



Assessment Decision Report

Walnut Creek

Assessment Unit ID: AL03140202-0401-102

Metals (Lead)

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

Located in the Choctawhatchee River Basin in Troy, Alabama, Walnut Creek is classified as *Fish and Wildlife (F&W)* and is currently listed on Alabama’s §303(d) List of Impaired Waters (Category 5) for Metals (Thallium) but is classified as a Category 4a for Metals (Lead). It was added to the list in 2010 after the State of Alabama identified the 3.3-mile segment of Walnut Creek from County Road 3304 to US 231 in Pike County as being impaired by Metals (Lead) based on data collected in 2008. The original §303(d) listing for this waterbody was reported on Alabama’s 1998 List of Impaired Waters for Unknown Toxicity, and subsequently included on the 2000, 2002, 2004, 2006, and 2008 lists.

For the original listing in 1998, Walnut Creek was listed as impaired for Unknown Toxicity based on a “Water Quality Assessment” study conducted between September and October 1997 by the Alabama Department of Environmental Management (ADEM). The results of this study indicated that the water quality of Walnut Creek below the Troy Walnut Creek Wastewater Treatment Plant (WWTP) to be moderately impaired based on degradation to the macroinvertebrate community. In 2010, a Metals (Lead) Total Maximum Daily Load (TMDL) was developed for the impaired segment of Walnut Creek and was approved in September 2010.

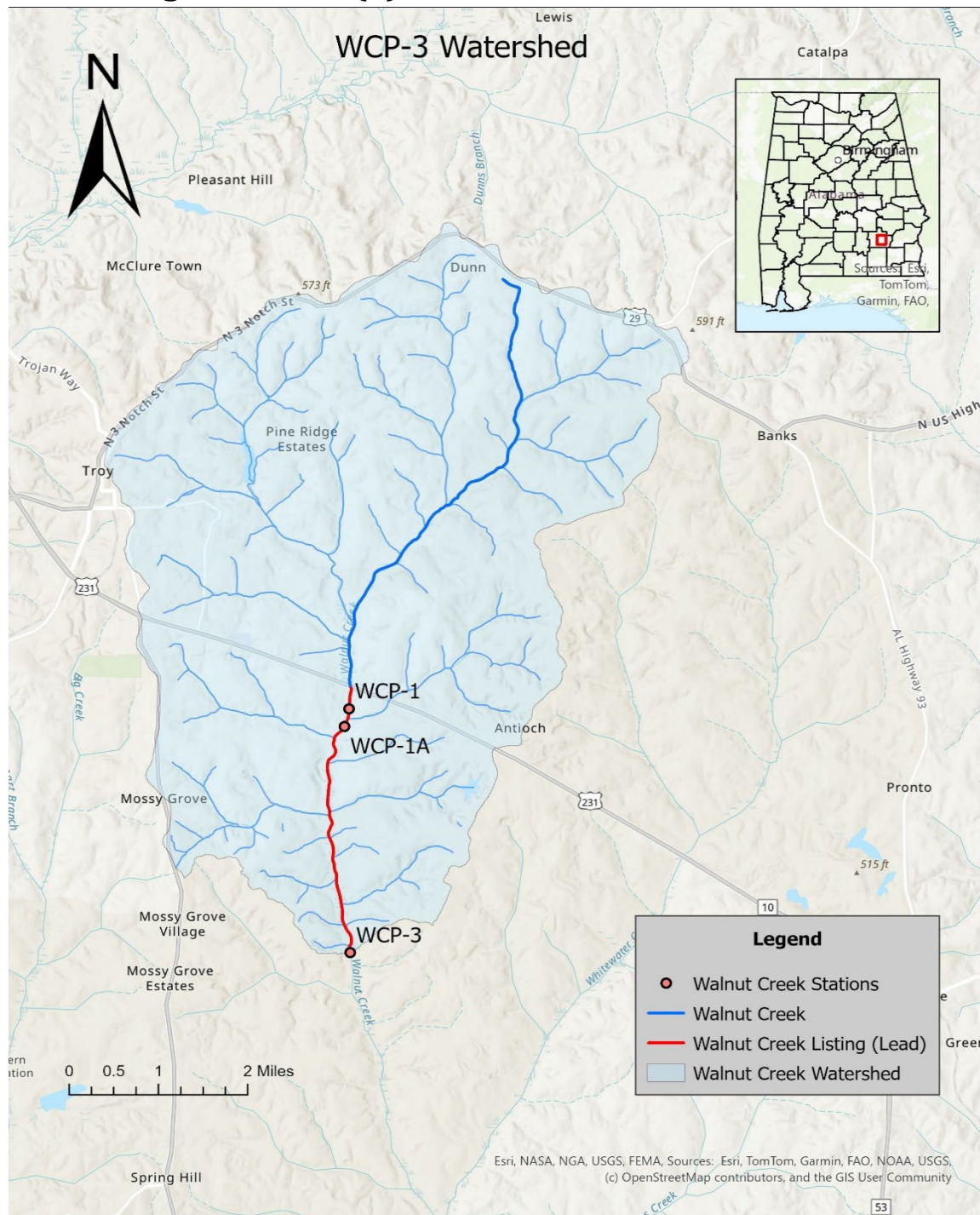
Following the TMDL approval in 2010, water quality sampling was conducted in 2017, 2019, and 2024. See Table 5 in the Appendix for the lead data collected at ADEM Stations WCP-1, WCP-1A, and WCP-3. This Assessment Decision Report (ADR) summarizes the recent Metals (Lead) data collected on Walnut Creek. Based on the recent data, ADEM has determined that this segment of Walnut Creek is no longer impaired and is meeting the criteria for Metals (Lead).

