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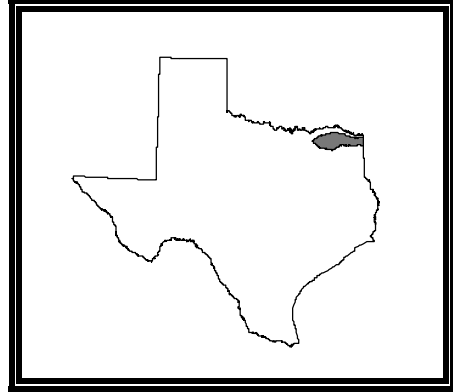
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# Basin 03

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## Sulphur River



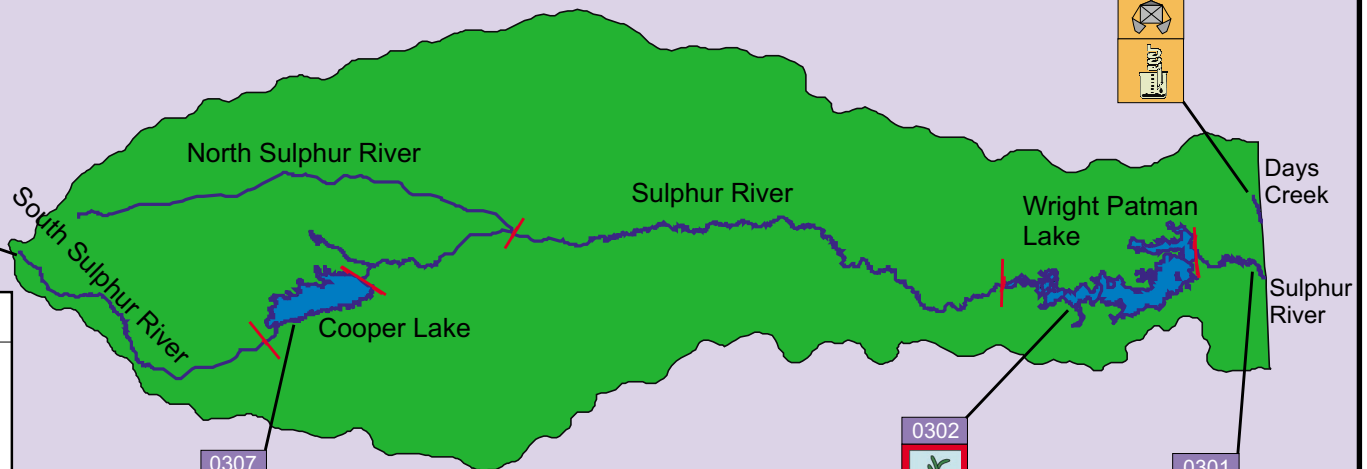
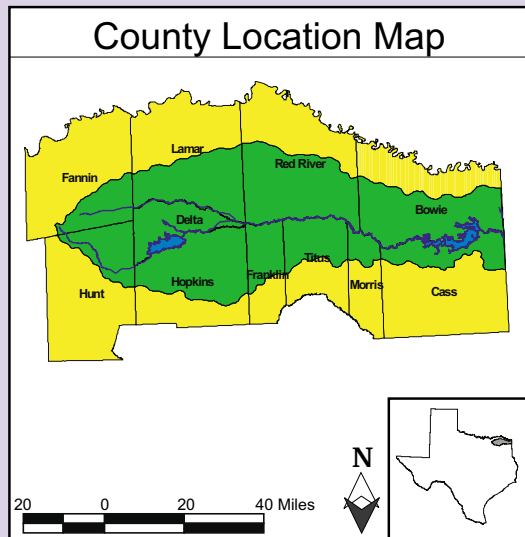
## Sulphur River Basin Narrative Summary

The Sulphur River Basin lies within 11 northeast Texas counties and drains an area of 3,558 square miles in Texas. The South Sulphur River originates in southeastern Fannin County and flows eastward, joining the Middle Sulphur and North Sulphur Rivers. From this confluence, the Sulphur River flows eastward into Lake Wright Patman. Downstream of Lake Wright Patman, the Sulphur River exits Texas and converges with the Red River in Arkansas. White Oak Bayou and Days Creek are the major tributaries to the Sulphur River.

