US Army Corps
of Engineers ®
Mobile District

ALABAMA-COOSA-TALLAPOOSA RIVER BASIN WATER CONTROL MANUAL

Final
APPENDIX F

CLAIBORNE LOCK AND DAM AND LAKE ALABAMA RIVER, ALABAMA

U.S. ARMY CORPS OF ENGINEERS
SOUTH ATLANTIC DIVISION
MOBILE DISTRICT
MOBILE, ALABAMA

APRIL 1972
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REVISED MAY 2015

Claiborne Lock and Dam
Alabama River, Alabama

NOTICE TO USERS OF THIS MANUAL

Regulations specify that this Water Control Manual be published in hard copy binder with loose-leaf form, and only those sections, or parts thereof; requiring changes will be revised and printed. Therefore, this copy should be preserved in good condition so that inserts can be made to keep the manual current. Changes to individual pages must carry the date of revision, which is the South Atlantic Division's approval date.

REGULATION ASSISTANCE PROCEDURES

If unusual conditions arise, contact can be made with the Water Management Section, Mobile District Office by phoning (251) 690-2730, during regular duty hours and (251) 509-5368 during non-duty hours. The Claiborne Lock Foreman can be reached at (251) 282-4575. The Millers Ferry Powerhouse can be reached at (334) 682-9124.

METRIC CONVERSION

Although values presented in the text are shown in English units only, a conversion table is listed in Exhibit B for your convenience.

VERTICAL DATUM

All vertical data presented in this manual are referenced to the project's historical vertical datum, National Geodetic Vertical Datum of 1929 (NGVD29). It is the U.S. Army Corps of Engineers (herein referred to as USACE or Corps) policy that the designed, constructed, and maintained elevation grades of projects be reliably and accurately referenced to a consistent nationwide framework, or vertical datum - i.e., the National Spatial Reference System (NSRS) or the National Water Level Observation Network (NWLON) maintained by the U.S. Department of Commerce, National Oceanic and Atmospheric Administration. The current orthometric vertical reference datum within the NSRS in the continental United States is the North American Vertical Datum of 1988 (NAVD88). The current NWLON National Tidal Datum Epoch is 1983 - 2001. The relationships among existing, constructed, or maintained project grades that are referenced to local or superseded datums (e.g., NGVD29, MSL), the current NSRS, and/or hydraulic/tidal datums, have been established per the requirements of Engineering Regulation 1110-2-8160 and in accordance with the standards and procedures as outlined in Engineering Manual 1110-2-6056. A Primary Project Control Point has been established at this project and linked to the NSRS. Information on the Primary Project Control Point, designated 6-21E, and the relationship between current and legacy datums are in Exhibit B.

CLAIBORNE LOCK AND DAM AND LAKE

WATER CONTROL MANUAL
ALABAMA RIVER, ALABAMA
U.S. Army Corps of Engineers, Mobile District, South Atlantic Division

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PERTINENT DATA

(see Exhibit A, page E-A-1 for Supplementary Pertinent Data)

GENERAL

Location – Clarke, Monroe, & Wilcox Counties, Alabama; Alabama River, river mile 72.5	
Drainage area Millers Ferry to Claiborne – sq. mi.	836
Total drainage area above Claiborne Dam site – sq. mi.	21,473
Maximum Static Head (feet)	30

RESERVOIR

Length at elevation 36.0 feet NGVD29 – miles	60.5
Area at pool elevation 36.0 ft. NGVD29 – acres	6,290
Total volume at elevation 36.0 ft. NGVD29 – acre-feet	102,480

GATED SPILLWAY

Total length, including end piers - feet	416
Elevation of crest – NGVD29	15.0
Number and Type of gates	6 Tainter
Size of gates – feet	60x21
Elevation of top of gates in closed position – NGVD29	36.0

FIXED CREST SPILLWAY

Length – feet	500
Elevation of ogee crest – NGVD29	33.0
Type of stilling basin	roller bucket

EARTH DIKES

Right Bank Dike	
Total length; Top width – feet	200; 25.0
Top elevation – NGVD29	40.0
Side slopes	1v to 3h
Left Bank Dike	
Total length including esplanade and ramp, feet	2,350
Top elevation – NGVD29	60.0
Top width – feet	32.0
Side slopes	1v to 4h

LOCK

Maximum lift – feet	30.0
Chamber width by length – feet	84 x 600

I – INTRODUCTION

1-01. Authorization. Section 7 of the Flood Control Act of 1944 instructed the Secretary of the Army to prescribe regulations for the use of storage allocated for flood control (now termed flood risk management) or navigation at all Corps reservoirs. This water control manual has been prepared as directed in the Corps' Engineering Regulation (ER) 1110-2-240, *Water Control Management, dated 8 October 1982*. This regulation prescribes the policies and procedures to be followed in carrying out water management activities, including establishment and updating of water control plans for Corps and non-Corps projects. This manual is also prepared under the format and recommendations described in ER 1110-2-8156, *Preparation of Water Control Manuals, dated 31 August 1995*; and ER 1110-2-1941, *Drought Contingency Plans, dated 15 September 1981*.

