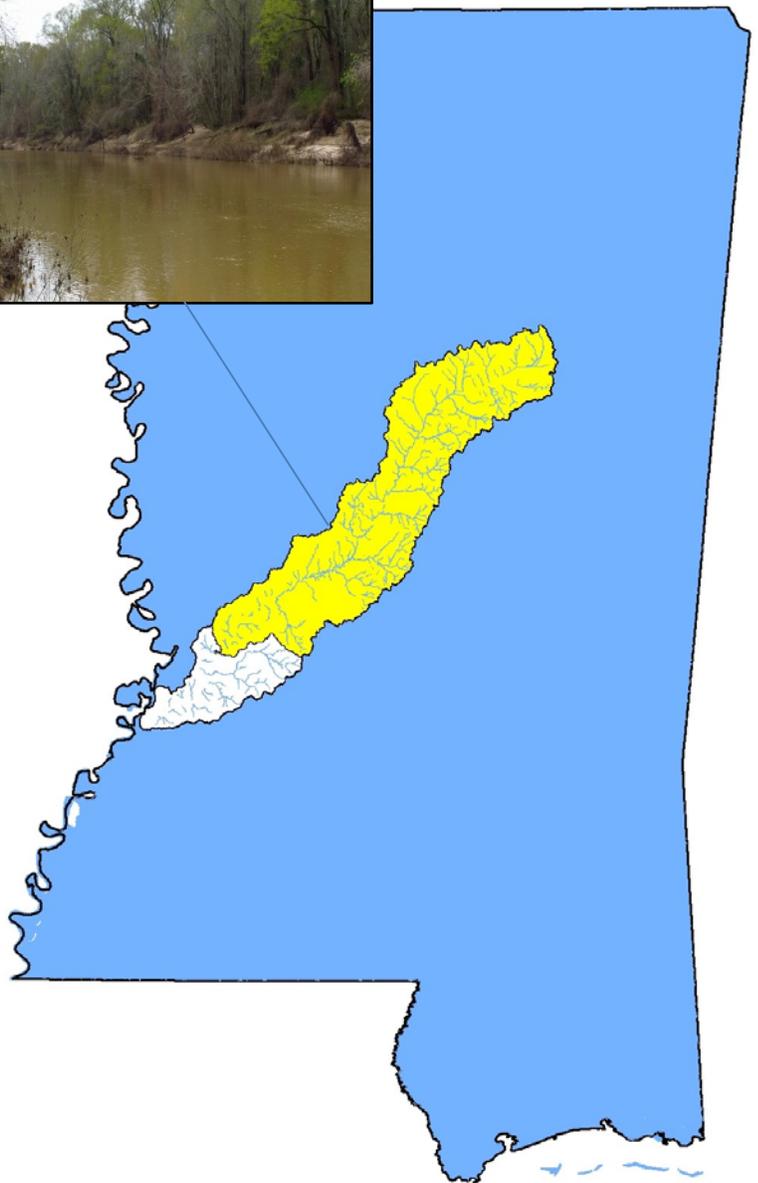


# pH TMDL for Big Black River Watershed

Big Black River Basin  
Hinds and Warren  
Counties, Mississippi

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Mississippi Department of  
Environmental Quality

## FOREWORD

The report contains one or more Total Maximum Daily Loads (TMDLs) for water body segments found on Mississippi’s 2014 Section 303(d) List of Impaired Water Bodies. The implementation of the TMDLs contained herein will be prioritized within Mississippi’s rotating basin approach.

As additional information becomes available, the TMDLs may be updated. Such additional information may include water quality and quantity data, changes in pollutant loadings, modifications to the water quality standards or criteria, or changes in landuse within the watershed. In some cases, additional water quality data may indicate that no impairment exists.

**Table 1. Conversion Factors**

From	To	multiply by	From	To	multiply by	From	To	multiply by
mi <sup>2</sup>	feet <sup>2</sup>	27,878,400	meter <sup>3</sup>	liter	1,000	miles	feet	5,280
km <sup>2</sup>	feet <sup>2</sup>	10,763,911	Feet <sup>3</sup> /sec	gallons/ min	448.8312	km	feet	3,280.84
hectares	feet <sup>2</sup>	107,639	meter <sup>3</sup>	gallons	264.1721	miles	meters	1,609.34
acre	feet <sup>2</sup>	43,560	meter <sup>3</sup>	Feet <sup>3</sup>	35.3147	meters	feet	3.2808
mi <sup>2</sup>	acre	640	Feet <sup>3</sup>	Liter	28.3168	km	miles	0.6214
km <sup>2</sup>	acre	247.1044	Yard <sup>3</sup>	Feet <sup>3</sup>	27	days	seconds	86,400
km <sup>2</sup>	hectares	100	Feet <sup>3</sup>	gallons	7.4805	mg/l * MGD	lbs/day	8.3454
hectares	acre	2.4710	Yard <sup>3</sup>	meter <sup>3</sup>	0.7646	µg/l * cfs	gm/day	2.4500
km <sup>2</sup>	mi <sup>2</sup>	0.3861	Feet <sup>3</sup> /sec	MGD	0.6463	tonnes	ton	1.1

**Table 2. Prefix Symbols**

Fraction	Prefix	Symbol	Multiple	Prefix	Symbol
10 <sup>-1</sup>	deci	d	10	deka	da
10 <sup>-2</sup>	centi	c	10 <sup>2</sup>	hecto	h
10 <sup>-3</sup>	milli	m	10 <sup>3</sup>	kilo	k
10 <sup>-6</sup>	micro	:	10 <sup>6</sup>	mega	M
10 <sup>-9</sup>	nano	n	10 <sup>9</sup>	giga	G
10 <sup>-12</sup>	pico	p	10 <sup>12</sup>	tera	T
10 <sup>-15</sup>	femto	f	10 <sup>15</sup>	peta	P
10 <sup>-18</sup>	atto	a	10 <sup>18</sup>	exa	E

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## TMDL INFORMATION PAGE

### Listing Information

Name	ID	County	Cause
Big Black River	107811	Hinds and Warren	pH
From confluence with Bear Creek to confluence with Clear Creek			

### Water Quality Standard

Parameter	Beneficial use	Water Quality Criteria
pH	Fish and Wildlife	The applicable water quality criteria, as described in the <i>WPC-2 State of Mississippi's Water Quality Criteria for Intrastate, Interstate, and Coastal Waters</i> , requires that the pH shall be within the range of 6.0 to 9.0 standard units (s.u.)

## Executive Summary

The Big Black River (107811) from the confluence with Bear Creek to the confluence with Clear Creek was assessed by the Mississippi Department of Environmental Quality (MDEQ) as not supporting its designated use for the pH standard on the State's 2014 Section 303(d) List of Impaired Water Bodies (MDEQ, 2014). This water quality limited segment is located in the Big Black Basin in Hinds and Warren Counties. The applicable water quality criteria, as described in the *WPC-2 State of Mississippi's Water Quality Criteria for Intrastate, Interstate, and Coastal Waters*, requires that the pH shall be within the range of 6.0 to 9.0 standard units (s.u.) (MDEQ, 2012).

The specific causes of the low pH for this water body are not known but probable causes may be attributed to stormwater runoff from fertilized soils from cropland, failed septic tanks, noncompliant point sources, and inactive natural gas pipelines. The wasteload allocation for the total maximum daily load (TMDL) requires that the pH in the effluent from permitted point sources shall be within the range of 6.0 to 9.0 s.u. The load allocation for the TMDL requires that the pH of waters originating from nonpoint sources shall be within the range of 6.0 to 9.0 s.u. These allocations provide for the year-round protection of water quality. The location of the watershed is shown in Figure 1.