Wright Patman Lake and Cooper Reservoir, covering 20,314 and 10,305 acres, respectively, are the only major main stem reservoirs presently existing on the Sulphur River. The riverine portion of the Sulphur River Basin has been divided into five segments that comprise 308 miles. Data from 34 routine surface water monitoring stations in the basin were used in the assessment.

Wright Patman Lake, Cooper Reservoir, and the Upper South Sulphur have pH levels that are sometimes higher than the criterion established. This may be reflective of natural conditions in East Texas. Sluggish flow, coupled with municipal wastewater discharges, contributes to elevated levels of nutrients and fecal coliform, as well as the periodically depressed dissolved oxygen concentrations that occur in the reservoirs and in some streams in the basin. Atrazine (a widely used herbicide) contamination in finished drinking water has been observed in Big Creek Lake.

# Sulphur River Basin Identified Water Quality Issues






# Sulphur River Basin Graphical Summary

Basin Map	Water Bodies									
	Segment 0301 Sulphur River Below L. Wright Patman	Segment 0302 Lake Wright Patman	Segment 0303 Sulphur/South Sulphur River	Segment 0303A Big Creek Lake	Segment 0303B White Oak Creek	Segment 0304 Days Creek	Segment 0304A Swampoodle Creek	Segment 0304B Cowhorn Creek	Segment 0305 North Sulphur River	Segment 0306 Upper South Sulphur River
<b>DESIGNATED USE SUPPORT</b>										
Contact Recreation	S	S	S	NA	NA	S	NA	NA	S	N
Noncontact Recreation	X	X	X	X	X	X	X	X	X	X
Public Water Supply	X	S	X	T	X	X	X	X	X	X
<b>Fish Consumption</b>										
Human Health	S	S	S	NA	S	NA	NA	NA	S	S
Advisories/Closures	S	S	NA	NA	NA	NA	NA	NA	NA	NA
<b>Aquatic Life</b>										
Dissolved Oxygen (Grab)	S	N	S	NA	P	S	NA	S	S	P
Dissolved Oxygen (24-Hour)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Metals in Water	S	S	S	NA	S	NA	NA	NA	S	S
Organics in Water	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Water Toxicity Tests	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sediment Toxicity Tests	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Macrobenthos	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fish	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
<b>GENERAL USE SUPPORT</b>										
Water Temperature	S	S	S	X	X	S	X	X	S	S
pH	S	N	S	X	X	S	X	X	S	N
Chloride	S	S	S	X	X	S	X	X	S	S
Sulfate	S	S	S	X	X	S	X	X	S	S
Total Dissolved Solids	S	S	S	X	X	S	X	X	S	S

S = Support; P = Partial Support; N = Nonsupport; T = Threatened; NC = No Concern; C = Concern; NA = Not Assessed; X = Not Applicable

### Sulphur River Basin Graphical Summary (Continued)

Basin Map	Water Bodies									
	Segment 0301 Sulphur River Below L. Wright Patman	Segment 0302 Lake Wright Patman	Segment 0303 Sulphur/South Sulphur River	Segment 0303A Big Creek Lake	Segment 0303B White Oak Creek	Segment 0304 Days Creek	Segment 0304A Swampoodle Creek	Segment 0304B Cowhorn Creek	Segment 0305 North Sulphur River	Segment 0306 Upper South Sulphur River
										