Table 1.1 Walnut Creek Assessment Unit Information

Assessment Unit ID	Waterbody Name	Downstream	Upstream	Size
AL03140202-0401-102	Walnut Creek	Pike County Road 3304	US Highway 231	3.3 miles

TMDL Listing	NTTS ID	Approval Date	Pollutants
AL03140202-0401-102	39067	09/21/2010	Metals (Lead)

Figure 1.1: 303(d) Listed Portion of Walnut Creek



2.0 Water Quality Criteria: Metals (Lead)

According to ADEM Administrative Code Rule 335-6-10-.07, the toxic pollutant criteria for Lead are as follows:

- (a) The freshwater and marine aquatic life criteria for certain pollutants are dependent on hardness or pH. For these pollutants, the criteria are given by the following equations. In the hardness-dependent equations for metals, a conversion factor converts the total recoverable value to a criterion expressed as the dissolved fraction in the water column. All numeric values listed for metals in Table 1 at the end of this chapter are expressed as dissolved metals unless otherwise noted.

4. Lead

- (i) freshwater acute aquatic life:

$$\text{conc. } (\mu\text{g/l}) = (e^{1.273[\ln(\text{hardness in } \frac{\text{mg}}{\text{l}} \text{ as } \text{CaCO}_3)] - 1.460})(\text{CF}); \text{ (Eq. 7)}$$

$$\text{conversion factor (CF)} = 1.46203 - [\ln(\text{hardness})(0.145712)]$$

- (ii) freshwater chronic aquatic life:

$$\text{conc. } (\mu\text{g/l}) = (e^{1.273[\ln(\text{hardness in } \frac{\text{mg}}{\text{l}} \text{ as } \text{CaCO}_3)] - 4.705})(\text{CF}); \text{ (Eq. 8)}$$

$$\text{conversion factor (CF)} = 1.46203 - [\ln(\text{hardness})(0.145712)]$$

3.0 Data Availability & Analysis

According to Alabama's Water Quality Assessment and Listing Methodology, the minimum data requirements for a F&W Wadeable stream includes three inorganic samples during the previous six years. From 2019-2024, ADEM collected fifteen samples (30 total) at Stations WCP-1 and WCP-1A (Figure 1). Samples were collected in the years 2019 and 2024 from March-October. Data from years prior to 2019 are also included at Station WCP-1, WCP-1A, and WCP-3 in Table 5 in the Appendix.

