

Sulphur River Basin Authority 2002 Basin Highlights Report

Program Overview

The Sulphur River Basin Authority (SRBA) strives to protect and improve water quality in the Sulphur River Basin through implementation of the Texas Natural Resource Conservation Commission's (TNRCC) Clean Rivers Program (CRP). This report highlights the efforts of the Clean Rivers Program partners during FY 2001 and plans for FY 2002.

CRP partners that are assisting SRBA in planning, data collection, analysis and reporting include the TNRCC, the Clean Rivers Program Steering Committee members, U. S. Geological Survey (USGS), and Texarkana College. The goal of these cooperative efforts is to provide the appropriate, quality assured data to allow continuing assessment and management of water

quality in the basin.

Objectives of this monitoring program are:

- Provide opportunities for public involvement with water quality issues,
- Provide reliable information to the public to enhance awareness and knowledge of water quality conditions in the basin,
- Establish a long-term monitoring program for the basin,
- Monitor and evaluate major water bodies on an ongoing basis to determine the suitability of existing water quality for designated uses, and document trends in water quality,
- Identify and characterize water quality problems and determine their source,

- Evaluate the applicability of State Surface Water Quality Criteria to specific water bodies in the basin,
- Evaluate permit requirements with respect to water quality conditions and trends in the basins, and, provide data to support the development of cost effective water quality management programs.

Notable events in the Sulphur River Basin during 2000-2001 included basin-wide fertilizer applications during January and April 2001 and above average rainfall and floodwaters, which caused Wright Patman Lake to rise to record levels during March 2001.

A survey, concerning taste

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Sulphur River Basin Monitoring Programs

The Sulphur River Basin Authority (SRBA) in conjunction with the TNRCC (Texas Natural Resource Conservation Commission) Clean Rivers Program monitors surface water quality throughout the basin utilizing three types of monitoring programs. These programs,

which will be continued through the 2002 fiscal year, include fixed station monitoring, systematic monitoring and special study monitoring.

The fixed station program uses historically sampled station locations while the systematic monitoring

program changes station locations yearly, thereby identifying potential localized water quality issues throughout the basin. Special study programs expand the existing water quality database to address a specific concern.

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Program Overview cont.

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and odor issues of local water utility customers was completed by the SRBA. This survey was part of a special study implemented by the Sulphur River Basin Authority which focused on Wright Patman Lake.

Results of the study support the need for the collection of more data that may help explain why taste and odor issues exist for Wright Patman Lake.

High pH and depressed dissolved oxygen levels are the most common concerns for the Sulphur River Basin on the 2002 305(b) assessment.

Segments with concerns or impairments due to pH exceedances are Wright Patman Lake (Segment 0302), Upper South Sulphur River (Segment 0306), and Cooper Lake (Segment 0307).

Those segments listed in response to depressed dissolved oxygen levels include Wright Patman Lake, South Sulphur River (Segment 0303), White Oak Creek (0303B), Upper South Sulphur River (Segment 303), and Cooper Lake (Segment 307). Both low dissolved oxygen and high pH could be a natural occurrence in the streams of the Sulphur River Basin, especially during summer low flow periods when algal and microbial activity generally increases.

Intense photosynthetic activity can lead to high pH, and the associated aerobic respiration can result in depressed dissolved oxygen. Other factors, such as nutrient loading from point and non-point sources may also be contributing to the pH and dissolved oxygen exceedances by stimulating algal growth.



Sulphur River Basin Monitoring Programs cont.

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Monitoring parameters at the majority of stations include field data, conventional water chemistry, metals in water, flow, E. coli and fecal coliform counts. Some stations will also be sampled for metals in sediment, fish and benthic macro-invertebrate collections, habitat assessment, and 24 hour dissolved oxygen studies.

Fixed stations, also known as routine stations, are located on each of the seven classified segments (0301-0307) within the Sulphur River Basin. Through the use of consistent sampling techniques, monitoring at the fixed stations expands the existing water quality database, which can be used to identify trends as well as short-term changes in the major sub-basins. In 2001, the fixed monitoring station located on Days Creek (segment 304), was monitored four times for conventional, bacteria and field parameters and twice for 24 hr DO, habitat, benthics, nekton and flow. A total of 19 stations will be monitored under the fixed monitoring program for FY 2002.

The systematic monitoring program collects water quality data from stations located primarily on unclassified streams, and is used to determine if there are localized water quality issues not identified by the fixed stations. Systematic station locations change on a yearly basis within a five-year cycle in order to sample the subwatersheds of all segments within the basin.

During FY 2001 systematic monitoring was collected from Segment 0304, Days Creek. Stations included were Waggoner Creek at SH93, Days Creek upstream of the wastewater treatment plant, Cowhorn Creek at US 67, Swampoodle Creek at W. Broad, and Boone Creek at FM991. These FY2001 systematic stations were sampled quarterly for conventional parameters, field parameters, bacteria and instantaneous flow. These stations were sampled twice yearly for 24-hour dissolved oxygen, benthic community, fish community and habitat quality.

The seven stations of the systematic monitoring program for FY 2002 are located in the sub watersheds of

segment 303, South Sulphur River, and segment 305, North Sulphur River. Streams monitored by the TNRCC, SRBA and Texarkana College include White Oak Creek, Kickapoo Creek, Cuthand Creek, Little Mustang Creek, Big Sandy Creek, Auds Creek, and Hickory Creek. Monitoring parameters at all stations include field data, flow, habitat assessment, fish and benthic macroinvertebrate collections, E. coli counts, and 24 hour dissolved oxygen studies. Additional parameters collected at various systematic stations include conventional water chemistry, fecal coliform counts, and metals in sediment and water.