WATER QUALITY CONCERNS										
Contact Recreation	X	X	X	NA	NA	X	C	NA	X	X
Noncontact Recreation	X	X	X	X	X	X	X	X	X	X
Fish Tissue	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sediment	NA	NA	NA	NA	NA	C	NA	NA	NA	NA
Narrative	NC	NC	NC	NC	NC	NC	NC	NA	NC	NC
Nutrient Enrichment										
Ammonia Nitrogen	NC	NC	NC	NA	NC	NC	C	NA	NC	NC
Nitrite + Nitrate Nitrogen	NC	NC	NC	NA	NC	C	NC	NA	NC	C
Orthophosphorus	NC	NC	NC	NA	NC	NC	NC	NA	NC	C
Total Phosphorus	NC	NA	NC	NA	NA	NC	NC	NA	NC	NC
Chlorophyll <i>a</i>	C	NA	NC	NA	NA	NC	NA	NA	NC	NC
Public Water Supply										
Finished Water Chloride	X	NC	X	NC	X	X	X	X	X	X
Finished Water Sulfate	X	NC	X	NC	X	X	X	X	X	X
Finished Water TDS	X	NC	X	NC	X	X	X	X	X	X
Surface Water Chloride	X	NC	X	NA	X	X	X	X	X	X
Surface Water Sulfate	X	NC	X	NA	X	X	X	X	X	X
Surface Water TDS	X	NC	X	NA	X	X	X	X	X	X
Aquatic Life										
Dissolved Oxygen	X	X	X	NA	X	X	NA	X	X	X
Metals in Water	X	X	X	NA	X	NA	NA	NA	X	X
Organics in Water	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Water Toxicity Tests	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sediment Toxicity Tests	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

# Sulphur River Basin Graphical Summary

Basin Map	Water Bodies									
	Segment 0307 Cooper Lake	Segment 0307A Middle Sulphur River								
<b>DESIGNATED USE SUPPORT</b>										
Contact Recreation	NA	NA								
Noncontact Recreation	X	X								
Public Water Supply	S	X								
<b>Fish Consumption</b>										
Human Health	NA	S								
Advisories/Closures	NA	NA								
<b>Aquatic Life</b>										
Dissolved Oxygen (Grab)	P	S								
Dissolved Oxygen (24-Hour)	NA	NA								
Metals in Water	NA	S								
Organics in Water	NA	NA								
Water Toxicity Tests	NA	NA								
Sediment Toxicity Tests	NA	NA								
Macrobenthos	NA	NA								
Fish	NA	NA								
<b>GENERAL USE SUPPORT</b>										
Water Temperature	S	X								
pH	N	X								
Chloride	S	X								
Sulfate	S	X								
Total Dissolved Solids	S	X								

S = Support; P = Partial Support; N = Nonsupport; T = Threatened; NC = No Concern; C = Concern;  
 NA = Not Assessed; X = Not Applicable



**Sulphur River Basin Graphical Summary (Continued)**

Basin Map	Water Bodies									
	Segment 0307 Cooper Lake	Segment 0307A Middle Sulphur River								
<b>WATER QUALITY CONCERNS</b>										
Contact Recreation	NA	NA								
Noncontact Recreation	X	X								
Fish Tissue	NC	NA								
Sediment	NA	NA								
Narrative	NC	NC								
<b>Nutrient Enrichment</b>										
Ammonia Nitrogen	NC	NC								
Nitrite + Nitrate Nitrogen	NC	NC								
Orthophosphorus	NA	NC								
Total Phosphorus	NA	NA								
Chlorophyll <i>a</i>	NA	NA								
<b>Public Water Supply</b>										
Finished Water Chloride	NC	X								
Finished Water Sulfate	NC	X								
Finished Water TDS	NC	X								
Surface Water Chloride	NC	X								
Surface Water Sulfate	NC	X								
Surface Water TDS	NC	X								
<b>Aquatic Life</b>										
Dissolved Oxygen	X	X								
Metals in Water	NA	X								
Organics in Water	NA	NA								
Water Toxicity Tests	NA	NA								
Sediment Toxicity Tests	NA	NA								

