

Project: 10

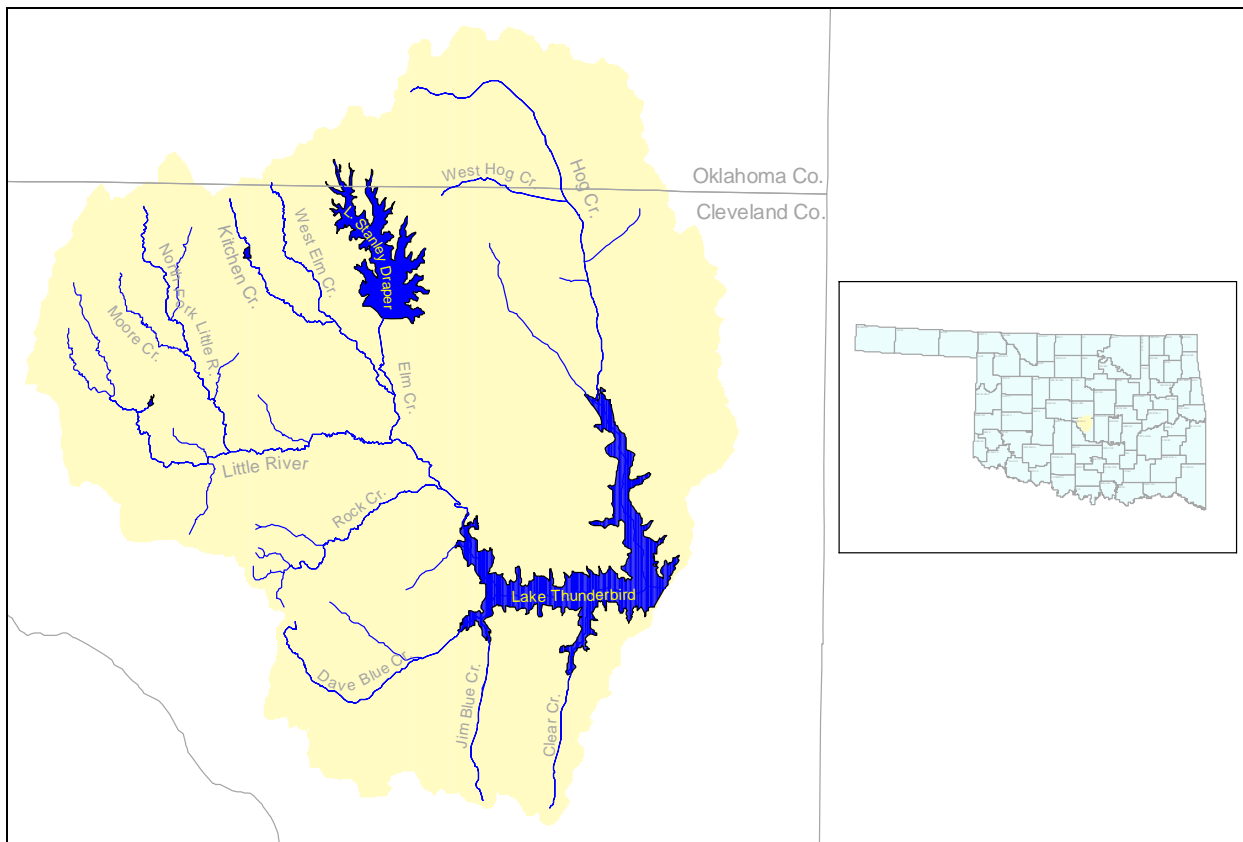
Agency: Oklahoma Conservation Commission

Title: Lake Thunderbird Watershed Implementation Project

INTRODUCTION:

Project Location:

Lake Thunderbird, in central Oklahoma, is a water supply reservoir for the cities of Norman, Del City, and Midwest City, which have a combined population of approximately 178,000. The Lake Thunderbird watershed covers approximately 258 square miles in Oklahoma and Cleveland Counties. The major tributary to Lake Thunderbird is the Little River, and other tributaries include Hog Creek, Clear Creek, Dave Blue Creek, Jim Blue Creek, Rock Creek, Moore Creek, Kitchen Creek, and Elm Creek. In addition, Lake Stanley Draper is located in the watershed.