An evaluation of the data at Stations WCP-1 and WCP-1A from 2019-2024 showed that there were no lead concentrations exceeding the acute or chronic criteria. The majority of data collected during that timeframe was below the Method Detection Limit (MDL). Older data from 2017 did not exceed acute or chronic criteria as well. Assessment of the lead data in the attached Appendix shows that this segment of Walnut Creek is currently meeting the criteria for Metals (Lead).

4.0 Conclusion

Based on the analysis of the water quality data collected on the 3.3-mile segment of Walnut Creek from Pike County Road 3304 to US Highway 231 from 2019-2024, it is evident that all lead data is currently meeting criteria. Consequently, ADEM has determined that Walnut Creek is no longer impaired for Metals (Lead).

5.0 Appendix: Water Quality Data

Table 5.1: Walnut Creek Lead Data at Stations WCP-1, WCP-1A, & WCP-3

Station ID	Visit Date	Hard mg/l	Pb Dissolved ug/l	Adjusted Pb 1/2 MDL	Pb Dissolved Detect Condition	Acute Lead Criteria ug/l	Chronic Lead Criteria ug/l
WCP-1	10/18/2006	72	5	2.5	< MDL 5	45.08	1.76
WCP-1	4/9/2008	35.4	1.47	0.735	< MDL 1.47	20.51	0.80
WCP-1	5/14/2008	58.3	1.47	0.735	< MDL 1.47	35.72	1.39
WCP-1	9/11/2008	51.4	1.47	0.735	< MDL 1.47	31.07	1.21
WCP-1	10/9/2008	33.9	1.47	0.735	< MDL 1.47	19.54	0.76
WCP-1	3/16/2017	24.4	0.156	0.078	< MDL .156	13.51	0.53
WCP-1	4/12/2017	29.8	0.157		JI	16.91	0.66
WCP-1	5/2/2017	31.4	0.261		JI	17.93	0.70
WCP-1	6/8/2017	26.1	0.303		JI	14.57	0.57
WCP-1	7/6/2017	33.4	0.156	0.078	< MDL .156	19.22	0.75
WCP-1	8/17/2017	34.3	0.164		JI	19.80	0.77
WCP-1	9/14/2017	27.5	0.156	0.078	< MDL .156	15.45	0.60
WCP-1	10/11/2017	27.4	0.196		JI	15.39	0.60
WCP-1	3/12/2019	21.9	0.697	0.3485	< MDL .697	11.96	0.47
WCP-1	4/9/2019	28.6	0.697	0.3485	< MDL .697	16.15	0.63
WCP-1	5/14/2019	28.9	0.697	0.3485	< MDL .697	16.34	0.64
WCP-1	6/4/2019	42.1	0.697	0.3485	< MDL .697	24.89	0.97
WCP-1	7/16/2019	37.8	0.697	0.3485	< MDL .697	22.07	0.86
WCP-1	8/13/2019	36.9	0.697	0.3485	< MDL .697	21.49	0.84
WCP-1	9/10/2019	47.9	0.697	0.3485	< MDL .697	28.73	1.12
WCP-1	10/8/2019	60.9	0.697	0.3485	< MDL .697	37.49	1.46
WCP-1	3/27/2024	28.2	0.478	0.239	< MDL .478	15.90	0.62
WCP-1	5/16/2024	32.4	0.478	0.239	< MDL .478	18.58	0.72
WCP-1	6/6/2024	80.1	0.478	0.239	< MDL .478	50.68	1.97
WCP-1	7/10/2024	43.6	0.478	0.239	< MDL .478	25.88	1.01
WCP-1	8/13/2024	46	0.478	0.239	< MDL .478	27.47	1.07
WCP-1	9/4/2024	56.4	0.478	0.239	< MDL .478	34.44	1.34
WCP-1	10/29/2024	42.3	0.478	0.239	< MDL .478	25.02	0.98

