5.0 WATER QUALITY IN THE ALABAMA RIVER BASIN

The overarching goal of this basin management plan is to clean up the polluted waters of the Alabama River Basin and to maintain waterbodies with good water quality. *What, then, is the current state of water quality in the creeks, rivers, lakes, and ponds of the Alabama River Basin?* The answer to this question is told by the data that is collected over the years by government agencies, private industry, and citizen volunteers. And, furthermore, some answers emerge after the Alabama Department of Environmental Management completes the challenging task of organizing the data and interpreting it so that all stakeholders can better understand what the state of the water quality in the Alabama River Basin is thought to be. This section looks at the current understanding of water quality in the Alabama River Basin.

Authorized by the Clean Water Act (CWA), the U.S. Environmental Protection Agency requires ADEM to complete two periodic water quality inventories and assessments: 1) Section 305(b) of the CWA calls for a bi-annual inventory of the quality of Alabama's waters and, 2) Section 303(d) of the CWA requires Alabama to list, on even-numbered years, all of its polluted and degraded waters that are not achieving their designated uses. The 2004 reporting year marked an evolution of water quality reporting for USEPA and Alabama because these two central water quality reports were integrated into one report called, *Alabama's 2004 Integrated Water Quality and Assessment Report*. This *Integrated Report* is the most current and comprehensive inventory and evaluation of water quality data for the waters of Alabama, including the Alabama River. It is vital to the basin management planning effort because it contains data and information that serve as a baseline of our understanding of the conditions of the waters in the Basin.

5.1 Water Quality Monitoring and Data Sources

Over a dozen water quality studies and monitoring programs generate data in support of the *Integrated Report* and inform our overall understanding of water quality in the Alabama River Basin. Table 5.1 below lists these water quality monitoring and data collection efforts as well as the type of data they collect. The majority of these efforts are the responsibility of ADEM

and constitute the agency's comprehensive approach to monitoring called, ASSESS.[30] Other efforts, such as ADPH's fish consumption advisories, SWCC's watershed assessments, and the Alabama Water Watch (AWW)'s citizen water quality monitoring data, support ADEM's efforts to evaluate the waters of the State. In addition, agencies such as USGS and the USACOE, perform targeted water quality studies that inform the overall state of knowledge regarding water quality in the basin. The *Integrated Report* contains a more detailed description of each of these programs and how they factor into the overall assessment picture. Several of these efforts are displayed on Map 4 and discussed below.

Table 5.1. Important Sources of Water Quality Data for the Alabama River Basin

Agency	Period of Record	Report or Program Title	Information Type
ADEM	2002 – 2003	Alabama's 2004 Integrated Water Quality and Assessment Report (305b & 303d)	Chemical, physical, habitat, biological
ADEM	2003	Nonpoint Source Assessment Program	Chemical, biological, physical
ADEM	2003	Point Source Assessment Program	Chemical, biological, physical
ADEM	2003	Ecoregion Reference Assessment Program	Chemical, physical, habitat, biological
ADEM	2003	Clean Water Act §303(d) Support Assessments	Chemical, physical
ADEM	2003	Fixed Ambient Trend Monitoring Program	Chemical, physical, habitat, biological
ADEM	1997 – 2003	Alabama Monitoring and Assessment Program (ALAMAP)	Chemical, physical, habitat
ADEM	2000	Surface Water Quality Screening Assessment of the Alabama River	Chemical, habitat, biological
ADEM	2002	Alabama's 2002 305 (b) Water Quality Report to Congress	Chemical, physical, habitat, biological
ADPH	2004	Fish Advisories	Fish consumption, toxics
AWW	1999 – 2003	Alabama Water Watch - Citizen Volunteer WQ Monitoring	Chemical and bacteria
GSA	1960s to present	Various studies and reports pertaining to water quality, aquatic fauna, and groundwater.	Chemical, physical, biological
SWCC	1998	Statewide Watershed Assessments (by County)	Sediment loading
USGS	1997 – 2001	Flow and water quality data	Chemical, physical
USGS NAWQA	1997 – 2003	National Water-Quality Assessment Program	Chemical, physical, habitat, biological

[30] ASSESS is an acronym for **A**labama's **S**trategy for **S**ampling **E**nvironmental indicators of **S**urface water quality **S**tatus. The agency strives to maximize resources by prioritizing monitoring needs according to certain objectives and reporting needs, such as those mandated for the 305(b) and 303(d) requirements.