Problem Statement

The Lake Thunderbird Watershed in central Oklahoma has a rapidly expanding urban component. The Lake is managed by the Central Oklahoma Master Conservancy District (COMCD), and serves as a water supply for Norman, Del City and Midwest City. The lake is also a major recreational resource for the area.

According to the Oklahoma Department of Environmental Quality (ODEQ) 2004 Integrated Report, Lake Thunderbird is not supporting its Fish and Wildlife Propagation (Warm Water Aquatic Community) designated use due to turbidity and low dissolved oxygen. Lake Stanley Draper is similarly impaired due to turbidity. Moore Creek is listed on the 2004 303(d) list as being impaired by chloride and total dissolved solids and not meeting its Agriculture designated use, and Elm Creek is not supporting its Primary Body Contact Recreation use due to impairment by pathogens, specifically *E. coli*. The excessive nutrient loading in the watershed and the resulting eutrophication of Lake Thunderbird is impacting the cities of Norman, Moore, and Del City which depend on the lake to supply drinking water and recreation. Significant taste and odor problems have been linked to eutrophication in the lake and led to complaints from water users.

In addition, the recent drought has resulted in significant lowering of the lake. A bathymetric survey of the lake completed by the Oklahoma Water Resources Board (OWRB) suggests that the lake has lost approximately 11% of its area and volume and mean depth has decreased approximately 22% since impoundment in 1966. Drought conditions and increasing water needs for the area increase the importance of protecting the water quality and storage capacity of the lake.

COMCD has been heavily focused on diagnosing and correcting water quality problems in the lake, and has cooperated with the OWRB to monitor water quality and implement some in-lake controls to address turbidity and eutrophication. Although the OWRB regularly monitors Lake Thunderbird as part of their Beneficial Use Monitoring Program, beginning in 2000, OWRB began working more closely with the COMCD to recommend management strategies for the lake and to conduct more intensive water quality monitoring. One recommendation of this collaboration was to upgrade the lakes aeration system to reduce algal productivity and reduce hypolimnetic anoxia. Another recommendation was to reduce shoreline erosion by reducing effective fetch and armoring eroding shoreline with natural materials.

However, the lake remains listed on the 303(d) list and although steps have been taken in portions of the watershed to limit new development, much of the watershed is expected to continue rapidly urbanizing. Several areas of the watershed are already developed to the level expected in the 2025 plan.

The City of Norman and the COMCD are both exploring options to limit water quality pollution to the lake. In 2005, the City of Norman approached the Oklahoma Conservation Commission for assistance with their stormwater master plan and protecting Lake Thunderbird. The OCC is cooperating with Norman on their stormwater Master Plan as part of a 104(b)(3) project. As part of a 2004 319 project, OCC worked

with Dr. Baxter Vieux of Vieux and Associates and with the University of Oklahoma to model the watershed and recommend load reductions necessary to meet beneficial use support in the lake. Dr. Vieux had previously modeled the watershed and had conducted recent water quality monitoring for the COMCD to help them predict some of the consequences of unregulated growth for the water supply reservoir.

The results of Dr. Vieux's modeling exercises suggest several things. The first of which is that metropolitan areas are well ahead of growth rates predicted in their 2025 plans. Secondly, although all portions of the lake, as represented by OWRB monitoring stations, violate water quality standards at various times, one station in particular is largely responsible for standards exceedances. Nutrient concentration and turbidity values are significantly higher at this station (upper Little River Arm) than in the remainder of the lake. This station is located upstream of a bridge and causeway which partially separate this arm from the main body of the lake.

The effect of this separation is an effective in-situ treatment or at least sedimentation of significant quantities of pollutants. Modeling of this arm to increase residence time and treatment capacity predicts significant decreases nutrient concentrations and turbidity loading to the lake as well as reductions in standards violations. Vieux and Assoc. have recommended similar treatment wetlands in the upper end other tributary arms.