# Sulphur River Basin

## Segment 0301 - Sulphur River Below Wright Patman Lake

**Water body description:** From the Arkansas state line in Bowie/Cass County to Wright Patman Lake Dam in Bowie/Cass County

**Water body classification:** Classified

**Water body type:** Freshwater Stream

**Water body length / area:** 19.00 Miles

**Use support summary:** Available data indicate all uses are supported.

**Water quality concerns summary:** Chlorophyll *a* is a concern.

### Monitoring sites used in the assessment

Station	Station Description
10212	Sulphur River Bridge on US 59 north of Atlanta
13783	Sulphur River at KCS Railroad Bridge below International Paper Company near Domino

### Wastewater dischargers

Permit type	Number of outfalls
Industrial	7

# Sulphur River Basin

## Segment 0302 - Wright Patman Lake

**Water body description:** From Wright Patman Lake Dam in Bowie/Cass County to a point 1.5 km (0.9 miles) downstream of Bassett Creek in Bowie/Cass County, up to the normal pool elevation of 225 feet (impounds the Sulphur River)

**Water body classification:** Classified

**Water body type:** Reservoir

**Water body length / area:** 20,300 Acres

**Use support summary:** The aquatic life use is not supported in the upper 6,693 acres of the reservoir due to depressed dissolved oxygen concentrations. The aquatic life use is partially supported due to depressed dissolved oxygen concentrations in a 400-acre area near the dam, a 123-acre area in the north-western-most tip of the reservoir and in a 3,381-acre area in the upper mid lake section. Due to elevated pH values, general uses are not supported in a 123-acre area in the northwestern-most tip of the reservoir, and are partially supported in the 2,350 acre arm northwest of the dam, a 3,726 acre area in mid-reservoir, and a 3,381 acre area in the upper-mid reservoir. Available data indicate that all other uses are supported.

**Water quality concerns summary:** Available data indicate that there are no water quality concerns in the reservoir.

**Additional information:** Projects are scheduled for dissolved oxygen and pH to do one or more of the following: assess the relevant water quality standard; to confirm the impairment; to conduct a total maximum daily load (TMDL) to evaluate the causes and sources and allocate the allowable loading; or to correct the impairment under another program. For more information on specific TMDL projects, visit the TNRCC Web site at [www.tnrcc.state.tx.us/water/quality/tmdl/](http://www.tnrcc.state.tx.us/water/quality/tmdl/).

## Monitoring sites used in the assessment

Station	Station Description
10213	Wright Patman Lake near dam approx 2.1km SW of spillway and 1.1km NW of raw water intake structure
10214	Wright Patman Lake at SH 8
14097	Wright Patman Lake USGS site AC
14098	Wright Patman Lake USGS site AL
14099	Wright Patman Lake USGS site BC
14100	Wright Patman Lake USGS site CC
14102	Wright Patman Lake USGS site DC
14103	Wright Patman Lake USGS site EC
15061	Wright Patman Lake at north shore at Clear Spring Park
16205	Lake Wright Patman near Atlanta State Park at Knight's Bluff

## Published studies

Publication	Date	Author
IMS 17 Lake Wright Patman	Jan. 1975	Twidwell, S.

## Wastewater dischargers

Permit type	Number of outfalls
Agriculture	4
Domestic	7
Industrial	7

## Historical fish kills

Start date	Location	Fish killed	Suspected cause
08/23/1995	Lake Wright Patman	1	Unknown
08/22/1996	Wright Patman at and above HWY 8 bridge to Anderson Creek	100	Low Dissolved Oxygen

# Sulphur River Basin

## Segment 0303 - Sulphur/South Sulphur River

**Water body description:** From a point 1.5 km (0.9 miles) downstream of Bassett Creek in Bowie/Cass County to Cooper Lake Dam in Delta/Hopkins County

**Water body classification:** Classified

**Water body type:** Freshwater Stream

**Water body length / area:** 181.00 Miles

**Use support summary:** Available data indicate all uses are supported.

**Water quality concerns summary:** Available data indicate that there are no water quality concerns.

**Additional information:** A wasteload evaluation (WLE) for dissolved oxygen was approved in 1988 and has been incorporated into the state Water Quality Management Plan. Advanced waste treatment is required for one or more dischargers.