Station ID	Visit Date	Hard mg/l	Pb Dissolved ug/l	Adjusted Pb 1/2 MDL	Pb Dissolved Detect Condition	Acute Lead Criteria ug/l	Chronic Lead Criteria ug/l
WCP-1A	8/15/2006	154	5	2.5	< MDL 5	103.00	4.01
WCP-1A	9/7/2006	161	5	2.5	< MDL 5	108.02	4.21
WCP-1A	10/18/2006	96	5	2.5	< MDL 5	61.77	2.41
WCP-1A	4/9/2008	59.8	1.47	0.735	< MDL 1.47	36.74	1.43
WCP-1A	5/14/2008	162	1.47	0.735	< MDL 1.47	108.74	4.24
WCP-1A	7/2/2008	92.2	3.34			59.11	2.30
WCP-1A	8/7/2008	133	4.46			87.97	3.43
WCP-1A	9/11/2008	137	1.47	0.735	< MDL 1.47	90.83	3.54
WCP-1A	10/9/2008	65.7	1.54			40.76	1.59
WCP-1A	11/19/2008	77.4	2.41			48.81	1.90
WCP-1A	5/2/2017	44.3	0.358		Jl	26.34	1.03
WCP-1A	6/8/2017	41.7	0.472		Jl	24.63	0.96
WCP-1A	7/6/2017	76.5	0.363		Jl	48.19	1.88
WCP-1A	8/17/2017	74.6	0.409		Jl	46.87	1.83
WCP-1A	9/14/2017	62.4	0.423		Jl	38.51	1.50
WCP-1A	10/11/2017	47.8	0.823		Jl	28.67	1.12
WCP-1A	3/12/2019	43.8	0.697	0.3485	< MDL .697	26.01	1.01
WCP-1A	4/9/2019	92.3	0.697	0.3485	< MDL .697	59.18	2.31
WCP-1A	5/14/2019	53.8	0.697	0.3485	< MDL .697	32.69	1.27
WCP-1A	6/4/2019	147	0.697	0.3485	< MDL .697	97.98	3.82
WCP-1A	7/16/2019	147	0.697	0.3485	< MDL .697	97.98	3.82
WCP-1A	8/13/2019	122	0.697	0.3485	< MDL .697	80.14	3.12
WCP-1A	9/10/2019	197	0.697	0.3485	< MDL .697	133.97	5.22
WCP-1A	10/8/2019	330	0.697	0.3485	< MDL .697	230.31	8.97
WCP-1A	3/27/2024	54.2	0.701		Jl	32.95	1.28
WCP-1A	5/16/2024	48.4	0.478	0.239	< MDL .478	29.07	1.13
WCP-1A	6/6/2024	55.6	0.478	0.239	< MDL .478	33.90	1.32
WCP-1A	7/10/2024	76.8	0.478	0.239	< MDL .478	48.39	1.89
WCP-1A	8/13/2024	90.4	0.518		Jl	57.85	2.25
WCP-1A	9/4/2024	129	0.478	0.239	< MDL .478	85.12	3.32
WCP-1A	10/29/2024	182	0.478	0.239	< MDL .478	123.14	4.80

Station ID	Visit Date	Hard mg/l	Pb Dissolved ug/l	Adjusted Pb 1/2 MDL	Pb Dissolved Detect Condition	Acute Lead Criteria ug/l	Chronic Lead Criteria ug/l
WCP-3	8/15/2006	110	5	2.5	< MDL 5	71.63	2.79
WCP-3	9/7/2006	137	5	2.5	< MDL 5	90.83	3.54
WCP-3	10/18/2006	101	5	2.5	< MDL 5	65.28	2.54
WCP-3	4/9/2008	58.4	1.47	0.735	< MDL 1.47	35.79	1.39
WCP-3	5/14/2008	139	1.47	0.735	< MDL 1.47	92.25	3.60
WCP-3	6/5/2008						
WCP-3	7/2/2008	93.1	1.47	0.735	< MDL 1.47	59.74	2.33
WCP-3	8/7/2008	102	1.47	0.735	< MDL 1.47	65.99	2.57
WCP-3	9/11/2008	104	1.47	0.735	< MDL 1.47	67.40	2.63
WCP-3	10/9/2008	60.3	1.47	0.735	< MDL 1.47	37.08	1.44
WCP-3	11/19/2008	66	0.55	0.275	< MDL .55	40.97	1.60
WCP-3	3/16/2017	48.5	0.156	0.078	< MDL .156	29.13	1.14
WCP-3	4/12/2017	57.6	0.377		JI	35.25	1.37