Finally, the Vieux and Associates model suggests subwatersheds where the most significant sources of loading exist. Not surprisingly, these subwatersheds are the most highly urbanized and urbanizing areas. The Vieux and Associates modeling also recognized that development that does occur in the watershed will need to be increasingly low-impact (LID) in order to protect the water resource.

Objective:

A Watershed Based Plan (WBP) is expected to be completed for the watershed by July 2007. The results of Vieux and Associates model will be incorporated into the plan as the load reduction goals for the watershed and strategies to achieve those goals.

This project will begin a program to complete a portion of the implementation necessary to meet the goals established in the watershed based plan. The program will focus on wetland development in the upper end of the Little River Arm and on implementing LID techniques in the watershed. It is anticipated that additional funds beyond those available in the 2007-2008 319 grants will be necessary to complete the recommended implementation, and that all cities involved will need to revise code to allow for necessary LID. A portion of the implementation strategy is to work with watershed cities to revise their city building codes as needed to allow for construction of LID practices.

Overview:

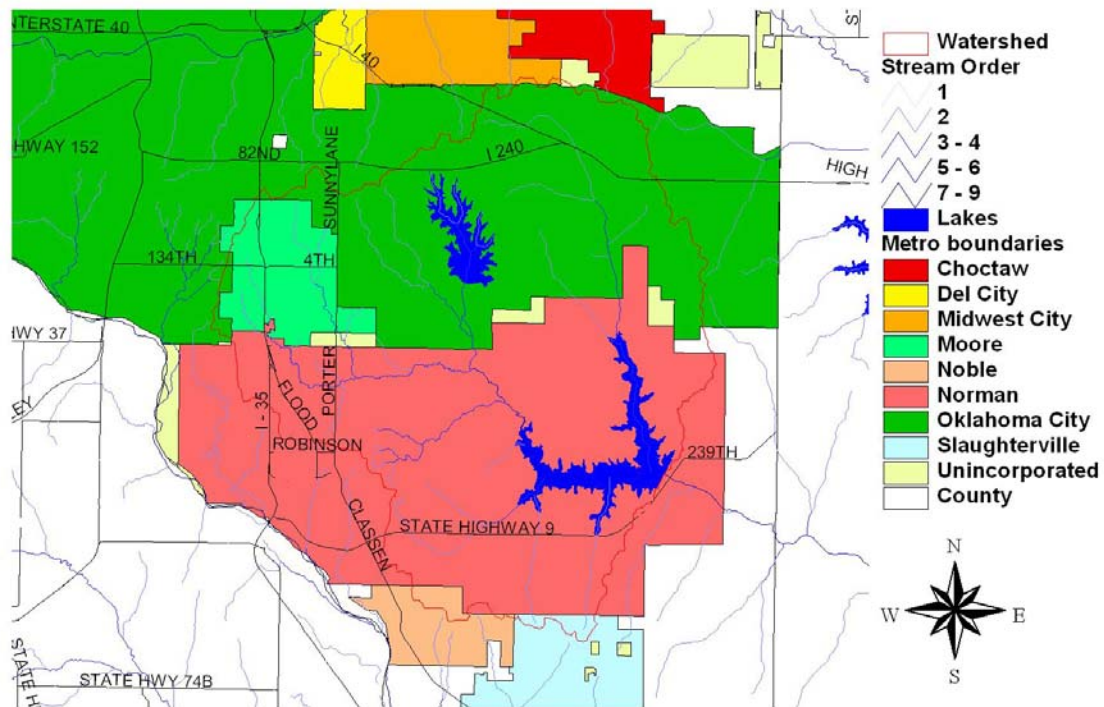
This project will be managed by the OCC with oversight from the Office of the Secretary of Environment. Judith Wilkins, OCC's Environmental Project Coordinator will be the

overall Project Manager although completion of individual tasks will be the responsibility of various individuals as detailed later. The project activities will fund three years of the program, to be continued at a later date with additional 319 and other sources of funding. Activities funded under this workplan will begin in July, 2008 and end in June 2011. Certain activities may be contracted out to insure completion of a quality product in a timely, cost effective manner. Further discussion of the project overview is detailed under each project task.