### Monitoring sites used in the assessment

Station	Station Description
10215	Sulphur River at US 67 NE of Naples
10219	Sulphur River Bridge at US 271 in northeast corner of county
10222	South Sulphur River at SH 19 east of Cooper

### Published studies

Publication	Date	Author
AS-36/SR Big Slough	Sept. 1992	Crowe, A (Region 5)
IMS 18 Sulphur River	Aug. 1974	Twidwell, S.
IS 10 Rock Creek	May 1979	Respass, D.
IS 86-06 Sulphur River	Aug. 1984	Ottmers, D.
IS 9 South Sulphur River	July 1979	Respass, D.

## Wastewater dischargers

Permit type	Number of outfalls
Agriculture	38
Domestic	15
Industrial	14

## Sulphur River Basin

### Segment 0303A - Big Creek Lake (unclassified water body)

**Water body description:** From Big Creek Dam up to normal pool elevation of 458 feet north of Cooper (impounds Big Creek)

**Water body classification:** Unclassified

**Water body type:** Reservoir

**Water body length / area:** 700.00 Acres

**Use support summary:** The public water supply use is threatened in the entire reservoir due to atrazine concentrations in finished drinking water. Other uses were not assessed due to insufficient data.

**Water quality concerns summary:** Available data indicate that there are no water quality concerns.

**Additional information:** A project is underway to assess the threat of impairment from atrazine to do one or more of the following: assess the relevant water quality standard; to confirm the impairment; to conduct a total maximum daily load (TMDL) to evaluate the causes and sources and allocate the allowable loading; or to correct the impairment under another program. For more information on specific TMDL projects, visit the TNRCC Web site at [www.tnrcc.state.tx.us/water/quality/tmdl/](http://www.tnrcc.state.tx.us/water/quality/tmdl/).

# Sulphur River Basin

## Segment 0303B - White Oak Creek (unclassified water body)

**Water body description:** From the confluence of the Sulphur River north of Naples in Morris County to the upstream perennial portion of the stream east of Sulphur Springs in Hopkins County

**Water body classification:** Unclassified

**Water body type:** Freshwater Stream

**Water body length / area:** 70.00 Miles

**Use support summary:** The aquatic life use is partially supported in the lower 50 miles due to depressed dissolved oxygen concentrations. The fish consumption use is supported. The contact recreation use was not assessed due to insufficient data.

**Water quality concerns summary:** Available data indicate no concerns in the segment.

**Additional information:** A project is scheduled for dissolved oxygen to do one or more of the following: assess the relevant water quality standard; to confirm the impairment; to conduct a total maximum daily load (TMDL) to evaluate the causes and sources and allocate the allowable loading; or to correct the impairment under another program. For more information on specific TMDL projects, visit the TNRCC Web site at [www.tnrcc.state.tx.us/water/quality/tmdl/](http://www.tnrcc.state.tx.us/water/quality/tmdl/).

### Monitoring sites used in the assessment

Station	Station Description
10198	White Oak Creek at US 259 north of Omaha
10199	White Oak Creek at US 271 southeast of Talco



# Sulphur River Basin

## Segment 0304 - Days Creek

**Water body description:** From the Arkansas state line in Bowie County to the confluence of Swampoodle Creek and Nix Creek in Bowie County

**Water body classification:** Classified

**Water body type:** Freshwater Stream

**Water body length / area:** 5.00 Miles

**Use support summary:** Available data indicate all uses are supported.

**Water quality concerns summary:** Nitrite + nitrate nitrogen is a concern. Phenanthrene, pyrene, and fluoranthene in sediment are concerns.

