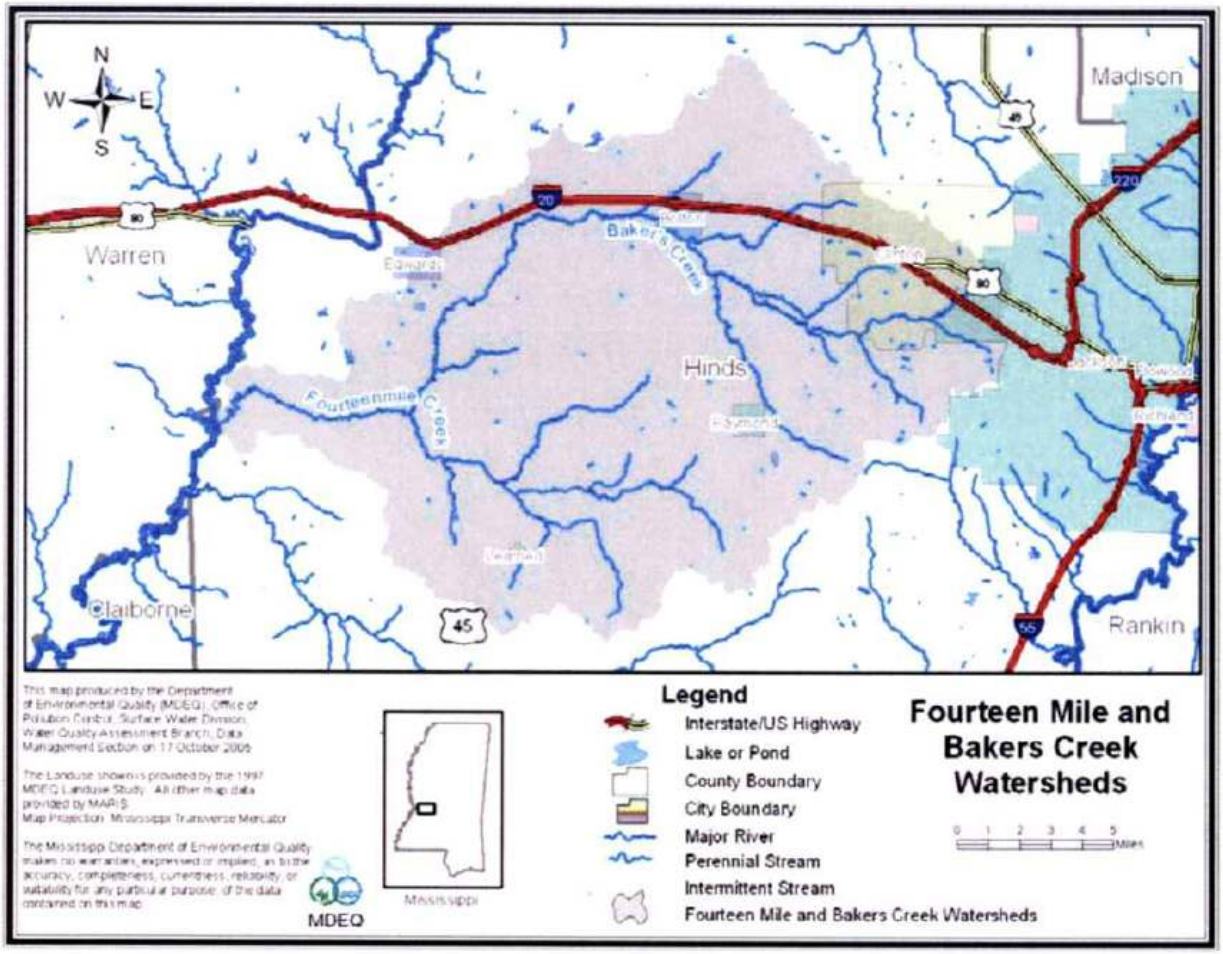

Figure 5.1 Fourteen Mile/Bakers Creek Watershed.

