

Sulphur River Basin Highlights Report 2005



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Highlights Of The Sulphur River Basin in 2004

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The Clean Rivers Program (CRP) is a water quality monitoring, assessment, and public outreach program administered by the Texas Commission on Environmental Quality (TCEQ), funded by fees collected by the State of Texas. Coordination of this program is a joint effort involving fifteen different planning agencies and encompassing twenty-three Texas river basins. The Sulphur River Basin Highlights Report is a summary of the efforts and goals of the Clean Rivers Program participants during fiscal year 2004 (September 2003 through August 2004). Assisting the Sulphur River Basin Authority (SRBA) in FY2004 planning, data collection, analysis, and

reporting of water quality data were program participants Paul Price Associates, Inc., Texarkana College, the Texas Commission on Environmental Quality (TCEQ), the U. S. Geological Survey (USGS), and SRBA Steering Committee members. The goal of these cooperative efforts is to make possible continuing evaluation and supervision of water quality in the basin by providing appropriate, accurate and up-to-date data.

Providing opportunities for the public to become involved in water quality issues, and provision of reliable water quality information are major objectives of the current monitoring program. It is hoped that enhanced

public awareness and greater knowledge of water quality conditions in the basin will lead to



greater community involvement in water quality issues.

Another major objective of this program is the establishment of a long-term monitoring plan for the Sulphur River Basin. This program would be used to examine and evaluate major water bodies on a continuing basis. An established monitoring program would help to determine the suitability of existing

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Special points of interest:

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- Map of FY2004 Sulphur River Basin Segments and Watersheds pg. 11

Highlights Of The Sulphur River Basin 2004 Cont.



"A map showing the location of each of these watersheds can be found within this report, on page 11 and additional information about each watershed is available on our website at www.sulphurr.org"

water sources for designated uses and record trends in water quality. Water quality problems can be identified and characterized through the use of data collected by this monitoring program followed by efforts to determine their source.

The Sulphur River Basin is divided into seven watersheds or areas, North Sulphur River Watershed, Sulphur River Watershed, Wright Patman Lake Watershed, Lower Sulphur River Watershed, White Oak Creek Watershed, and South Sulphur River Watershed.. A map showing the location of each of these watersheds can be found within this report, on page 11 and additional information about each watershed is available on our website at www.sulphurr.org.

Rainfall and runoff were near normal throughout the Sulphur River Basin during 2004 with the exception of a drier than normal May and wetter than normal June.

During 2004, additional water related projects were initiated within the Sulphur River Basin. An instream flow analysis project intended to help

support local permit holders by providing site specific flow information was conducted. A station located at Waggoner Creek at US 82 between Nash and Texarkana was monitored in FY2004 and will be monitored by the Sulphur River Basin Authority in FY2005. .

Lake Wright Patman is included in the State's list of Impaired Waters, Draft 2004 303(d) list, as it has been since 1998, for concerns associated with depressed dissolved oxygen and high pH levels. In 2004 SRBA assisted the TCEQ in sampling Lake Wright Patman at three stations: Highway 8, North Shore and the International Paper Intake. The results of the sampling to date support the 303(d) listing of Lake Wright Patman. 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. Further sampling may be needed to identify the source of the nutrients that support the abundant algal growth.

SRBA assisted the

TCEQ with a follow-up study to the one conducted ten years ago on the extent and potential impact of sediment and soil contamination in Days Creek. This contamination is probably the result of creosote discharges from three closed wood treatment plants located upstream from the study sites. Four stations were monitored by SRBA in 2004 on Days Creek.

The Sulphur River Basin Summary Report, which includes the analysis of all water quality data obtained in the previous five years of monitoring, was completed in 2004. It was found that the greatest proportion of water quality problems in the Sulphur River Basin result ultimately, if not indirectly, from the presence of excess nutrients, or are associated with the nutrient sources (i.e., coliform bacteria). Data evaluated in this report, and the TCEQ's Draft 2004 Water Quality Inventory, indicates that the upper South Sulphur River (above Cooper Lake) and the upper reaches of White Oak Creek are both being negatively influenced

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Highlights Of The Sulphur River Basin 2004 Cont.

by excessive inputs of both nitrogen and phosphorus, resulting in relatively high levels of chlorophyll a and deteriorating dissolved oxygen conditions in those streams. While the sources of the high nutrient concentrations are known in a general sense (e.g., treated wastewater discharges, urban runoff, intensive agricultural operations and temporary inputs associated with soil erosion and land clearing), the relative importance of those sources is unknown. Urban runoff and treated wastewater discharges from Commerce, Sulphur Springs and

Texarkana may be significant contributors to the respective nutrient loads in the South Sulphur River, White Oak Creek and Days Creek Watersheds.

The TCEQ compared data from twenty reservoirs in east Texas to determine if they were experiencing acidification, caused by air pollution, "acid rain," from nitrogen compounds. The Texas Water Development Board produced a final report in July 2004 of an analysis of instream flows for the Sulphur River. This stream flow study of the Sulphur River began in 2001, and was designed to

determine current reservoir capacity. It is designed to be used primarily as a planning tool and to determine dredging feasibility.



Overview of Water Quality Monitoring

Assessment and management of water quality within the Sulphur River Basin is dependant on appropriate and accurate data. Water quality monitoring and data collection is an integral part of the Clean Rivers Program (CRP). Sulphur River Basin monitoring is made possible through a cooperative program directed by the Sulphur River Basin Authority (SRBA). Program participants assisting SRBA in planning, data collection, analysis, and

reporting of water quality data include the Texas Commission on Environmental Quality (TCEQ), the Clean Rivers Program Steering Committee members, U. S. Geological Survey (USGS), Texarkana College, and Paul Price Associates, Inc. (PPAI).