**Additional information:** A wasteload evaluation (WLE) for dissolved oxygen was approved in 1987 and has been incorporated into the state Water Quality Management Plan. Advanced waste treatment is required for one or more dischargers.

### Monitoring sites used in the assessment

Station	Station Description
10226	Days Creek at State Line Road south of Texarkana

### Published studies

Publication	Date	Author
AS 67/SR Days Creek	Dec. 1993	Crowe, A.
IS 33 Days Creek	Dec. 1980	Respass, D.

### Wastewater dischargers

Permit type	Number of outfalls
Domestic	2
Industrial	3

# Sulphur River Basin

## Segment 0304A - Swampoodle Creek (unclassified water body)

**Water body description:** From the confluence of Days Creek in central Texarkana in Bowie County to the upstream perennial portion of the stream in northern Texarkana in Bowie County

**Water body classification:** Unclassified

**Water body type:** Freshwater Stream

**Water body length / area:** 3.00 Miles

**Use support summary:** Uses were not assessed due to insufficient data.

**Water quality concerns summary:** Fecal coliform is a concern in the lower 1.5 miles.  
Ammonia nitrogen is a concern.

### Monitoring sites used in the assessment

Station	Station Description
15256	Swampoodle Creek at Richmond Rd. in Texarkana
15342	Swampoodle Creek at Broad St. in Texarkana, 0.7 km upstream of the confluence with Days Creek

# Sulphur River Basin

## Segment 0304B - Cowhorn Creek (unclassified water body)

**Water body description:** From the confluence of Wagner Creek in southern Texarkana in Bowie County to the upstream perennial portion of the stream in northern Texarkana in Bowie County

**Water body classification:** Unclassified

**Water body type:** Freshwater Stream

**Water body length / area:** 4.50 Miles

**Use support summary:** Available data indicate that the aquatic life use is supported. Other uses were not assessed due to insufficient data.

**Water quality concerns summary:** Available data indicate that there are no water quality concerns.

### Monitoring sites used in the assessment

Station	Station Description
15254	Cowhorn Creek at Tucker St. in Texarkana

# Sulphur River Basin

## Segment 0305 - North Sulphur River

**Water body description:** From the confluence with the South Sulphur River in Lamar County to a point 6.7 km (4.2 miles) upstream of FM 68 in Fannin County.

**Water body classification:** Classified

**Water body type:** Freshwater Stream

**Water body length / area:** 48.00 Miles

**Use support summary:** Available data indicate all uses are supported.

**Water quality concerns summary:** Available data indicate that there are no water quality concerns.

**Additional information:** A wasteload evaluation (WLE) for dissolved oxygen was approved in 1988 and has been incorporated into the state Water Quality Management Plan. Advanced waste treatment is not required for dischargers.

### Monitoring sites used in the assessment

Station	Station Description
10231	North Sulphur River at SH 24-19 south of Paris

### Wastewater dischargers

Permit type	Number of outfalls
Agriculture	4
Domestic	2
Industrial	4

# Sulphur River Basin

## Segment 0306 - Upper South Sulphur River

**Water body description:** From a point 1.0 km (0.6 miles) upstream of SH 71 in Delta/Hopkins County to SH 78 in Fannin County

**Water body classification:** Classified

**Water body type:** Freshwater Stream

**Water body length / area:** 42.00 Miles

**Use support summary:** In the middle 25-mile reach, general uses are not supported due to elevated pH values. In the lower 6 miles, the aquatic life use is partially supported due to depressed dissolved oxygen concentrations, the contact recreation use is not supported due to elevated fecal coliform densities, and general uses are partially supported due to low and elevated pH values. The fish consumption use is supported.

**Water quality concerns summary:** Nitrite + nitrate nitrogen and orthophosphorus are concerns in the upper 25 miles.

**Additional information:** A wasteload evaluation (WLE) for dissolved oxygen was approved in 1988 and has been incorporated into the state Water Quality Management Plan. Advanced waste treatment is required for one or more dischargers.