5.1.1 Nonpoint Source Pollution Assessments

This basin management plan primarily focuses on nonpoint source pollution and how to manage activities in the watersheds of the Alabama Basin to minimize it. As mentioned above, the plan is an integral step in implementing the Alabama Nonpoint Source (NPS) Management Program, which focuses on preventing or eliminating water quality impairments related to NPS runoff pollutants and protecting unimpaired waters.[31] Through the use of its Section 319 funds, the NPS Program supports county-by-county, citizen-based nonpoint source screening assessments under the administration of the Soil and Water Conservation Committee. These assessments occur on a 5-year rotational basis. The first assessment for the Alabama River Basin was completed in 1999-2000; the second rotational assessment is scheduled for 2005.[32]

5.1.2 Alabama Water Watch

An integral part of Alabama's approach to the management of nonpoint source pollution is the reliance on citizen volunteers to monitor water quality in its basins. Alabama Water Watch (AWW) is a statewide program coordinated out of the Department of Fisheries and Allied Aquacultures and the International Center for Aquaculture and Aquatic Environments at Auburn University. It is dedicated to developing citizen volunteer monitoring of Alabama's surface waters. According to ADEM, 75 citizen groups submitted data during the report period for the 2004 Report and one of those groups was new to AWW. Most AWW groups monitored in the Tennessee, Coastal Plains and Mobile River watersheds. Of the 3,930 chemistry data records received from October 2001 through September 2002, monitors in the Coosa, Mobile and Tennessee watersheds submitted 68% of the data (26%, 23% and 19%, respectively). Monitors also submitted a total of 893 bacteriological data records during the report period. Since the inception of the AWW program in late 1992, monitors have sampled 1,400 sites on 575 water bodies and submitted over 21,000 chemistry and over 4,000 data forms.[33] AWW is funded by the USEPA, ADEM, Alabama Cooperative Extension System, and Alabama Agricultural Experiment Station.

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[31] ADEM, 2004. *Alabama's 2004 Integrated Water Quality and Assessment Report.* Page 129.
[32] Ibid, Page 132.
[33] Ibid, Page 132.

Table 5.1.2. Summary of Alabama Water Watch Monitoring Activity in the Alabama River Basin, 1998 – 2005.

Group Name	County	Last Date Sampled	Active Sites	Inactive Sites	# Chemical Samples	# Bacteria Samples	# Biological Samples	Status
Bridge Creek Scouts	Autauga	26-Aug-04	2	3	41	15	0	Active
Camp Creek Water Watcher	Montgomery	15-Jan-05	1	0	8	9	0	Active
Isabella Water Watchers	Chilton	1-Aug-00	0	3	4	1	0	Inactive
Lanier High School	Montgomery	8-May-98	0	2	18	0	0	Inactive
Perry County	Perry	19-Feb-04	4	0	4	0	0	Active
Selma High School	Dallas	29-Apr-02	0	1	6	0	0	Inactive
Tri-River Region Water Watch	Autauga Dallas Elmore Lowndes Montgomery	5-Jan-05	8	51	843	31	1	Active

In the Alabama River Basin, seven citizen monitoring groups have sampled 64 sites. Currently, four of those seven groups are actively monitoring 15 sites. The majority of the sampling conducted is chemical although there are data collections for biological and bacteriological indicators. Samples and field data are collected and submitted to AWW by volunteers, which is then made available on-line through Auburn University (http://frontpage.auburn.edu/icaae/index.aspx.).