Potential sources in the watershed include both agricultural and urban sources. Agriculture in the watershed is largely in the form of small, urban ranchettes where landowners own 5-20 acres to keep a few horses or a small herd of cattle. Preliminary results from the Vieux and Associates model suggest that although these areas contribute to overall loading, the most significant pollutant sources are found in rapidly urbanizing areas of the watershed. In addition, the small acreage size managed by the typical agricultural producer coupled with the respectively large number of small landowners adds significantly to the difficulty of significantly reducing loading from agricultural areas.

Therefore this project will focus on urban sources. Although a significant portion of the watershed is still in pasture and urban ranchette agriculture, very little of the watershed is not incorporated. Therefore, reduction of NPS from agricultural sources in the watershed might be best achieved through zoning requirements. OCC will work with

Thunderbird Watershed



the watershed cities to recommend potential zoning changes.

This project was developed based on the nine key components of a watershed based plan. Although not all components of the WBP are addressed specifically in the workplan, it was developed to work towards the goals and activities outlined in the WBP.

Project Tasks:

Task 10.1. Targeting Nonpoint Source Pollution¹

Task Description: The Lake Thunderbird Watershed is located in a rapidly urbanizing area of central Oklahoma. TMDLs have not yet been completed for the watershed; however preliminary goals have been set by a water quality modeling effort which will be incorporated into the watershed based plan.

Available resources are inadequate to blanket the entire watershed with best management practices to reduce NPS pollution from all sources. Therefore, the program will focus practices in urban areas where they are needed the most and where the environmental benefit will be maximized. Also, in contrast to past projects, almost the entire project area is zoned and the potential of working with municipalities to achieve pollution control through zoning is significant and will be pursued. OCC will utilize a targeting process funded under the FY 2004 program for this effort. The FY 2004 effort will include results specific to the Lake Thunderbird Watershed and will also provide preliminary goals for nutrient and sediment reduction to meet water quality standards.

Task Objective: The objective of this task is to define the method used to target resources at the most significant sources and in the most cost-effective manner in the Lake Thunderbird Watershed. Completion of this task will also identify, more specifically, the critical areas of the watershed in which measures must be implemented to reduce NPS pollution, and be used to update a portion of component (c) of a watershed based plan.

Task Activities: The result of the targeting effort will be a detailed map of areas in the Lake Thunderbird Watershed most likely producing the greatest nutrient and sediment loading. In addition, estimated loadings from subwatersheds will be provided in both a map and tabular form such that the greatest contributing subwatersheds can be targeted first. This will suggest urban areas of the watershed where the most efficient load reduction can be accomplished. The targeting report will also suggest nutrient and sediment reduction goals necessary to meet water quality standards in the watershed.

¹ Completion of targeting under the FY 2004 NPS Technical Support Project will allow completion of the Watershed Based Plan and set initial load reduction goals to meet water quality standards, as well as identifying critical areas for implementation.

The targeting has been contracted out to the Vieux and Associates, who have previous experience conducting similar exercises, as part of the FY 2004 project and therefore will not be funded under this project.

The Environmental Project Coordinator (Judith Wilkins, funded annually under the implementation task of OCC Implementation of NPS Management Program Projects such as FY 2007/2008 Projects 2 and 7) will be responsible for insuring that the targeting contractors remain on schedule and that reports and tasks are completed in a timely manner.

Task Schedule:

Subtask #	Milestone Description	Completion Date
10.1.1	Receive results from contractor in report form	June 2007
10.1.2	Meet with COMCD, cities, and Conservation District to discuss results of first stage	July 2007
10.1.3	Develop a wetland development plan for the Upper Little River Arm above the bridge, and select areas to demonstrate principles of low-impact development (LID)	July 2008

* No funding for these tasks is provided with this workplan

Deliverables:

Subtask #	Deliverable	Due Date
10.1.1	Targeting Results	June 2007
10.1.3	Pre-implementation report	July 2008

Task 10.2. Project Local Management.