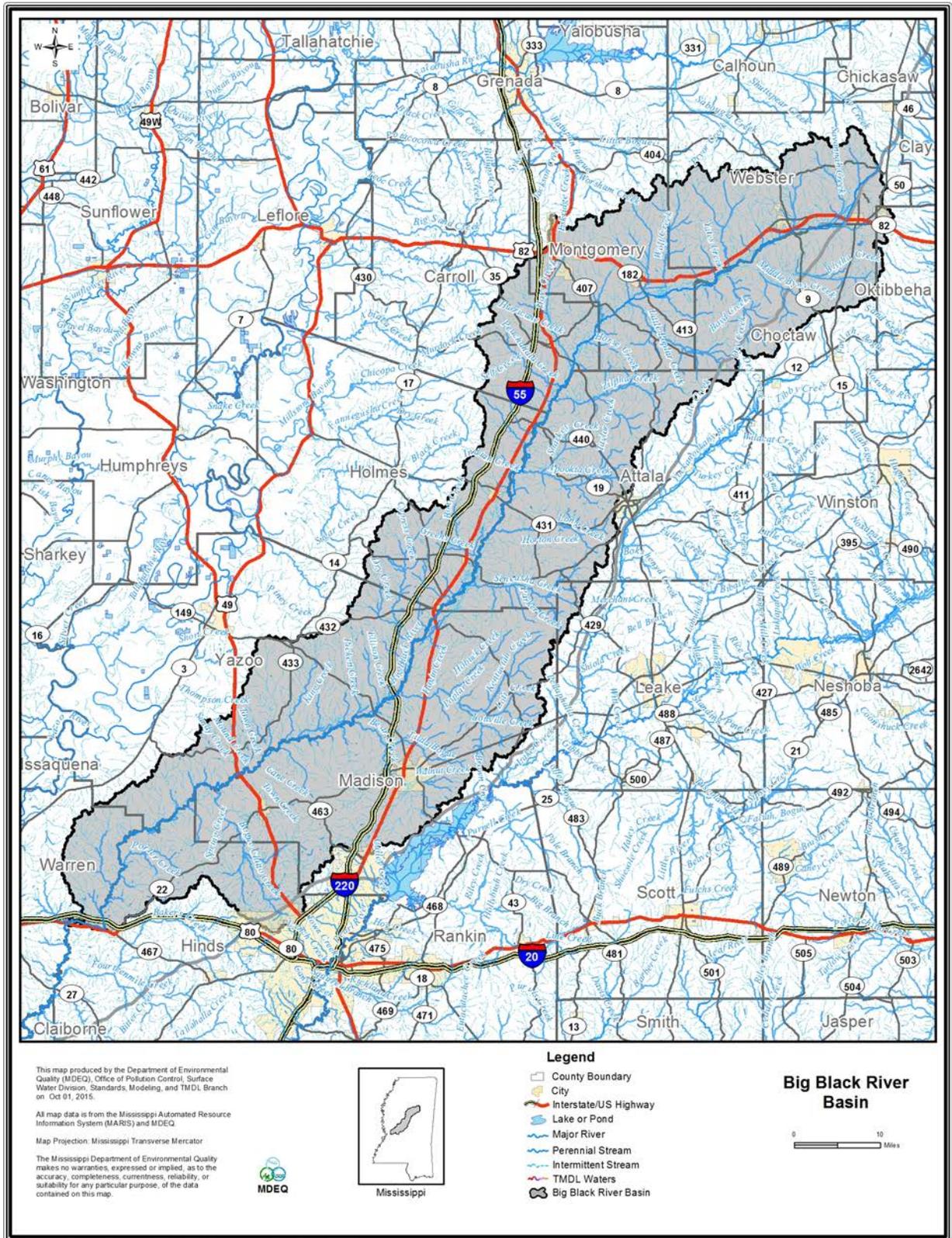


Figure 1. Location of the Big Black River Watershed

## Introduction

The Big Black River (107811) was identified by MDEQ as not supporting the designated use for the pH standard on *Mississippi's 2014 Section 303(d) List of Impaired Water Bodies* (MDEQ, 2014). TMDLs are required for impaired waters on the §303(d) list as required by the Federal Clean Water Act §303(d) and the implementing regulations in accordance with 40 CFR.130. A TMDL establishes the maximum amount of a pollutant a water body can assimilate without exceeding the applicable water quality standard. The TMDL also allocates the total allowable load to individual sources or categories of sources through wasteload allocations (WLAs) for point sources, and through load allocations (LAs) for non-point sources. The WLAs and LAs in the TMDL provide a basis for states to reduce pollution from both point and non-point source activities that will lead to the attainment of water quality standards and protection of the beneficial use. The impaired segment of the Big Black River is shown in Figure 2.

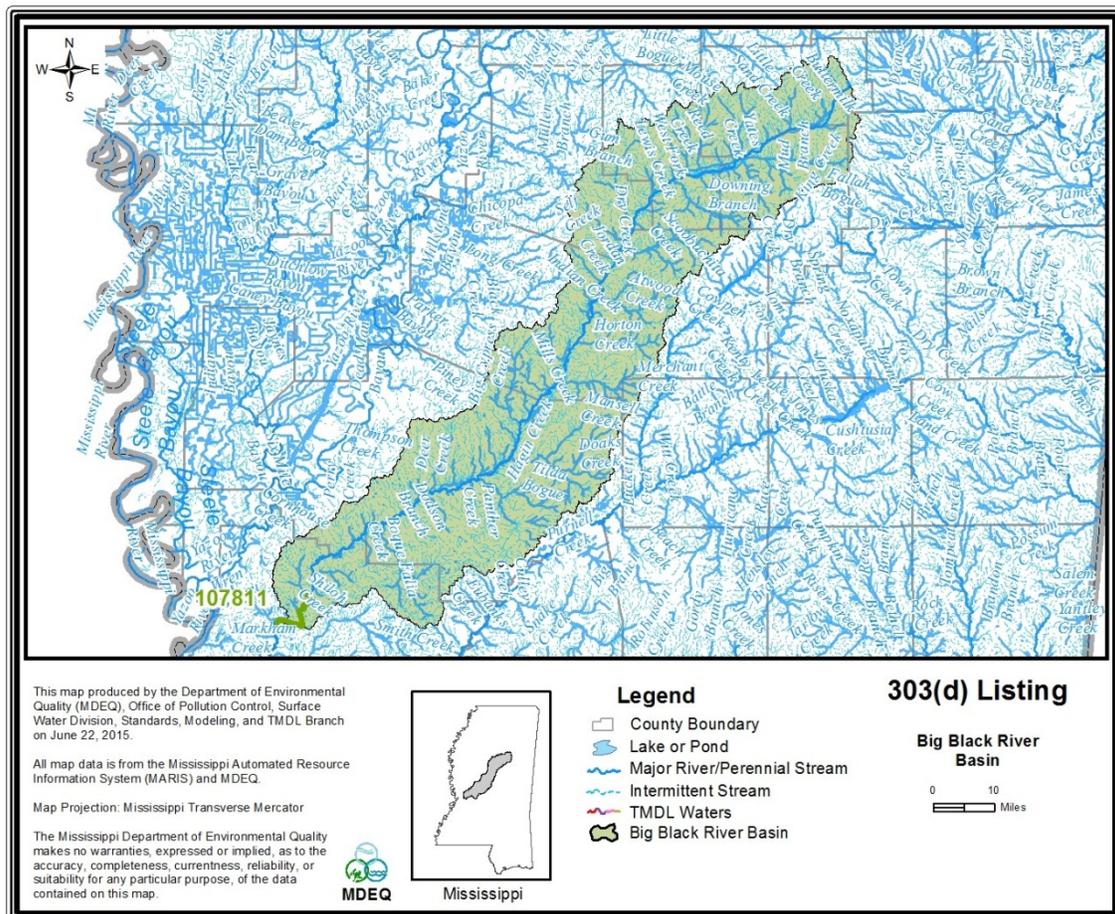


Figure 2. The Big Black River 303(d) Impaired Segment

## Problem Definition

pH is a measure of the hydrogen ion concentration in water as well as a measure of the acidity or alkalinity. Specifically, pH is defined as the negative logarithm of the hydrogen ion concentration in terms of moles per liter.

$$\text{pH} = -\log [\text{H}^+]$$

pH values can range from 0 s.u. for a very acidic solution to 14 s.u. for a very basic solution. A pH equal to 7.0 s.u. represents neutrality. One of the most significant environmental impacts of pH is the effect that it has on the solubility and thus the bioavailability of potentially toxic substances that may be present in surface waters. As the pH in a water body becomes lower (i.e., the solution becomes more acidic) many insoluble toxic substances like cyanides, sulfides, and most metals become more soluble and thus more likely to have toxic effects on fish and other aquatic life. Slight increases in pH may greatly increase the toxicity of pollutants such as ammonia. (Lee, 1998)

## Applicable Water Quality Standard

The TMDL for the Big Black River will be established at a level to ensure consistency with the applicable water quality criteria and protection of its designated use (i.e., Fish and Wildlife). The State of Mississippi *Water Quality Criteria for Intrastate, Interstate, and Coastal Waters* includes numeric water quality criteria for pH of 6.0 to 9.0 s.u. for waters with these designated uses (MDEQ, 2012).