Sampling locations within the basin for the fiscal year 2005 contain five types of monitoring. These monitoring types include: 1) Routine, 2) Intensive/

Systematic, 3) Special Study, 4) Flow and 5) Diel sampling, and are described in the paragraphs below.

What are the Water Quality Parameters?

Field Parameters provide information about the physical and chemical water quality characteristics that can be measured on-site. These generally include: dissolved oxygen

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"Dissolved oxygen (DO) indicates the amount of oxygen available in the stream. Certain minimum concentrations are needed to support aquatic life"

Overview of Water Quality Monitoring Cont.



“Routine station monitoring is primarily used to expand and maintain the long-term water quality database. The focus of this monitoring is to improve our ability to follow trends and to identify water quality changes in the watersheds of the Sulphur River Basin.”

(DO), conductivity, pH, temperature, stream flow, flow severity, secchi disc depth, and field observations and conditions.

What is Dissolved Oxygen and why is it Important?

Dissolved oxygen (DO) indicates the amount of oxygen available in the stream. Certain minimum concentrations are needed to support aquatic life. DO can be reduced by a number of factors such as elevated water temperatures and the presence of organic substances that require oxygen for decomposition (e.g., plant debris and wastewater effluent).

Conventional Parameters are chemical and biological components in water that typically require laboratory analysis. These parameters generally include: several forms of nitrogen, phosphorus,

bacteria, chlorophyll-a, total dissolved solids, and total suspended solids.

Why do we collect nutrients?

To determine compliance with water quality levels set by the TCEQ to protect human health and to determine if there is an abnormal level of nutrients. High levels of nutrients can cause excessive plant growth which can lead to reduced dissolved oxygen in the waterbody, in turn this can reduce the ability of fish to survive. In addition, at certain levels nutrients are a threat to human health and can result in taste and odor problems in drinking water.

Metal Parameters are measured to evaluate the potential for exposure to toxic concentrations of metals. Metal parameters generally include: aluminum, arsenic, chromium, copper, nickel, silver, zinc, barium,

molybdenum, calcium, selenium, iron and manganese.

Biological and Habitat Evaluations

are performed at stream stations that are wadeable, twice a year during the low flow period of summer. These measurements are used to evaluate the streams aquatic community composition, integrity, and appropriate aquatic life use. Included are sampling for benthic (bottom dwelling organisms), fish, and habitat characteristics. The better the water quality, the more diverse the aquatic community is expected to be, resulting in a higher evaluation score. A detailed monitoring schedule for the Sulphur River Basin, fiscal year 2005 is available by accessing the basin website at www.sulphurr.org, and selecting Site Map,

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Monitoring Parameters*

Field Parameters	Conventional Parameters	Metals Parameters In Water	Metals Parameters In Sediment	Biological and Habitat Evaluations
Temperature (°C)	Total Suspended Solids (TSS)	Aluminum, dis.	Aluminum, Arsenic	Benthic Organisms (those that live near or in the stream bottom including insects, snails and worms)
PH (Standard units)	Total Dissolved Solids (TDS)	Arsenic, dis.	Barium, Cadmium	
Dissolved Oxygen (mg/l)		Chromium, dis.	Chromium, Copper	
Depth		Copper, dis.	Lead, Manganese	
Conductivity	Sulfate	Nickel, dis.	Nickel, Selenium,	Nekton Organisms (fish)
Streamflow	Chloride	Silver, dis.	Silver, Zinc,	
Secchi Depth (clarity)	Chlorophyll-a	Zinc, dis.	Molybdenum, Mercury	Physical Habitat Characteristics (flow, slope, depth, substrate, etc)
24 Hr Dissolved Oxygen	Ammonia-N,	Barium, dis.	Total Phosphorus	
	Phaeophytin	Molybdenum, dis.	Total Organic Carbon	
	E. coli,	Calcium, total	Total Kjeldahl N	
	Nitrate-N	Selenium, total	% Grain Size	
	Nitrite-N	Iron, total	Oil and Grease	
	Total Phosphate-P	Manganese, total	Acid Volatile Sulfide Solids in Sediment	

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

Overview of Water Quality Monitoring Cont.



then FY 2005 Monitoring Schedule. In addition, a copy can be requested from the Sulphur River Basin Authority, 911 N. Bishop St., Suite C-104, Wake Village, TX 75501.

Routine station monitoring

is primarily used to expand and maintain the long-term water quality database. The focus of this monitoring is to improve our ability to follow trends and to identify water quality changes in the watersheds of the Sulphur River Basin. Routine station locations are chosen to provide information on each of the seven classified segments (numbered 0301-0307) and White Oak Creek (0303B-a major unclassified watershed within the Sulphur River Basin). A map of the Sulphur River Basin Routine Monitoring Stations is on page 6 of this report.

Intensive/Systematic

monitoring is designed to investigate known areas of concern and detect areas of potential concern. These stations are typically placed on the smaller, unclassified streams. The monitoring schedule of this

type of station is based on a five-year-cycle, with one group of stations monitored each of five years.

Complete coverage of the basin is the final goal at the end of the five-year rotation. During FY2004 the Clean Rivers Program systematic monitoring within the Sulphur River Basin focused on Segment 303-the Sulphur and South Sulphur River.

Special Study sampling

is planned to address a specific concern. A special study was designed beginning in 2002 as a response to the listing of Wright Patman Lake on the Texas 1998 303(d) list for dissolved oxygen, and on the 2000 303(d) list for dissolved oxygen and pH concerns. One objective of this study was to help eliminate taste and odor problems with the water. The addition of extra sites and additional 24-hr dissolved oxygen sampling in this study should help TCEQ evaluate concerns for the lake.