5.1.3 National Water-Quality Assessment Program (NAWQA)

NAWQA is implemented by the United States Geological Survey to assess water quality status and trends of the Nations' ground and surface waters on a regional and national scale (USGS, 2003).[34] Physical, chemical, and biological data are collected from a wide range of environmental settings to assess overall water quality within a study unit. The Mobile River Basin is one of the study units that NAWQA has assessed since 1997. Several recent reports contain data and analyses pertinent to the management of the

[34] United States Geological Survey, 2003. *Occurrence and Distribution of Nutrients, Suspended Sediment, and Pesticides in the Mobile River Basin, Alabama, Georgia, Mississippi, and Tennessee, 1999-2001, as amended.* By Ann K. McPherson, Richard S. Moreland, and J. Brian Atkins. USGS NAWQA Water-Resources Investigations Report 03-4203. Montgomery, Alabama.

Alabama River Basin. A list of the most pertinent USGS publications and their area of relevance to the Basin is provided below.

Table 5.1.3. Major USGS Publications pertinent to the Alabama River Basin

Title	Principal Author	Relevance to Alabama River Basin Management Plan
Water Resources Data, Alabama, Water Year 2003 (AL-03-1)	W.L. Psinakis	Contains data for records of stage, discharge, and water quality of streams; stages and contents of lakes and reservoirs; and water levels in wells, includes 11 surface water stations in the Alabama River Basin.
Occurrence and distribution of nutrients, suspended sediment, and pesticides in the Mobile River Basin, Alabama, Georgia, Mississippi, and Tennessee, 1999-2001 (WRIR 03-4203)	A.K. McPherson	Targeted water quality analysis (January 1999 to December 2001) to measure levels of nitrogen, phosphorus and pesticides at nine sites. Three sites in the Alabama River Basin: Threemile Branch, Pintlalla Creek and Alabama River.
Environmental setting and water-quality issues of the Mobile River Basin, Alabama, Georgia, Mississippi, and Tennessee (WRIR 02-4162)	G.C. Johnson	Overview of the physiographic and hydrologic features of the Mobile River Basin. Characterization of water quality issues throughout the study area including the Alabama River Basin.
Water Quality in the Mobile River Basin, Alabama, Georgia, Mississippi, and Tennessee, 1999-2001 (USGS Circular 1231)	J. Brian Atkins	Summary of other water quality reports completed for the Mobile River Basin. Contains study highlights that are important for local, state and federal water resource managers and stakeholders (*see discussion below*).

NAWQA's publication, *Water Quality in the Mobile River Basin, Alabama, Georgia, Mississippi, and Tennessee, 1999-2001*, contains important observations about the effects of land use on water quality in the Mobile River Basin, and more specifically, the Alabama River Basin. The report looks at levels of nutrients, pesticides, organochlorine compounds, volatile organic compounds (VOCs), biological communities and radon. Furthermore, it provides a valuable comparison about the impacts of urban versus rural (agricultural) land uses. Study segments within the Alabama River Basin (*e.g.,* Pintlalla Creek, Catoma Creek and Threemile Branch) produced data results that suggest that the prevalent land use dictates the dominant pollutant(s) found in the water, *i.e.*, higher levels of herbicides in urban versus rural streams (Atkins, et al, 2003).

Overall, the study provides a national perspective on water quality issues in the Mobile River Basin. It may be access online, free-of-charge from USGS Alabama at the following URL: http://al.water.usgs.gov/publications/onlineALpubs.html.

5.1.4 United States Army Corps of Engineers

The ACOE collects water resource data at its three locks and dams on the Alabama River. Flow and stage data on available on a regular basis for all three projects. However, only at the R.F. Henry Dam in Lowndes County does the Army Corps collect water quality data using one automatic water quality monitor. This monitor collects temperature, pH, conductivity, and dissolved oxygen data on an hourly basis.[35] In addition, the ACOE has been involved in numerous studies pertaining to the water resources of the Alabama River Basin. In particular, there are studies that provide historical data for the rivers and impoundments associated with the three ACOE projects on the Alabama River. One large-scale effort worth mentioning began in the early 1990s in support of the Alabama-Coosa-Tallapoosa Compact. This research is discussed in more detail below.