## Watershed Characterization

The impaired segment of the Big Black River is located in Hinds and Warren Counties. Landuse for the watershed is predominantly forest (Table 3 and Figure 4). The landuse distributions presented in Table 3 and Figure 3 were derived from the State of Mississippi's Automated Resource Information System (MARIS), which is based on 2006 Landsat Thematic Mapper digital images.

Table 3. Landuse in the Big Black River Watershed

	Water	Urban	Forest	Scrub/ Barren	Pasture	Cropland	Wetland
area	17,966.39	101,328.4	778,848.5	162,926.6	331,930.9	158,349.3	209,907.8
% area	1.0%	5.8%	44.2%	9.3%	18.8%	9.0%	11.9%

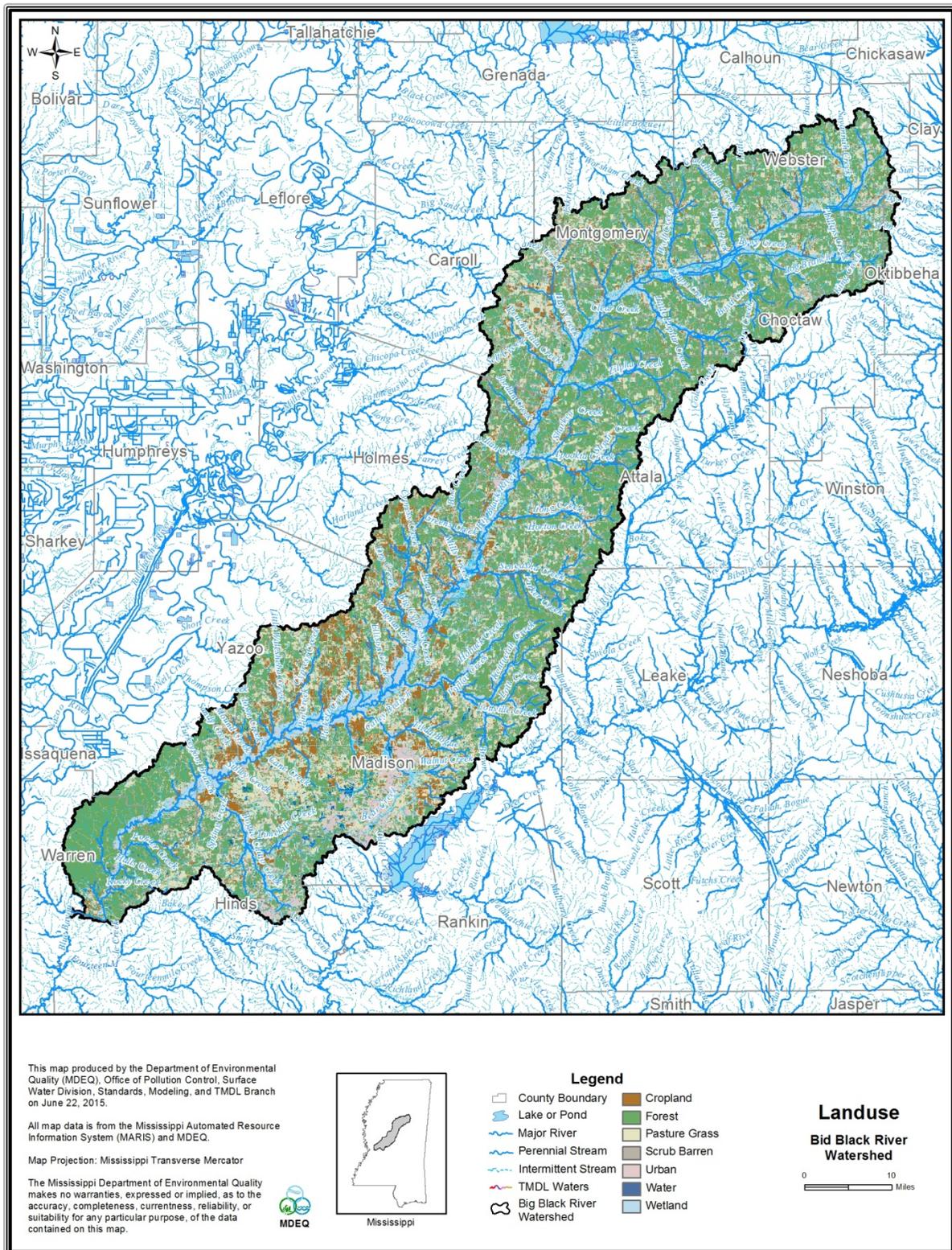


Figure 3. Landuse Distribution Map

## Water Quality Data

MDEQ collected ambient monthly water quality samples from the Big Black River from 2001 to 2014 at 07290000. The monitoring station is depicted in Figure 4. Figure 5 shows the ambient data in comparison with the discharge measured in the stream. All of the water quality standard excursions were attributed to low pH. Table 4 shows a further breakdown of the pH violations as compared to the discharge measured on those days for station 07290000. MDEQ also looked at historical data for the Big Black River to assess whether the violations are attributed to naturally occurring conditions. It is believed the low values are not associated with naturally occurring conditions due to the few violations noted by USGS during this timeframe. The data range for the historical data is available from 1972-1994. Only 3 violations out of 164 pH samples were observed. Figure 6 shows the historical USGS pH data.

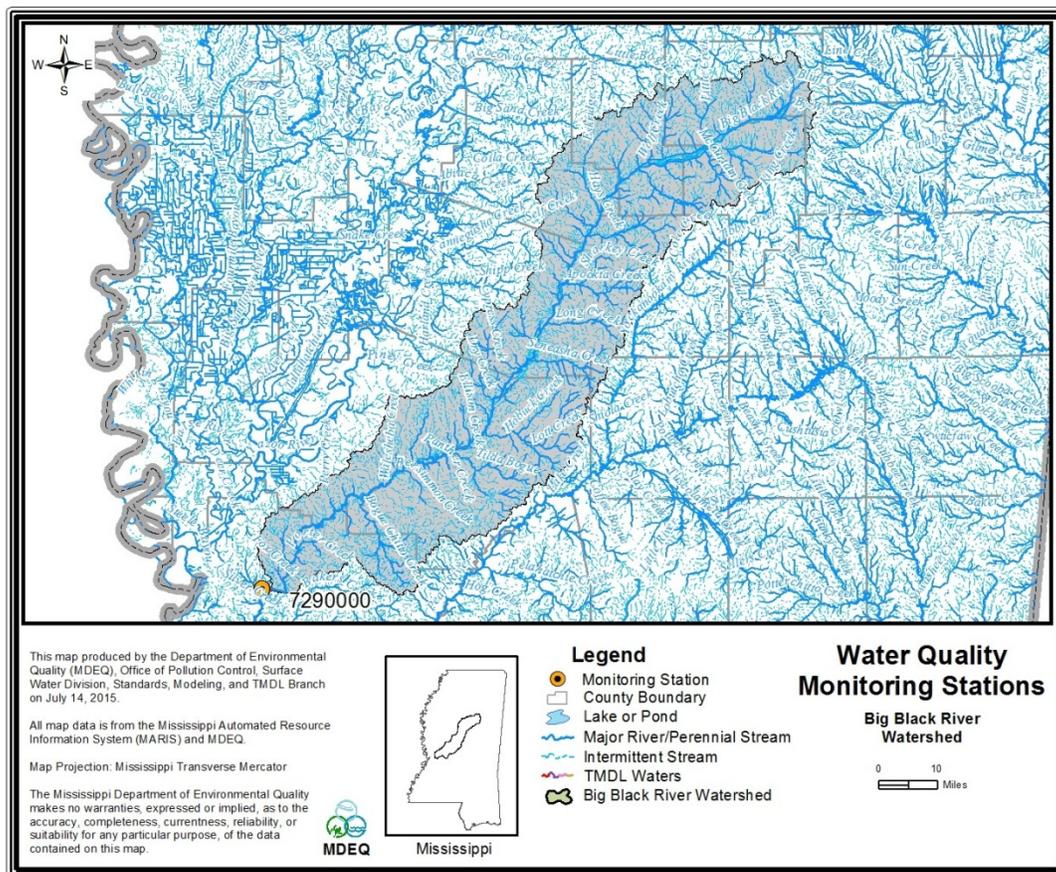


Figure 4. Monitoring Station for Ambient Site (07290000)