Flow monitoring is utilized to support permitted discharger actions. Streamflow in Waggoner Creek at US HWY 67 will

be measured monthly upstream of a selected permitted discharger for at least 18 months. The information collected will be used to help the state establish appropriate permit limits based on site-specific characteristics.

Diel sampling involves multiple field measurements conducted over a 24 hr

period, usually by an electronic sampling probe. This type of sampling usually includes Dissolved Oxygen (DO), temperature, conductivity and pH measurements. Diel sampling is frequently done where DO is a concern and the variability need to be evaluated. The 24-hour minimum and maximum DO measurements are compared to the DO criteria to assign an aquatic life use. Seven sites were monitored in the Sulphur River Basin for

24-hr DO during the past fiscal year. Three of the diel stations in FY2004 involved additional 24-hr dissolved oxygen sampling on Lake Wright Patman in response to previous sampling results.



The following discussion contains an overview of the water quality data available for the Sulphur River Basin and recommendations proposed to address the identified issues. A watershed approach is used within the basin to identify and attribute water quality trends within a specific area. Watersheds as defined in this report consist of one or more segments (classified water bodies) or subwatersheds, (unclassified or tributary water bodies). These watersheds are grouped to reflect major changes in habitat and water quality within the basin.

Every two years, the state must assess the quality of the water and submit a report to the EPA (Environmental Protection Agency) detailing the extent to which each water body in the state meets water quality standards. The TCEQ (Texas Commission on Environmental Quality) publishes this assessment as the Texas Water Quality Inventory and 303(d) List. This document essentially has two main parts: the Inventory, which gives the status of all the waters in the state, and the 303(d) List, which identifies waters that do not meet one or more of the standards set to protect a designated use.

The DRAFT 2004 Texas 303(d) List (November 23, 2004), currently lists four bodies of water in the Sulphur River Basin that do not support dissolved

oxygen and/or pH standards. This list includes Wright Patman Lake (Segment 0302), White Oak Creek (Segment 0303B), Upper South Sulphur River (Segment 0306) and Cooper Lake (Segment 0307). These are the same bodies of water that were listed in 2000 and 2002.

North Sulphur River Watershed

The North Sulphur River Watershed extends from the extreme northwestern end of the basin to the joining of the North and South Sulphur Rivers. The North Sulphur River (Segment 0305) flows year round throughout most of its length. Typical of Texas Rivers, its annual flow measurement generally consists of extended periods of low flow punctuated by large rain events during which the majority of the water flow occurs along with its transport of sediment and dissolved materials.

The vegetation of the watershed is marked by a transition from the extensive agricultural clearing of the western portion of the basin to the more forested eastern portion. The North Sulphur River Watershed does not include any large lakes or reservoirs.

Land use in the North Sulphur River Watershed is dominated by agribusiness. Agricultural land uses occupy 94% of the

watershed, making the North Sulphur River Watershed the most intensively developed watershed in the basin. Agriculture in the watershed includes dairies, beef cattle, wheat, corn, hay and sorghum. The northern half of the Caddo National Grassland is located in the western end of the watershed. The largest urban concentration in the watershed is the city of Paris, which is partially located in the Red River Basin, and has a population of around 25,000. Permitted dischargers in the North Sulphur River Watershed include five industrial and two municipal permits.

Field parameters indicate that water in the lower third of the North Sulphur River tends to be turbid, slightly alkaline, well oxygenated and of moderate to high conductivity. The results for the tributary stations were similar to those of the main stem. The results of conventional parameter analyses in the North Sulphur River show that much of the conductivity (and total dissolved solids) in the North Sulphur River is due to the presence of sulfates and chlorides. With respect to the tributaries, sulfate and chloride concentrations tend to be substantially less than the amounts occurring in the North Sulphur River.

None of the waters in the North Sulphur River watershed have been placed on the 303(d) list, and the



"The DRAFT 2004 Texas 303(d) List (November 23, 2004), currently lists four bodies of water in the Sulphur River Basin that do not support dissolved oxygen and/or pH standards"

Water Quality Data Review cont.

Draft 2004 Texas Water Quality Inventory (305(b) list indicated no concerns were present in the current data from this watershed. However, additional data is required for complete assessment of toxicants in water, sediments, and fish tissue.

Monitoring within the North Sulphur River Watershed for the fiscal year 2004 included one routine station sampled for e-coli bacteria, conventional parameters, flow and field.

South Sulphur River Watershed

The South Sulphur River Watershed is located in the extreme western portion of the basin between the North Sulphur River Watershed and the White Oak Creek Watershed. The western upland half of the watershed is drained by the Middle and South Sulphur Rivers, which meet in Cooper Lake. There is a deleted State superfund site located near the City of Commerce. This site, once used for the distribution of insecticides and cotton defoliant, was cleaned up and officially removed as a superfund site in 1996.

The South Sulphur River Watershed includes the South Sulphur River, including the reaches above (Segment 0306) and below Cooper Lake (upper reaches of Segment 0303), and Cooper Lake (Segment 0307). Water bodies in the watershed include Big Creek Reservoir and Cooper Lake, which is the largest

body of water in the South Sulphur River Watershed. In addition to the South Sulphur River, the Middle Sulphur River and Pecan Creek flow directly into Cooper Lake. The South Sulphur River below Cooper Lake includes Big Creek.

Landuse in the South Sulphur River Watershed is dominated by agricultural land uses that occupy about 88% of the watershed. Cattle rangeland and crops dominate agriculture in this watershed. Remaining areas surrounding the South Sulphur River and the south shore of Cooper Lake are occupied primarily by bottomland or remnant riparian forest (10%). The southern half of the Caddo National Grassland is located in the western end of the watershed near the city of Ladonia. Urban concentrations in the watershed are primarily located in the cities of Commerce, Cooper and Wolfe City. All of the urban areas in this watershed have a population that is under 10,000 persons. Permitted dischargers in the South Sulphur River Watershed are limited to eight small municipal waste dischargers.