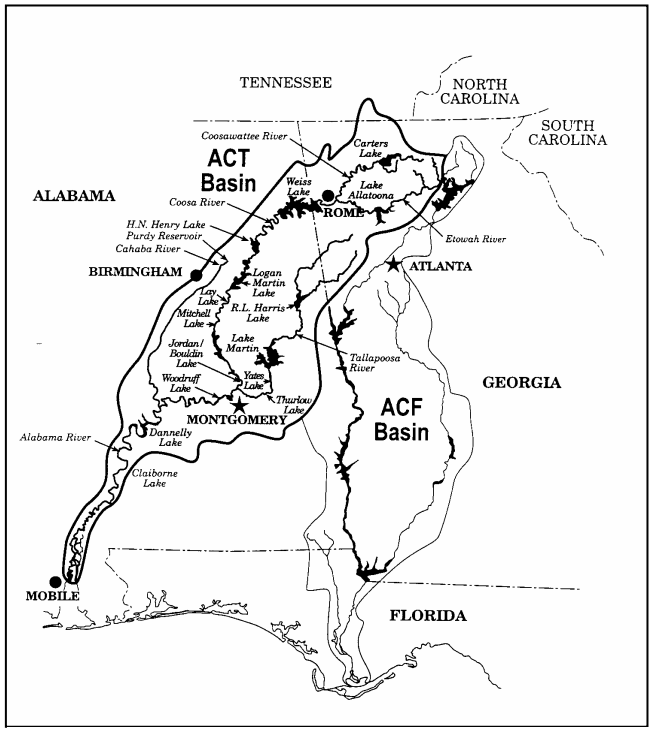

Illustration of the Alabama-Coosa-Tallapoosa and Apalachicola-Chattahoochee-Flint River Basins (ACOE, 1988).

[35] Diane I. Findley. RE: WQ Data for Alabama and Tombigbee. Diane.I.Findley@sam.usace.army.mil (January 31, 2005)

5.1.5 Draft Environmental Impact Statement - Water Allocation for the Alabama-Coosa-Tallapoosa River Basin

In September 1998, the ACOE – Mobile District published the *Draft Environmental Impact Statement for Water Allocation for the Alabama-Coosa-Tallapoosa River Basin* in Alabama and Georgia. The EIS was triggered by the signing into law of the *ACT River Basin Compact* on November 20, 1997. The Compact formed an interstate administrative agency, the ACT Basin Commission, comprised of the Governors of Alabama and Georgia and a Federal Commissioner appointed by the President of the United States. The primary mission of the Commission and the Compact was to "develop an allocation formula for equitably apportioning the surface waters of the ACT Basin among the States while protecting the water quality, ecology, and biodiversity of the ACT…"[36] These efforts directly emerged out of an earlier (1992) interstate Memoranda of Agreement that the States of Alabama, Florida, and Georgia agreed to, along with agency support from the ACOE, to conduct a 'Comprehensive Study' of the ACT and Apalachicola-Chattahoochee-Flint (ACF) River Basins.

The ACOE took a broad-view or 'programmatic' approach to the Draft EIS because of the large geographic extent of the ACT Basin. . This approach was also used because no water allocation formula had been settled upon by the Commission and without a preferred allocation formula it was only possible to examine the impacts of several hypothetical alternatives, or allocation scenarios, including a "no action" scenario. Nonetheless, the Draft EIS contains a wealth of research and data pertinent to the environmental and socioeconomic resources of the ACT Basin and the potential impacts to them given various water use scenarios.