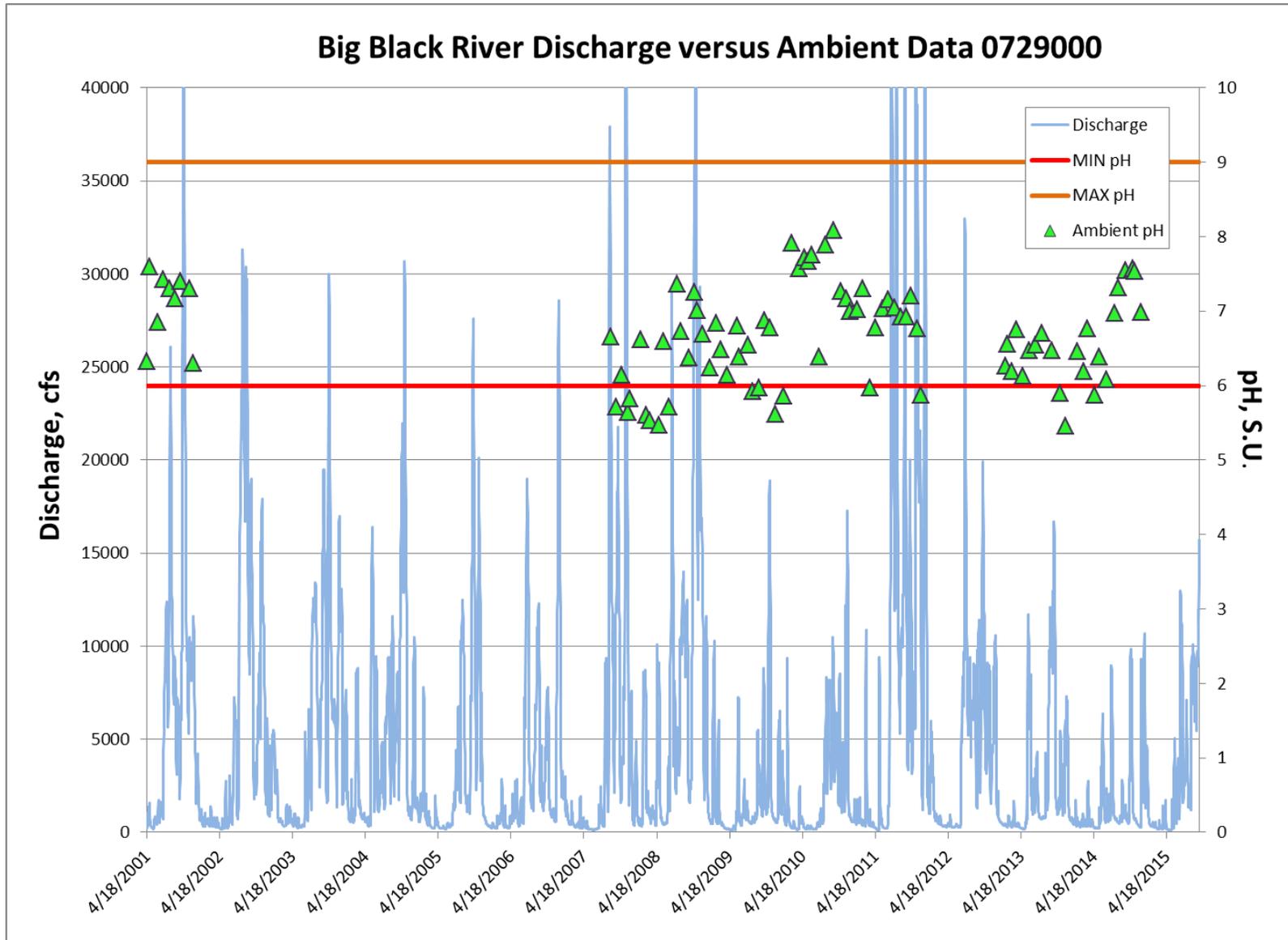


Figure 5. Big Black River Ambient pH Data and Discharge Data

Table 4. Ambient pH Violations versus USGS Discharge Data (07290000)

Date	pH Value	Average discharge measured (cfs)
9/27/2007	5.72	557
11/27/2007	5.64	295
12/4/2007	5.82	310
2/25/2008	5.6	9390
3/12/2008	5.53	2970
4/29/2008	5.47	6180
6/19/2008	5.72	457
8/12/2009	5.92	1140
9/10/2009	5.97	525
12/3/2009	5.62	1530
1/12/2010	5.86	240
3/21/2011	5.97	6690
12/1/2011	5.87	619
10/28/2013	5.9	294
11/25/2013	5.46	1030
4/22/2014	5.87	24200

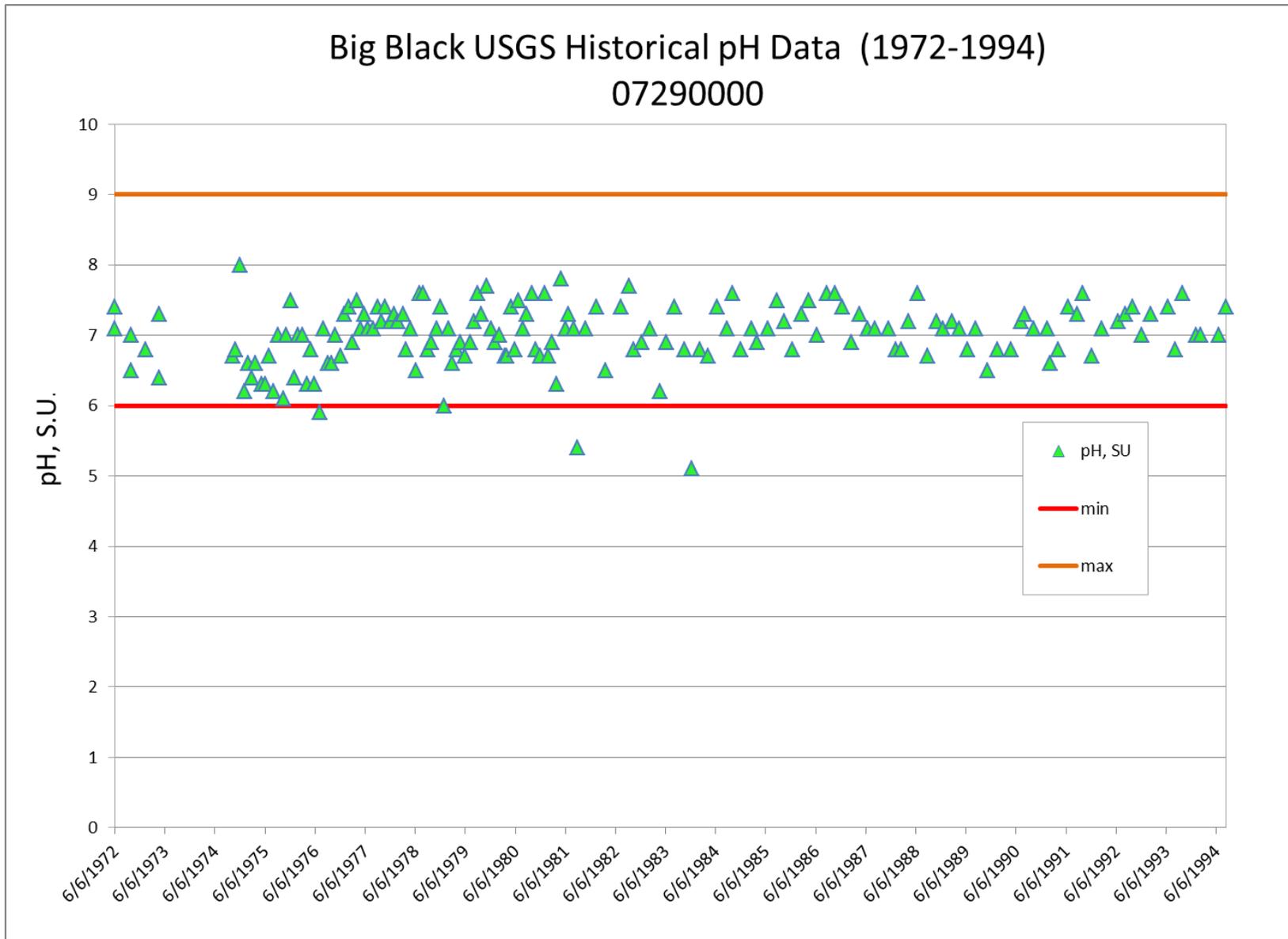


Figure 6. Big Black River Historical USGS pH Data (1972-94)