The upper South Sulphur River (Segment 0306) was included on the 2000 303 (d) list as partially supporting the aquatic life use as a result of low dissolved oxygen concentrations. Because an insufficient number of samples have been collected to complete the assessment of this

segment, it remains listed as not meeting the dissolved oxygen standard in the 25 miles below SH 11 in the Draft 2004 303(d) list. There are also concerns in the upper 25 miles of Segment 0306 in the Draft 2004 303(d) list as a result of high pH values. Nutrient concerns in the same reach are also identified in the Draft 2004 Water Quality Inventory. The water quality problems identified in this segment are consistent with the development of excessive levels of photosynthesis and respiration initiated by large nutrient loads. During FY2004 there was one routine sampling site located in this segment. This site, at South Sulphur River at State Highway 11 was sampled for e-coli bacteria, conventional, flow and field parameters which continues to provide information needed to assess nutrients and dissolved oxygen

Portions of Doctor's Creek Arm and lower Cooper Lake (Segment 0307) near the dam are included on the 2000 303(d) list as partially supporting the aquatic life use as a result of low dissolved oxygen concentrations. An insufficient number of 24-hour dissolved oxygen samples have been collected to complete the assessment of this segment, so it also remains listed as not meeting the dissolved oxygen standard in the Draft 2004 303(d) list. Data have been collected since the last assessment period that will be used to help complete

the evaluation of water quality in Cooper Lake. The aquatic life use is considered partially supported in mid-lake near Finley Branch because of low dissolved oxygen concentrations. Cooper Lake does not appear to have serious dissolved oxygen problems at this time, and more monitoring will be conducted before a commitment to conduct a TMDL project is made. The general use is also not supported, or partially supported, as a result of high pH values throughout most of the lake. There were two routine stations sampled in this segment during FY2004. Both stations were sampled for e-coli bacteria, conventional, and field parameters on a quarterly basis during the year.

In the South Sulphur River Watershed portion of Segment 0303, the South Sulphur River below Cooper Lake, the aquatic life, contact recreation, fish consumption and general use are all fully protected. In Big Creek Lake (Segment 0303A), an impoundment on Big Creek, the public water supply use is fully supported, but the other uses have not been assessed at this time. Monitoring for organics in water continued in 2004, due to an earlier concern about Atrazine contamination in Big Creek Lake. One routine station was sampled in this segment during FY2004 for e-coli bacteria, conventional, flow and field



parameters.

Sulphur River Watershed

The Sulphur River Watershed is the largest watershed in the Sulphur River Basin, occupying the northern half of the central region of the basin. This watershed includes the lower reach of Segment 0303, which is the Sulphur River from the confluence of the North and South Sulphur Rivers to the headwaters of Wright Patman Lake. The Sulphur River always flows throughout this section and is the major source of water for Wright Patman Lake. Although there are several small impoundments near the city of Clarksville, the largest body of water in the Sulphur River Watershed is River Crest Lake adjacent to the Sulphur River south of the city of Bogata.

Although land use in the Sulphur River Watershed is dominated by agricultural activities (65%), forested land occupies a significant proportion of the area (33%). Urban concentrations in the watershed are primarily located in the cities of Clarksville, Blossom and Bogata, all cities with a population under 5,000. Permitted dischargers in the Sulphur River Watershed include nine municipal dischargers and two industrial permitted dischargers.

The lower 25 miles of the Sulphur River (Segment 0303) was included in the Draft 2004 Water Quality Inventory because of an aquatic life use concern

due to depressed dissolved oxygen concentrations.

A recent special study within the Sulphur River Basin included intensive monitoring of Big Creek Lake. This special study was implemented as a result of the disclosure that several Texas reservoirs, including Big Creek Lake, showed elevated atrazine concentrations in finished drinking water. These reservoirs were identified on the 1998 and 2000 303(d) lists. Following the initial three-year period of sampling, the atrazine data was evaluated to determine the existing level of impairment and possible trends and if additional monitoring or delisting was appropriate for the lake. Big Creek Lake has since been removed from the October Draft 2002 303(d) List as a result of this intensive monitoring, which demonstrated that atrazine values are below the finished drinking water criterion. Monthly monitoring for atrazine continued through FY2004 for this lake. Best Management Practices (BMP's) are also now in place to ensure that this water body supports the public water supply use.

This watershed was sampled by the TCEQ Region 4 staff at two routine stations during FY2004. These stations were located at the Sulphur River at US 67, and the Sulphur River at Red River County Road NW39. E-coli bacteria, conventional, flow and field parameters were sampled at both sites, in addition, metals in water were

sampled at the US 67 station.

White Oak Creek Watershed

The White Oak Creek Watershed, an unclassified tributary of Segment 0303, is the second largest watershed in the basin and occupies much of the south central region of the basin. Streams of the watershed are drained by White Oak Creek, which is always flowing throughout its length from Lake Sulphur Springs to where it joins with the Sulphur River (Segment 0303). There are numerous small impoundments within the watershed, but the largest bodies of water in the watershed are Lake Sulphur Springs and Century Lake. These two reservoirs are impoundments of White Oak Creek located to the northwest of Sulphur Springs.

Land use in the White Oak Creek Watershed is more heavily utilized by confined animal feeding operations (CAFO's), such as cattle feedlots and dairy farms, than the other watersheds. Agricultural land uses occupy 69%, while forest occupies 28%. Urban concentrations in the watershed are primarily located in the cities of Sulphur Springs (population over 14,000) and Mount Vernon (population under 3,000). These two largest cities in the watershed both

exhibited positive growth between the years 1990 and 2000.