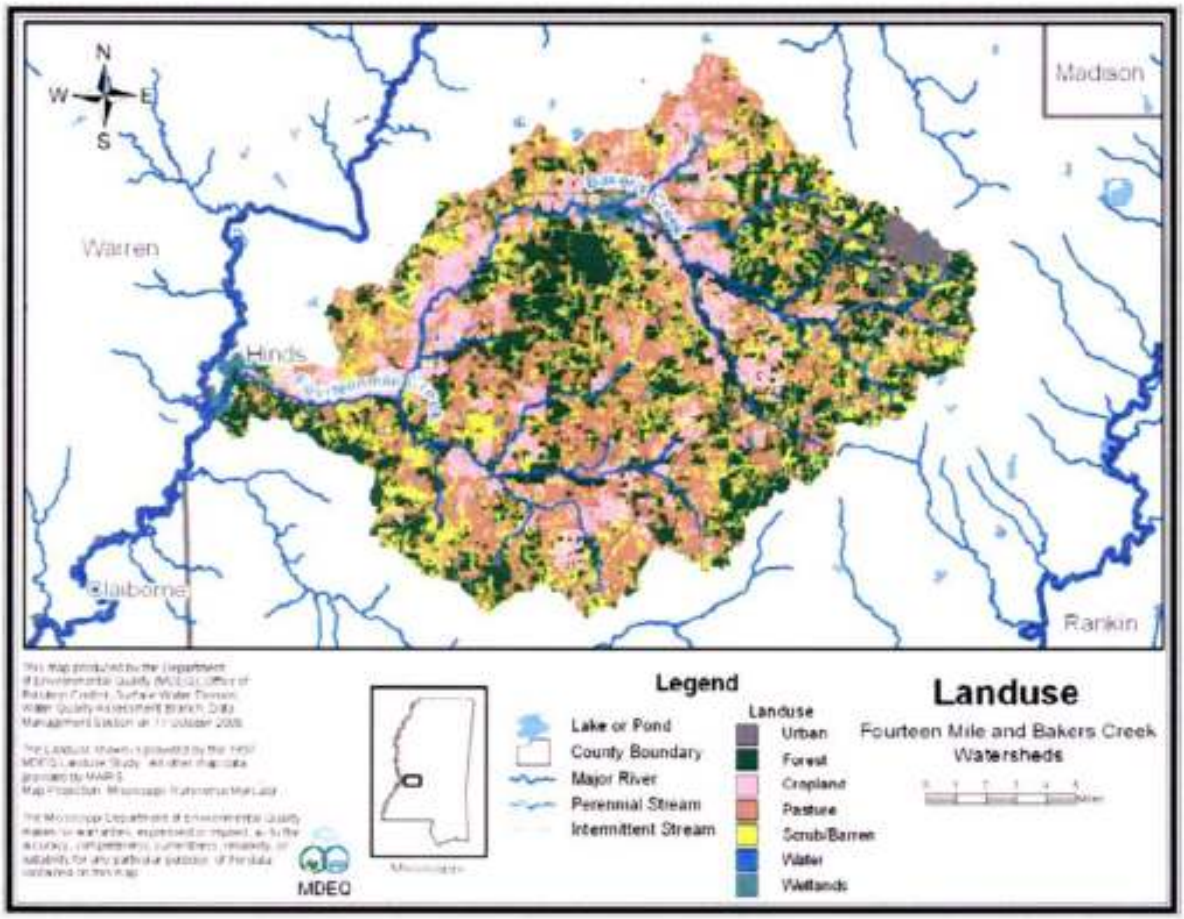

Figure 5.2 Land Use in Fourteen Mile/Bakers Creek.

VI. STAKEHOLDER INTERESTS

The stakeholders in this watershed want to conserve and preserve the soil, water, and wildlife habitat. Stakeholders in the watershed want to restore the watershed creeks and streams to a state of good water quality. Some of the interests that the stakeholders feel will impact restoring the creeks in the watershed to good water quality include reducing runoff (stopping erosion and loss of topsoil) and improving habitat for fish and wildlife. The interests the stakeholders have in the watershed are using the natural resources wisely, eliminating snags and debris, stopping people from littering, issues associated with the landfill, and beaver control. Also, there are issues where people target practice from bridges endangering cattle and other livestock nearby. The stakeholders feel all the interests are tied together. The snags and debris are coming from two different issues. Storm damage to woody areas cause log and brush debris to get into the streams also, people toss household trash and old appliances from bridges into the streams and creeks. This debris causes large snags that interrupt the flow causing flooding. Once the flood waters recede the topsoil is washed away taking nutrients and chemicals with it. This helps increase the potential of starting head cuts and gullies while leaving debris in pastures and on cropland. Therefore, the stakeholders feel stopping the littering would help resolve a lot of the snag and debris issues in the streams and creeks. This would, in turn, help reduce the sediment and nutrients entering the streams. A concern that has recently become a major concern is the landfill in the headwaters of the watershed. It is the concern of the landowners that sediment and other contaminants will affect the water quality in the watershed. The concern for beaver control has always been an issue, but recently the beaver dams have started causing flooding of croplands. Due to this flooding, some of the farmers will lose parts of some fields that they farm.

VII. Water Resources

A. History of Activity in the Watershed

The primary players in restoration and /or conservation efforts in the Fourteen Mile/Bakers Creek Watershed are the Natural Resources Conservation Service, Hinds County Soil and Water Conservation District and the Mississippi Soil and Water Conservation Commission. Local landowners and operators will play a major role in the restoration and conservation of the natural resources in this watershed by installing best management practices on their land. There have been several programs that have been utilized by landowners in the watershed in past years. These programs include Environmental Quality Incentive Program (EQIP), Wildlife Habitat Incentives Program (WHIP), Conservation Reserve Program (CRP), Forestry Incentives Program (FIP), Conservation Security Program (CSP), Hold Our Topsoil (HOT) and the Agricultural Conservation Program (ACP). These programs have helped a lot of landowners apply conservation on the ground while reducing soil loss, enhancing wildlife habitat, enhancing water quality, increasing water quantity, increasing tree production and promoting conservation education.

The Fourteen Mile/Bakers Creek Watershed was selected as a priority watershed by the Tenn-Tom, Big Black Basin Team. As the management agency for Agricultural Nonpoint Source Pollution in Mississippi, the Mississippi Soil and Water Conservation Commission (MSWCC) determined that the Fourteen Mile/Bakers Creek Watershed would be a good candidate for restoration. After meetings with local landowners and Natural Resources Conservation Service (NRCS) employees that work in this area, MSWCC felt there was enough interest in the watershed that a measurable difference could be shown, and submitted a proposal to the Mississippi Department of Environmental Quality (MDEQ). Through a collaborative effort between Hinds County SWCD, NRCS, MDEQ and MSWCC, the team members for the Watershed Implementation Team were assembled. At this point in time, there has been no process discussed to modify this team.

B. Wildlife and Fisheries

There are important recreational species located throughout the watershed. These species include deer, turkey, bass, catfish, bream, rabbits, squirrel, and raccoon. The list of plants and animals of special concern are included as Appendix A. This list also includes the animals and plants that are threatened or endangered.

C. Designated Use Classifications and Water Quality Standards

The designated beneficial uses for the Fourteen Mile/Bakers Creek and the waterbodies included in the watershed are aquatic life support and secondary contact. The water use classification for the listed segments of Fourteen Mile and Bakers Creeks is fish and wildlife support according to the 2002 Water Quality Criteria for Intrastate, Interstate and Coastal Waters. There are no numeric water quality standards for sediment applicable at this time. The acceptable reference yields range for stable streams within HUC 08060202 established by EPA Region IV is .0003 to .014 tons per acre per day at the effective discharge. It is expected that all values within this range will result in attainment of water quality standards. It is estimated the typical range for unstable streams in HUC 08060202 is .321 to 2.333 tons per acre per day at the effective discharge. This range is representative of the load that would be expected from the Fourteen Mile/Bakers Creek Watershed. The aquatic life use attainment threshold scores associated with the Fourteen Mile/Bakers Creek Watershed are as follows: Fourteen Mile- 30.24 and Bakers Creek- 25.74. The reference MBISQ score for the Bioregion is 57.55.

Table 7.1 Water Quality Standards.