Table 5 below summarizes the pH violations by season. 18.8% of the pH measurements did not meet water quality standards. These violations occurred throughout the year with no specific pattern, and are shown in Table 6 according to the season that was violated. Only the violations for station 0729000 are shown. All of the ambient monitoring data are included in Appendix A. After reviewing all available data, including the historical data, it is believed the pH values do not correlate with any particular season or discharge of flow. There is insufficient information available to determine the cause for the lower pH values; however, probable causes may be attributed to stormwater runoff from fertilized soils for cropland, failed septic tanks, noncompliant point sources, and inactive natural gas pipelines.

Table 5. Assessment Table for Ambient pH

Data Window	Number of Samples	Number of samples not meeting water quality standards (low pH)	Percentage of data not meeting water quality standards
2007 - 2014	85	16	18.8%

Table 6. The Big Black River Ambient pH Violations by Season

Date	pH Value	Season Violated*
9/27/2007	5.72	fall
11/27/2007	5.64	fall
12/4/2007	5.82	winter
2/25/2008	5.6	winter
3/12/2008	5.53	spring
4/29/2008	5.47	spring
6/19/2008	5.72	summer
8/12/2009	5.92	summer
9/10/2009	5.97	fall
12/3/2009	5.62	winter
1/12/2010	5.86	winter
3/21/2011	5.97	spring
12/1/2011	5.87	winter
10/28/2013	5.9	fall
11/25/2013	5.46	fall
4/22/2014	5.87	spring

\*Dec-Feb (winter), Mar-May (spring), Jun-Aug (summer), Sep-Nov (fall)

## Source Identification

### NPDES Dischargers

There are 90 point sources (126 outfalls) in the watershed. The point sources are shown in Figure 7 and Table 7. Currently, there are 64 that are active and 63 that are inactive. It is noted that an inactive point source is a NPDES facility that is not in use or is closed. An inactive point source may be reactivated when needed. There are data available for 72 of the point sources (active and inactive). Almost all of the discharge monitoring report (DMR) data are within the 6.0 S.U. to 9.0 S.U. range which is the water quality standard. Of the available DMR data, 11 facilities showed pH violations. These facilities are shown in Figure 8. All the available DMR data (violations and non-violations) are included in Appendix B for review.

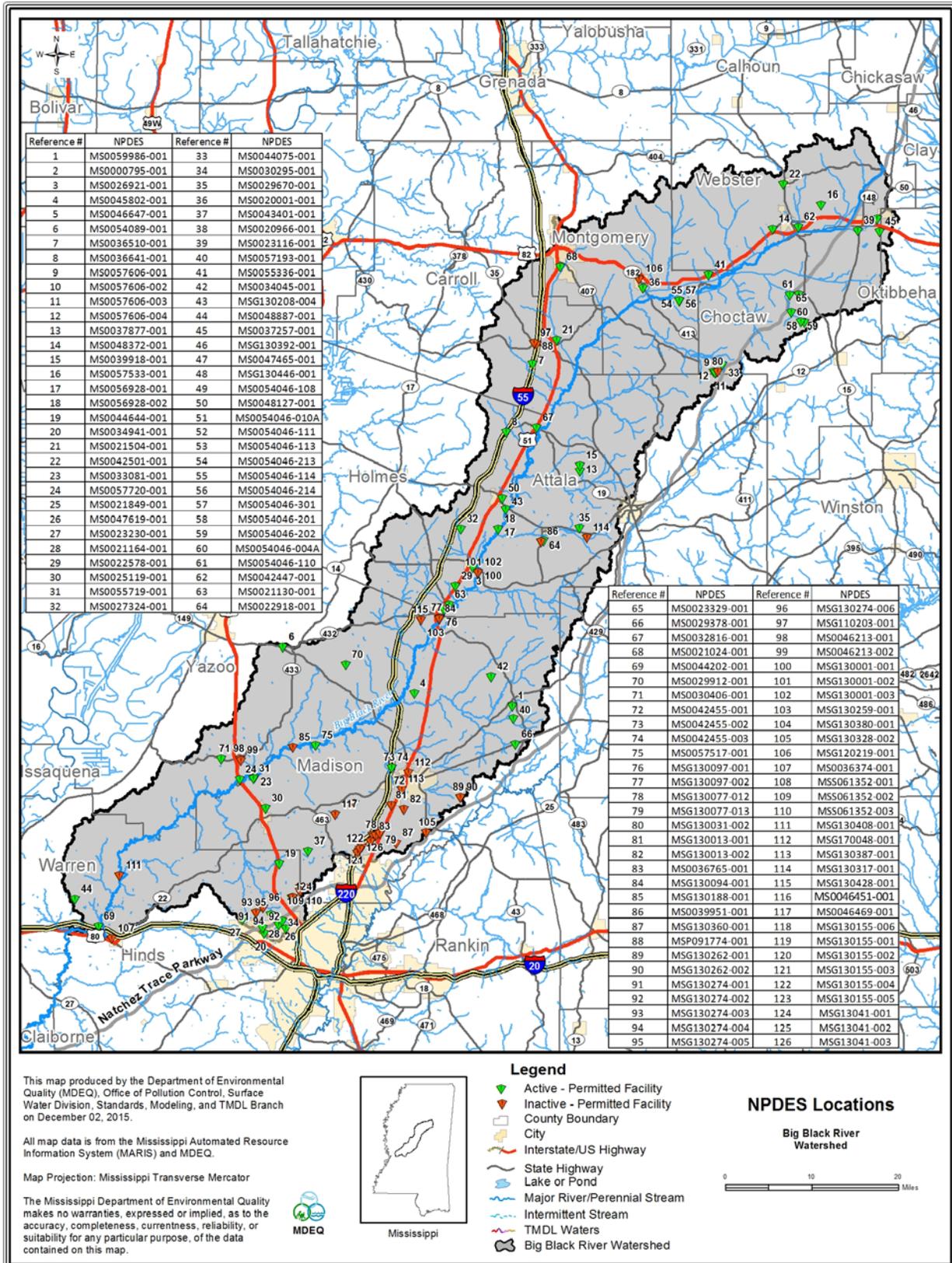


Figure 7. NPDES for the Big Black River Watershed

Table 7. NPDES Permitted Sources

Agency ID	Name	Permit	County	Description	Ref # on Figure 4
19343	Madison County School District, North Madison County Elementary School	MS0059986	Madison	Outfall 001 (Treated domestic wastewater)	1
6235	Burrows Paper Corporation	MS0000795	Holmes	Outfall 001 (Process Wastewater, Seal Water, and Non-contact Cooling Water)	2
13152	Goodman POTW	MS0026921	Holmes	Outfall 001 (Domestic/ Municipal Wastewater)	3
14093	Duncan M Gray Episcopal Camp and Conference Center	MS0045802	Madison	Outfall 001 (Treated Domestic Wastewater)	4
14117	Environmental Quality Management Services, Southern Oaks Subdivision	MS0046647	Hinds	Outfall 001 (Domestic Wastewater)	5
14335	BMW Enterprises LLP, Benton Truck Stop	MS0054089	Yazoo	Outfall 001 (Domestic Wastewater)	6
13873	MDOT, Interstate 55 South, Rest Area, Carroll	MS0036510	Carroll	Outfall 001 (Domestic wastewater)	7
13878	MDOT, Interstate 55 North, Rest Area, Holmes	MS0036641	Holmes	Outfall 001 (Domestic Wastewater)	8
15595	GenOn Wholesale Generation LP, Choctaw County Generating Station	MS0057606	Choctaw	Outfalls 001, 002, 003, 004 (Discharges include facility stormwater and treated sanitary wastewater)	9-12
13896	Mississippi Baptist Convention Board, Central Hills Baptist Retreat	MS0037877	Attala	Outfall 001 (Treated domestic wastewater)	13
14175	Central Mississippi Inc, Eupora Headstart Center	MS0048372	Webster	Outfall 001 (Domestic Wastewater)	14

