

**Summary Page for the
CWA Section 319(h)
Silvicultural BMP Effectiveness Monitoring Project**

- 1. Title of Project:** Texas Silvicultural BMP Effectiveness Monitoring Project
- 2. Project Goals/Objectives:** 1) To evaluate the effectiveness of silviculture BMPs, 2) To establish BMP demonstration areas, 3) To develop and implement Water Quality Management Plans (WQMPs) on treatment sites, and 4) To coordinate project efforts with Soil and Water Conservation Districts (SWCDs) and natural resource agencies.
- 3. Project Tasks:** 1) BMP Effectiveness Monitoring, 2) BMP Education and Demonstration, 3) Implement Silvicultural WQMPs on treatment sites, and 4) Project Coordination.
- 4. Measures of Success:** A clear determination of the effectiveness of forestry BMPs in protecting water quality from a scientifically valid study design. Outlining the strengths and weaknesses of the recommended BMP guidelines will show the success of this project. Reductions in sedimentation are expected from full BMP implementation and development of forestry water quality plans on treatment sites. Also, a three year effectiveness monitoring program in Texas will be established.
- 5. Project Type:** Statewide Watershed Demonstration TMDL
- 6. Waterbody Type:** River Groundwater Other
- 7. Project Location:** East Texas, see Figure 1.
- 8. NPS Management Program Reference:** State of Texas Agricultural/Silvicultural Nonpoint Source Management Program, approved February 25, 2001.
- 9. NPS Assessment Report Status:** Impaired Impacted Threatened
- 10. Key Project Activities:** Hire Staff Monitoring Regulatory Assistance Technical Assistance Education BMP Implementation Demonstration Project Other
- 11. NPS Management Program Elements:** Implementing Milestones from the "1999 Texas Nonpoint Source Pollution Assessment Report and Management Program", which will be implemented include: (1) Coordination with federal, state, and local programs (2) TSSWCB is committed to technology transfer, technical support, administrative support and cooperation between agencies and programs for the prevention of NPS pollution.
- 12. Project Costs:** Federal (\$367,620); State/Local (\$245,080); Total (\$612,700)
- 13. Project Contractor:** Texas Forest Service
- 14. Project Period:** July 1, 2003 – Jun 30, 2006

WORKPLAN

Texas Silvicultural BMP Effectiveness Monitoring Project

FY03 CWA Section 319(h)

7/1/03 – 6/30/06

Problem/Need Statement:

Many water bodies in East Texas have been listed as impaired on the 2000 *State of Texas Water Quality Inventory and List of Impaired Waters* report due to dissolved oxygen (D.O.) standard violations. These violations may be caused by point and/or nonpoint source pollution and extensive monitoring is currently underway to gain a better understanding of this problem. Forestry operations are widely present throughout this region, making potential nonpoint source pollution contributions from silvicultural activities a concern. This area encompasses the watersheds of five major river basins. They are the Sulphur, Cypress Creek, Sabine, Neches, and Trinity River basins.

These river basins have 52 water bodies listed on the above mentioned report. Twenty-six of those water bodies are listed for D.O. (See table 1). This five-basin area concentrates in a seventeen-SWCD area in East Texas (see figure 1). These SWCDs include the following: Wood, Harrison County, Smith County, Rusk, Panola, Cherokee County, Shelby, Nacogdoches, Upper Neches, Long Leaf, Sulphur-Cypress, Marion-Cass, Upshur-Gregg, Piney Woods, Jasper-Newton, Davy Crockett-Trinity, and Polk-San Jacinto. Many of these SWCDs are currently involved in implementation projects designed to mitigate various potential nonpoint source (NPS) concerns that implicate agriculture. The Texas Forest Service (TFS) has also been working, in conjunction with the SWCDs, to implement best management practices (BMPs) on forestry operations to mitigate NPS pollution involving silviculture. In order to quantify success of these implementation strategies, it is imperative to instigate a pre- and post- monitoring regime that could more accurately substantiate the obvious aesthetic improvements.