Parameter	Beneficial Use	Narrative Water Quality Standards
Sediment/ Siltation	Aquatic Life Support	Waters shall be free from materials attributable to municipal, industrial, agricultural, or other dischargers producing color, odor, taste, total suspended solids, or other conditions in such degree as to create a nuisance, render the waters injurious to public health, recreation, or to aquatic life and wildlife, or adversely affect the palatability of fish, aesthetic quality, or impair the waters for any designated uses.

Parameter	Beneficial Use	Water Quality Standards
Fecal Coliform	Secondary Contact	**May-October:** Fecal coliform colony counts not to exceed a geometric mean of 200 per 100ml based on a minimum of 5 samples taken over a 30-day period with no less than 12 hours between individual samples, nor shall the samples examined during a 30-day period exceed 400 per 100 ml more than 10% of the time. **November-April:** Fecal coliform colony counts not to exceed a geometric mean of 2,000 per 100ml based on a minimum of 5 samples taken over a 30-day period with no less than 12 hours between individual samples, nor shall the samples examined during a 30-day period exceed 4,000 per 100 ml more than 10% of the time.

D. Current Status of Water Bodies in the Watershed

Waterbodies in the Fourteen Mile/Bakers Creek watershed are included on Mississippi's 303(d) list of impaired waters and they are as follows:

Fourteen Mile Creek- listed for fecal coliform, sediment, low DO, nutrients and organic enrichment, and

Bakers Creek - listed for fecal coliform.

E. TMDLs

The Fourteen Mile/Bakers Creek watershed is located in Hinds County, Mississippi. The watershed ID number is 150, and the Hydrologic Unit Code (HUC) code for the watershed is 08060202. The streams in Fourteen Mile Creek Watershed are biologically impaired due to sediment/siltation, fecal coliform, low dissolved oxygen (DO), nutrients, and organic enrichment. The steams in Bakers creek are impaired due to fecal coliform loading.

A fecal coliform TMDL has been developed for Fourteen Mile and Bakers creeks for fecal coliform for segments MS441FE and MS441BE respectively. Also, there have been two other TMDLs developed for Fourteen Mile Creek. The first TMDL is for biological impairment due to sediment. The second TMDL is for biological impairment due to nutrients, low DO, and organic enrichment.

The recommended load reduction for sediment is a narrative criteria because at this time Mississippi does not have numeric criteria for sediment. Also, due to sediment data being unavailable and insufficient, the sediment range used for the TMDL were obtained from those values of unstable streams in the level III ecoregion. This range is from .321 to 2.333 tons per acre per day at the effective discharge, therefore, a reduction in the sediment loading is recommended to bring those unstable streams back to yields that are acceptable for stable streams in the ecoregion. The recommended management actions to reduce the loading to the streams are streambank and riparian buffer zones restoration and any other sediment reduction BMPs, especially for the road crossings, agricultural activities, and construction activities.

The recommended load reduction and management action, in the TMDL addressing fecal coliform, is to reduce the summer loading in Fourteen Mile by 52% and Bakers Creek by 80%. The summer period is from May to October. The water quality standard for fecal coliform loading is located in Table 7.1. This reduction applies to point and nonpoint sources combined. This TMDL will not require any changes to any of the existing NPDES permits at this time.

The recommended load reduction for nutrients, low DO and organic enrichment are 50% for nonpoint source loads of Biochemical Oxygen Demand (BOD), total Phosphorus (TP), and total Nitrogen (TN). The management actions for this load reduction include riparian buffer zone restoration and other nutrient reduction BMPs. Implementation of these BMP activities should reduce nutrient loading to the streams that will result in attainment of applicable water quality standards.

VIII. WATERSHED MANAGEMENT ACTIONS

Agricultural Best Management Practices

Sediment and Nutrient BMPs

1. Stakeholder Interests

The major interests of the stakeholders are the sediment and nutrient loadings to Fourteen Mile and Bakers creeks in the watershed. These are the reasons these creeks are listed on Mississippi's 303(d) list of impaired waters.

2. Goals/Objectives

The goal and objective is to reduce the sediment and nutrient loading coming from agricultural lands and bring the creeks back from unstable stream levels to stable stream levels. By accomplishing this task, the above named creeks could be removed from the state's 303(d) list.

3. Management Actions

The management action that will be taken to address sediment and nutrient loading is the installation of agricultural BMPs that pertain to sediment and nutrients. These BMPs include but are not limited to:

- Critical Area Planting,
- Grade Stabilization Structures,
- Pasture Planting,
- Filter Strips,
- Fencing,
- Diversions, and
- Terraces.

These BMPs will be installed by cooperating landowners in the watershed. The program that these BMPS will be installed under is the MSWCC cost-share program. The Natural Resources Conservation Service (NRCS) will provide the technical/planning assistance for this project. Most of the BMPs that will be installed are permanent structures and must be maintained by the landowner for a period of 10 years. NRCS and Hinds County Soil and Water District employees identified landowners in the watershed that had agricultural land using maps provided by the Mississippi Department of Environmental Quality.

4. Project Tracking/Assessment of Progress

The Fourteen Mile/Bakers Creek 319 project began in 2007 and is scheduled to end August 2010. The milestones for the Fourteen Mile/Bakers Creek Watershed 319 project are listed below:

1. Form the Fourteen Mile/Bakers Creek Watershed Implementation Team (WIT) with assistance from MDEQ.
2. Form a watershed "watchdog" group.
3. Convene a project kick-off meeting of the newly formed Fourteen Mile/Bakers Creek WIT.
4. Facilitate all Fourteen Mile/Bakers Creek WIT meetings.
5. Develop a Watershed Implementation Plan (WIP) consistent with MDEQ guidance and assistance from the WIT.
6. Present a draft WIP to MDEQ and the Big Black Basin Team for review and comments.
7. Coordinate with Mississippi Department of Environmental Quality (MDEQ), Natural Resources Conservation Service (NRCS), United States Geological Survey (USGS), and the Hinds County Soil and Water Conservation District (SWCD) to determine priority areas that are contributing significant pollutant loads in the watershed.
8. Inform the public, landowners, and other stakeholders within the project area about the project and secure commitments from priority landowners and others willing to participate in the project.

9. Identify the appropriate Best Management Practices (BMPs) for targeted areas and educate landowners as to the need to participate. Also, coordinate with USGS in selecting a site to premonitory for determination of sediment loadings.