Agency ID	Name	Permit	County	Description	Ref # on Figure 4
13956	Mississippi District Assemblies of God, Indian Springs Campground	MS0039918	Holmes	Outfall 001 (Domestic wastewater)	15
15667	Church of God of Prophecy, Kamp Kumbaya	MS0057533	Webster	Outfall 001 (Domestic Wastewater)	16
12502	Entergy Mississippi Attala Plant	MS0056928	Attala	Outfalls 001, 002 (Cooling Tower Blowdown)	17,18
14060	Cock of the Walk	MS0044644	Hinds	Outfall 001 (Domestic Wastewater)	19
13843	Hurricane Bay Car Wash	MS0034941	Hinds	Outfall 001 (Treated Car Wash Effluent)	20
13430	Vaiden POTW	MS0021504	Carroll	Outfall 001 (Treated Domestic Wastewater)	21
13443	Walthall POTW	MS0042501	Webster	Outfall 001 (Municipal Wastewater)	22
12204	West Madison Utility District	MS0033081	Madison	Outfall 001 (Treated domestic wastewater)	23
13026	Bentonina POTW	MS0057720	Yazoo	Outfall 001 (Domestic/ Municipal Wastewater)	24
13610	Methodist Childrens Homes	MS0021849	Hinds	Outfall 001 (Domestic Wastewater)	25
13068	Clinton Briars POTW	MS0047619	Hinds	Outfall 001 (Domestic/ Municipal Wastewater)	26
13071	Clinton POTW, Lovett	MS0023230	Hinds	Outfall 001 (Domestic/ Municipal Wastewater)	27
13072	Clinton POTW, Northeast	MS0021164	Hinds	Outfall 001 (Domestic/ Municipal Wastewater)	28

Agency ID	Name	Permit	County	Description	Ref # on Figure 4
13620	Holmes County School District, Goodman Pickens Elementary School	MS0022578	Holmes	Outfall 001 (Domestic Wastewater)	29
13134	Flora POTW	MS0025119	Madison	Outfall 001 (Municipal Wastewater)	30
13135	Flora POTW	MS0055719	Madison	Outfall 001 (Treated Domestic Wastewater)	31
13656	Mississippi Department of Wildlife Fisheries and Parks, Holmes County State Park	MS0027324	Holmes	Outfall 001 (Domestic wastewater)	32
13140	French Camp POTW	MS0044075	Choctaw	Outfall 001 (Municipal Wastewater)	33
13199	Jackson POTW, Presidential Hills	MS0030295	Hinds	Outfall 001 (Domestic/ Municipal Wastewater)	34
13706	Attala County Schools, McAdams High School	MS0029670	Attala	Outfall 001 (Treated Domestic wastewater)	35
13210	Kilmichael POTW	MS0020001	Montgomery	Outfall 001(Treated Domestic wastewater)	36
13214	Lake Lorman POTW	MS0043401	Madison	Outfall 001 (Treated domestic wastewater)	37
13237	Maben POTW	MS0020966	Choctaw	Outfall 001 (Domestic Wastewater Discharge)	38
13252	Mathiston POTW	MS0023116	Webster	Outfall 001 (Domestic/ Municipal Wastewater)	39
15088	Madison County School District, North Madison Middle School	MS0057193	Madison	Outfall 001 (Treated Domestic Wastewater)	40
14389	4D Grocery and Carwash	MS0055336	Montgomery	Outfall 001 (Treated Carwash Effluent)	41

Agency ID	Name	Permit	County	Description	Ref # on Figure 4
13816	Madison County School District, Velma Jackson School	MS0034045	Madison	Outfall 001 (Domestic Wastewater Discharge)	42
2339	Texas Gas Transmission LLC, Greenville Compressor Station	MSG130208	Washington	Outfall 004 (Hydrostatic Test Discharge)	43
3902	Culkin Water Treatment Facility	MS0048887	Warren	Outfall 001 (Industrial Wastewater)	44
2195	Sansing Meat Service	MS0037257	Choctaw	Outfall 001 (Process Wastewater)	45
5317	Texas Eastern Transmission LP, Clinton Compressor Station	MSG130392	Hinds	Outfall 001 (Hydrostatic Test Discharging)	46
5317	Texas Eastern Transmission LP, Clinton Compressor Station	MS0047465	Hinds	Outfall 001 (Non-process Wastewater)	47
5317	Texas Eastern Transmission LP, Clinton Compressor Station	MSG130446	Hinds	Outfall 001 (Hydrostatic Testing Discharge)	48
676	Mississippi Lignite Mining Company	MS0054046	Choctaw	Outfalls 108, 010A, 111, 113, 213, 114, 301, 201, 214, 202, 110, 004A (Stormwater Runoff)	49, 51-61
13115	Durant POTW	MS0048127	Holmes	Outfall 001 (Domestic/ Municipal Wastewater)	50
13124	Eupora POTW	MS0042447	Webster	Outfall 001 (Municipal Wastewater)	62
13339	Pickens POTW	MS0021130	Holmes	Outfall 001 (Domestic/ Municipal Wastewater)	63
13637	Attala County Schools, Long Creek Elementary School	MS0022918	Attala	Outfall 001 (Domestic Wastewater)	64

Agency ID	Name	Permit	County	Description	Ref # on Figure 4
13640	Natchez Trace Parkway, Jeff Busby Camper Park	MS0023329	Choctaw	Outfall 001 (Domestic Wastewater)	65
13691	Madison County School District, Luther Branson Elementary School	MS0029378	Madison	Outfall 001 (Domestic Wastewater Discharge)	66
13452	West POTW	MS0032816	Holmes	Outfall 001 (Domestic/ Municipal Wastewater)	67
13455	Winona POTW	MS0021024	Montgomery	Outfall 001 (Treated Domestic Wastewater)	68
1573	Ceres Industrial Interplex	MS0044202	Warren	Outfall 001(Treated Effluent Wastewater)	69
13714	Yazoo County School District, Linwood Elementary School	MS0029912	Yazoo	Outfall 001 (Treated Domestic Wastewater)	70
13725	Yazoo County School District, Bentonia Gibbs School	MS0030406	Yazoo	Outfall-001 (Domestic wastewater)	71
13051	Canton Municipal Utilities, Hydrograph Controlled Release POTW	MS0042455	Madison	Outfalls 001, 002, 003 (Treated Domestic Wastewater)	72-74
15644	Canton Municipal Utilities, Beatties Bluff Wastewater Treatment Facility	MS0057517	Madison	Outfall 001 (Treated Domestic Wastewater)	75
19215	Southern Natural Gas Company, Big Black River Replacement Project, 2nd North Main Pipeline	MSG130097	Holmes	Outfall 001, 002 (Hydrostatic Testing Discharge)	76,77
18295	Mississippi Major Economic Impact Authority, Water Transmission Line	MSG130077	Madison	Outfall 012, 013 (Hydrostatic Testing Discharge)	78,79
16994	Texas Eastern Transmission LP, McCool Rockport Road and Highway 407	MSG130031	Choctaw	Outfall 002 (Hydrostatic Test Discharge)	80
16846	Enmark Energy Inc, Nissan Automotive Plant	MSG130013	Madison	Outfalls 001, 002 (Hydrostatic Test Discharge)	81,82