Task Description: Task two involves employing a Project Coordinator and establishing a Watershed Advisory Group. The Project Coordinator will coordinate the planning effort on water quality issues in the Lake Thunderbird Watershed and work with the various groups in the watershed to reduce duplication of efforts. The coordinator will be responsible for the tasks listed below.

- Coordinate the Watershed Advisory Group (WAG).
- Coordinate with Project Education Coordinator
- Coordinate planning efforts with the various cities, COMCD, and other groups as necessary.
- Represent the Project Interests at Conservation District Board Meetings and to the various city councils and COMCD.
- Compile photographs of implementation/demonstration sites, before and after implementation

The Coordinator's position is a forty-percent time position, with duration of three years from July 2008 through June 2011.

The Watershed Advisory Group will be made up of local stakeholders from the watershed, representing groups such as the city planners, developer's council, COMCD, Oklahoma Department of Environmental Quality, watershed residents, lake users, etc. The WAG will represent the best interests of the watershed to recommend the city ordinances, initiatives, and other strategies that must ultimately be implemented to protect the resource.

The Cleveland County Conservation District will provide substantial support for the implementation of this project. The Oklahoma County Conservation District will also provide support for the project, but to a lesser degree than Cleveland County. The Districts will provide clerical support for the demonstration program and participate in the educational activities. The Districts will also provide office and telephone service for the project staff. Support will be provided to the participating district to help offset the office space, telephone, and clerical workload costs.

Task Objective: The objective of this task is to insure localized project input and management.

Task Schedule:

Subtask #	Description	Milestones
10.2.1	Establish district support agreements	July 2008
10.2.2	Hire Project Coordinator	July 2008
10.2.3	Select a WAG and hold first meeting	August 2008

Task 6.2 Deliverables

Subtask #	Description	Due Date
10.2.3	WAG and Conservation District Meeting Minutes and Agendas	With final report

Task 6.2 Budget:

Position	Salary	Fringe	Travel	Contractual	Supplies
On-site Coordinator*	\$58,727	\$21,907	3,000		\$7,250
District support agreements				\$12,000	

* Position not included nor funded in FY 2007/2008 319(h) Projects 7 - 9.

Task 10.3. Demonstrate Practices and Achievable Water Quality Improvements

Task 10.3.1 BMP Demonstration

This sub-task describes the implementation of practices projected for the Lake Thunderbird Watershed. The BMPs that will be implemented in the demonstration area

will focus on reduction of nutrient and sediment loading. A Watershed Advisory Group will be assembled to review the proposed plan for wetland development and LID in the watershed.

Oversight of implementation will be the responsibility of the Project Coordinator with assistance from the City of Norman, the Cleveland County Conservation District, and additional OCC staff.

Demonstration of the success of these practices could help spread the efforts to remaining parts of the watershed. A detailed plan for the initial phase of implementation will be appended to the finalized Watershed-Based Plan, once they have been drafted. This plan will detail the location of needs and the location of the planned practices. This plan will also evaluate, on a subwatershed level, the load reduction likely to result from the planned practices. This implementation plan will allow project planners to evaluate the completeness of the initial effort and such that a follow-up effort can be developed as necessary to target producers who did not participate in the initial program but who could have a significant impact on water quality in the watershed. This plan will be presented to cities, developers and other appropriate groups in the watershed in an attempt to further the adoption of these practices.

Task 10.3.2 Present Model Code to Cities

As previously mentioned, much of the watershed is zoned and under the control of various cities and towns. Although some of these cities and developers in the area have expressed an interest in actions to protect water quality, current codes and ordinances effectively prohibit many of the principles of LID. LID is being implemented across the region in many neighboring States. Communities in northwestern Arkansas are incorporating LID into ordinances for their rapidly developing areas as are communities in Kansas City and Topeka, Kansas, and in various cities in Colorado and Texas.

