

Alabama Department of Environmental Management

TMDL Little Wills Creek – Coosa River Basin Organic Enrichment/Dissolved Oxygen

June 12, 1996
Water Quality Branch
Water Division

June 12, 1996

MEMORANDUM

To: File

From: Charles Reynolds
Water Quality Branch

Subject: Little Wills Creek TMDL

As mandated by section 303(d) of the Clean Water Act, a TMDL has been completed for Little Wills Creek for CBOD₅ and NH₃-N. Little Wills Creek is in DeKalb County and is a tributary to Big Wills Creek. Big Wills Creek is a part of the Coosa River basin.

Attached is a spreadsheet labeled "ADEM TMDL SUMMARY." This attachment summarizes all relevant information for the TMDL, including maximum allowable loadings. "Total LA" refers to "total load allocation" and is the maximum allowable loadings from all nonpoint sources, including tributaries, headwaters and incremental inflow (IF). "Total WLA" refers to "total waste load allocation" and is the maximum allowable loadings from all point sources. "Total Loading" is the sum of all point and nonpoint source loadings and is the maximum allowable loadings from all sources.

One of the sources of water quality impairment to this creek is considered to be the Collinsville WWTP.

The water quality model was run such that the F&W D.O. standard of 5 mg/l was not violated during the summer season. The summer effluent limitations for Collinsville are as follows:

CBOD₅ (mg/l)	10
NH₃-N (mg/l)	4.4
D.O. (mg/l)	6

The aforementioned effluent limitations are for a design wasteflow of 0.3 mgd. An ultimate-to-five-day CBOD ratio (CBOD_U/CBOD₅) of 3.09 was assumed for the Collinsville effluent.

Chronic ammonia toxicity to aquatic life was evaluated at the Collinsville outfall location. Using an interpolated EPA 26°C criterion, this resulted in an allowable effluent NH₃-N concentration of 4.4 mg/l.

ADEM SUMMER TMDL SUMMARY

Impacted Waterbody: Little Wills Creek
303(d) Priority Ranking: Low
County(s): DeKalb
Size: 5 miles
From: Big Wills Creek
To: Its Source
Use Classification: F&W
Support Status: Partial Support
Causes: Nutrients
Sources: Urban Surface Runoff/Municipal WWTP
Critical Conditions: Monthly 7Q₁₀ Flows & 26°C Temp
Water Quality Model: W2E
MOS: Monthly 7Q₁₀ Flows, 26°C Temp & Model Reaction Rate Coefficients
Pollutants Evaluated: CBOD₅, NH₃-N & Ammonia Toxicity
Background Numbers for Ammonia Toxicity: 26°C Temp & pH of 7
EPA Chronic Total Ammonia Criterion: 1.64 mg/l

TMDL LOADINGS (ppd)

Source	CBOD ₅	NH ₃ -N
Headwaters	13.56	1.32
Total LA	13.56	1.32
Collinsville STP	25.02	11.01
Total WLA	25.0	11.01
Total Loading	38.6	12.33

SOURCE	FLOW		CONCENTRATION (mg/l)				LOADING (ppd)	
	(cfs)	(mgd)	CBODU	CBOD5	ANOD	NH3-N	CBOD5	NH3-N
Headwaters	1.84	1.19	2.05	1.37	0.61	0.13	13.56	1.32
Collinsville		0.3	30.9	10.00	20.11	4.40	25.02	11.01

ADEM WINTER TMDL SUMMARY

Impacted Waterbody: Little Wills Creek
303(d) Priority Ranking: Low
County(s): DeKalb
Size: 5 miles
From: Big Wills Creek
To: Its Source
Use Classification: F&W
Support Status: Partial Support
Causes: Nutrients
Sources: Urban Surface Runoff/Municipal WWTP
Critical Conditions: Monthly 7Q₁₀ Flows & 20°C Temp
Water Quality Model: W2E
MOS: Monthly 7Q₁₀ Flows, 20°C Temp & Model Reaction Rate Coefficients
Pollutants Evaluated: CBOD₅, NH₃-N & Ammonia Toxicity
Background Numbers for Ammonia Toxicity: 20°C Temp & pH of 7
EPA Chronic Total Ammonia Criterion: 2.50 mg/l

WINTER TMDL LOADINGS (ppd)

Source	CBOD ₅	NH ₃ -N
Headwaters	15.40	1.50
Total LA	15.40	1.50
Collinsville STP	55.04	22.27
Total WLA	55.0	22.3
Total Loading	70.4	23.8

WINTER TMDL: LITTLE WILLS CREEK

SOURCE	FLOW		CONCENTRATION (mg/l)				LOADING (ppd)	
	(cfs)	(mgd)	CBODU	CBOD5	ANOD	NH3-N	CBOD5	NH3-N
Headwaters	2.09	1.35	2.05	1.37	0.61	0.13	15.40	1.50
Collinsville		0.3	67.98	22.00	40.67	8.90	55.04	22.27

LITTLE WILLS CREEK - DeKALB COUNTY

SW1/4, SEC 3, T9S, R7E

Lat. Long.
34°16'43" 85°53'22"

NH₃ Toxicity=4.4 mg/l

Total Length=.54 miles



EL=667

Qw=0.3 mgd
DA=12.0 sq mi
7Q₁₀=1.84 cfs
T=26° C

$\Delta H=4$
L=.54
AVG H=665
IF=0



EL=663

BIG WILLS CREEK

LITTLE WILLS CREEK - DeKALB COUNTY - WINTER

SW1/4, SEC 3, T9S, R7E

Lat. Long.
34°16'43" 85°53'22"

NH₃ Toxicity=8.9 mg/l

Total Length=.54 miles



EL=667

Qw=0.3 mgd
DA=12.0 sq mi
7Q₁₀=2.09 cfs
T=20° C

$\Delta H=4$
L=.54
AVG H=665
IF=0



EL=663

BIG WILLS CREEK