10. Notify MDEQ project officer, in a timely manner, of all project visits/ inspections/ field days/ and any other public meetings so that the project officer may have an opportunity to attend.

11. Assist USGS with the development and implementation of a water quality monitoring plan and the collection of any relevant project data.

12. Assist landowners and operators in the installation of appropriate BMPs and collect before and after soil loss and GPS coordinates each installed BMP.

13. Establish at least two (2) demonstration farms to inform the public about BMPs

14. Provide a least two (2) informational field days/tours to inform the public about the benefits of the project.

15. Develop and distribute no fewer than 1,000 informational fact sheets highlighting the benefits derived from the project.

16. Publish no fewer than 4 articles about the project in newsletters and local newspapers.

17. Erect no fewer than 20 project roadside signs where water quality practices are installed in the project.

18. Document pre-existing site conditions and improvements by conducting before and after photo documentation.

19. Secure maintenance agreements from cooperators/landowners in accordance with MSWCC state cost-share guidelines.

20. Submit bi-annual reports by every September 25th and March 25th of each year showing status of tasks and start/completion dates of each task.

21. Submit a final report to MDEQ.

5. Desired Results/Benefits

The desired benefit of this project will be the reduction of sediment and nutrient loading to levels that are considered to be acceptable and remove the impaired segments of Fourteen Mile and Bakers creeks from Mississippi's 303(d) list.

6. Roles/Responsibilities

There are several different groups with responsibilities in this watershed. MSWCC has the responsibility and role of administering the 319 project. The Hinds County Soil and Water Conservation District and the local NRCS staff have the role of technical assistance. The landowners have the responsibility of implementation of BMPs in the project area. The Fourteen Mile/Bakers Creek Watershed Implementation Team has the role of helping gather all the information needed to write the Watershed Implementation Plan. MSWCC also has the responsibility of compiling all the information and writing the initial plan for the watershed. Other programs that are available to landowners in the watershed include EQIP, CRP, and WHIP. Under these three programs, there has been $658,900 spent over the last three years with another $540,000 projected to be spent over the next three years.

7. Budget

The table below shows a list of potential Best Management Practices to be installed with the 319 grant.

Table 8.1 Funded 319 Project Budget for BMPs.

Practice	Area Affected	BMP Cost	BMP Total
Critical Area Planting	180 acres	$200/ac	$36,000
Grade Stabilization Structure	103 structures	$3,500 each	$360,500
Pasture Planting	200 acres	$100/ac	$20,000
Fencing	12,000 feet	$1.10/foot	$13,200
Filter Strips	60 acres	$190/acre	$11,400
Diversions	6,9490 feet	$1.02/foot	$7,087
Terraces	19,000 feet	$.65/foot	$13,350
Total			**$460,537**

Table 8.2 Technical Assistance

Item	Cost
Technical Assistance	$35,000
Total	**$35,000**

IX. EDUCATION/OUTREACH ACTIVITIES

A. Educational Activities to be Implemented

The overall objective of community education in the Fourteen Mile/Bakers Creek watershed is to develop an atmosphere that promotes sustained, long-term protection and improvement of aquatic resources in the watershed. Specific objectives of education efforts in the watershed include the following:

- Increase public awareness of the value of clean water.
- Increase public awareness of agricultural runoff and encourage behaviors that will reduce levels of sediments and nutrients in the watershed by education, watershed characterization and stewardship opportunities.
- Increase public awareness of how BMPs can be used to reduce negative water quality and habitat effects.
- Increase public awareness of the long term environmental and economic advantages of protecting and improving water quality and habitat in the Fourteen Mile/Bakers Creek watershed.

1. Signage

Signs identifying the BMPs that have been installed will be erected throughout the watershed upon permission of landowners.

Primary partners- Mississippi Soil and Water Conservation Commission, Mississippi Department of Environmental Quality, Hinds County Soil and Water Conservation District, Natural Resources Conservation Service, and Environmental Protection Agency.

a. Indicators

There will be field days held to show other landowners and the interested public the BMPs installed. Participants will be counted at these field days. Traffic through the watershed cannot be documented, but some areas are heavily traveled being along a state highway.

b. Schedule

The BMP signs will be erected as practices are completed and/or requested by the landowners throughout the life of the project.

c. Budget

Table 9.1 Projected Costs for Signage.

Item	Unit	Cost	Total Cost
Signs	20	$100.00	$2,000.00
Total			**$2,000.00**

2. Field Days

There will be at least two field days held to highlight the BMPs that have been installed during the project period. This will allow other landowners and the interested public to view some of the practices that are being installed to benefit water quality in the watershed.

Primary partners- Mississippi Soil and Water Conservation Commission, Mississippi Department of Environmental Quality, Hinds County Soil and Water Conservation District, Natural Resources Conservation Service, and Environmental Protection Agency

a. Indicators

Attendance at these field days will be documented and reported to MDEQ. The number of individuals who install BMPs as a result of the field days will also be documented.

b. Schedule

Field days in the watershed will take place in 2009-2010.

c. Budget

Table 9.2 Projected Costs for Field Days.

Item	Units	Cost	Total Cost
Event Flyers	200	.60/each	$120.00
Mailing/Delivery	200	.41/each	$82.00
Miscellaneous (facilities, supplies)	2	$5,399/each	$10,798.00
Total			**$11,000.00**

3. Fact Sheets

A fact sheet will be developed at the end of the project. This fact sheet will contain information about the watershed, the number and type of BMPs that were installed, the number of tons of soil being saved, and the number of acres impacted by the BMPs.

Primary Partners- Mississippi Soil and Water Conservation Commission, Hinds County Soil and Water Conservation District, and Natural Resources Conservation Service.

a. Indicators

1,000 fact sheets will be designed and distributed. These fact sheets will be handed out at the final field day and will also be available in the district offices.

b. Schedule

The fact sheet will be developed once all BMPs are in place to get a total tons of soil saved and the correct number of BMPs installed.

c. Budget

Table 9.3 Projected Costs for Fact Sheets.