Special study programs are designed to address a specific concern or to expand the existing water quality database of areas of special interest. Three stations will be monitored during the FY 2002 special study program. Big Creek Lake is the location for one station, and two stations are positioned on Wright Patman Lake. Monthly selective organics in water will be collected at Big Creek Lake, with 24 hour monitoring of field parameters collected four times at the two stations on Wright Patman Lake. The Wright Patman Lake data will be evaluated in conjunction with data collected from the fixed station program.

Wright Patman Lake Special Study

The State of Texas 2000 Clean Water Act Section 303(d) assessment indicated depressed dissolved oxygen and pH concerns for Wright Patman Lake. TNRCC guidelines require ten sampling events on a water body over a period of five years to make an assessment concerning impairment. Because the number of samples previously collected is too small to define the impairment or justify expenditure of funds to initiate a TMDL, additional sampling was needed.

A Special Study within the Sulphur River Basin supplemented efforts by the TNRCC by supplying additional monitoring events including pH and 24-hour diurnal dissolved oxygen sampling at two stations on Wright Patman Lake. The sites selected for the study are routine monitoring stations of interest to stakeholders due to their proximity to water intake stations for local water utilities. In addition, this study has also collected more information about nutrient levels, which may indirectly influence the dissolved oxygen and pH concerns.

The TNRCC regional office completed two monitoring events that included diurnal monitoring during the summer of 2001. This Special Study, conducted from June to October 2001, supplied four additional monitoring events. Six monitoring events at three sites are scheduled for routine monitoring by SRBA during FY 2002. After the FY 2002 data has been collected, there should be a sufficient amount of data to make a decision about the current impairments for Wright Patman Lake.

The results of sampling to date supports the 303(d) listing of Wright Patman Lake for high pH values and low levels of dissolved oxygen during some of the sampling events. The maximum pH was above the TNRCC criterion of 8.5 during all six of the monitoring events at North Shore Intake and four times at the International Paper Intake. The average value of the 24-hour diurnal DO was at times below the 5.0 mg/L criterion established by TNRCC. However, the levels of dissolved

oxygen have not been shown to be persistently low, but rather to be extremely variable from day to day as well as over a 24-hour period. The lake also exceeded the screening level for chlorophyll during the six monitoring events. The elevated pH and depressed DO averages are thought to be the result of high levels of photosynthetic activity occurring during weather conditions favorable for algae growth. Photosynthesis can cause a depletion of dissolved oxygen during the night and a rise of pH during the daylight hours by removing carbon dioxide from the water.

Further sampling may be needed to identify the source of the nutrients that support the abundant algal growth. A study of the nutrients in the streams contributing to Wright Patman Lake as well as a study that illustrates the recycling of nutrients from sedimentary material may help identify the source.

Taste and Odor Study of Wright Patman Lake

Although taste and odor problems are not considered a direct threat to public health, they constitute the greatest public relations issue many water utilities face. Consumers generally rely on the taste and odor of their water as an indicator of its safety. In response to local concerns and to prompt stakeholder participation, a survey focusing on taste and odor issues of local water utility customers was conducted by the SRBA. A survey was mailed to local water systems that utilize Wright Patman Lake water. The questions contained in this survey focused on the frequency, magnitude, and timing of taste and odor problems. For purposes of comparison, the survey was also sent to three water utilities that utilized other sources.

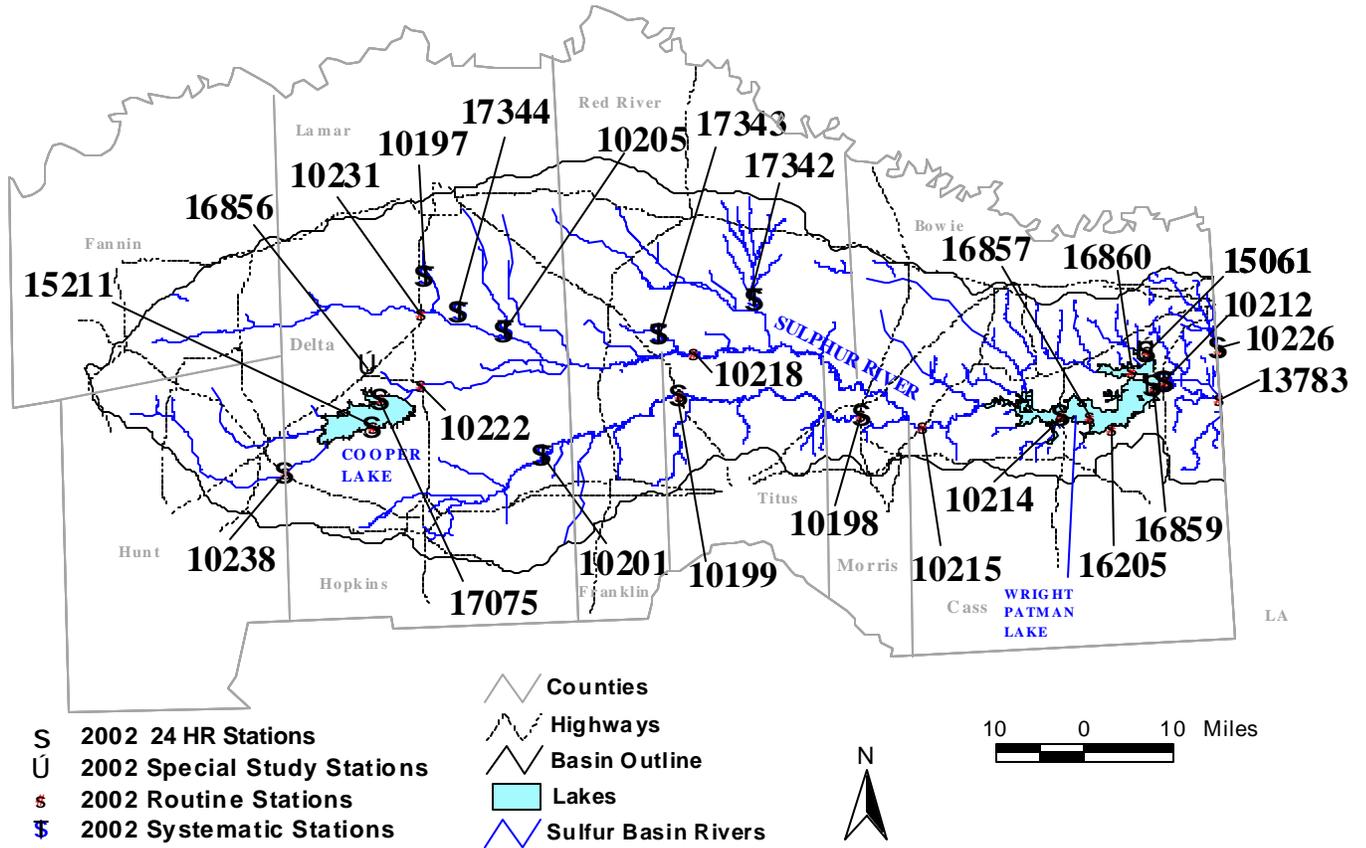
The results of the survey show that many of the cities that are serviced by Wright Patman Lake do experience problems with taste and odor, while few complaints were reported at the three utilities that do not use Wright Patman Lake water. The problem seems to occur most frequently during the summer months and subsides in the fall. Because the water produced for the cities serviced by Wright Patman Lake arrives as treated water, standby chlorination is the only chemical treatment utilized by local utilities. Some strategies applied to combat the taste and odor problem are the mixing of ground water and flushing of water mains.