Figure 1: Project Location Map

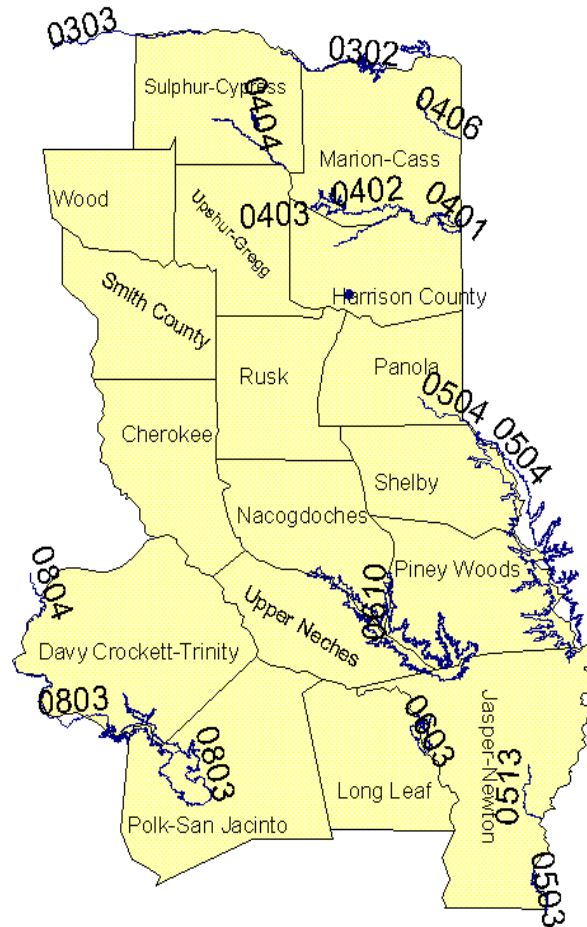


Table 1: Impaired D.O. Segments within Project Area

Segment #	Segment Name	Basin	Priority
0302	Wright Patman Lake	Sulphur River	M
0303	Sulphur/ South Sulphur River	Sulphur River	M
0303B	White Oak Creek	Sulphur River	M
0401	Caddo Lake	Cypress Creek	M
0401A	Harrison Bayou	Cypress Creek	L
0402	Big Cypress Creek Below L.O.T.P.	Cypress Creek	M
0402A	Black Cypress Bayou	Cypress Creek	M
0403	Lake O' The Pines (L.O.T.P.)	Cypress Creek	H
0404	Big Cypress Creek Below Lake Bob Sandlin	Cypress Creek	TMDL
0406	Black Bayou	Cypress Creek	L
0407	James' Bayou	Cypress Creek	M
0409	Little Cypress Bayou	Cypress Creek	M
0503	Sabine River Below Toledo Bend Reservoir	Sabine River	L
0503A	Nichols Creek	Sabine River	L
0504	Toledo Bend Reservoir	Sabine River	M
0505B	Grace Creek	Sabine River	M
0505D	Rabbit Creek	Sabine River	L
0505G	Wards Creek	Sabine River	M
0506A	Harris Creek	Sabine River	L
0508A	Adams Bayou Above Tidal	Sabine River	M
0511A	Cow Bayou Above Tidal	Sabine River	M
0512	Lake Fork Reservoir	Sabine River	L
0601A	Star Lake Canal	Neches River	L
0608A	Beech Creek	Neches River	L
0610	Sam Rayburn Reservoir	Neches River	M
0803	Lake Livingston	Trinity River	M

The TSSWCB administers and carries out Texas' Soil and Water Conservation Law, and coordinates Texas' soil and water conservation program with SWCDs. The TSSWCB is the lead agency in Texas for the management of agricultural and silvicultural nonpoint source pollution, as designated under Title 7, Chapter 201, Section 201.026 of the Agriculture Code of Texas. The TSSWCB addresses the prevention and/or abatement of NPS pollution through Water Quality Management Plan (WQMP) development and implementation. Past TFS projects have resulted in the institutionalization of various BMP programs such as the WQMP program administered by the Texas State Soil and Water Conservation Board (TSSWCB). For example, forest products companies, who own and manage over four million acres of commercial timberland in Texas, now have very strict internal BMP policies, including internal BMP compliance programs. This policy has even been extended to land that they do not own, yet receive timber from for their mills. TFS personnel recommend BMPs to be installed in all applicable management plans written for forest landowners. TFS Foresters share their working knowledge of BMPs with landowners in one-on-one interactions. BMP programs have

become a regular component of landowner meeting discussions and public interest groups regularly request silvicultural BMP presentations.