Agency ID	Name	Permit	County	Description	Ref # on Figure 4
10047	Central Mississippi Industrial Park	MS0036765	Madison	Outfall 001 (Industrial Wastewater)	83
19094	Southern Natural Gas Company, Big Black River Replacement Project, Gwinville Pickens Main Line	MSG130094	Holmes	Outfall 001 (Hydrostatic Testing Discharge)	84
36177	Denbury Onshore LLC, Tinsley 24 Inch CO2 Pipeline Project	MSG130188	Madison	Outfall 001 (Hydrostatic Testing Discharge)	85
13957	Central Mississippi Inc, Barlow Headstart Center	MS0039951	Attala	Outfall 001 (Domestic Wastewater)	86
57541	Denbury Onshore LLC, South Gluckstadt 24 Inch Pipeline	MSG130360	Madison	Outfall 001 (Hydrostatic Test Discharge)	87
14980	Stuckeys of Vaiden Inc	MSP091774	Carroll	Outfall 001 (Remediated Groundwater)	88
49617	Denbury Resources Inc, Trace Dehydration Facility	MSG130262	Madison	Outfalls 001,002 (Hydrostatic Test Discharge)	89,90
52435	Texas Eastern Transmission LP, Union Church Site 4 DOT Replacement	MSG130274	Hinds	Outfall 001, 002, 003,004,005,006 (Hydrostatic Testing Discharge)	91-96
16317	APAC Tennessee Inc, Vaiden	MSG110203	Carroll	Outfall 001	97
11748	Memphis Hardwood Flooring Company, Bentonia Facility	MS0046213	Yazoo	Outfall 001,002 - Overflow from Log Spray Recirculation Pond	98,99
12791	TPS McAdams LLC	MSG130001	Holmes	Outfalls 001, 002, 003 Hydrostatic Test Discharge-	100,101,102
49365	Southern Natural Gas Company, 12 Inch Gwinville Pickens Loop Line Replacement	MSG130259	Holmes	Outfall 001 Hydrostatic Test Discharge-	103
62603	Gulf South Pipeline Company LP, Hydrostatic Test Discharge PN 4017	MSG130380	Madison	Outfall 001 (Hydrostatic Test Discharge)	104
55590	Denbury Onshore LLC, 8-3 Valve to Tinsley CO2 Pipeline	MSG130328	Madison	Outfall 002 (Hydrostatic Test Discharge)	105

Agency ID	Name	Permit	County	Description	Ref # on Figure 4
25087	PELA GeoEnvironmental Inc, Kilmichael One Stop	MSG120219	Montgomery	Outfall 001 (Remediated Groundwater)	106
13118	Edwards POTW, West	MS0036374	Hinds	Outfall 001 (Domestic / Municipal Wastewater)	107
40389	NCL Waste LLC, North County Line Landfill	MSS061352	Madison	Outfalls 001,002,003 (Non-contact Stormwater)	108,109,110
64919	Gulf South Pipeline Company LP, Hydrostatic Test Discharge PN 4699	MSG130408	Warren	Outfall 001 (Hydrostatic Test Discharge)	111
1846	Scott Penn Inc, Canton Woodyard	MSG170048	Madison	Outfall 001 - (Overflow from log spray recirculation pond)	112
63501	Gulf South Pipeline Company LP, Hydrostatic Test Discharge PN 4581	MSG130387	Madison	Outfall 001 (Hydrostatic Test Discharge)	113
55277	Texas Gas Transmission LLC, 36 Inch Greenville Kosciusko Pipeline	MSG130317	Attala	Outfall 001 (Hydrostatic Test Discharge)	114
66376	Southern Natural Gas Company, North Main Loop Line Replacement	MSG130428	Yazoo	Outfall 001 (Hydrostatic Test Discharge)	115
13052	Canton Municipal Utilities, Lake Caroline Northeast Facility	MS0046451	Madison	Outfall 001 (Treated domestic wastewater)	116
13053	Canton Municipal Utilities, Lake Caroline Southwest Facility	MS0046469	Madison	Outfall 001 (Treated Domestic Wastewater)	117
22935	Texas Eastern Transmission LP, Park Way East Pipeline Replacement Project	MSG130155	Madison	Outfalls 001, 002, 003, 004, 005, 006 (Hydrostatic Testing Discharge)	118-123
23405	Texas Eastern Transmission LP, 2006 Clinton Discharge SCC Retest Lines 14 and 18	MSG13041	Hinds	Outfalls 001, 002, 003 (Hydrostatic Test Discharge)	124-126

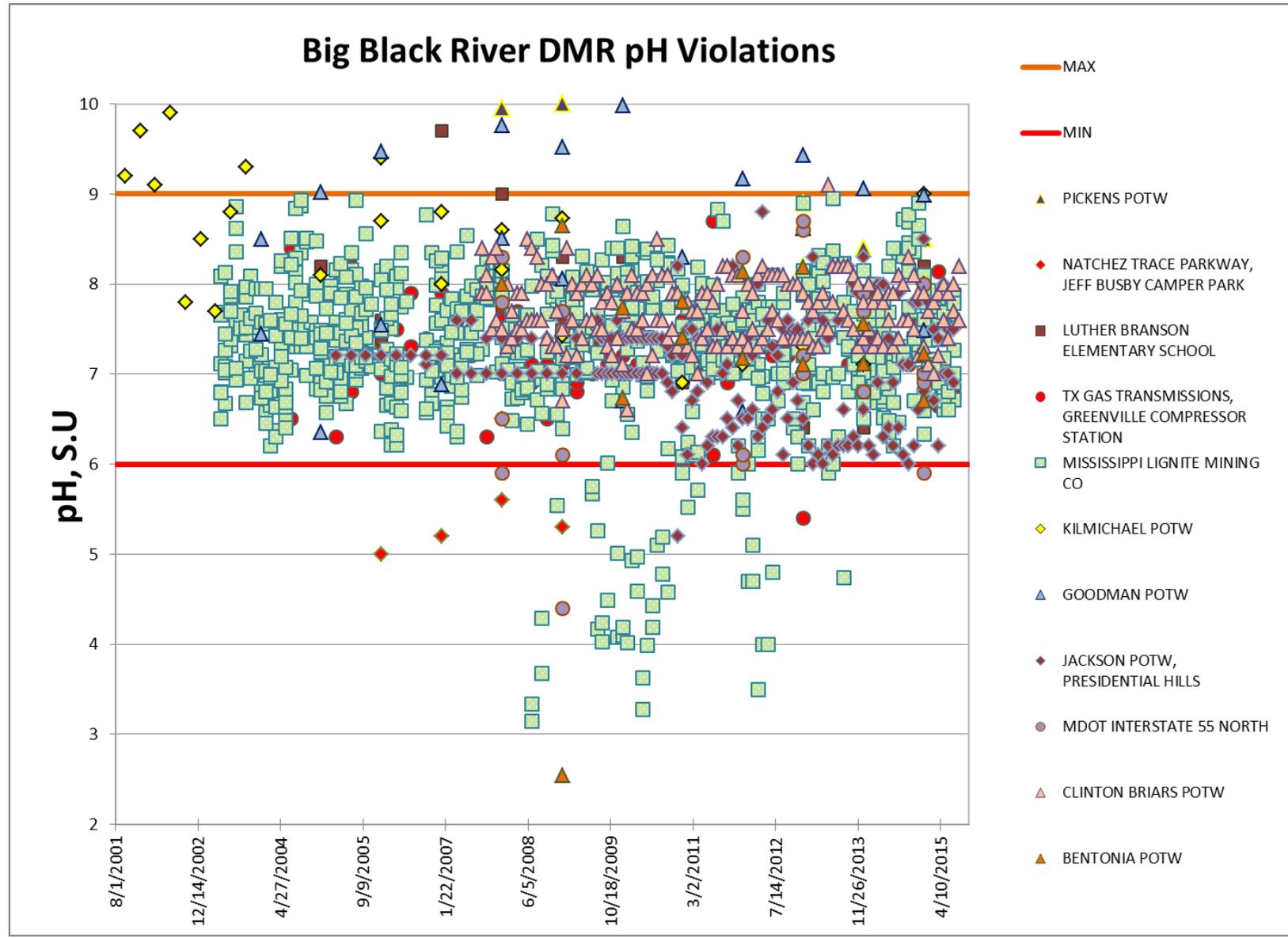


Figure 8. Available DMR pH Violations

## **Total Maximum Daily Load (TMDL)**

A TMDL establishes the total pollutant load a water body can receive and still achieve water quality standards. The components of a TMDL include a WLA for point sources, a LA for non-point sources, and a margin of safety (MOS) to account for uncertainty. 40 CFR.130.2(i) provides flexibility concerning how TMDLs are expressed and suggests that they may be expressed in terms of mass per time, toxicity, or other appropriate measure. For this TMDL as well as other pH TMDLs that have been established by MDEQ, it has been determined that the appropriate measure for the allocation should be in terms of pH standard units.