Projects are scheduled for dissolved oxygen, pH, and fecal coliform bacteria to do one or more of the following: assess the relevant water quality standard; to confirm the impairment; to conduct a total maximum daily load (TMDL) to evaluate the causes and sources and allocate the allowable loading; or to correct the impairment under another program. For more information on specific TMDL projects, visit the TNRCC Web site at [www.tnrcc.state.tx.us/water/quality/tmdl/](http://www.tnrcc.state.tx.us/water/quality/tmdl/).

### Monitoring sites used in the assessment

Station	Station Description
10234	South Sulphur River at FM 71 east of Commerce
10238	South Sulphur River at State Hwy 11 southeast of Commerce

## Wastewater dischargers

Permit type	Number of outfalls
Domestic	6

# Sulphur River Basin

## Segment 0307 - Cooper Lake

**Water body description:** From Delta/Hopkins County Dam in Delta/Hopkins County to a point 1.0 km (0.6 miles) upstream of SH 71 on the South Sulphur River Arm in Delta/Hopkins County and 300 meters (330 yards) below the confluence of Barnett Creek on the Middle Sulphur River Arm in Delta County, up to conservation pool elevation of 440 feet (impounds the Middle Sulphur/South Sulphur River).

**Water body classification:** Classified

**Water body type:** Reservoir

**Water body length / area:** 19,305 Acres

**Use support summary:** The aquatic life use is partially supported in the lower 8,000 acres due to depressed dissolved oxygen concentrations. General uses are not supported in the 3,000-acre lower arm of the reservoir and partially supported in 10,000 acres of the middle and lower portions of the reservoir due to elevated pH values. The public water supply use is supported. The contact recreation and fish consumption uses were not assessed due to insufficient data.

**Water quality concerns summary:** Available data indicate that there are no water quality concerns.

**Additional information:** A wasteload evaluation (WLE) for dissolved oxygen was approved in 1988 and has been incorporated into the state Water Quality Management Plan. Advanced waste treatment is required for one or more dischargers.

Projects are scheduled for dissolved oxygen and pH to do one or more of the following: assess the relevant water quality standard; to confirm the impairment; to conduct a total maximum daily load (TMDL) to evaluate the causes and sources and allocate the allowable loading; or to correct the impairment under another program. For more information on specific TMDL projects, visit the TNRCC Web site at [www.tnrcc.state.tx.us/water/quality/tmdl/](http://www.tnrcc.state.tx.us/water/quality/tmdl/).

### Monitoring sites used in the assessment

Station	Station Description
13855	Cooper Lake USGS site AC
13856	Cooper Lake USGS site BC
13857	Cooper Lake USGS site CC
13858	Cooper Lake USGS site DC
13860	Cooper Lake USGS site GC
15211	Cooper Lake mid-lake approx. 100 meters north of North Texas Municipal Water Supply District's intake structure, north of Peerless
16699	Cooper Lake at headwaters South Sulphur River arm approx 6.0km downstream of SH 71, 12.5km east of Commerce

### Wastewater dischargers

Permit type	Number of outfalls
Domestic	4



# Sulphur River Basin

## Segment 0307A - Middle Sulphur River (unclassified water body)

**Water body description:** From the confluence Cooper Lake in Hopkins County to the upstream perennial portion of the stream east of Wolfe City in Hunt County

**Water body classification:** Unclassified

**Water body type:** Freshwater Stream

**Water body length / area:** 29.00 Miles

**Use support summary:** Available data indicate that the aquatic life and fish consumption uses are supported. The contact recreation use was not assessed due to insufficient data.

**Water quality concerns summary:** Available data indicate that there are no water quality concerns.

### Monitoring sites used in the assessment

Station	Station Description
13632	Middle Sulphur River at SH 11, 1.5 mi. upstream from Willow Creek, 1.5 mi. north of Commerce