Item	Unit	Cost	Total Cost
Printing	1,000	1.00/each	$1,000.00
Total			**$1,000.00**

4. Adopt-A-Stream

Adopt-A-Stream is a program that promotes environmental stewardship through training workshops, outdoor field activities, and by introducing participants to watershed action projects. One and two-day workshops inform participants about watershed topics such as stream health, stream ecology, aquatic life and water chemistry.

Primary Partners- Mississippi Department of Environmental Quality and Mississippi Wildlife Federation.

a. Indicators

There were 32 participants who participated in the workshop. The number of participants that move forward with the stream stewardship project will be documented as soon as the information becomes available.

b. Schedule

The Adopt-A-Stream workshop took place on June 4, 2008.

c. Budget

Table 9.4 Projected Costs for Adopt-A-Stream Workshop.

Item	Unit	Cost	Total Cost
Adopt A Stream Workshop	1 day workshop	$1,000.00	$1,000.00
Total			**$1,000.00**

5. Project Learning Tree

Project Learning Tree (PLT) is an award winning education program designed for teachers and other educators, parents, and community leaders working with youth from pre-K to 8th grade. PLT activity guides and modules are not sold, but are earned by educators who attend a six-hour workshop. The PLT activity guide is a 400 page book containing 96 activities written in the form of lesson plans. PLT's goal is to "teach students HOW to think, not WHAT to think about environmental issues."

Primary Partners- Mississippi Department of Environmental Quality and Mississippi Forestry Commission.

a. Indicators

There were 54 participants for the workshop.

b. Schedule

This workshop took place in September 2008.

c. Budget

Table 9.5 Projected Costs for Project Learning Tree.

Item	Unit	Cost	Total Cost
PLT Workshop	1 workshop	$1,350.00	$1,350.00
Total			**$1,350.00**

6. Watershed Harmony Puppet Show

Watershed Harmony is a musical puppet performance aligning with the fourth and fifth grade Mississippi Framework and National Science Standards. Audiences of all ages will delight in environmental stewardship through this toe tapping musical. Performances are not only enjoyed by school groups, but also by adults attending teacher workshops, civic clubs, and conferences. This program serves to inform, excite, and enlist the help of citizens in an ongoing effort to promote water quality in their communities.

Primary Partners- Mississippi Department of Environmental Quality and Bayou Town Productions.

a. Indicators

The number of participants will be documented and submitted to MDEQ.

b. Schedule

Watershed Harmony will be presented before August 2010.

c. Budget

Table 9.6 Projected Costs for Watershed Harmony Puppet Show

Item	Unit	Cost	Total Cost
Watershed Harmony Puppet Show	1 show	$1,000.00	$1,000.00
Total			**$1,000.00**

7. Total Projected Cost of Education/Outreach Activities

Table 9.7 Total Projected Education Budget

Item	Unit	Cost	Total Cost
Signage			$2,000.00
Field Days			$11,000.00
Fact Sheets			$1,000.00
Adopt-A-Stream			$1,000.00
Project Learning Tree			$1,350.00
Watershed Harmony Puppet Show			$1,000.00
Total			**$17,350.00**

8. Total Budget for Fourteen Mile/Bakers Creek Watershed Implementation Plan

Table 9.8 Fourteen Mile/Bakers Watershed Implementation Plan Total Budget

Item	Cost
BMPs	$460,537
Technical Assistance	$35,000
Education/Outreach	$17,350
Total	**$512,887**

X. EVALUATION

A. Plan Evaluation Procedure

This watershed implementation plan will be evaluated and revised every three to five years or on an as needed basis. The evaluation of this plan will be organized by the Fourteen Mile/Bakers Creek Watershed Implementation Team. At that time, the WIT will develop a detailed schedule for review and revision of this watershed implementation plan. The WIT members will be responsible for notifying their stakeholders of the opportunity to propose changes to the watershed implementation plan. One month will be allowed for notification of stakeholders.

The plan will be evaluated by the team, or their designee, and any interested stakeholders. One month will be allowed for evaluation and submittal of comments. Therefore, comments will be due two months after the evaluation procedure is initiated. The plan will be evaluated in two ways. First, to determine if the plan goals have been achieved, and second, to determine if it reflects the current condition of the watershed, state of science, and issues in the watershed.

B. Implementation Evaluation Strategy

1. The following measures and indicators of progress will be utilized to track the success of this plan by MSWCC:

- Before and after photo documentation on a representative sample of the BMPs installed,
- Before and after soil loss collection on each BMP installed, and
- An R5 Load estimation Model Field Data Entry Sheet completed on each BMP installed,
- Establishment of two demonstration farms that will be used to inform the public about best management practice systems, and
- Informational fact sheets will be distributed that highlight the benefits derived through the installation of Best Management Practices.

2. MDEQ will be responsible for any monitoring at the conclusion of the project to determine the pollutant reductions achieved by the application of Best Management Practices in the watershed.

XI. PLAN REVISION

A. Plan Revision Procedure

After evaluation, MDEQ will prepare a revised watershed implementation plan incorporating the changes requested by the reviewers. At this point it may be necessary to call a meeting to reconcile any conflicting comments or requests for change.

If the evaluation criteria are all being met in Fourteen Mile/Bakers Creek surface waters, the watershed implementation plan will be revised to address a different restoration issue or issues, or to protect the water quality of the watershed. If the evaluation criteria for the watershed are not being met, the approach for restoring Fourteen Mile/ Bakers Creek watershed will be revised based on the knowledge that has been gained since 2008.

The draft watershed implementation plan will be submitted to the Implementation Team, and all others who submitted comments. Within two weeks of receiving the draft watershed implementation plan, the Implementation Team will notify their stakeholders of the availability of the revised watershed implementation plan for stakeholder review. One month will be allowed for review of the draft. Comments will be due at the end of this review period.

Within a month after the comments on the draft watershed implementation plan are received, the DRAFT watershed implementation plan will be submitted to the Implementation Team for review and approval. After the DRAFT watershed implementation plan has been approved, the Implementation Team will notify their stakeholders of the completion and availability of the plan for use as a guide to watershed restoration and protection activities.

XII. RESOURCES

MDEQ. 2006. Designated Streams in HUC 08060202 (lower Big Black River) for Impairment Due to Sediment. Big Black River Basin, Mississippi, Mississippi Department of Environmental Quality. Jackson, Mississippi.

