



Assessment Decision Report

Big Nance Creek

Assessment Unit ID: AL06030005-0105-100

Pesticides

(Endosulfan and Parathion)

Alabama Department of Environmental Management
Water Quality Branch
Water Division
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1.0 Executive Summary

Big Nance Creek, a part of the Tennessee River basin, flows from Wilson Lake to its source and is located in Lawrence County. It was placed on the State of Alabama's §303(d) use impairment list in 1992 for Pesticides (Atrazine, Methyl Parathion, Endosulfan, and Chlorpyrifos). Its use classification is Fish and Wildlife.

Big Nance Creek was placed in Category 4A after TMDLs for Pesticides (Atrazine, Methyl Parathion, Endosulfan, and Chlorpyrifos) were developed and approved by EPA in 2002.

In 2023, the Alabama Department of Environmental Management (ADEM) conducted Pesticides sampling at station BGNL-1 on Big Nance Creek and collected 8 samples of Endosulfan and Parathion which have been analyzed and reported. All results are below Method Detection Limits (MDLs), and all MDLs are below ADEM criteria shown below. Water quality data is shown in the Appendix.

Pollutant	Criteria Effective June 14, 2025					
	Aquatic Life Criteria, ug/l				Human Health Criteria, ug/l	
	Freshwater Acute	Freshwater Chronic	Marine Acute	Marine Chronic	Consumption of Water and Fish	Consumption of Fish Only
Endosulfan (alpha)	0.22	0.056	0.034	0.0087	41.6	51.9
Endosulfan (beta)	0.22	0.056	0.034	0.0087	41.6	51.9
Endosulfan (sulfate)					41.6	51.9
Parathion	0.065	0.013				

Based on the analysis of all available water quality data and information collected on the 24.75-mile segment of Big Nance Creek from Wilson Lake to its source, there are no longer any issues related to Endosulfan or Parathion. Based on Table 19 in the WQALM, the datasets in this report show the maximum number of samples exceeding criteria have not been exceeded for delisting or declaring unimpaired. Consequently, ADEM has determined that Endosulfan and Parathion impairments on Big Nance Creek no longer exist.

Figure 1.1: Big Nance Creek Watershed Map:

2.0 Water Quality Target Identification

2.1 Endosulfan and Parathion

According to ADEM's Water Quality Criteria (Administrative Code 335-6-10), the maximum concentration for Endosulfan and Parathion are based off the following criteria:

335-6-10-.01 Toxic Pollutant Criteria Applicable to State Waters.

(1) The U.S. Environmental Protection Agency has listed the chemical constituents given in Table 1 as toxic pollutants pursuant to Section 307(a)(1) of the Federal Water Pollution Control Act (FWPCA). Concentrations of these toxic pollutants in State waters shall not exceed the criteria indicated in Table 1 to the extent commensurate with the designated usage of such waters.

ADEM's Water Quality Criteria (Administrative Code 335-6-10) Table 1 sets the maximum concentration for Endosulfan and Parathion as shown below:

Pollutant	Criteria Effective June 14, 2025					
	Aquatic Life Criteria, ug/l				Human Health Criteria, ug/l	
	Freshwater Acute	Freshwater Chronic	Marine Acute	Marine Chronic	Consumption of Water and Fish	Consumption of Fish Only
Endosulfan (alpha)	0.22	0.056	0.034	0.0087	41.6	51.9
Endosulfan (beta)	0.22	0.056	0.034	0.0087	41.6	51.9
Endosulfan (sulfate)					41.6	51.9
Parathion	0.065	0.013				

Table 2.1 Big Nance Creek Assessment Information

Assessment Unit ID	Waterbody Name	Downstream	Upstream	Size	Category	Use Classification
AL06030005-0105-100	Big Nance Creek	Wilson Lake	Its Source	24.75 miles	5	F&W

2.2 Basis for Removing a Waterbody from Category 5 or 4A

Waterbodies may be removed from a 303(d) list (Category 5) for various reasons, including:

- Assessment of more recent water quality data demonstrates that the waterbody is meeting all applicable water quality standards. (Move to Category 1)

- A review of the original listing decision demonstrates that the waterbody should not have been included in Category 5. (Move to Category 1 or Category 2)
- TMDL has been completed. (Move to Category 4a)
- Other pollution control requirements are reasonably expected to result in the attainment of the water quality standards in the near future. These requirements must be specifically applicable to the particular water quality problem. (Move to Category 4b)
- Impairment is not caused by a pollutant. (Move to Category 4c)
- Natural causes, when it can be demonstrated the exceedance of a numeric water quality criterion is due to natural conditions and not to human disturbance activities. (Move to Category 1)

Table 2.2 (Table 19 in WQALM) shows the allowable number of exceedances of criteria for conventional pollutants for various sample sizes and a 90% confidence level. This table will be used to determine the number of allowable exceedances of Alabama numeric water quality criteria for pollutants listed in ADEM Administrative Code r. 335-6-10, with the exception of chlorophyll *a* criteria and the toxics criteria listed in the appendix to ADEM Administrative Code r. 335-6-10, for the waterbody to be removed from a 303(d) list for a specific pollutant (move to Category 1). In addition, the original basis for listing the waterbody will be considered as a part of the delisting process. Included in this evaluation will be a review of pollutant sources to determine which ones may have been removed or remediated, changes in land practices or uses, installation of new treatment facilities or best management practices, and changes in stream hydrology or morphology.