For the purposes of this Alabama River Basin Management Plan, only the sections of the Draft EIS addressing water quality within the Alabama River Basin are referenced. This plan relied on more recent assessments and reports (*e.g.,* 2004 Integrated Report/303d List of Impaired Waters, 2000 Surface Water Quality Screening Assessment for the Alabama River) for water quality information rather than the Draft EIS due to the

[36] Public Law [PL]105-105

fact that the greater proportion of the EIS assessments were completed seven or more years ago. It is worth mentioning, however, that the Draft EIS did address nonpoint source pollution. The ACOE used several models to understand the hydrological features of the basin, and most notably, the BASINS[37] Model to assess nonpoint source pollution throughout the ACT Basin. It also used BASINS and HEC-5Q to predict the environmental consequences to rivers and reservoirs based on the water allocation alternatives.

The scale of the nonpoint source pollution modeling effort for the ACT study included the Alabama, Coosa, and Tallapoosa river basins and groups of subwatersheds. The modeling effort designated 200 subwatersheds within the ACT, grouping these into seven separate groups. ACT Subwatershed Group #7 represents the Alabama River Basin in the model outputs. The BASINS nonpoint source pollution model (NPSM) estimated nonpoint source pollutant loadings for three different scenarios equating to three difference land use distributions for the years 1995, 2020, and 2050. Model outputs were in 5-year daily times series for five key parameters: flow, BOD-5, total nitrogen, total phosphorus, and fecal coliform bacteria colonies.

Generally speaking, the model predicted pollutant loads to increase from 1995 to 2020 and from 2020 to 2050 in the ACT Basin. Biological Oxygen Demand (BOD-5) showed the greatest increase of the four pollutants measured from 1995 to 2050. Whereas, total nitrogen showed the smallest rate of increase of the four pollutants from 1995 to 2050. Flows were predicted to increase over time throughout the basin.[38]

For Subwatershed Group #7 (Alabama River Basin) of the ACT Study flow and the four pollutants were predicted to increase from 1995 to 2050. Flow would increase by 1.58% overall. For BOD-5, an increase of 24.80% would occur in the basin while total nitrogen, total phosphorus, and fecal coliform would increase by 11.81%, 17.57%, and

[37] Better Assessment Science Integrating Nonpoint and Point Source Pollution
[38] U.S. Army Corps of Engineers, 1998. *Draft EIS – Water Allocation for the Alabama-Coosa-Tallapoosa River Basin Main Report.* Mobile, AL. Appendix D, Section 8, pages 49 & 50.

17.24%, respectively. Compared to the other ACT subwatershed groups, these increases were not considered the highest.[39]

5.2 The Status of Monitoring in the Alabama River Basin

ADEM categorizes each waterbody based on the level of available information and its assessment status. This categorization identifies future monitoring needs as well as priorities for pollution management. The table below provides a brief description of each category.

Table 5.2. Water Quality Categorization for the State of Alabama

Category	Description
Category 1	Waterbody attains all designated uses. There is data (e.g. chemical, biological and physical) and information that are consistent with the State's 303(d) listing and assessment methodology to support a determination that all water quality standards are attained.
Category 2	There are some data and information available for the waterbody but the information is insufficient to make a determination that the water does or does not support all of its designated uses.
Category 3	No data and information to determine if any designated use is attained. Monitoring on a priority basis needed to obtain data
Category 4	Waterbodies belong in Category 4 if one or more designated uses are impaired or threatened but establishment of a TMDL is not required. Contains three subcategories: **Category 4a -** A TMDL has been completed for the water-pollutant combination **Category 4b** - Other required control measures are expected to result in the attainment of water quality standards in a reasonable period of time **Category 4c –** The impairment is not caused by a pollutant.
Category 5	Category 5 waterbodies constitute those waters in the Section 303(d) list that, "EPA will approve or disapprove under the CWA. Waters should be placed in Category 5 when it is determined, in accordance with the State's assessment and listing methodology, that a pollutant has caused, is suspected of causing, or is projected to cause an impairment or threat." (ADEM, 2003).
Source: *Alabama's 2004 Integrated Water Quality and Assessment Report*, Appendix C-2	

Table 5.2a provides a summary of the categorization for the waters of the Alabama River Basin while a complete table from the *2004 Integrated Report* of the categorized waters in the basin is presented in Appendix C. This list shows that while twelve stream segments meet their designated uses (Category 1), several streams within the Alabama River Basin have not been monitored or evaluated. Fourteen stream segments are Category 2 or, lack sufficient data to determine if it meets water quality standards. Twenty-six (26) segments are in Category 3 or, waters where no data and information exists to determine if they meet water quality standards.