Aside from the need to know if silvicultural BMPs are effective in protecting water quality, federal law mandates it. The reauthorization of the Clean Water Act of 1987 requires that “states develop methods for determining BMP effectiveness.” The results of this project may lead to a revision in the *Texas Forestry Best Management Practices* handbook so that water quality is protected during forestry operations.

General Project Description:

This project will serve to quantify improvements in the quality of surface water in East Texas. In addition, BMPs will be established on the project sites and will be used for educational purposes. The established TSSWCB Water Quality Management Plan (WQMP) Program will continue as a part of this project to increase coordination among all entities involved.

Although silvicultural BMP implementation rates are at the highest levels in the history of the program, primarily due to the work of past projects, there is very little quantifiable data to substantiate actual water quality protection. BMPs were installed during earlier projects, primarily for demonstrations, however sampling them for BMP effectiveness now would be of little value. A controlled, holistic approach to looking at potential water quality impacts from intensive forest management would provide the information to make this determination. Therefore, it is necessary to use the method outlined below to assess the effectiveness of Texas’ recommended forestry BMPs in protecting water quality.

To better quantify BMP effectiveness, four sites under intensive forest management and adjacent to perennial streams, will undergo rigorous habitat assessments, water chemistry and biological monitoring before and after forestry operations. Sites will be selected that encompass the higher topography and erodibility hazards found in East Texas commercial forestlands. This in-stream monitoring will be conducted both above and below the forestry operation, allowing the results to be compared so that a determination on BMP effectiveness can be made. A separate control site is not necessary, since this approach utilizes the location above the treatment area as well as the monitoring that occurs before the harvesting operation begins to serve as the “control”.

A modified version of EPA’s Rapid Bioassessment Protocol III (RBP III) will be followed to assess BMP effectiveness in Texas. The habitat assessment and biological monitoring will be conducted twice a year (spring and fall). Fish and benthic macroinvertebrates will be collected using an electroshocker, seines, and D-frame dip nets. Two logging portable water quality samplers will be used to continuously monitor water chemistry (conductivity, DO, pH, temperature, and turbidity) on the above and below locations and rotated throughout the four project sites. Grab samples will also be taken every month.

The fish and benthic macroinvertebrate samples will be sent to the contractors for identification. Upon identification, the Texas Forest Service will analyze the results and calculate various biological metrics for determining water quality. The grab samples will be sent to the Sabine River Authority's environmental laboratory for further testing (total suspended solids and phosphorous).

Data will be entered into an electronic database for storage, retrieval, and analysis (EDAS). Global Positioning Systems (GPS) and Geographic Information Systems (GIS) will be used to document project sites and their proximity to 303(d)-listed stream segments.

This project will also contain a stormwater runoff monitoring component that will be used to estimate sediment loading. Two automatic stormwater samplers and bubbler flow meters will be installed at each project site (1 for each above and below location). Project personnel will retrieve collected samples immediately after storm events for laboratory analysis (total suspended solids and phosphorous).

In addition to assessing BMP effectiveness, the TFS will also install BMPs on the project sites for educational purposes. Articles regarding this project and BMP implementation will be included in silvicultural newsletters sent to forest landowners and natural resource professionals. All landowners who participate in this technology transfer will be encouraged to enroll in the TSSWCB WQMP Program.

Silvicultural WQMPs are used to achieve a level of pollution prevention or abatement determined by the TSSWCB, in consultation with the local SWCD, to be consistent with state water quality laws. Highest priority is given to the implementation of the most cost effective and most needed pollution abatement practices. These plans enable forest landowners to protect particularly sensitive areas, such as wetlands and critically eroding areas by ensuring BMP implementation. Forest landowners can demonstrate their long-term commitment to NPS management by enrolling in these plans.

Once the TFS completes a TSSWCB WQMP, the landowner, NRCS, and SWCD must sign it. It will then be sent, through the SWCD, to the TSSWCB regional office for technical review, and on to the TSSWCB state office for certification. Upon TSSWCB certification of a WQMP, the technician will work with the landowner in taking the appropriate steps needed to implement the WQMP. If the landowner does not implement the WQMP according to the established conditions, the TSSWCB has the authority to decertify the plan. The TFS will coordinate with the TSSWCB regional offices, and their concerns on 100% of the status reviews implemented by this project.