Table 2.2 (Table 19 in WQALM): Maximum Number of Samples Exceeding the Numeric Criterion Necessary for Delisting *

Sample Size	Number of Exceedances	Sample Size	Number of Exceedances
8 thru 21	0	104 thru 115	7
22 thru 37	1	116 thru 127	8
38 thru 51	2	128 thru 139	9
52 thru 64	3	140 thru 151	10
65 thru 77	4	152 thru 163	11
78 thru 90	5	164 thru 174	12
91 thru 103	6	175 thru 186	13

*For conventional parameters, including bacteria, at the 90% confidence level.

For waters originally placed in Category 5 due to a specific toxic pollutant or specific toxic pollutants, there should be no violations of the appropriate criteria in a preferred minimum of eight samples collected over a three-year period before the cause of impairment is removed or the water is placed in Category 1. As stated in section 4.10 Minimum Sample Size and Allowable Number of Water Quality Criterion Exceedances, the decision to use smaller data sets for making use support decisions will be made on a case-by-case basis using best professional judgment and the decision will be documented.

3.0 Data Collection & Analysis

In 2023, the Alabama Department of Environmental Management (ADEM) conducted Pesticides sampling at station BGNL-1 on Big Nance Creek and collected 8 samples of Endosulfan and Parathion which have been analyzed and reported. All results are below Method Detection Limits (MDLs), and all MDLs are below ADEM criteria shown below. Water quality data is shown in the Appendix.

4.0 Conclusion

Based on the analysis of all available water quality data and information collected on the 24.75-mile segment of Big Nance Creek from Wilson Lake to its source, there are no longer any issues related to Endosulfan or Parathion. Based on Table 19 in the WQALM, the datasets in this report show the maximum number of samples has not been exceeded for delisting or declaring unimpaired. Consequently, ADEM has determined that Endosulfan and Parathion impairments on Big Nance Creek no longer exist.

5.0 Appendices:

Table 5.1 Endosulfan

STATION_ID	Date	Endosulfan I (ug/l)	DET_COND - Endosulfan I	Endosulfan II (ug/l)	DET_COND - Endosulfan II	Endosulfan sulfate (ug/l)	DET_COND - Endosulfan sulfate
BGNL-1	4/10/2023	0.002	< MDL .002	0.003	< MDL .003	0.003	< MDL .003
BGNL-1	5/17/2023	0.002	< MDL .002	0.003	< MDL .003	0.003	< MDL .003
BGNL-1	6/7/2023	0.002	< MDL .002	0.003	< MDL .003	0.003	< MDL .003
BGNL-1	7/17/2023	0.002	< MDL .002	0.003	< MDL .003	0.003	< MDL .003
BGNL-1	8/8/2023	0.002	< MDL .002	0.003	< MDL .003	0.003	< MDL .003
BGNL-1	9/25/2023	0.002	< MDL .002	0.003	< MDL .003	0.003	< MDL .003
BGNL-1	10/18/2023	0.002	< MDL .002	0.003	< MDL .003	0.003	< MDL .003
BGNL-1	11/8/2023	0.002	< MDL .002	0.003	< MDL .003	0.003	< MDL .003

Table 5.2 Parathion

STATION_ID	Date	Parathion Ethyl (ug/l)	DET_COND - Parathion Ethyl	Parathion Methyl (ug/l)	DET_COND - Parathion Methyl
BGNL-1	4/10/2023	0.015	< MDL .015	0.003	< MDL .003
BGNL-1	5/17/2023	0.015	< MDL .015	0.003	< MDL .003
BGNL-1	6/7/2023	0.015	< MDL .015	0.003	< MDL .003
BGNL-1	7/17/2023	0.015	< MDL .015	0.003	< MDL .003
BGNL-1	8/8/2023	0.015	< MDL .015	0.003	< MDL .003
BGNL-1	9/25/2023	0.015	< MDL .015	0.003	< MDL .003
BGNL-1	10/18/2023	0.015	< MDL .015	0.003	< MDL .003
BGNL-1	11/8/2023	0.015	< MDL .015	0.003	< MDL .003