OCC will compile and review examples of existing code from nearby states that supports LID and protects water quality. These examples will be presented to the watershed cities for possible incorporation into their municipal codes.

In addition, OCC will send city planners from the area to LID workshops such as the one offered by the Water Conservation Resource Center in Fayetteville, Arkansas. OCC will also organize tours for the city planners of LID implementation in nearby states such as Arkansas, Texas, Kansas, or New Mexico.

Task 10.3.3 Tracking of BMP Implementation

A GIS data layer of the implementation will be created and maintained by the Project Coordinator. BMPs as planned and implemented will be tracked for future watershed modeling and for reporting project performance. Project staff will make regular site visits to assess progress in implementing planned BMPs. Semiannual progress reviews

will formally assess cooperator performance. Where implementation problems are identified, the Project Coordinator will follow through with plan revisions. Details will be summarized in the project final report.

The final report will attempt, where possible, to report on BMPs implemented in the watershed through other means such as through the City Programs and State and federally-funded cost-share programs. As possible, implementation data will be presented in a GIS format. Load reductions expected due to 319 implementation of practices will be estimated using a watershed-based model such as SWAT or StepL.

Task Objective: The purpose of this task is to implement those practices to reduce NPS loading to the Lake Thunderbird Watershed.

Task Schedule:

Subtask #	Milestone Description	Due Date
10.3.1.a	Appendix to WBP that includes a specific Pre-Implementation Plan (10.1.3) for this project which will provide greater detail on practices to be implemented as part of this project and expected results	September 2008
10.3.1.b	BMP Demonstration	August 2008 – June 2011
10.3.2.a	Compile and Review LID ordinances in nearby states	July – December 2008
10.3.2.b	Send city planners or other appropriate city staff from Norman, Oklahoma City, and Moore to an LID training workshop	July 2008 – December 2009
10.3.2.c	Implement an LID tour for city planners or other appropriate staff from watershed communities to tour LID implementation in neighboring states.	One tour per year of the project
10.3.3	Tracking of BMP Implementation	August 2008 – June 2011

Deliverables:

Subtask #	Description	Due Date
10.3.1.a	Appendix to WBP that includes specific Pre-Implementation Plan for this project which will provide greater detail on practices to be implemented as part of this project and expected results	September 2008
10.3.1.b	Summary of BMP Demonstration	To be included in final report
10.3.2	Compilation of LID ordinances from neighboring states and recommendations of potential ordinances for Thunderbird Watershed cities.	February 2008

Task Budget:

Total Demonstration	Non-federal Funds for BMP Demonstration	Federal Funds for BMP Demonstration	Workshops and tours for city planners/staff (travel)
\$479,456	\$326,653	\$152,803	\$17,000

Task 10.4 Watershed Education Program

This project is intended to affect long-term behavioral changes of watershed residents and users that will assure continued protection of water quality in the Lake Thunderbird Watershed. Substantial effort in this project is devoted to determining and demonstrating practices essential for this goal. The education program must ensure widespread adoption of these practices over the entire watershed. Cooperation and Implementation by Cities in the Watershed is imperative to reach this goal. The education program must also be established in a fashion such that it will continue past the life of the project.

Cities in the watershed maintain active, well-developed education programs. However, education programs are rarely funded to a level that meets existing needs and can always use additional technical support and other resources. This education program will be required to supplement rather than replace the existing education programs in the watershed in cooperation with local stakeholders.