The potential causes of taste and odor

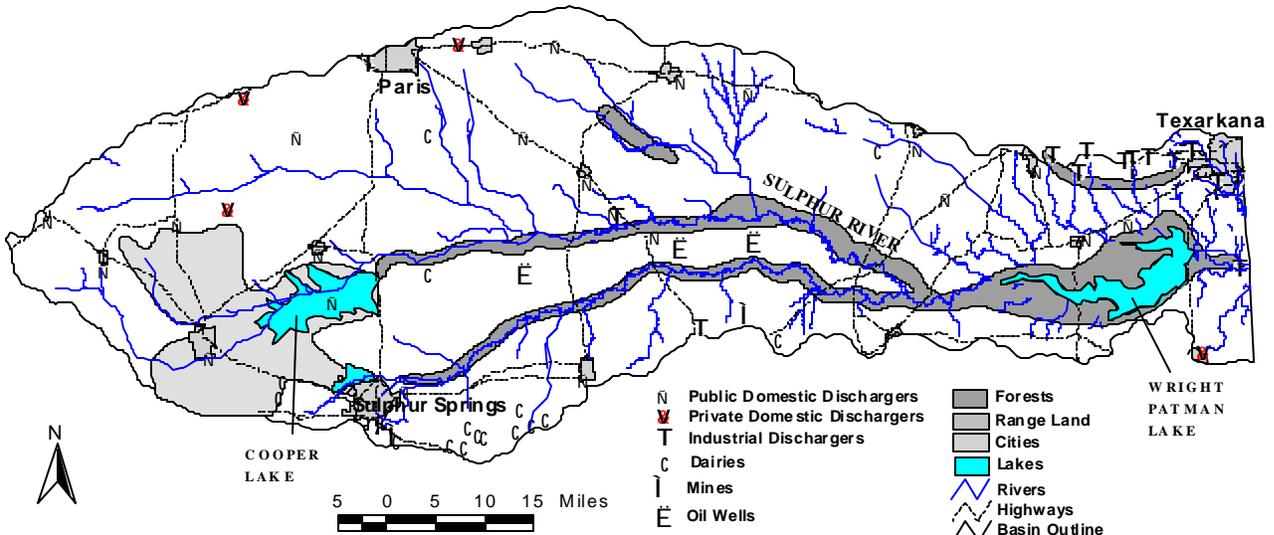
problems are thought to be trace amounts of several organic compounds whose sources include certain species of algae, weeds, standing timber, soil, and sediment. High levels of chlorophyll indicate that algae may be the dominant factor in Wright Patman Lake.

The need for collection of more data to help to explain why the taste and odor issues exist for Wright Patman Lake is supported by this study. A study of the algae levels and the algae type may be warranted in order to identify which types of algae dominate Wright Patman Lake and to what extent they contribute to the taste and odor issues.