[39] Ibid.

Waters in these categories represent monitoring needs; these are waters where governmental and volunteer resources have not been mustered to collect the necessary data to assess the waterbody.

There are no Category 4 waters listed for the Alabama River Basin. However, there are several Category 5 waters and these, by definition, are listed on the State's '303(d) List of Impaired Waters,' which is a major component of its *2004 Integrated Report.* EPA and ADEM have scheduled these waters for the development of a TMDL, or Total Maximum Daily Load, which require ADEM to set limits to the amount of pollutants impacting that water. The TMDL is the prerequisite water quality restoration component that addresses nonpoint sources of pollution within a watershed and is discussed more thoroughly in the next section

Table 5.2a. Summary of Categorized Waters in the Alabama River Basin

Category 1 Waters
Autauga Creek, Pintlalla Creek, Mulberry Creek, Buck Creek, Valley Creek, Soapstone Creek, Pine Barren Creek, Cub Creek, Gravel Creek, Pursley Creek, Silver Creek
Category 2 Waters
Mortar Creek, Pierce Creek, Autauga Creek, Catoma Creek, Swift Creek,, Alabama River, Morgan Creek, Mulberry Creek, Bogue Chitto Creek, Chilatchee Creek, Beaver Creek, Randons Creek, Bear Creek, Little River
Category 3 Waters
Callaway Creek, Hurricane Branch, South Mortar Creek, Cottonford Creek, Middle Creek, Kenner Creek, Pine Level Branch, Galbraith Mill Creek, Sevenmile Creek, Three Mile Branch, Mill Creek, Still Creek, Hudson Creek, Grandview Branch, Alabama River, Sand Creek, Turkey Creek, Rockwest Creek, Big Flat Creek, Limestone Creek
Category 4 Waters
No Category 4 Waters in the Alabama River Basin
Category 5 Waters
Three Mile Branch, Catoma Creek, Alabama River downstream of Rockwest Creek and upstream of Bear Creek
Source: *Alabama's 2004 Integrated Water Quality and Assessment Report*, Appendix D

5.3 Setting Limits to Nonpoint Source Pollution – TMDLs

ADEM is required to plan for the restoration of all the [Category 5] waters listed on the 303(d) list. Each impaired waterbody is subject to further investigation and analysis to determine the amount of a pollution that would be allowed to enter it and still meet water quality standards. The process of setting these allowable pollutant limits or, Total Maximum Daily Loads (TMDLs), follows a basic formula that considers the allowable load of a particular pollutant from point sources and nonpoint sources, plus a margin of safety to help ensure environmental

protection.[40] TMDLs are developed for an individual waterbody or, a segment of stream or river, as well as on a watershed basis where technological solutions (e.g. wastewater treatment) would not result in the achievement of water quality standards. A map of the Alabama River Basin Classified Waters is provided as Map 5.