Permitted dischargers in the White Oak Creek Watershed include thirty permits for CAFO's (Confined Animal Feeding Operations), four industrial discharge permits and two municipal discharge permits.

White Oak Creek (Segment 303B), is included on the Draft 2004 Texas 303(d) List as a result of depressed dissolved oxygen concentrations. Inspection of the longer-term data set reveals that dissolved oxygen concentrations below acceptable levels have occurred numerous times, usually during summer conditions when dissolved oxygen ordinarily reaches its annual minimum in response to changing temperature conditions and biological activity. However, this stream has a history of dissolved oxygen problems and is presently scheduled for a reevaluation to establish the appropriate standard. In addition, the Draft 2004 Water Quality Inventory reported a use concern (not fully assessed due to limited data) as a result of elevated dissolved aluminum concentrations in the lower 25 miles of the stream.

In fiscal year 2004, intensive/systematic monitoring occurred in this watershed. Although the source of the problem is

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Water Quality Data Review cont.

unclear, low dissolved oxygen levels in White Oak Creek have been well documented. SRBA studied four tributaries of White Oak Creek to see if low dissolved oxygen was characteristic of these streams as well. The following streams and sites were selected for study: East Caney Creek, Stouts Creek, North Caney Creek, and Big Creek. The four monitoring events at each station included field parameters, stream flow, conventional parameters, and E. coli bacteria counts. Biological (benthic and nekton) studies were completed twice at each site during the summer of 2004 as well as habitat analysis and 24-hour studies (Diel). There was no stream flow in three of the streams during the fourth event with the other flow being quite low. These streams are not perennial, and are not expected to support significant aquatic life use. Both East Caney and Stouts Creek had elevated E. coli levels for one sample but on different dates. These streams have low flows with lots of shade. They contain abundant wildlife and drain pastureland, and occasional high E. coli counts are to be expected. In the May monitoring, Big Creek had an average 24-hour DO of less than 4 ppm. In July, only East Caney Creek had an average 24-hour dissolved oxygen level of greater than 4 ppm. The nekton studies gave and aquatic life rating of "intermediate" to all the

streams for both monitoring events. The benthic studies gave a varied result for the streams. North Caney Creek had a "high" aquatic life use rating in May, as did Big Creek in August. All the other ratings were "limited" with the exception of East Caney Creek that scored "intermediate" in August.

Wright Patman Lake Watershed

The Wright Patman Lake Watershed, occupies much of the eastern third of the basin, including Wright Patman Lake (Segment 0302) and its direct tributaries. Major tributaries of Wright Patman Lake Watershed include Segment 0303 of the Sulphur River, Anderson Creek, Big Creek, and Elliot Creek. There is a Federal superfund site, Lone Star Army Ammunition Plant, located in the basin near Elliott Creek in the northeast portion of the watershed.

Land use in the Wright Patman Lake Watershed is dominated by forest at 47% while agricultural land uses occupy only 33% of the basin. Urban concentrations in the watershed are primarily located in the cities of New Boston and DeKalb, both with a population of under 6,000. These urban areas occupy a significant 11% of the total land use in the basin. Permitted dischargers in the Wright Patman Lake Watershed include three municipal dischargers, three industrial dischargers

and four CAFO's (Confined Animal Feeding Operations) discharge permits.

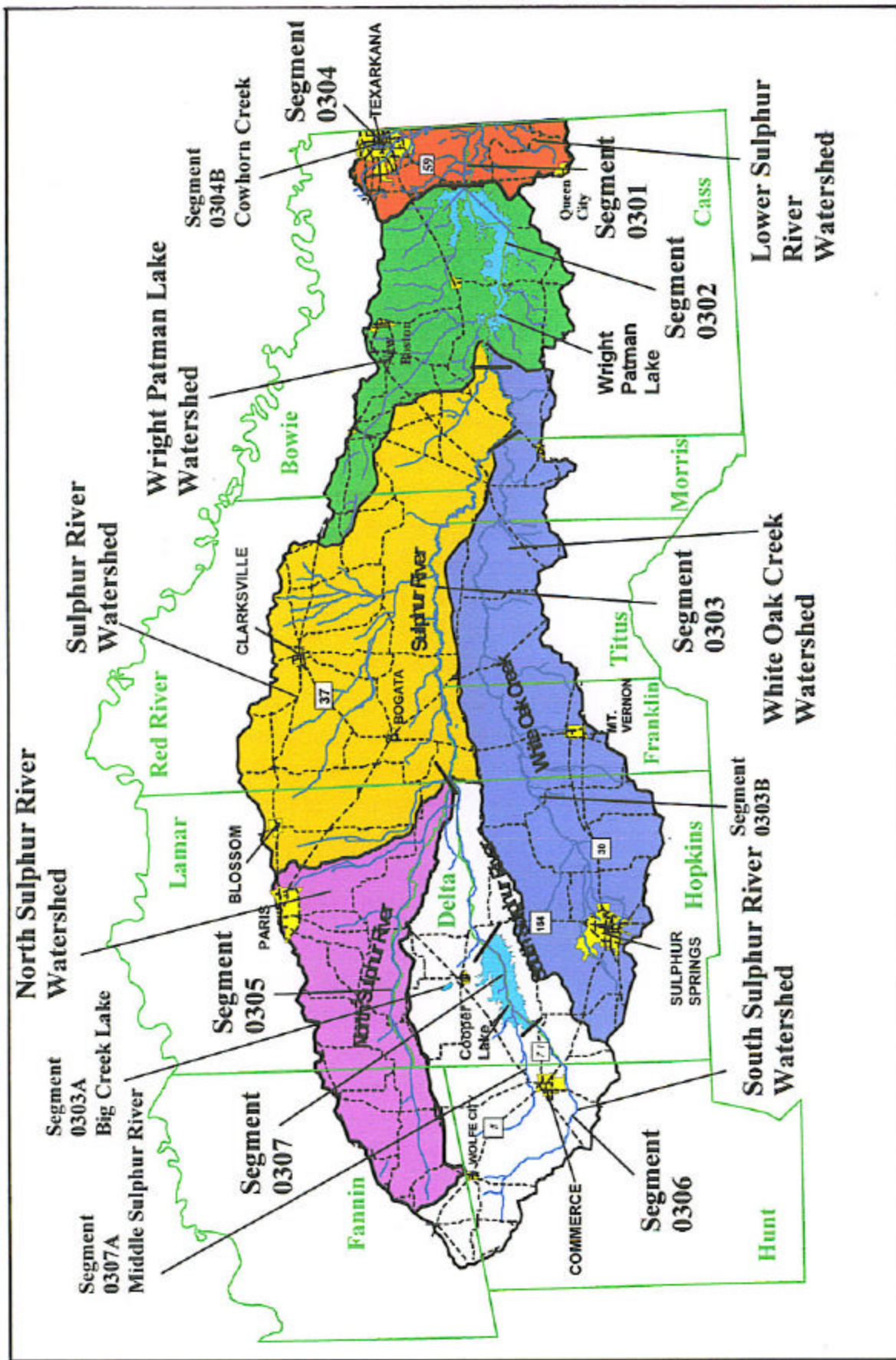
Wright Patman Lake is included in the Draft 2004 Water Quality Inventory due to partial support of the aquatic life use near the International Paper intake, and non-support in the Sulphur River arm as a result of low dissolved oxygen concentrations. High pH levels result in partial support of general uses near the dam and non-support in the northeast corner of the reservoir. Wright Patman Lake is also included on the Draft 2004 303(d) list as a result of these same problems. In addition, concerns with high total phosphorus concentrations in the Sulphur River arm and excessive algal growth in the northeast corner of the reservoir are expressed in the Draft 2004 Water Quality Inventory.