**Sulphur River Basin
FY2002 Sampling Stations**



**Sulphur River Basin
Location of Possible Factors Influencing Water Quality**



Fiscal Year 2002 Coordinated Monitoring Schedule for the Sulphur River Basin

Seg	Station ID	Site Description	Sampling Entity*	Prog Code **	E. coli	24HR	Aq. Hab	Rt Benthics	Rt Nekton	Metals in Water	Organics in Water	Metals in Sediment	Conv	Fecal Coli-form	Flw	Field	
0301	10212	Sulphur River at US59 North of Atlanta	WC/FO	RT	4								4	4	4	4	
	13783	Sulphur River at KCS R/R Bridge	WC/FO	RT	4								4	4	4	4	
	16859	Wright Patman Lake at IP intake	WC/FO	RT	4						2			4			4
SU/TC			SS										2			2	
SU/TC			DI		6												
0302	15061	Wright Patman Lake, at North Shore	WC/FO	RT	4								4	4		4	
			SU/TC	SS										2			2
			SU/TC	DI		6											
	16860	Wright Patman Lake in Big Creek Arm	WC/FO	RT	4								4			4	
	16205	Wright Patman Lake mid lake, at Atlanta State Park	WC/FO	RT	4								4			4	
	16857	Wright Patman Lake upper lake, 1 mi SE of McFarland Island	WC/FO	RT	4								4			4	
10214	Wright Patman Lake at SH 8	WC/FO	RT	4									4	4		4	
		SU/TC	DI		6												
0303	10222	South Sulphur River at SH 19	WC/FO	RT	4									4	4	4	
	10218	Sulphur River at CR 2152 (Talco)	WC/FO	RT	4										4	4	
			USGS	RT						2	1	6				6	
	10215	Sulphur River at US67	WC/FO	RT	4					2				4	4	4	
	10198	White Oak Creek at US 259	WC/FO	RT	4		2	2	2	2					4	4	4
			WC/FO	DI		6											
	10199	White Oak Creek at US 271	WC/FO	RT	4		2	2	2							4	4
			WC/FO	DI		6											
	10201	White Oak Creek at CR 900	WC/FO	IS	4		2	2	2							4	4
			WC/FO	DI		6											
	16856	Big Creek Lake	WC/FO	SS							12						12
	17342	Kickapoo Creek at CR 412	SU/TC	IS	4		2	2	2			1	4		4	4	4
SU/TC			DI		2												
10202	Cuthand Creek at CR 1487	SU/TC	IS	4		2	2	2			2	4		4	4	4	
		SU/TC	DI		2												
17343	Little Mustang Creek at CR 1410	SU/TC	IS	4		2	2	2			2	4		4	4	4	
		SU/TC	DI		2												
0304	10226	Days Creek at State Line Road South of Texarkana	SU/TC	RT	4								4	4		4	
			SU/TC	RT			2	2	2						2	2	
			SU/TC	DI		2											
0305	10231	North Sulphur at SH19	WC/FO	RT	4								4	4	4	4	
	10205	Big Sandy Creek at CR 1497	SU/TC	IS	4		2	2	2			1	4	4	4	4	
			SU/TC	DI		2											
	10197	Auds Creek at CR 1184	SU/TC	IS	4		2	2	2			1	4	4	4	4	
			SU/TC	DI		2											
17344	Hickory Creek at CR 1498	SU/TC	IS	4		2	2	2			1	4	4	4	4		
		SU/TC	DI		2												
0306	10238	South Sulphur River at Hwy 11	WC/FO	RT	4								4	4	4	4	
			WC/FO	DI		2											
0307	15211	Cooper Lake at North Texas Municipal raw water intake	WC/FO	RT	4								4			4	
			WC/FO	DI		6											
	17075	Cooper Lake near mouth of Doctors Creek Arm	WC/FO	RT	4								4			4	
			WC/FO	DI		6											

* WC = TNRCC, FO = TNRCC regional office, SU = SRBA, TC = Texarkana College, **RT=Routine, DI=DIEL, IS=Intensive/Systematic, SS=Special Study

FY 2002 Monitoring Parameters

Field Parameters	Conventional Parameters	Organics in Water	Metals		Biological and Habitat Evaluations
			In Water	In Sediment	
Temperature pH Water color and odor Diss. Oxygen Depth Conductivity Stream Flow Secchi Depth (clarity)	Total Suspended Solids (TSS) Total Dissolved Solids (TDS) Volatile Suspended Solids (VSS) Total Kjeldahl Nitrogen (TKN) Total Organic Carbon (TOC) Total Alkalinity Pheophytin-a, Chlorophyll-a Sulfate Chloride, Ammonia-Nitrogen E. coli, Fecal coliform Ortho-phosphate, Nitrate/Nitrite-Nitrogen, Total Phosphorus	Pesticides	Aluminum Arsenic Cadmium Chromium Copper Lead Mercury Nickel Selenium Silver Zinc Calcium Magnesium Hardness	Aluminum Arsenic Barium Cadmium Chromium Copper Lead Manganese Nickel Selenium Silver Zinc Total Organic Carbon Sediment Grain Size Oil and Grease Acid Volatile Sulfide Solids in Sediment	Nekton (fish) Benthic Macroinvertebrates (bottom dwelling organisms) Physical Habitat Characteristics (flow, slope, depth, substrate, instream cover etc.)

* Parameters analyzed at each station may vary depending on sampling entity

Field Parameters are measured “in the field” at all of the stations during every visit, because they provide basic information about the physical, chemical and biological condition of the water. The field parameters are extremely sensitive to environmental change and must be measured immediately to obtain meaningful results.

Conventional Parameters are materials (including some bacteria) that are normally found dissolved or suspended in natural waters. The amounts and relative proportions of these materials determines what is ordinarily referred to as “water quality”, that is; the amounts of various mineral salts, plant nutrients, suspended sediments, potential for the presence of harmful bacteria, and biological activity. These materials must generally be measured under laboratory conditions to achieve acceptable accuracy.

Organics in Water are semivolatile, volatile, and pesticide compounds.

Metals in both water and sediment are measured to assess the potential for exposure of either humans or aquatic community to toxic concentrations of metals, some of



Photograph provided by Mike Buttram

which (such as iron and zinc) are very common in the environment, while others, like mercury and cadmium, are not. While substantial amounts of various metals may be present in sediments, they are ordinarily present in water in small amounts, and require painstaking care to measure accurately.

Biological and habitat evaluations are performed at wadeable stream stations and taken twice a year during the low flow period of summer to assess the aquatic community composition, integrity and appropriate aquatic life use. Data are assessed according to the 1999 Texas Natural Resource Conservation Commission Surface Water Quality Monitoring Procedures Manual and 1999 Receiving Waters Assessment Procedures Manual.