Task 106.4.A. The education program will be guided and implemented by a Project Education Coordinator. The Thunderbird Watershed education program will be developed around the following goals:

- (1) Working within the MS4 coordinators of Moore, Norman, and Oklahoma City to assist their programs with NPS pollution education
- (2) Educating city staff about low impact development, nonpoint source pollution, water quality, and water conservation
- (3) Involving cities and residents in the targeted areas in education programs designed to explain the water quality problems and what can be done to reduce potential impacts.
- (4) The education coordinator will write monthly articles for area newsletters and/or newspapers about project activities.
- (5) Work with Conservation Districts on a Blue Thumb program in the watershed.
- (6) Form an Education Watershed Advisory Group to set some area goals for the program
- (7) Exhibits – develop a display for the project that can be used to educate the public on the 319 Program. Display should include basic information on the program, its cooperators, and contact people of ongoing programs in the watershed
- (8) Develop a recognition program for project cooperators.

- (9) Track how participation in the education program has changed people's behaviors. Project Education coordinator will follow five to ten percent of people intercepted through different aspects of this and related project activities and will contact them on an annual basis throughout the project period to determine whether they have made any changes that would affect NPS pollution.
- (10) Assist the project coordinator with work as needed

Task Objective: The purpose of this task is to develop an education program that will help the citizens of the Thunderbird Watershed reduce NPS pollution.

Task Schedule:

Subtask #	Milestone Description	Due Date
10.4.1	Work with MS4 coordinators to identify additional goals and actions for the education program	December 2008
10.4.2	Conduct at least semiannual education programs for city staff to focus on NPS pollution in the watershed and potential solutions	At least two per year between July 2008 and June 2011
10.4.3	Publish at least monthly articles in newsletters or newspapers	July 2008 to June 2011
10.4.4	Hold Blue Thumb Training in watershed	March 2009
10.4.5	Develop a display on program that is showcased at a minimum of 4 fairs, home shows, or similar events each year during the project.	March 2009
10.4.6	Develop a recognition program for local cooperators- articles, certificates, signs, etc. Program must have WAG approval	December 2008
10.4.7	Tracking behavioral change	Throughout project

*Position not included or funded under FY2007/2008 319(h) Projects 7-9.

Deliverables:

Subtask #	Description	Due Date
10.4.1	Workplan update to incorporate additional goals and actions recommended by MS4	December 2008

	coordinators	
10.4.2	Three copies of all education materials produced during the project and summary of behavioral change study ²	Included with final report

Measures of Success

Overall success of this task will be assessed largely by tracking behavioral change. At least thirty percent of people reached through the project will enact some sort of behavioral change to protect water quality and reduce NPS pollution.

Task Budget:

Position	Salary	Fringe	Contractual	Supplies
Project Education Coordinator	\$103,161	\$35,488	Lease Vehicle \$21,600	\$22,475

*Position not included or funded under FY2007/2008 319(h) Projects 7-9.

Task 10.5. Measurement of Success

Water Quality monitoring is ongoing in the Thunderbird Watershed is ongoing. This monitoring has identified numerous water quality problems as shown in the introductory paragraphs of this work plan. In addition, under Task 10.1, critical areas will be identified in the watershed that are suspected to contribute most significantly to NPS loading in the watershed. This information could provide a baseline for comparison to evaluate changes in water quality and potential sources over the project period.

Subtask 10.5.1. Water Quality Monitoring

Due to the number of changes ongoing in the watershed relative to past projects, lawsuits, and other factors, it is important to continue to monitor water quality in the system.

OCC will install autosamplers in the Thunderbird Watershed to assess impacts of the implementation. These autosamplers will be used to collect continuous, flow-weighted samples. In addition, OCC will rely on OWRB lake monitoring data to assess whether or not practices have resulted in improved lake water quality. Biological and habitat monitoring will not be completed as part of this project to minimize project expenses and the project size is unlikely to significantly impact habitat availability in the Watershed. In addition, specific single landuse areas will be sampled during runoff events for better model calibration. Water Quality Monitoring will begin once the QAPP is approved, and continue throughout the length of the project.

To focus on the parameters of concern, and to reduce monitoring expenses, water quality samples will be analyzed only for total phosphorus, nitrate-nitrogen, nitrite-

² Fliers, Brochures, and other educational materials produced through the project will be forwarded to EPA for approval prior to the time they are distributed for use in the project.

nitrogen, ammonium nitrogen, total coliform, *E. coli*, and *Enterococcus* bacteria. Field parameters to be collected include dissolved oxygen, pH, temperature, turbidity, conductivity and instantaneous discharge, and alkalinity. The QAPP will be submitted by July 2008.