### **Wasteload Allocation**

There are 90 point sources that are identified for this watershed. For future dischargers to discharge to this watershed or to tributaries in the watershed, effluent pH levels should be no less than 6.0 s.u. and no greater than 9.0 s.u. and shall not cause the pH to rapidly change more than 1 unit s.u. This is a standard NPDES permit requirement.

### **Load Allocation**

The nonpoint sources causing or contributing to pH violations are unknown, but probable causes may be attributed to stormwater runoff from fertilized soils for cropland, failed septic tanks, noncompliant point sources, and inactive natural gas pipelines. The load allocation for this TMDL suggests that the pH of waters originating from any nonpoint source in the watershed shall be no less than 6.0 s.u. and no greater than 9.0 s.u. if possible based on the natural conditions found in the watershed.

### **Margin of Safety**

The margin of safety in TMDLs is used to account for the lack of knowledge concerning the relationship between the pollutant loads and the resulting quality of the receiving water body. The allocations used in this TMDL ensure that loads from any point source(s) and loads originating from any non-point source activities must individually meet the pH target of 6.0 to 9.0 s.u. before entering the stream. As long as pH from both point and non-point source activities are consistent with the allocations in this TMDL, water quality standards will be met.

### **Seasonal Variation**

The allocation proposed for this TMDL provides for year-round protection (i.e., protection during all seasons and environmental conditions) of the pH criteria. Based on the available data and information, critical conditions for this TMDL could not be determined. However, considering that this TMDL is protective during all seasons

and environmental conditions, it will inherently be protective during critical conditions whenever they occur.

## **Recommendations**

The wasteload allocation for this TMDL is considered and used by MDEQ through its NPDES permitting process. This TMDL recommends further monitoring from the point sources in their DMRs. The TMDL also recommends further ambient monitoring within the stream.

Achieving the load allocation will require a better understanding of the causes and sources of the low pH. Future monitoring and data collection should provide insight regarding the potential causes of the low pH in this watershed.

## **Next Steps**

MDEQ has adopted the Basin Approach to Water Quality Management, a plan that divides Mississippi's major drainage basins into five groups. During each yearlong cycle, MDEQ resources for water quality monitoring will be focused on one of the basin groups. During the next monitoring phase in the Big Black River Basin, these watersheds may receive additional monitoring to identify any changes or improvements in water quality.

## **Public Participation**

This TMDL will be published for a 30-day public notice. During this time, the public will be notified by publication in the newspaper. The public will be given an opportunity to review the TMDL and submit comments. MDEQ also distributes all TMDLs at the beginning of the public notice to those members of the public who have requested to be included on a TMDL mailing list. Anyone wishing to become a member of the TMDL mailing list should contact Mike Freiman at [mfreiman@deq.state.ms.us](mailto:mfreiman@deq.state.ms.us).

All comments should be directed to Mike Freiman at [mfreiman@deq.state.ms.us](mailto:mfreiman@deq.state.ms.us) or Mike Freiman, MDEQ, PO Box 2261, Jackson, MS 39201. All comments received during the public notice period and at any public hearings become a part of the record of this TMDL and will be considered in the submission of this TMDL to EPA Region 4 for final approval.

## References

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- Lee, C. P. (Ed.). (1998). *Environmental Engineering Dictionary*. Rockville, Maryland: Government Institutes, Inc.
- MDEQ. (2013). *WPC-1 NDPES Permitting Regulations*. Jackson: MDEQ Office of Pollution Control.
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## APPENDIX A

(Ambient pH Data for Station 07290000 2001-2014)

STATION_ID	ACTIVITY_DATE	pH
07290000	04/19/2001 13:03	6.33
07290000	05/02/2001 11:25	7.6
07290000	06/12/2001 10:50	6.85
07290000	07/10/2001 11:50	7.43
07290000	08/09/2001 10:50	7.3
07290000	09/07/2001 13:11	7.17
07290000	10/04/2001 11:25	7.4
07290000	11/19/2001 11:35	7.3
07290000	12/05/2001 11:20	6.3
07290000	08/29/2007 10:15	6.65
07290000	09/27/2007 10:20	5.72*
07290000	10/24/2007 10:00	6.14
07290000	11/27/2007 10:00	5.64
07290000	12/04/2007 09:50	5.82
07290000	01/28/2008 10:05	6.62
07290000	02/25/2008 10:30	5.6
07290000	03/12/2008 09:25	5.53
07290000	04/29/2008 10:20	5.47
07290000	05/22/2008 10:15	6.59
07290000	06/19/2008 10:20	5.72
07290000	07/28/2008 10:10	7.37
07290000	08/14/2008 10:10	6.73
07290000	09/25/2008 10:30	6.37
07290000	10/22/2008 10:20	7.26
07290000	11/06/2008 10:25	7.01
07290000	12/02/2008 09:30	6.69
07290000	01/08/2009 09:50	6.24
07290000	02/09/2009 10:06	6.84
07290000	03/04/2009 10:15	6.48
07290000	04/07/2009 10:20	6.14
07290000	05/26/2009 10:05	6.8
07290000	06/03/2009 10:15	6.39
07290000	07/21/2009 10:15	6.55
07290000	08/12/2009 10:20	5.92
07290000	09/10/2009 10:30	5.97
07290000	10/07/2009 09:40	6.87
07290000	11/05/2009 10:30	6.78
07290000	12/03/2009 10:35	5.62
07290000	01/12/2010 10:40	5.86
07290000	02/23/2010 10:15	7.91
07290000	03/30/2010 10:55	7.57
07290000	04/29/2010 10:00	7.72
07290000	05/18/2010 10:20	7.67
07290000	06/02/2010 10:25	7.76

STATION_ID	ACTIVITY_DATE	pH
07290000	07/08/2010 10:20	6.39
07290000	08/10/2010 10:25	7.89
07290000	09/22/2010 10:25	8.09
07290000	10/28/2010 10:45	7.27
07290000	11/22/2010 10:05	7.17
07290000	12/13/2010 10:45	7
07290000	01/18/2011 10:20	7.02
07290000	02/15/2011 09:55	7.3
07290000	03/21/2011 10:45	5.97
07290000	04/18/2011 10:05	6.78
07290000	05/23/2011 09:30	7.04
07290000	06/23/2011 09:54	7.16
07290000	07/21/2011 10:15	7.05
07290000	08/25/2011 09:20	6.92
07290000	09/22/2011 11:30	6.93
07290000	10/12/2011 11:00	7.2
07290000	11/15/2011 10:00	6.77
07290000	12/01/2011 09:55	5.87
07290000	01/28/2013 10:05	6.27
07290000	02/06/2013 10:10	6.56
07290000	02/28/2013 10:15	6.19
07290000	03/26/2013 09:40	6.75
07290000	04/25/2013 09:20	6.13
07290000	05/28/2013 09:55	6.47
07290000	06/27/2013 09:35	6.54
07290000	07/30/2013 09:45	6.71
07290000	09/18/2013 09:16	6.47
07290000	10/28/2013 09:31	5.9
07290000	11/25/2013 09:08	5.46
07290000	01/23/2014 08:00	6.46
07290000	02/26/2014 09:00	6.19
07290000	03/14/2014 08:25	6.76
07290000	04/22/2014 09:15	5.87
07290000	05/13/2014 08:20	6.39
07290000	06/18/2014 09:11	6.08
07290000	07/29/2014 09:05	6.97
07290000	08/18/2014 08:50	7.32
07290000	09/24/2014 08:48	7.55
07290000	10/28/2014 09:30	7.57
07290000	11/10/2014 08:53	7.53
07290000	12/12/2014 09:17	6.99

\*Yellow denotes violations