Atrazine Study in Big Creek Lake

March 2002 marks two years of monitoring Big Creek Lake for atrazine, a widely used herbicide. Big Creek Lake, a small, unclassified reservoir of about 700 acres was listed as threatened by contamination on the 2000 303(d) list due to atrazine in finished drinking water.

The Big Creek Lake study is part of a larger project conducted by the TNRCC involving several Texas reservoirs, titled "Targeted Monitoring and BMP implementation in Seven Atrazine Threatened Lakes." The two major components of

the project are: (1) surface water quality monitoring to better distinguish the threat of atrazine to drinking water source and (2) implementation of best management practices (BMP'S) to reduce the addition of atrazine in the subject watersheds.

The TNRCC Region 5 staff has conducted monthly surface water quality monitoring in Big Creek Lake for atrazine, alachlor, metolachlor and simazine. To eliminate the effects of water treatment, only raw (untreated) water has been sampled. These first two years

of data will be reviewed by the TNRCC to assess the degree of atrazine contamination and to determine if further action is warranted.



Sulphur River Basin Action Summary

The Basin Action Summary provides for each watershed within the basin, a summary of data collection assessment efforts, and implementation recommendations. It is the key source of information used to plan specific monitoring in areas that have a possible problem.

A tabular format is used to summarize previous assessment findings, data collection activities and input from stakeholders. Information included in the Basin Action Summary table includes water quality impairments and concerns, local water quality issues with a possible explanation for the impairment, concern, or issue, monitoring and implementation activities to date, and recommended actions. Utilizing this table as a planning tool, future monitoring and assessment activities in the basin will be organized and focused. Please see associated Basin Action Summary Table on page 8 and 9.



Basin Action Summary for Sulphur River Basin FY 2001-2002*

Watershed Waterbody	Concern/ Impairment	Identified Parameter(s)	Potential Source	Actions Taken	Recommended Action(s)	Priority
Sulphur River below Lake Wright Patman	0301					
Akin Creek	Aquatic Life	Depressed Dissolved Oxygen	Non-point source -natural occurrence	Systematic sampling by SRBA in FY2000	Monitoring by SRBA and Texarkana College during normal scheduled monitoring events.	L
Sulphur River below Wright Patman Lake	General Water Quality Conditions	Concern about Chlorophyll-a and Ammonia-nitrogen	Non-point source Releases from Wright Patman Lake	Fixed, systematic and non-point source sampling by SRBA in FY2001	Monitoring by CRP, TC, TWA and TNRCC during normal scheduled monitoring events.	M
Wright Patman Lake Watershed	0302					
Tributaries of Wright Patman Lake	Aquatic Life	Depressed Dissolved Oxygen	Non-point source -natural occurrence	Systematic sampling by SRBA in FY2000	Monitoring by SRBA and Texarkana during normal scheduled monitoring events.	L
Wright Patman Lake	Aquatic Life	Depressed Dissolved Oxygen	Point Source – Non-point Source -natural occurrence	Fixed station monitoring by TNRCC. Special Study sampling.	Monitoring through TNRCC fixed sampling. Special Study monitoring continued FY2002.	M
Wright Patman Lake	Aquatic Life	Levels of pH periodically above criterion	Point Source – Non-point Source -natural occurrence	Fixed station monitoring by TNRCC Special Study sampling.	Monitoring through TNRCC fixed sampling. Special Study monitoring continued FY2002.	M
Wright Patman Lake	Public Water Supply	Taste and Odor	Bacteria and Algae	Special study structured for Texarkana College by TNRCC	Monitoring of two water intake structures from July 2001 to October 2001 to document existing lake water by quality conditions.	M
Sulphur/South Sulphur River Watershed	0303					
Sulphur/South Sulphur River Entire Segment	Aquatic Life	Depressed Dissolved Oxygen	Non-point source -natural occurrence	CRP Fixed Station Monitoring	Continued monitoring through fixed and systematic monitoring. Based on new data, concentrations of dissolved oxygen met the criterion set for aquatic life use and has been delisted as a concern	L
Sulphur/South Sulphur River Entire Segment	Aquatic Life	Dissolved cadmium and aluminum	Non-point source	CRP Fixed Station Monitoring	Continued monitoring through fixed and systematic monitoring. The original basis for listing of cadmium was inaccurate. Cadmium concentrations were recalculated and are now lower than the criterion. Based on new data, average concentrations of aluminum in water are lower than the criterion and it has been delisted as a concern.	L
Big Creek Lake (Segment 0303A)	Finished Drinking Water	Atrazine	Non-point source -Agriculture	Monitoring by TNRCC. Special Study scheduled during FY 2002	Continued Monitoring by TNRCC during normal scheduled monitoring events. Alachlor, metolachlor and simazine will also be monitored.	T-h