The TFS will lead and coordinate this project ensuring effective performance through continued coordination among federal, state, and local agencies and entities. In addition, the TFS will develop and chair a BMP Effectiveness Monitoring committee. This group will be made up of state, federal, academia, and industry cooperators that will provide direction for this project. Local media will be utilized to promote project tasks and the

TFS will supply all project deliverables to the TSSWCB project manager. Finally, the TFS will cooperate with and involve SWCDs and TSSWCB field representatives in all project activities as appropriate.

The Objectives of this Project are as Follows:

- 1.) To document improvement of water quality in East Texas due to the implementation of forestry BMPs.
- 2.) To assess and map silvicultural BMP effectiveness.
- 3.) Cooperate with and involve SWCDs and TSSWCB field representative in all activities associated with the project as appropriate.
- 4.) To establish a three year term forestry BMP effectiveness monitoring program in Texas.
- 5.) To enroll the study sites into silvicultural WQMPs if applicable, implementing forestry BMPs.
- 6.) To coordinate project efforts with natural resource agencies and project participants.

Tasks, Objectives, Schedules, and Estimated Costs:

TASK 1: Evaluation of BMP Effectiveness

Costs: \$312,477.00 (Federal); \$208,318.00 (Non-Federal Match); \$520,795.00 (Total)

Objective: To assess the effectiveness of Texas' recommended BMPs during forestry operations.

Subtask 1.1 The TFS, in cooperation with TSSWCB, will develop a QAPP to submit to EPA for approval before data collection is started. (Start Date: Month 1; Completion Date: Month 36)

Subtask 1.2 The TFS will monitor the effectiveness of forestry BMPs in protecting water quality on four project sites located throughout East Texas. The monitoring will be conducted by TFS trained staff. Monitoring will be conducted on four intensively managed sites, both above and below the treatment area. The treatment area will consist of harvesting, site preparation and reforestation activities. These sites will be monitored prior to the treatment and at the culmination of treatment. (Start Date: Month 1; Completion Date: Month 36)

Subtask 1.3 The TFS will maintain a BMP database for the project results, including GIS data, for Hydrologic Unit Codes (HUCs), as provided by the TSSWCB. (Start Date: Month 1; Completion Date: Month 36)

Subtask 1.4 The TFS will produce maps of the project sites using GIS. (Start Date: Month 1; Completion Date: Month 36)

Subtask 1.5 The TFS, in cooperation with SWCDs, will prepare and distribute a BMP Effectiveness Monitoring Report to interested entities. (Start Date: Month 1; Completion Date: Month 36)

*The TSSWCB project manager will be involved in the development and approval of all press releases, and workshop information (as they relate to TSSWCB programs) prior to dissemination.

Deliverables:

- QAPP approved by EPA before monitoring begins
- Monitor BMP effectiveness on 4 project sites
- Provide additional biological monitoring data on East Texas streams
- BMP Effectiveness Monitoring Report
- Produce GIS maps which show BMP effectiveness monitoring sites in relation to 303(d)-listed segments.
- Document project sites with before/after pictures and/or descriptions

TASK 2: BMP Education

Costs: \$18,381.00 (Federal); \$12,254.00 (Non-Federal Match); \$30,635.00 (Total)

Objective: To provide technical assistance and educational opportunities to landowners, loggers, foresters, and other interested groups through demonstration areas.

Subtask 2.1 The TFS will install BMPs on the project sites for educational purposes. (Start Date: Month 1; Completion Date: Month 36)

Subtask 2.2 The TFS will include articles regarding this project in quarterly newsletters to natural resource professionals in Texas and forest landowners in target watersheds. (Start Date: Month 1; Completion Date: Month 36)

Subtask 2.3 The TFS will coordinate field tours of the project sites throughout the duration of the project. (Start Date: Month 1; Completion Date: Month 36)

*The TSSWCB project manager will be involved in the development and approval of all press releases, and workshop information (as they relate to TSSWCB programs) prior to dissemination.

Deliverables

- Pictures of BMPs on project sites
- Copies of articles published in newsletters to natural resource professionals and forest landowners

TASK 3: Develop and Implement Forestry Water Quality Management Plans

Costs: \$18,381.00 (Federal); \$12,254.00 (Non-Federal Match); \$30,635.00 (Total)

Objective: To increase forest landowner awareness of and enrollment into silvicultural WQMPs.