The results of sampling to date support 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 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. pH during the daylight hours by removing

carbon dioxide from the water.

SRBA monitored three RT sites on Lake Wright Patman during FY 2004. The three sites are located near the International Paper (IP) intake, at the North Shore, and at Hwy 8. Each site was monitored six times with field parameters, and depth profiles recorded. On four of the six monitoring events, conventional water samples were collected and 24-hour studies conducted. Lake Wright Patman has a history of low dissolved oxygen, high pH, and high chlorophyll levels. This monitoring tended to support previous data. The dissolved oxygen criteria standard for Lake Wright Patman is 5 mg/l. The average dissolved oxygen concentration was below 5mg/L during each of the 24-hour studies and the Hwy 8 site was below the 4-mg/l level during three of the four studies. This site is located in the channel just east of the Hwy 8 Bridge, and the water depth is between 5 and 6 meters. The depth profiles show that the dissolved oxygen levels fall off rapidly as the distance below the surface increases. The chlorophyll concentration was highest at the International Paper intake site with a maximum value of 38.9 mg/l. During the summer months, the pH and DO concentrations tend to undergo large swings with low DO and pH at night and high values during the day. This

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Sulphur River Basin Subwatersheds and Segments Mentioned on the DRAFT 2004 Texas Water Quality Inventory and 303(d) List



Water Quality Data Review cont.

behavior is characteristic of lakes with a high level of photosynthesis.

Lower Sulphur River Watershed

The portion of the Sulphur River from Wright Patman Lake to the Arkansas border (Segment 0301) and its tributaries constitute the Lower Sulphur River Watershed. Days Creek (Segment 0304), the watershed's largest tributary joins with the Lower Sulphur River in Arkansas.

Although there are numerous small impoundments on Days Creek and its tributaries, there are no large reservoirs in the Lower Sulphur River Watershed.

Land use here is dominated by rural land uses except in the vicinity of Texarkana. The proportion of urban land is substantially higher in the Lower Sulphur River drainage area than in the other portions of the Sulphur River Basin discussed in this report, roughly equaling the area occupied by agricultural land uses (19%). There are a relatively large number of Confined Animal Feeding Operations (CAFOs) present in the area of the watershed devoted to agricultural land uses.

Permitted dischargers in the Lower Sulphur River Watershed include six industrial dischargers, two municipal dischargers, and one CAFO discharge permit. There are two Federal superfund sites located in this watershed

near the City of Texarkana, Texarkana Wood Preservers and Koppers, both wood treatment facilities.

Although it is the smallest classified watershed in the Sulphur River Basin, population growth in the urban areas of the Lower Sulphur River Watershed is higher than that of the other watersheds in the basin. The three largest cities in the watershed all showed positive growth between 1990 and 2000. Texarkana, the largest city in the basin, showed the largest numerical growth in the basin (3,126 people) and continues to grow.

Segment 0301 (Lower Sulphur River) is included in the Draft 2004 Water Quality Inventory as a result of algal growth concerns in the lower 9 miles of the segment, but neither Segment 0301 nor 0304 (Days Creek) are on the draft 2004 303(d) list.

A station located on Days Creek at State Line (Segment 304), below the Texarkana South Regional Wastewater Plant, was the site monitored in FY2004 by SRBA. Days Creek drains most of the Texarkana, Texas and Texarkana, Arkansas area and is subject to rapid changes in flow with regular high water levels. During normal flow the water is dominated by the release from the wastewater treatment plant. The four monitoring events at this station included field parameters, stream flow, nutrients, and E. coli bacteria counts. The parameters collected were all nor-

mal for streams of this area with the exception of high nitrate-N levels that were as high as 15 ppm. The maximum level of nitrate acceptable for drinking water standards is 12 ppm. The values are high due to the release from the wastewater plant. Benthic (bottom dwelling organisms) and nekton (fish) collections were completed twice during the summer of 2004 as well as habitat analysis and 24-hour studies (Diel). Both the benthic and nekton studies indicated the aquatic life use rating to be "intermediate", which supports its designated use. The average daily dissolved oxygen levels were adequate for intermediate aquatic life. The stream reach studied was also determined to have an aquatic life use rating of "intermediate".