Basin Action Summary for Sulphur River Basin FY 2001-2002 cont.*

Watershed Waterbody	Concern/ Impairment	Identified Parameter(s)	Potential Source	Actions Taken	Recommended Action(s)	Priority
White Oak Creek (Segment 0303B)	Aquatic Life	Depressed Dissolved Oxygen in lower 50 miles of creek	Point Source -Non-point source -natural occurrence	TNRCC Region 5 Special Study Sampling.	Special Study done by TNRCC.	M
Days Creek Watershed	0304					
Days Creek	Sediment contaminated.	Polycyclic aromatic hydrocarbons.	Local superfund sites or past contamination.	More study being done in FY2002 by SRBA.		M
Swampoodle Creek (Segment 0304A)	Aquatic Life and Human Health	Malathion and mercury in water	Non-point source -Agriculture -Atmospheric deposition	Systematic Station Monitoring by TNRCC and CRP.	Continued Monitoring through systematic and systematic stations. These two parameters were considered but not listed. Samples not meeting proper quality assurance measures resulted in the lack of sufficient data to assess support the criteria for aquatic life and human health	M
Cowhorn Creek 0304b	Contact recreation and fish consumption uses	Insufficient number of samples available to make assessment.			Additional samples need to be taken to complete the data set and provide enough samples to complete the assessment of contact recreation and fish consumption.	L
Upper South Sulphur River Watershed	0306					
Upper Sulphur River	General Water Quality Uses	Values for pH periodically higher and lower than the criterion	Non-point sources	Fixed Station Monitoring by TNRCC and CRP.	Monitoring through TNRCC and CRP fixed and systematic monitoring	L
Upper Sulphur River	Aquatic Life	Depressed Dissolved Oxygen in lower 6 miles	Non-point source -natural occurrence	Fixed Station Monitoring by TNRCC and CRP.	Monitoring through TNRCC and CRP fixed and systematic monitoring	M
Upper Sulphur River	Contact recreation	Pathogens (Bacteria)	Point Source -WWTP -Non-point source -Leaking septic systems -Agriculture	Fixed Station Monitoring by TNRCC and CRP.	Monitoring through TNRCC and CRP fixed and systematic monitoring	L
Cooper Lake Watershed	0307					
Cooper Lake	Aquatic Life	Depressed Dissolved Oxygen in the lower 8,000 acres	Non-point source -natural occurrence	Monitoring by TNRCC	Continued Monitoring by CRP and TNRCC during normal scheduled monitoring events.	M
Cooper Lake	General Water Quality Uses	Periodic exceedences in pH criterion	Non-point source -natural occurrence	Monitoring by TNRCC	Continued Monitoring by CRP and TNRCC during normal scheduled monitoring events.	M

* Basin Action Summary may be modified pending updates to the 303(d) list

2002 305(b) Review

Section 305(b) of the Clean Water Act requires each state to submit a biennial report to the U.S. Environmental Protection Agency (EPA) on current water quality conditions and their water quality management programs. The EPA then transmits the data compiled and summarized from the State reports to Congress along with an analysis of the nationwide status of water quality. The 305 (b) report process is the primary means by which the Nation's water resources are evaluated at the Federal, State and public level to determine if achievement of national clean water goals are being met, that progress in improving the maintenance and restoration of water quality is being attained, and the extent of actual or potential sources of pollution problems.

Surface water quality assessments of streams, estuaries, and lakes are made with data from biological chemical and physical monitoring programs. Biological data consist of benthic macro-invertebrate and fish community composition assessments, and fish tissue analyses. Point source monitoring data, shellfish closure reports, lake trophic status studies and data from outside sources such as volunteer citizens groups are also used in the surface water assessment. By incorporating these data with best professional

judgment, use support assessments are developed for each water body.

The Texas Natural Resource Conservation Commissions (TNRCC) evaluated water bodies support for their designated uses and criteria. These reports result in the production of the 305(b) assessment. Data for conventional and toxic pollutants are reviewed to determine if surface water quality standards and screening levels are being met. The data review is based on the TNRCC "Guidance for Assessing Texas Surface and Finished Drinking Water Quality Data" as well as data about the watershed as provided by the Planning Agencies. Data for each river basin are collected and reviewed by TNRCC to identify water quality use impairments (303d list) and concerns (305b assessment). Concern occurs when the concentration or level of a water quality parameter exceeds a threshold level established through statewide surveillance of the normal range of concentration. There can also be concerns when there is a lack of data. When threshold levels for a given parameter are exceeded in 10-25% of the samples, a partial concern is expressed. Full concern is expressed when the threshold levels are exceeded in greater than 25% of the samples. Segments of each water body have designated

uses and impairments occur when the water quality is not sufficient to support this use. The initial TNRCC findings are then reviewed by the Planning Agency for each basin and a detailed report is prepared discussing the use impairments and concerns and providing explanations and recommendations to the extent possible. Any discrepancies that exist are further researched by the Planning Agency and any additional information evaluated.

The results of the 305(b) report are analyzed in conjunction with other factors affecting water quality such as flow, in an attempt to identify and describe the reason for the impairment or concern, evaluate its relative importance, and suggest alternatives for addressing the problem. Relating water quality to other factors in the watershed may allow some differentiation between point and nonpoint source contributions to water quality problems. The findings of the 305(b) report will be the basis for the development of the Clean Water Act Section 303(d) list, which requires the TNRCC to list water bodies that do not meet the state's water quality standards. A summary of the TNRCC 305(b) listings for the Sulphur River Basin is provided within this report.