Table 5.3. Waterbodies in the Alabama River Basin listed on the 2004 303(d) List

Waterbody Name	Support Status	Rank	County	Uses	Causes	Sources	Size	Downstream/Upstream	1996 303(d)?	Draft TMDL Date
Three Mile Branch	Non	M	Montgomery	F&W	Pesticides (Dieldrin)	Unknown	7.6 miles	Lower Wetumpka Rd/Its source	No	2007
Catoma Creek	Partial	M	Montgomery	F&W	Organic Enrichment/ DO	Pasture grazing Urban runoff /storm sewers	23.2 miles	Alabama River/Ramer Creek	Yes	2002
Catoma Creek	Partial	M	Montgomery	F&W	Pathogens	Urban runoff /storm sewers Agriculture	23.2 miles	Alabama River/Ramer Creek	No	2007
Alabama River	Partial	L	Wilcox	PWS	Organic Enrichment/ DO	Dam construction Flow regulation /modification	5.0 miles	Beaver Creek/Rockwest Creek	Yes	2003
Alabama River	Partial	L	Wilcox	S F&W	Organic Enrichment/ DO	Industrial	7.6 miles	Bear Creek/Frisco Railroad Crossing	Yes	2003
Alabama River	Partial	L	Wilcox	F&W	Organic Enrichment/ DO	Industrial	5.0 miles	Frisco Railroad Crossing/Pursley Creek	Yes	2003
Alabama River	Partial	L	Wilcox	F&W	Organic Enrichment/ DO	Dam construction Flow regulation /modification	8.7 miles	Pursley Creek/River Mile 131	No	2003
Alabama River	Partial	L	Wilcox	PWS	Organic Enrichment/ DO	Dam construction Flow regulation /modification	1.5 miles	River Mile 131/Beaver Creek	No	2003

The 2004 303(d) List contains eight segments of impaired streams within the Alabama River Basin. Table 5.3 above is adapted from the Final 2004 list and provides detail about these segments.[41] Map 6 illustrates these stream segments within the context of the Basin and its subwatersheds. Five segments totaling 27.8 miles of the main stem of the Alabama River in Wilcox County are impaired and partially supporting classified uses due to enrichment by organic matter, which leads to below-standard levels of dissolved oxygen in the water. One segment of the Catoma Creek in Montgomery County measuring 23.2 miles is listed for two different causes: organic enrichment/dissolved oxygen and pathogens. Finally, 7.6 miles of the

[40] The amount of pollution that a water body can assimilate considers waste load allocation (WLA) for point sources, the load allocation (LA) for nonpoint sources, and a margin of safety (MOS). The formula for a TMDL is as follows: TMDL = WLA + LA + MOS.

[41] ADEM, 2004. *Alabama's 2004 Integrated Water Quality and Assessment Report, Appendix F.*

Three Mile Branch in Montgomery County has been listed due to high levels of pesticides found by monitoring.

5.3.1 TMDLs in the Alabama River Basin

Several waterbodies within the Alabama River Basin have been subject to or are scheduled for TMDL development. All of the listed segments of the Alabama River currently have a draft TMDL. (Please refer to inset text box in this section for a summary of the Claiborne Pool TMDL.) There are no new TMDLs scheduled for completion in Fiscal Year 2004 for stream segments within the Alabama River Basin (ADEM, 2004). Catoma Creek, which is listed for two impairments – organic enrichment (OE)/dissolved oxygen (DO) and pathogens - has been scheduled for two TMDLs in 2002 and 2007, respectively.[42] The Three Mile Branch TMDL for pesticides (dieldrin) is scheduled for completion in 2007.

It is worth noting that since the last posting of the 303(d) list in 2002, the list changed because of textual corrections, additional listed water bodies and segments, and removal of waterbodies from the list. In the Alabama River Basin, no new segments were added. Three sections of Claiborne Pool were delisted (*i.e.,* removed from the 303d list) due to improvements in nutrient levels in the lake.[43] Therefore, ADEM was no longer required to complete a nutrient TMDL for this waterbody.

[42] The draft OE/DO TMDL for Catoma Creek was drafted in 2002 and will finalized and submitted to EPA in 2004.
[43] Table E-2 Alabama's Final 2004 §303(d) List, Waterbody/Pollutants Removed from the 2002 List

Summary of Delisting Decision for the Claiborne Pool of the Alabama River—Nutrients

Three segments of the Alabama River comprising Claiborne Pool were listed for nutrient enrichment/eutrophication. The segments run from Rockwest Creek to Bear Creek along the Alabama mainstem. Two segments from Beaver Creek to Rockwest Creek and Bear Creek to Pursley Creek were listed in 1996 as impaired by nutrients and organic enrichment (OE)/dissolved oxygen (DO). The section from Pursley Creek to Beaver Creek was added in 2000.