Subtask 3.1 The TFS will increase forest landowner awareness of silvicultural WQMPs via media options listed in subtask 2.2 as well as other means that may be made available. (Start Date: Month 1; Completion Date: Month 36)

Subtask 3.2 The TFS, in cooperation with SWCDs, will enroll the forest landowners in WQMPs, if applicable. (Start Date: Month 1; Completion Date: Month 36)

*The TSSWCB project manager will be involved in the development and approval of all press releases, and workshop information (as they relate to TSSWCB programs) prior to dissemination.

Deliverables

- TSSWCB-certified WQMPs
- Newspaper/media articles regarding WQMPs

TASK 4: Project Coordination

Costs: \$18,381.00 (Federal); \$12,254.00 (Non-Federal Match); \$30,635.00 (Total)

Objective: To coordinate project efforts with natural resource agencies, and project participants.

Subtask 4.1 The TFS will create and chair a BMP Effectiveness Monitoring committee made up of state, federal, academia, and industry cooperators. Industrial and private interest groups will include Temple Inland, International Paper, Texas Forestry Association, and Texas Logging Council. (Start Date: Month 1; Completion Date: Month 36)

Subtask 4.2 The TFS will work with local media to promote project activities. (Start Date: Month 1; Completion Date: Month 36)

Subtask 4.3 The TFS will give BMP presentations to various groups in East Texas. These groups will consist of, but not limited to the following, Kiwanis, Rotary, and Lions clubs. (Start Date: Month 1; Completion Date: Month 36)

*The TSSWCB project manager will be involved in the development and approval of all press releases, and workshop information (as they relate to TSSWCB programs) prior to dissemination.

Deliverables

- BMP Effectiveness Monitoring committee participants
- Newspaper articles
- Local media interviews

Coordination, Roles, and Responsibilities:

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

- Texas Forest Service – Project lead, technical assistance, project coordination,
- TSSWCB – Project management, State NPS lead agency for silviculture. The TSSWCB project manager will be involved in the development and approval of all press releases, and workshop information (as they relate to TSSWCB programs) prior to dissemination. Attend and present TSSWCB programs at workshops.
- Texas Forestry Association– Assist with education, training, provide framework for organization of cooperators, provide communication within forestry community,
- SWCDs – Assist with WQMPs, private landowner cooperation in BMP installations, and project coordination.
- EPA Region VI- Project coordination and funding.

Cooperating entities include, but are not limited to the following:

Texas Forestry Association, Texas State Soil and Water Conservation Board, Soil and Water Conservation Districts, forest products companies, USDA Forest Service, USDA Natural Resources Conservation Service, County Forest Landowner Associations, Texas Logging Council, EPA Region VI, and river authorities.

Public Participation:

The primary goals of this project are to determine the effectiveness of Texas silviculture BMP and to educate landowners about BMPs. The public involvement will be extensive. The project activities will directly involve landowners, and will offer educational outreach to the general public. The following subtasks will involve public participation:

- 2.1 - The TFS will install BMPs on project site for educational purposes.

- 2.3 - The TFS will coordinate field tours of the project sites throughout the duration of the project.
- 4.2 - The TFS will work with local media to promote project tasks.
- 4.3 - The TFS will give BMP presentations to civic groups in East Texas.

Measures of Success:

A clear determination of the effectiveness of forestry BMPs in protecting water quality from a scientifically valid study design is expected. Outlining the strengths and weaknesses of the recommended BMP guidelines will show the success of this project. Reductions in sedimentation are expected from full BMP implementation and development of forestry water quality plans on treatment sites. Also, a long term effectiveness monitoring program in Texas will be established.

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OBJECT CLASS BUDGET

**for the
CWA, Section 319(h) Agricultural/Silvicultural Nonpoint Source Program
Texas Silvicultural BMP Effectiveness Monitoring Project
Texas Forest Service
7/1/03 – 6/30/06**