2002 Texas Clean Water Act Section 305(b) Water Quality Inventory For the Sulphur River Basin

Segment	Waterbody	Cause(s) of Concern/Impairment	TMDL Priority *	Impairment or Concern	# of Samples Exceeding Criteria vs. # of Samples**
0301	Sulphur River Below Wright Patman Lake	Algal growth concern in the lower 9 miles.	M	(C) chlorophyll a	7 of 11
This segment is dominated by Wright Patman Lake (WPL) water release. Studies on Lake during FY 2001 have shown high chlorophyll-a levels, which is indicative of excessive algal growth. The algal growth may be caused by the same factors that affect WPL. Recommendations include additional monitoring of nutrients and chlorophyll					
0302	Wright Patman Lake	Impairments for high pH and depressed dissolved oxygen. Concerns for high pH, thermal modifications, depressed dissolved oxygen, total phosphorus, and excessive algal growth.	M	I, C) pH C) thermal mod. I) DO C) Total phosphorus C) Chlorophyll a	17 of 58 3 of 24 12 of 40 4 of 12 3 of 10
Wright Patman Lake was the subject of a FY 2001 special study, which indicated concerns for high pH, low dissolved oxygen, and high chlorophyll-a levels at two sites. SRBA is continuing data collection in FY 2002 by monitoring 3 sites on 6 occasions to complement the work being done by the TNRCC. The exceedances may be caused by nutrients that come from non-point sources. WPL is over 40 years old, which may be a factor in the high nutrient levels.					
0303	South Sulphur River	Use Concern for depressed dissolved oxygen in the lower 25 miles.	L	(C) DO	3 of 20
Segment 0303 has depressed dissolved oxygen levels at times. This may be characteristic of this stream segment. It is a fairly slow moving stream and carries a large sediment load. The banks are steep and usually have stands of hardwood timber and there is little plant growth in the river channel. The exposure of the stream to direct sunlight is limited to short periods of time during the day and as a result, little oxygen is produced by photosynthesis.					
0303A	Big Creek Lake	Public water supply use was listed as threatened on 2000 303(d) list due to elevated atrazine levels in finished drinking water. An insufficient number of atrazine samples were available to evaluate use	T - h	(C) atrazine	Previous impairment from 2000, no samples listed.
Big Creek Lake is currently the target of a TNRCC study for atrazine levels. The results of this study should verify if atrazine is a concern. Atrazine may be present in the runoff from fields adjacent to Big Creek due to agricultural activities above Big Creek Lake. Recommendations include additional monitoring.					
0303B	White Oak Creek	Impairment for depressed DO in the lower 50 miles. Use Concern for aluminum (acute) in water and depressed DO in the lower 25 miles.	M	(C) aluminum C) DO	1 of 4 5 of 26
White Oak Creek is a rather slow moving stream surrounded by standing timbers for much of its reach. It may naturally have low DO levels. During the summer months, flow is effluent dominated by the Sulphur Springs Water Treatment Plant, which could be a source of excess nutrients. Non-point sources may also contribute to the nutrient load in the stream. Further study to define the DO concern and elucidate its cause will be necessary in the future. The source of aluminum is undetermined at this time.					
0304	Days Creek	Use Concern for bacteria.	not ranked	(C) bacteria	7 samples, mean = 210
Days Creek was monitored by SRBA during FY 2001 and will be monitored in FY 2002. A leaking sewer junction box was discovered by Texarkana College during one of its habitat assessments of Waggoner Creek. It is not known how long the leak existed, but it could have contributed to the elevated fecal coliform levels in Days Creek. The leak was reported to the Texarkana Water Treatment personnel. The stream below the wastewater treatment plant had high nitrate/nitrite levels. The FY 2001 data indicated the sediment to be heavily contaminated with polycyclic aromatic hydrocarbons (PAHs). Recommendations include a special study to determine if the PAHs are leaking from local superfund sites or if they are from past contamination. Studies currently scheduled for FY 2002 should supply more information about the nitrate/nitrite issue.					

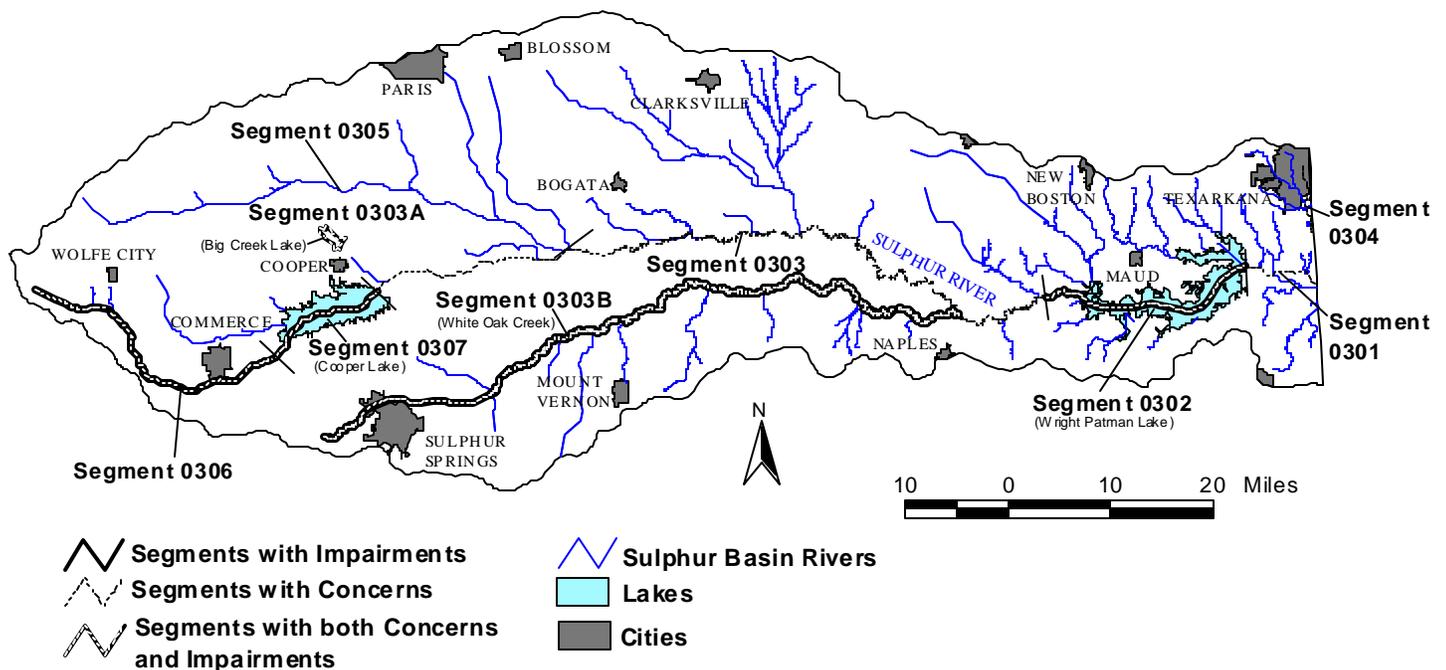
2002 Texas Clean Water Act Section 305(b) Water Quality Inventory cont.