Days Creek has no bends of any consequence and the bottom is mostly sand and silt. When the stream bottom is disturbed, it is often accompanied by the release of an oily sheen. The site is located downstream from three closed wood treatment plants that are the probable source of a creosote mixture that is found in both soil and sediment. Two of the wood treatment plants have been closed for many years and are currently superfund sites (Koppers and Texarkana Wood Preserving). The third plant, Kerr-McGee Corporation, was closed and completely dismantled during FY 2004. The extent and

impact of the creosote in the sediment is the subject of a TCEQ special study during FY 2004.

As part of a TCEQ Special Study (see SS section) SRBA also evaluated benthic communities, nekton communities, and habitat at 3 sites: Days Creek below its junction with Howard Creek, Days Creek near Kerr McGee, and Days Creek at Lubbock Street. The aquatic life use rating for the nekton studies was "intermediate" for all studies. The aquatic life use rating for the benthic study was "limited" at the Kerr McGee and Lubbock Street sites in May, and the other ratings were intermediate. The habitat analysis resulted in a rating of "high" for each site.



"The Sulphur River Watershed is the largest watershed in the Sulphur River Basin, occupying the northern half of the central region of the basin."

A number of special studies have been conducted in the Sulphur River Basin in the last few years within the Clean Rivers Program. The focus of these studies has been the improvement of water quality within the basin, and the documentation of watershed conditions both current and historical. Special studies are additional water monitoring projects designed to address a specific concern or to provide additional information as a result of a previous monitoring effort or a current issue affecting water quality. As part of the Texas Clean Rivers Program, these special studies deal with specific water quality issues or are used to support other programs (e.g., Total Maximum Daily Load development) addressing water quality issues in the basin. Water quality and associated studies completed or in progress in the last few years within the Sulphur River Basin include the following:

Days Creek Sediment Study

Days Creek has been studied at several sites over a period of years because it drains two superfund sites, numerous industrial sites, and the city of Texarkana. This stream has no bends of any consequence and the bottom is mostly sand and silt. When the stream bottom is disturbed, it is often accompanied by the release of an oily sheen. One site studied is located downstream from three closed wood treatment

plants that are the possible source of a creosote mixture that is found in both the soil and sediment. Two of these wood treatment plants have been closed for many years and are currently superfund sites (Koppers and Texarkana Wood Preserving). The third plant, Kerr-McGee Corporation, was closed and completely dismantled during 2004.

Days Creek has been documented as having high levels of semi-hydrocarbon residue in sediment samples by both the Texas Commission on Environmental Quality (TCEQ) and the Sulphur River Basin Authority (SRBA). A cooperative Special Study is being conducted to document present levels of PAH (polyaromatic hydrocarbons) and other constituents in Days Creek (Segment 0304). TCEQ Region 5 and SRBA/TC are monitoring to collect a data set that can be compared with results collected during an initial study in 1994. SRBA assisted TCEQ in this special study of Days Creek to evaluate the stream status with respect to creosote contamination documented in prior years. The role of SRBA was to study three sites; Days Creek 0.9km downstream of the Howard Creek confluence, Days Creek near Kerr McGee, and Days Creek at Lubbock Street. The SRBA study involved routine benthic and nekton studies and habitat analysis. The

aquatic life use rating for the nekton studies was "intermediate" for all studies, which means that this water body supports the expected aquatic life use most of the time. The designated Texas Surface Water Quality Standard for Days Creek is also listed as intermediate. The aquatic life use rating for the benthic study was "limited", or supporting the expected aquatic life use some of the time, at the Kerr McGee and Lubbock Street sites in May, and the other ratings were intermediate. The habitat analysis resulted in a rating of "high" for each site, which means that the water body supports the expected aquatic life use all of the time. It is hoped that data from the sites selected on Days Creek will help to identify the source of the hydrocarbons and to quantify their impact.

Targeted Flow Monitoring

The TCEQ uses the seven-day, two-year low-flow (7Q2) and the harmonic mean flow to calculate water-quality based effluent limits and to establish testing parameters in wastewater discharge permits. The TCEQ often has very little site-specific flow information upon which to base the 7Q2 and harmonic mean flow, and the uncertainty in these flows carries through to the permit limit calculations and the testing requirements. The TCEQ has identified a permitted



The aquatic life use rating for the nekton studies was "intermediate" for all studies, which means that this water body supports the expected aquatic life use most of the time

Special Studies cont.



discharge site at which flow information would improve the quality of information about the permit limits and conditions. The targeted flow monitoring study was initiated based on this selected site location.

In 2004, SRBA implemented a targeted monthly monitoring flow study at a site located at Waggoner Creek at US 82, which was recommended

by the TCEQ Permitting Section. This monthly monitoring will continue for 18 months and a final report will be submitted to the TCEQ upon completion of the study. Flow measurements, field parameters, recorded observations and photos will be included in the report. Stream discharge will be monitored monthly to help characterize flow conditions for the

permitting process and add to the information available for the current permit holder. This information will then be used by the TCEQ in setting permit discharge limits. This monitoring will allow the TCEQ to better characterize the flow regime of the receiving stream, and determine the 7Q2 and the harmonic mean flow. Use of this information will help to set more accurate permit discharge limits.

“ Increased public involvement can result in more public awareness and a larger sense of community responsibility.”