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Appendix A

Plant and Animal Species of Special Concern

Animals of Special Concern in Hinds County

Scientific Name	Common Name	Threatened	Endangered
ACIPENSER OXYRINCHUS DESOTOI	GULF STURGEON	X	
ALOSA ALABAMAE	ALABAMA SHAD		
ARCIDENS CONFRAGOSUS	ROCK POCKETBOOK		
CYCLEPTUS ELONGATUS	BLUE SUCKER		
GRAPTEMYS OCULIFERA	RINGED MAP TURTLE	X	
CYPRINELLA WHIPPLEI	STEELCOLOR SHINER		
ELLIPSARIA LIONEOLATA	BUTTERFLY		
OBOVARIA JACKSONIANA	SOUTHERN HICKORYNUT		
ETHEOSTOMA RUBRUM	BAYOU DARTER	X	
PLEUROBEMA BEADLEIANUM	MISSISSIPPI PIGTOE		
POLYODON SPATHULA	PADDLEFISH		
GRAPTEMYS PSEUDOGEOGRAPHICA KOHNI	MISSISSIPPI MAP TURTLE		
HEMIDACTYLIUM SCUTATUM	FOUR-TOED SALAMANDER		
LAMPROPELTIS CALLIGASTER RHOMBOMACULAT	MOLE KINGSNAKE		
LAMPSILIS CARDIUM	PLAIN POCKETBOOK		
LASIONYCTERIS NOCTIVAGANS	SILVER-HAIRED BAT		
LASIURUS CINEREUS	HOARY BAT		
LITHASIA HUBRICHTI	BIG BLACK ROCKSNAIL		
NYCTICORAX NYCTICORAX	BLACK-CROWNED NIGHT-HERON		
OBOVARIA SUBROTUNDRA	ROUND HICKORYNUT		
OBOVARIA UNICOLOR	ALABAMA HICKORYNUT		
PETROCHELIDON PYRRHONOTA	CLIFF SWALLOW		

Animal Species of Special Concern in Hinds County

Scientific Name	Common Name	Threatened	Endangered
PLETHODON WEBSTERI	WEBSTER'S SALAMANDER		
PLEUROBEMA RUBRUM	PYRAMID PIGTOE		
POTAMILUS INFLATUS	INFLATED HEADSPLITTER	X	
POTAMILUS OHIENSIS	PINK PAPERSHELL		
QUADRULA CYLINDRICA CYLINDRICA	RABBITSFOOT		
QUADRULA NODULATA	WARTYBACK		
TRUNCILLA TRUNCATA	DEERTOE		
UNIOMERUS DECLIVIS	TAPERED PONDHORN		

Plants of Special Concern in Hinds County

Scientific Name	Common Name	Threatened	Endangered
ADIANTUM CAPILLUS-VENERIS	SOUTHERN MAIDENHAIR-FERN		
ASARUM CANADENSE	CANADA WILD-GINGER		
ATHYRIUM THELYPTERIOIDES	SILVERY SPLEENWORT		
CAMASSIA SCILLOIDES	WILD HYACINTH		
ECHINACEA PURPUREA	EASTERN PURPLE CONEFLOWER		
CELASTRUS SCANDENS	CLIMBING BITTERSWEET		
COELORACHIS CYLINDRICA	PITTED JOINTGRASS		
CRATAEGUS CALPODENDRON	PEAR HAWTHORN		
LILIUM SUPERBUM	TURJ'S-CAP LILY		
MAGNOLIA TRIPETALA	UMBRELLA MAGNOLIA		
PANAX QUINQUEFOLIUS	AMERICAN GINSENG		
PLATANTHERA PERMOENA	PURPLE FRINGELESS ORCHID		
SCHISANDRA GLABRA	SCARLET WOODBINE		
SILENE OVATA	OVATE CATCHFLY		
SPIRANTHES OVALIS	LESSER LADIES'-TRESSES		
SWERTIA CAROLINIENSIS	AMERICAN COLOMBO		
TRILLIUM LUDOVICIANUM	LOUISIANA TRILLIUM		
UTRICULARIA OLIVACEA	PIEDMONT BLADDERWORT		

Appendix B

Funded 319 Project Proposal

PROJECT TITLE:
Fourteen Mile/ Baker Creek Watershed Agricultural Nonpoint Source Pollution Control Project

PROJECT ABSTRACT:
This project will be located in the central portion of Hinds County in central Mississippi.
The objectives of this project will be:

To improve water quality and protect high quality waters by demonstrating the economic benefits and effectiveness of selected BMPs in targeted areas.

To apply Best Management Practices (BMPs) to agricultural lands in the demonstration project area so as to reach the desired outcome of reduced runoff and sedimentation.

To foster optimal applications of fertilizer (nitrogen, phosphorus, and potassium).

To inform and educate the public about Best Management Practices that benefit water quality.

The project cost is $509,537. Of this amount, $305,723 in 319 funds are requested with the balance of $203,814 to be supplied as match.

LEAD ORGANIZATION:

Mississippi Soil and Water Conservation Commission
Mark E. Gilbert, Project Manager
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Phone: (601) 354-7645
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COOPERATING AGENCIES:

Hinds County Soil and Water Conservation District; USDA Natural Resources Conservation Service; Mississippi Department of Environmental Quality

GRANT ADMINISTRATOR:

Mark E. Gilbert, Environmental Administrator
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P.O. Box 23005
Jackson, MS 39225-3005

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PROJECT LOCATION:

Fourteen Mile Baker Creek Watershed (08060202-150)
(see attachment 1 for a map depicting the targeted demonstration areas of the project)

PROJECT OBJECTIVE:

The overall objective of this project will be to demonstrate the benefits and effectiveness of selected Best Management Practices (BMPs) on water quality in the Fourteen Mile/Bakers Creek Watershed that address sediment, pesticide and nutrient loadings from agricultural nonpoint sources. Soils in the watershed are very erosive, with sheet erosion occurring on sloping cropland and pastureland. The State's 2006 303(d) list of monitored water bodies lists Fourteen Mile Creek and Bakers Creek's use of aquatic life support as impaired by biological impairment, nutrients, sediment, organic enrichment and low DO. The monitored segments listed are MS441FE and MS441BE. The MS Department of Environmental Quality (MDEQ) has developed a TMDL for the listed segments of Fourtenn Mile/Bakers Creek and it has been targeted for implementation by the Big Black Basin team. The TMDL model indicates violation of the States water quality standards for fecal coliform. The model calls for a summertime coliform reduction of 52% for Fourteen Mile Creek and 80% for Bakers Creek respectively.