It is anticipated that additional water quality monitoring will be necessary to document success of specific LID implementation areas. This monitoring will likely be funded under future project year's grants.

Subtask 10.5.2.

In addition, OCC will document success with before and after photos of implementation sites. Initial photos will be taken at the time of site preparation. Secondary Photos will be taken immediately following BMP installation. Final photos will be taken near the end of the project. This documentation will be summarized in the final report.

Additional measures of success include:

- Full implementation of BMPs as planned in task 10.3.
- Adoption of LID ordinances by metropolitan areas in the watershed.
- To reach a significant reduction³ in sediment and nutrient loading, based on water quality modeling such as SWAT or StepL.

The results of these efforts, along with the project, will be detailed in the project final report.

Task Schedule:

Task #	Milestone Description	Due Date
Task 10.5.1	Water Quality Monitoring QAPP	July 2008
Task 10.5.2	Photodocumentation of BMPs	Throughout the project

Deliverables⁴:

Subtask #	Description	Due Date
10.5.1	Water Quality Monitoring QAPP	July 2008
10.5.2	Photodocumentation QAPP	September 2008
10.5.3	Final Report	October 2011

Task Budget:

Subtask #	Contractual	Supplies	Equipment
10.5.2	\$23,940	\$3,000	\$18,000

*monitoring completed by staff funding under 2008-2011 Rotating Basin Monitoring Program Projects

³ The specific load reduction goal will be identified in the Watershed Based Plan following completion of the Vieux and Associates modeling project.

⁴ To be completed by OCC tech writers funded under FY 2007 – 2011 Project 2.

Total Project Outputs:

Task #	Description	Person Responsible	Due Date
10.1.1	Targeting Results	Contractor	June 2007
10.1.3	Pre-implementation report	OCC Tech Writers	July 2008
10.2.3	WAG and Conservation District Meeting Minutes and Agendas	Project Coordinator	With final report
10.3.1.a	Appendix to WBP that includes specific Pre-Implementation Plan for this project which will provide greater detail on practices to be implemented as part of this project and expected results	OCC Tech Writers	September 2008
10.3.1.b	Summary of BMP Demonstration	OCC Tech Writers	To be included in final report
10.3.2	Compilation of LID ordinances from neighboring states and recommendations of potential ordinances for Thunderbird Watershed cities.	Project Coordinator/OCC Tech Writers	February 2008
10.4.1	Workplan update to incorporate additional goals and actions recommended by MS4 coordinators	OCC Tech Writers with assistance from Project Education Coordinator	December 2008
10.4.2	Three copies of all education materials produced during the project and summary of behavioral change	Project Education Coordinator	Included with final report
10.5.1	Water Quality Monitoring QAPP	OCC Tech Writers	July 2008
10.5.2	Photodocumentation QAPP	OCC Tech Writers	September 2008
10.5.3	Final Report	OCC Tech Writers	October 2011
	Semi-annual Reports	OCC Tech Writers	April and October

Project Management:

This project will be managed by the Oklahoma Conservation Commission in cooperation with the Office of the Secretary of the Environment. The Oklahoma Conservation Commission will provide oversight for all project activities.

Project Duration:

Three years.

Project Budget:

Project 10. Lake Thunderbird Watershed Implementation Project	
State	\$326,653
Federal	\$500,351
Total	\$827,004
Object Class Categories	
a. Personnel	\$161,888
b. Fringe Benefits	\$57,395
c. Travel	\$20,000
d. Equipment	\$18,000
e. Supplies	\$32,725
f. Contractual	\$57,540
g. Construction	0
h. Other	\$479,456
i. Total Direct Charges (sum of 6a-6h)	\$827,004
j. Indirect Charges	
k. TOTALS (sum of i and j)	\$827,004