<u>Object Class Category</u>	<u>Federal Funds</u>	<u>Non-Federal Match</u>	<u>Total Costs</u>
Personnel			
Project Biologist (100% @ \$32,000)	\$96,000	\$0	\$96,000
Project Technician (100% @ \$10/hour)	\$62,400	\$0	\$62,400
Benefits @ 25%	<u>\$39,600</u>	<u>\$0</u>	<u>\$39,600</u>
Subtotal Personnel and Fringe Benefits	\$198,000	\$0	\$198,000
Travel			
In-state	\$18,360	\$0	\$18,360
Supplies			
Continuous portable water quality samplers (2)	\$9,800	\$0	\$9,800
Backpack Electrofisher	\$4,900	\$0	\$4,900
Automatic Stormwater samplers (8)	\$36,000	\$0	\$36,000
Bubbler Flow Meters (8)	\$30,000	\$0	\$30,000
Laptop Computer	\$2,500	\$0	\$2,500
NWS Rain Gauges (8)	\$1,800	\$0	\$1,800
Nets and other sampling supplies	\$3,000	\$0	\$3,000
Heavy Equipment used for BMP work	\$0	\$7,000	\$7,000
Forestry and BMP supplies (rock, seed, etc)	\$0	\$7,200	\$7,200
Contractual			
Water Analysis	\$32,300	\$0	\$32,300
Fish and Benthic ID	\$7,200	\$0	\$7,200
Industry Personnel (@ \$25/hour)	\$0	\$31,200	\$23,400
Contract Harvesting	\$0	\$108,000	\$108,000
Site Preparation	<u>\$0</u>	<u>\$60,000</u>	<u>\$60,000</u>
Subtotal Other Direct Costs	\$145,860	\$213,400	\$359,260
Total Direct Costs	\$343,860	\$213,400	\$557,260
Indirect @ 10.5%	<u>\$23,760</u>	<u>\$31,680</u>	<u>\$55,440</u>
Total Project Costs	\$367,620	\$245,080	\$612,700

Itemized Budget Justification

The Project Biologist will spend 100% of his/her time on the project. This person is responsible for the overall data collection and implementation of the project, supervises the project technician, and coordinates project efforts with other agencies and entities.

The Project Technician will spend 100% of his/her time assisting with implementation and data collection of the project.

Forest industry personnel will be vital to the success of this project. The time they spend locating potential project sites, supervising harvesting, site preparation, and reforestation operations will be counted as match, totaling \$31,200 (\$25 per hour for 416 hours per year for three years.)

In-state travel includes frequent trips to the project sites located throughout East Texas for site selection, treatment supervision, and stream monitoring. Other in-state travel is necessary for periodic trips to Temple (TSSWCB), Dallas (EPA), and Austin (TMDL, NPS meetings); and other travel. At an average of 1,500 miles per month per employee, in-state travel cost will be \$18,360 (1500 miles per month for project employees for 36 months at \$.17 per mile). This mileage rate was derived from the IRS mileage allowance (\$.35) minus the depreciation rate (\$.18).

Supplies include the purchase of two portable continuous monitoring water quality samplers to conduct standard physiochemical field analysis of water samples for the four project sites at a total of \$9,800. A backpack electrofisher will be used in fish sampling at project sites, costing a total of \$4,900. This project also includes measuring stormwater runoff at the project sites. Eight automatic stormwater samplers, bubbler flow meters, and National Weather Service rain gauges will need to be purchased to accomplish this at a total cost of \$67,800 (\$4500/automatic stormwater sampler, \$3750/bubbler flow meter, and \$225/NWS rain gauge). A laptop computer will also be purchased to manage the data that is collected from this project. Dip nets, seines, and other materials will total \$3,000.

Contractual expenses include laboratory analysis of water samples collected from project sites for a total of \$32,300 (96 grab samples a year for 3 years @ \$42 per sample and 160 storm samples a year for 3 years @\$42 per sample). Fish and benthic macroinvertebrate identification will also have to be performed in a laboratory at a total cost of \$10,800 (16 benthic macroinvertebrate samples a year for 3 years @ \$75 per sample and 16 fish samples a year for 3 years @ \$75 per sample).

Match expenses include the use of heavy machinery (bulldozers and motor graders) at project sites after harvest to ensure proper BMP implementation at a cost of \$7,000 (\$125/hour for 14 hours on 4 project sites). Other forestry and BMP supplies used in the harvesting process (rock, grass seed, etc.) will also be counted as match expenses at a cost of \$7,200. Contract harvesting will account for \$108,000 in match (\$27,000 for each

of the 4 project sites) and site preparation and reforestation expenses will total \$60,000 (\$200/acre on an average of 75 acres for each of the 4 project sites).