PROJECT DESCRIPTION:

This project will implement selected Best management Practices (BMPs) on targeted areas in the Fourteen Mile/Bakers Creek watershed that will result in reduced pollutant loadings from agricultural nonpoint sources. The main water quality problems to be addressed by this project are sediment, pesticides and nutrients from agricultural nonpoint sources. Of primary concern is sediment from agricultural lands in the watershed. Erosion is occurring from cropland in the project area at the rate of 12 tons per acre per year and from pasture land at the rate of 5 tons per acre per year. Sediment contained in runoff is entering Fourteen Mile Creek and Bakers Creek along with their tributaries causing degradation of the resource base. In addition, nutrients and pesticides contained in runoff from agricultural sources, attached to sediment are posing an increasing water quality problem due to runoff from agricultural sources.
The erosion of the soil resource base removes nutrients, reduces water holding capacity, undermines plant rooting systems, reduces the soil's organic matter content, reduces soil tilth and degrades water quality within the project area.

The current land uses in the Fourteen Mile/ Bakers Creek Watershed include 46,200 acres of cropland, 53,000 acres of pasture land, 52,020 acres of timber land, and 17,000 acres of urban land.

This project will be implemented in three phases. Phase 1 will consist of analyzing existing assessment data, determining target areas within the watershed where the stressors are causing the greatest damage and if the application of needed Best Management Practices will yield a beneficial reduction in pollutant loadings. This will be done in conjunction with a Watershed Implementation Team (WIT) that will be form to develop and Watershed Implementation Plan (WIP). The team will consist of natural resource agency personal as well as landowners who live in the watershed. The team develop a plan that includes all resource concerns in the watershed and lists all programs available to address those concerns for the present as well as the near future. Education and outreach activities will also be conducted during this phase to inform landowners in the watershed about the objectives of the project. The Mississippi Soil and Water Conservation Commission (MSWCC) will cooperate with the United States Geological Survey, the USDA Natural Resources Conservation Service and the Hinds County Soil and Water Conservation Districts in identifying the appropriate Best Management Practices for targeted areas in the watershed and educating landowners as to the need for their participation.

Phase 2 will consist of (based upon the finding of phase 1) the application of best management practices on targeted areas in the watershed that will result in desired pollutant load reductions. The Mississippi Soil and Water Conservation Commission will accomplish this through it's water quality cost share program. In this project, records will be kept at both the state level and local level so as to determine the progress being made in carrying the project out and the benefits that are being received as related to the improvement of water quality within the project. During the planning process with participants, the amount of soil loss from the area to be treated with a particular BMP will be determined and recorded. The amount of soil saved as a result of applying the BMP will also be determined and recorded. Additional information will be collected on each BMP installed in the project that will be provided to MDEQ and used to calculate the pollutant load reduction for each BMP installed. This information will indicate the project effectiveness in reducing pollutant loadings. Participants in the project will be required to maintain BMPs for a period of up to ten years after installation.

Additional education and outreach efforts will be conducting during this phase to inform and educate the public about Best Management Practices that benefit water quality. This will be accomplished by the following:
Establishing at least 2 demonstration farms to inform the public about best management systems.
Conduct at least 2 field day/tours during the life of the project.
Prepare and distribute at least 1,000 fact sheets highlighting the benefits derived from the project.
Publish at least 4 articles about the project in newsletters and local newspapers.
Arrange for Watershed Harmony puppet show at local elementary schools in the watershed
Conduct an anti litter campaign in the watershed that will consist of circulating flyers in the watershed
Form a watershed "watchdog" group made up of Earth Team Volunteers that will report any potential pollutant sources(illegal dumping, failing septic systems, ec.)
Erect at least 20 project roadside signs that designate where water quality practices are in progress or have been completed.

To address the above stated water quality problems, Best Management Practices (BMPs) will be installed on agricultural lands in the project area. Potential BMPs to be installed include but are not limited to:
180 acres of critical area planting
100 grade stabilization structures
60 acres of filter strips
9,000 feet of terraces
4,000 feet of diversions
300 acres of tree planting
12,000 feet of fencing
200 acres pasture planting

Phase 3 will consist of post BMP monitoring to determine the pollutant load reductions achieved by the application of Best Management Practices. The MSWCC will coordinate with the MDEQ and the USGS in conducting these activities.

MILESTONES:

1. Sign grant contract with MS Department of Environmental Quality. (Month 0)
2. Form the Fourteen Mile/Bakers Creek Watershed Implementation Team (WIT). (Month 1)
3. Form Watershed "Watchdog" group. (Month 1)
4. Convene a project kick-of meeting of the newly formed Fourteen Mile/Bakers Creek WIT. (Month 2)
5. Facilitate all Fourteen Mile/Bakers Creek WIT Meetings. (Month 1-36)
6. Determine priority areas that are contributing significant pollutant loads in the watershed. (Month 3-4)
7. With assistance from the WIT, develop a WIP consistent with MDEQ guidance. (Month 3-6)
8. Present a draft WIP to MDEQ and the WIT for their review and comments. (Month 7)
9. Issue policies and procedures for implementing the project to the SWCD office. (Month 1)
10. Meet with the board of SWCD commissioners to get their understanding of their responsibilities and participation. (Month 2)
11. In conjunction with the local SWCD, establish a locally led watershed advisory group to assist with implementation activities. (Month 2-3)
12. Provide training to district staff. (Month 2-3)
13. Assist in establishing an evaluation system in conjunction with the MS Department of Environmental Quality to indicate the benefits of the project. (Month 2-3)
14. Conduct a landowner meeting to inform potential participants about the project. (Month 3)
15. Secure commitments from several landowners and operators who are willing to participate in the project. (Month 3-4)
16. Assist participants in developing a conservation plan and applying best management practices (Month 4-12)
17. Establish at least demonstration farm (Month 4-12)
18. Conduct an anti-litter campaign in the watershed (Month 4-12)
19. Arrange Watershed Harmony puppet show for elementary schools in watershed (Month 4-24)
20. Document pre-existing site conditions. (Month 2-12) (Before and after photo documentation will be conducted).
21. Accelerate conservation planning and application assistance. Special effort will be made to complete conservation plans during this time frame. (Month 13-24)
22. Conduct at least 1 informational field day/tour to inform the public about the project . (Month 13-24)
23. Establish at least 1 demonstration farm. (Month 13-24)
24. As requested, assist DEQ with evaluations. (Month 0-36)
25. Collect GPS coordinates and other data required by MDEQ on all BMPs installed in the project. (Month 0-36)
26. Assemble data on the amount of soil saved. (Month 0-36)
27. Erect project roadside signs which designate where water quality practices are in progress or have been completed. (Month 4-36)
28. Provide continued conservation planning and application assistance to participants. (Month 25-36)
29. Review the status of applying best management practices to reach the objectives of the project. (Month 25)