ADEM water quality standards state that minimum DO concentration in a waterbody classified under swimming and fish/wildlife is 5.0 mg/L except under extreme natural conditions, when 4.0 mg/L is allowed. Sampling in 2002 confirmed that DO concentrations below 5 mg/L (but above 4 mg/L) occur within listed segments more than 10 percent of the time during the summer growing season. Modeling revealed that DO excursions are indeed associated with OE and flow modifications, but nutrients and the impacts of nutrients on algal growth were determined not to be contributors to depleted DO in the listed segments. The TMDL for OE/DO was drafted in October 2003 but a TMDL for nutrients was not required.

Based on detailed sampling conducted during 2000 and 2002, ADEM has also determined that chlorophyll a concentrations present in the entire Claiborne Pool of the Alabama River are "fully consistent with support of all designated beneficial uses." There is no need to develop a nutrient TMDL to address eutrophication within the Claiborne Pool. Delisting for nutrients is justified because there exists "more recent or accurate data" to assess the role of nutrients in the impairment.

A second indicator that supports removal of nutrients from the list of potential impairment sources is the ***average trophic state index*** (TSI), observed over the last 15 years. The lake has an average TSI of 53, which indicates the presence of nutrients and biological activity, but does not suggest an imminent nutrient or algal problem. However, it is important to maintain nutrient loads at present levels to prevent algal blooms and additional DO problems.

- ADEM, 2003. *Draft Delisting Decision for the Claiborne Pool of the Alabama River, Waterbody ID# AL/Alabama R_01, AL/Alabama R_02, and AL/Alabama R_03, Nutrients.* Alabama Department of Environmental Management – Water Quality Branch, Water Division. October 2003. Montgomery, AL

The stretch of the Alabama River referred to as Claiborne Pool is also subject to a TMDL because of impairments due to organic enrichment (OE) and low dissolved oxygen (DO). Claiborne Pool begins at the tail waters of Millers Ferry Lock & Dam and is impounded by Claiborne Lock & Dam. In October 2003, ADEM released the *Draft Total Maximum Daily Load (TMDL) for OE/DO* for three segments of the Alabama River (Waterbody ID# AL/Alabama R_01, AL/Alabama R_02, and AL/Alabama R_03). This TMDL is scheduled to be finalized in Fiscal Year 2005 for EPA review and approval (ADEM, 2004). OE includes sources of carbonaceous biochemical oxygen demand (CBOD) that consume dissolved oxygen (ADEM, 2003).

The major point source contributor of OE loads to the listed segments is the Weyerhaeuser Pine Hill Mill, a container board pulp mill with an industrial discharge that enters the system at River Mile 121.2 and has a reported flow rate of 12.4 million gallons per day (MGD). Weyerhaeuser's NPDES permit imposes the following additional requirements: "Stream monitoring shall be performed daily between June 1 and October 31 at river mile 121.8 (Station C). If any DO values at Station C are found to be less than 5.4 mg/L, the permittee shall either immediately initiate daily river monitoring or immediately cease discharge until DO values at Station C are found to be equal to or greater than 5.4 mg/L."(ADEM, 2004).

ADEM and Tetra Tech conducted modeling to better understand the role of the mill in the Claiborne Pool water quality issues. The model scenarios indicated that the existing Weyerhaeuser discharge contributes a small portion of the oxygen deficit resulting in excursion of DO criterions in the Claiborne Pool. Proposed modifications to decrease the loading from Pine Hill, which Weyerhaeuser has reportedly already begun to implement, should reduce the impact of the Pine Hill Mill effluent to low levels—assuming the effluent quality, particularly the BOD, improves to the extent indicated by Weyerhaeuser. Fully achieving water quality standards within the listed segments would appear to require an improvement in the upstream water quality leaving Millers Ferry Lock and Dam (ADEM, 2004).

This concludes the summary of current water quality management efforts in the Alabama River Basin. The following section – *Basin Management Needs* – will detail the water quality concerns and issues raised by stakeholders throughout this basin management planning process.