Public Outreach

The focus in the Sulphur River Basin public outreach efforts is the encouragement of public involvement concerning the Clean Rivers Program and other basin activities. This involvement is important to the development of support for the program, and a means of gathering recommendations from the public. The public can get involved in basin activities either through the steering committee meetings or volunteer activities.

The primary purpose of our website www.sulphurr.org is to provide the citizens of our basin and other interested parties a useful tool which focuses on the Sulphur River Basin. The Sulphur River Basin Authority (SRBA) is the Sulphur River Basin partner with the Texas Commission on Environmental Quality (TCEQ) in the statewide Clean Rivers Program. Under this program SRBA has assumed a portion of the responsibility for monitoring the water quality and ecosystem health in the

rivers and lakes of the Sulphur River Basin. Information obtained through this monitoring is critical to understanding how our waterways respond to human activity. Monitoring is the primary source of information utilized by those responsible for managing water quality. Members of the community interested in the health of the Sulphur River Basin will find all this information and more available to them on the SRBA website. Included within our site is a summary of the Clean Rivers Program work plan, current information on water monitoring, water data, basin maps, and special study information in addition to other resources. Our goal is to provide a readily available resource of information to the public, which we hope will encourage citizens of our basin to be well informed about local environmental issues.

On our website, there are several key elements that help define our goals and

provide current information to the public. These elements include:

Public Participation and Outreach: Volunteer monitoring activities, events, newsletters, special studies activities, and meeting dates with agendas are posted regularly. Increased public involvement can result in more public awareness and a larger sense of community responsibility. More volunteerism in our basin is another important goal. Organizations such as Texas Watch, and TCEQ host statewide and regional meetings, partner certification training, special events and projects that are designed to aid in increasing public awareness and involvement. Contact information for these events are easily found on the Sulphur River Authority website. Questions or comments concerning any information found on the website are always welcome.



Public Outreach cont.

Basin Steering Committee Meetings: Held at least once a year, meeting announcements and minutes are updated regularly on our website. Meeting agendas are structured to promote public involvement and serve as a review of achievable water quality objectives and priorities for the basin. Steering committee meeting minutes are available on the Sulphur River Basin webpage. Open to the public, these meetings are designed to be a forum for public comments and input on water quality issues.

Texas Watch: Is prominently highlighted within the SRBA website. Through community action projects Texas Watch assists communities with strategies that encourage actions focused on correcting environmental problems. Some of these strategies include trash clean-ups, stream bank stabilization, and storm drain stenciling. Assistance with the assessment of water quality information is also avail-

able on a limited basis, and is generally focused in areas where interest in environmental problems will possibly inspire citizens to create positive change. Texas Watch may also help communities with data screening, data analysis, and problem identification within these selected target areas.

Quality Assurance: To the greatest extent possible, the data produced by the Clean Rivers Program (CRP) is of the highest quality required for its intended use. The Quality Assurance Project Plan (QAPP) includes a series of checks and balances that are used in the operation of all CRP activities. The site map on www.sulphurr.org will lead you to current information regarding several aspects of the Quality Assurance Project Plan.

Water Quality Monitoring: Navigate to the site map on www.sulphurr.org and you will find Coordinated Monitoring schedules that

list all the scheduled monitoring being done in the current fiscal year. Maps of all areas that have been sampled on either the past or present schedules are updated regularly. Monitoring activities, events, special studies activities and meetings dates with agendas are available to increase public awareness and encourage a larger sense of community responsibility. Current water quality data are posted at least quarterly, including specifics about the sampling station location and date sampled.

Data Analysis and Reporting: Compiled data, maps and reports are the result of the information we gather and evaluate. The most current as well as historical data can be viewed on www.sulphurr.org

Special studies such as the Lake Wright Patman Report can also be downloaded or printed from the www.sulphurr.org



“Through community action projects Texas Watch assists communities with strategies that encourage actions focused on correcting environmental problems.”

www.sulphurr.org



Ask yourself
What watershed do I live in? Which streams and rivers in my area are being monitored? Where can I find the current monitoring schedule for my area? To whom can I direct environmental questions about the Sulphur River Basin?

These are a few of the questions that are easily

answered in a matter of minutes when you access the Sulphur River Basin Authority (SRBA) Clean Rivers Program website www.sulphurr.org Getting acquainted with the Sulphur River Basin opens up a world of interest and concerns that we all have in common when it comes to our land and drinking water. Not everyone has time to donate towards

state projects that span counties, towns and basins, however almost everyone has some time they can devote to gathering information about their own local area. Our web site is intended to be a place where the public can access that information about SRBA and the Sulphur River Basin. The

(Continued on page 16)



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We're On the Web!
www.sulphurr.org



www.sulphurr.org cont.

SRBA website makes this task easier by providing updates on various projects being undertaken throughout the basin, and serving as a forum for public input.

Items available on the Sulphur River Basin website include:

The site map: All the information contained within the website is found on the site map. Click on the site map link on the homepage, it's easy to find your way through the site at this point.

Links to Texas Commission On Environmental Quality (TCEQ): TCEQ provides a current and historical record of all basin activity. TCEQ's water quality databases include maps, reports and future projects for all the basins in Texas.

Contact information: Email, snail mail, we want to hear from you! We are here for your community's benefit!

Links to Texas Watch: Find programs and grants

for pollution control and recycling. Texas Watch provides many volunteer opportunities in your basin.

Steering Committee Meetings: Attend a meeting or read the minutes recorded at the last meeting. The meetings are announced a month in advance on the website.

Public speaking engagements and presentations: As members of the community you are encouraged to get involved

and become aware of your environment. If you have questions about the Sulphur River Basin, our website is the place to start. Current maps, reports and calendar of events are continually updated. The Sulphur River Basin website serves as an accessible tool for you to use at your convenience at www.sulphurr.org