Segment	Waterbody	Cause(s) of Concern/Impairment	TMDL Priority *	Impairment or Concern	# of Samples Exceeding Criteria vs. # of Samples**
0305	North Sulphur River	No water quality concerns/impairments identified.			
0306 Impairment and Concerns	Upper South Sulphur River	Impairment for high pH, depressed dissolved oxygen, and bacteria. Concerns for nitrate+nitrite nitrogen and orthophosphorus in the 25 miles above SH 11.	M	(I) pH (C) nitrate+nitrite (C) O-phosphorus (I) bacteria (I) DO	6 of 24 15 of 24 10 of 24
The sub watersheds of segment 0306 are the subjects of SRBA's systematic study efforts for FY 2002. The tillage of the soil in this region may cause and increase the nitrate/nitrite levels along with fertilizer applications. The streambed contains a large amount of limestone, which causes a high natural pH.					
0307 Impairment and Concern	Cooper Lake	Impairments for high pH and depressed dissolved oxygen. Concern for high pH.	M	(I, C) pH (I) DO	15 of 55
The sub watersheds of segment 0306 are the subjects of SRBA's systematic study efforts for FY2002. The pH of the water flowing into Cooper Lake may be higher than normal due to the calcareous nature of the subsoil in the region. This would suggest a higher than normal pH for the lake. High levels of photosynthesis may also cause pH levels to be higher than normal during certain times of the day. If this is the cause, nutrient levels may be the problem.					

* Overall Priority as listed in the DRAFT Texas 2000 Clean Water Act Section 303(d) List (August 31, 2000)

** Criteria for impairments and concerns can be found in the Guidance for screening and Assessing Texas Surface and Finished Drinking Water Quality Data located on the TNRCC website.

2002 Texas Clean Water Act Section 305(b) Impairments and Concerns



2002 Texas Clean Water Act Section 305(b) Condensed Impairment and Concerns Table

Name of Waterbody	Segment Number	Concerns and Impairments	TMDL Priority Ranking
Sulphur River below Wright Patman Lake	0301	Concern for excessive algal growth in the lower 9 miles	M
Wright Patman Lake	0302	Impairments for high pH and depressed dissolved oxygen. Concerns for high pH, thermal modifications, depressed dissolved oxygen, total phosphorus, and excessive algal growth.	M
South Sulphur River	0303	Use Concern for depressed dissolved oxygen in the lower 25 miles.	L
Big Creek Lake	0303A	Impaired atrazine in finished drinking water. An insufficient number of atrazine samples were available to reevaluate use support.	T-h
White Oak Creek	0303B	Impairment for depressed dissolved oxygen in the lower 50 miles. Use Concern for aluminum (acute) in water and depressed dissolved oxygen in the lower 25 miles.	M
Days Creek	0304	Use Concern for bacteria.	Not ranked
Upper South Sulphur River	0306	Impairments for high pH, depressed dissolved oxygen, and bacteria. Concerns for nitrate+nitrite nitrogen and orthophosphorus in the 25 miles above SH 11.	M
Cooper Lake	0307	Impairment and concern for high pH and impairment for depressed dissolved oxygen.	M

Sulphur River Basin Public Outreach

Sulphur River Basin's Clean Rivers Program (CRP) places a priority on encouraging public involvement concerning their activities. It is considered an important part of the development of support for the program, and a means of obtaining broad-based recommendations from the public.

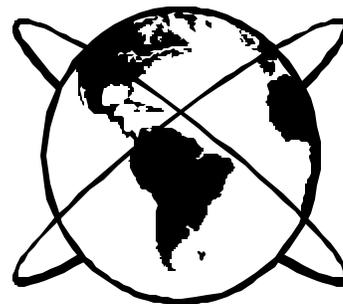
The main means of accomplishing the public outreach goals of the CRP is through the Sulphur River Basin Website ([sulphurr.org](http://www.sulphurr.org)). The SRBA website is our most useful tool specifically designed to reach the stakeholders and citizens of the basin and inform them about the Clean Rivers Program. The website contains information about the

scheduling of the SRBA Board meetings, current CRP activities, monitoring schedules and data, events in the basin, wastewater permit holders, CRP reports, and studies which are either being conducted or have been completed in the Sulphur River Basin.

In addition, Sulphur River Basin maps with segments and sampling station locations are available at <http://www.sulphurr.org/maps.htm>.

Public involvement and outreach efforts help support the permitting process, and encourage citizen involvement in helping to identify permit-related priorities and other water quality issues. An opportunity for citizens to voice

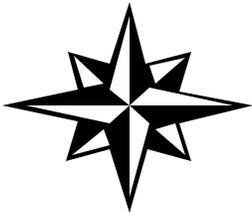
their concerns or opinions about water quality issues is provided through the Contact Us page of the web site.



[Http://www.sulphurr.org](http://www.sulphurr.org)

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Photographs from the Field

*The
Sulphur River Basin Authority
and the
Texarkana College
staff, students and laboratory
study the water in the
Sulphur River Basin.*



Photograph of Elliott Creek provided by Mike Buttram