30. Based upon the needs and finding of milestone 18, assistance in planning and/or application will be redirected and/or accelerated. (Month 25-36)
31. Publish at least 4 articles about the project. (Month 0-36)
32. Publicity of the project will be increased; at least 1 field day/tour will be conducted and at least 1,000 fact sheets will be developed and distributed. (Month 25-36)
33. Bi-annual reports will be made to MSDEQ. (Month 0-36)
34. Make Final report to MSDEQ. (Month 36)

CRITERIA FOR EVALUATION

The following measures and indicators of progress will be utilized to track the success of this project:

NPS Pollutant Load Reduction – the amount of soil saved as a result of the installation of best management practices (BMPs) in this project will be a direct indicator of sediment load reduction to Fourteen Mile Creek and Bakers Creek along with their tributaries. Since pesticides and fertilizer/plant nutrients are transported to the waters as attachments to the sediment, any reduction in sediment loadings will result in a reduction of pesticide and nutrient loadings thereby enhancing the effectiveness and success of the project.

Implementation of NPS Controls – this project will involve the installation of Best Management Systems. Best Management Systems are defined as a combination of BMPs, both structural and vegetative, which are the most practical, effective and economical means of preventing or reducing pollution from nonpoint sources to a level compatible with water quality goals. **The estimated types and numbers of BMPs to be installed as part of Best Management Systems are listed in the project description of this proposal.** The application of best management systems in the project will be the responsibility of the landowners and operators participating in the project as cooperators of the local soil and water conservation district.

Public Education, Awareness, and Action - this project will include the establishment of at least 2 demonstration farms that will be used to inform the public about best management systems. These will be utilized during the 2 field day/tours that will be conducted in the project. Also, at least 1,000 informational fact sheets highlighting the benefits derived from the project will be developed and distributed as well as the publishing of at least 4 articles about the project in newsletters and local newspapers. At least 20 project roadside sign will be erected where water quality practices are installed in the project. A watershed "watchdog" group made up of NRCS Earth Team Volunteers will report any potential pollutant sources to the WIT. An anti-litter campaign will be conducted in the watershed. The Watershed Harmony puppet show will be presented to elementary students in the watershed. Other educational actions will be conducted to measure the success of the project. These include such things as increased public awareness; before and after photo documentation; increased cooperation among agencies, associations, public bodies and educational institutions; and the economic benefits of applying best management practices. The Mississippi Soil and Water Conservation Commission will request information through the local soil and water conservation district that will assist in measuring the success of the project in the demonstration area.

PROJECT PERIOD

The length of this project will be 3 years.

Appendix C

Stressors

Table 2
Stressor Summary Table

Concern	Link/Immediate Cause	Stressor	Description of Stressor	Location/Extent
Sediment Loading From Agricultural Lands	Landuse runoff and in-channel sediment processes	Sediment	A stressor identification study was completed for Fourteen Mile/Bakers Creek Watershed. This analysis identified sediment as the most probable stressor of the waterbody. Certain contaminants may be associated with sediment such as pesticides and nutrients. However, these contaminants would also be controlled by the same best management practices (BMPs) that control sediment coming from fields.	See figure 3.1 for the locations of cropland along streams. There are approximately 21,700 acres of agriculture land in the watershed. The majority of this land is cropland. All the lands referred to above are in HUC 03180002.

Concern	Link/Immediate Cause	Stressor	Description of Stressor	Location/Extent
Nutrient Loading From Agricultural Lands	Degradation of in-stream biological conditions	Nutrients	A stressor identification study was completed for Fourteen Mile/Bakers Creek Watershed. This analysis identified nutrients and organic enrichment as the most probable primary stressor of the waterbody. Certain contaminants may be associated with sediment such as pesticides and sediment. However, these contaminants would also be controlled by the same best management practices (BMPs) that control nutrients coming from fields.	See figure 3.1 for the locations of cropland along streams. There are approximately 21,700 acres of agriculture land in the watershed. The majority of this land is cropland. All the lands referred to above are in HUC 03180002.

Concern	Link/Immediate Cause	Stressor	Description of Stressor	Location/Extent
Littering	Increasing the number of snags and the amount of debris in the creeks and streams	Litter	People dumping old appliances, household trash, old mattresses and other garbage into the creeks and streams from bridges and letting it wash down the creeks and streams when the flow is increased.	This occurs throughout the watershed at most bridge sites in rural areas.

Appendix D

Checklist of Watershed Implementation Elements

Table D. 9 Key Elements of a Watershed Plan for 319 Grant

Required WIP Elements for 319 Grant	Location in Watershed Implementation Plan
1. Watershed Description and Background	Chapter V, Chapter VII Section A
2. Implementation	Chapter VIII Section A Subsection 3
3. Project Goals	Chapter VIII Section A Subsections 2 and 5
4. Project Costs	Chapter VIII Section A Subsection 7 Chapter IX Section A Subsection 7, 8
5. Education and Outreach	Chapter IX
6. Implementation Schedule	Chapter VIII Section A Subsection 4
7. Milestones	Chapter VIII Section A Subsection 4
8. Adaptations and Revisions	Chapter X Section A, Chapter XI Section A
9. Monitoring	Chapter X Section B Subsections 1 and 2