

# TMDLs for Dissolved Oxygen in Selected Subsegments in the Pearl River Basin, Louisiana

**(090105, 090204, 090207)**

## Fact Sheet

Section 303(d) of the Clean Water Act and the U.S. Environmental Protection Agency’s Water Quality Planning and Management Regulations (at Title 40 of the *Code of Federal Regulations* Part 130) require states to develop Total Maximum Daily Loads (TMDLs) for waterbodies that are not meeting water quality standards. A TMDL establishes the amount of a pollutant that a waterbody can assimilate without exceeding the water quality standard for that pollutant. TMDLs provide the scientific basis for a state to establish water quality-based controls to reduce pollution from both point and nonpoint sources to restore and maintain the quality of the state’s water resources.

A TMDL for a given pollutant and waterbody includes the sum of individual wasteload allocations (WLAs) for point sources and load allocations (LAs) for nonpoint sources and natural background levels. In addition, the TMDL must include an implicit or explicit margin of safety (MOS) to account for the uncertainty in the relationship between pollutant loads and the quality of the receiving waterbody. It may also include a future growth (FG) component. The TMDL components are illustrated using the following equation:

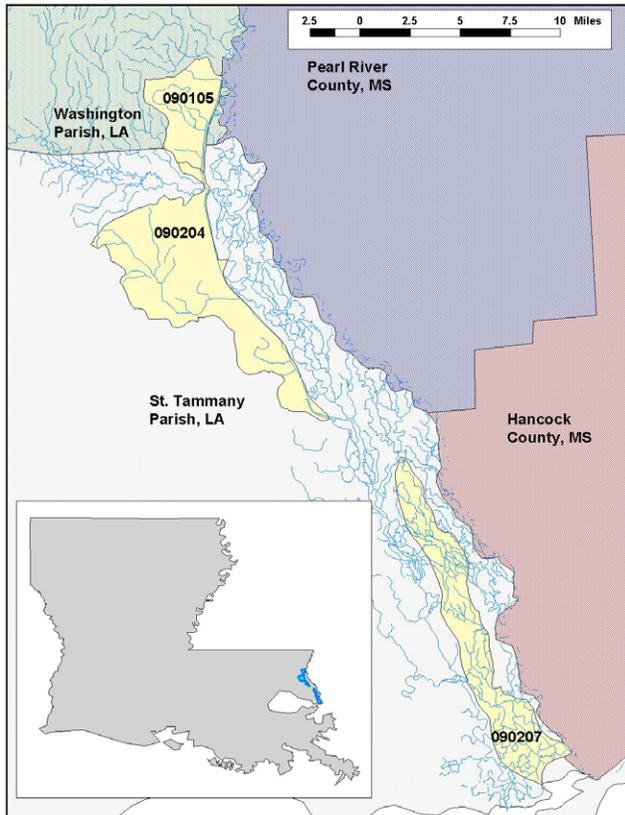
$$TMDL = \sum WLAs + \sum LAs + MOS + FG$$

This fact sheet describes the TMDLs that have been developed for dissolved oxygen in 3 subsegments in the Pearl River Basin in eastern Louisiana (Figure 1). The Louisiana Department of Environmental Quality (LDEQ) included the 3 subsegments on the state’s 2004 section 303(d) list of impaired waterbodies because of dissolved oxygen impairments (Table 1). The impaired designated uses for the subsegments are primary or secondary contact recreation, and fish and wildlife propagation. The subsegments are classified as fully supporting (F) and not supporting (N). Louisiana’s section 303(d) list identifies unknown as the suspected cause of the dissolved oxygen impairment in the 3 listed subsegments in the Pearl River Basin.

**Table 1. Section 303(d) listing for subsegments included in this report**

Sub-segment	Subsegment name	Subsegment description	Designated use		
			PCR	SCR	FWP
090105	Pearl River Navigation Canal	Pools Bluff to Lock No. 3	F	F	N
090204	Pearl River Navigation Canal	Below Lock No.3	F	F	N
090207	Middle River and West Middle River	West Pearl River to Little Lake	F	F	N

A water quality model (LA-QUAL) was set up to simulate dissolved oxygen, carbonaceous biochemical oxygen demand (CBOD), ammonia nitrogen, and nitrate. The model was calibrated using data from field work conducted in



**Figure 1. Location of the impaired subsegments in the Pearl River Basin**

August 2006. The projection simulation was run at critical flows and temperatures to address seasonality as required by the Clean Water Act. Reductions of NPS loads were required for the projection simulation so that the dissolved oxygen standard of 5 mg/L is met. In general, the modeling in this study was consistent with guidance in the Louisiana TMDL Technical Procedures Manual. A TMDL for oxygen demanding substances was calculated using the results of the projection simulation.

In TMDL development, allowable loadings from all pollutant sources that cumulatively amount to no more than the TMDL must be established, thereby providing the basis for establishing water quality-based controls. WLAs were given to permitted point source discharges. The LAs include background loadings and human-induced nonpoint sources. An explicit MOS of 10 percent and an FG component of 10 percent were included. A summary of the TMDLs for each of the subsegments is presented in Table 2.

**Table 2. Summary of dissolved oxygen TMDLs, WLAs, LAs, MOSs, and FGs for Pearl River Basin**

Subsegment	Oxygen demand (kg/d)				
	SOD	CBOD	Ammonia <sup>a</sup>	Nitrate <sup>a</sup>	Total
<b>090105</b>					
WLA	0.00	4.48	13.86	0.00	18.34
MOS for WLA	0.00	0.56	1.73	0.00	2.29
FG for WLA	0.00	0.56	1.73	0.00	2.29
LA	178.00	646.40	49.54	248.72	1,122.65
MOS for LA	22.25	80.80	6.19	31.09	140.33
FG for LA	22.25	80.80	6.19	31.09	140.33
TMDL	222.50	813.60	79.24	310.89	1,426.23
Subsegment	Oxygen demand (kg/d)				
	SOD	CBOD	Ammonia <sup>a</sup>	Nitrate <sup>a</sup>	Total
<b>090204</b>					
WLA	0.00	6.92	3.21	0.00	10.13
MOS for WLA	0.00	0.86	0.40	0.00	1.27
FG for WLA	0.00	0.86	0.40	0.00	1.27
LA	984.80	561.20	393.86	60.97	2,000.82
MOS for LA	123.10	70.15	49.23	7.62	250.10
FG for LA	123.10	70.15	49.23	7.62	250.10
TMDL	1,231.00	710.14	496.33	76.21	2,513.69
Subsegment	Oxygen demand (kg/d)				
	SOD	CBOD	Ammonia <sup>a</sup>	Nitrate <sup>a</sup>	Total
<b>090207</b>					
WLA	0.00	0.00	0.00	0.00	0.00
MOS for WLA	0.00	0.00	0.00	0.00	0.00
FG for WLA	0.00	0.00	0.00	0.00	0.00
LA	2,940.40	2,811.04	33.25	1,752.44	7,537.13
MOS for LA	367.55	351.38	4.16	219.05	942.14
FG for LA	367.55	351.38	4.16	219.05	942.14
TMDL	3,675.50	3,513.80	41.57	2,190.55	9,421.42

<sup>a</sup> Converted to oxygen demand. (concentration × 4.33 [conversion factor])

## For More Information

EPA seeks input on this proposed TMDL, including comments, information, and data from the public. For additional information on this TMDL project, please contact the EPA staff member listed below:

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