1-02. Purpose and Scope. The primary purpose of this manual is to document the water control plan for the Claiborne Lock and Dam Project. Details of the coordinated reservoir regulation plan for Claiborne Lock and Dam within the multiple project system of the Alabama River Basin are presented which insure optimum benefits consistent with the physical characteristics and purposes for which the system was authorized. Included are descriptions of physical components of the lock and dam, operating procedures, historical facts and other pertinent data. Also presented are general characteristics of the area including: flood frequencies, meteorology, examples of reservoir regulation and a discussion on river forecasting. In conjunction with the *ACT Basin Master Water Control Manual*, this manual provides a general reference source for Claiborne water control regulation. It is intended for use in day-to-day, real-time water management decision making and for training new personnel.

1-03. Related Manuals and Reports. The *Alabama-Coosa-Tallapoosa (ACT) River Basin - Basin Master Water Control Manual*, of which this is Appendix F, contains general information for the entire basin. Appendices to the basin master water control manual are prepared for all reservoir projects within the basin when one or more project functions are the responsibility of the Corps. Other manuals published for use by project personnel include Claiborne Lock and Dam Operation and Maintenance Manual, and CESAM Plan 500-1-4, Emergency Notification Procedures. A list of all the appendices for the ACT Basin and the master water control manual are listed below.

Alabama-Coosa-Tallapoosa River Basin Master Water Control Manual

Appendix A - Allatoona Dam and Lake

Appendix B - Weiss Dam and Lake (Alabama Power Company)

Appendix C - Logan Martin Dam and Lake (Alabama Power Company)

Appendix D - H. Neely Henry Dam and Lake (Alabama Power Company)

Appendix E - Millers Ferry Lock and Dam and William "Bill" Dannelly Lake

Appendix F - Claiborne Lock and Dam and Lake

Appendix G - Robert F. Henry Lock and Dam and R. E. "Bob" Woodruff Lake

Appendix H - Carters Dam and Lake and Carters Reregulation Dam

Appendix I - Harris Dam and Lake (Alabama Power Company)

1-04. Project Owner. The Claiborne Lock and Dam project is a federally-owned project entrusted to the Corps, South Atlantic Division (SAD), Mobile District.

1-05. Operating Agency. The Corps' Mobile District operates the Claiborne Lock and Dam Project. Reservoir operation and maintenance are under the supervision of Operations Division. The project falls under the direction of the Operations Project Manager located at Tuscaloosa, Alabama. The lock is operated 24 hours a day, seven days a week. The Claiborne Lock Foreman can be reached at (251) 282-4575.

1-06. Regulating Agencies. Authority for the water control regulation of the Claiborne Project has been delegated to the SAD Commander. Water control regulation activities are the responsibility of the Mobile District, Engineering Division, Water Management Section. When necessary, the Water Management Section instructs the lockmaster regarding normal procedures and emergencies for unusual circumstances.

II – DESCRIPTION OF THE PROJECT

2-01. Location. Claiborne Lock and Dam is located 72.5 miles above the mouth of the Alabama River in the southwestern part of the State of Alabama. The dam and about 28 miles of the lower part of the reservoir lie entirely within Monroe County, except for two small reaches totaling about one mile which are in Clarke County. The remaining 32 miles of the reservoir are in Wilcox County. The project is shown on Plate 2-1, Plate 2-2, and on Figure 2-1.

Figure 2-1. Claiborne Lock and Dam

2-02. Project Purpose. The Claiborne Lock and Dam is primarily a navigation structure. The project's minimum reservoir level, elevation 32 feet NGVD29, provides navigation depths up to the Millers Ferry Lock and Dam. The Claiborne Project also reregulates the peaking power releases from the upstream Millers Ferry Project providing navigable depths in the channel below Claiborne. Other purposes provided by the project include water quality, public recreation and fish and wildlife conservation and mitigation. Recreation facilities and access to the reservoir are provided, but because of the nature of the project, recreation is typically not considered in water control decisions. There is no flood risk management storage for this project.

2-03. Physical Components. The Claiborne Project consists of a concrete gravity-type dam with both a gated spillway section and a free overflow section, supplemented by earth dikes, a navigation lock and control station, and a reservoir extending approximately 60 miles upstream to the Millers Ferry Lock and Dam. The project's principal features are described in detail in

subsequent paragraphs. Plan, elevation and section views of project structures are shown on Plates 2-3 through 2-5.

a. Spillway. The spillway is a concrete gravity structure consisting of two different sections, a gated spillway and a free overflow un-gated spillway.

The gated spillway consists of a broad crested weir with the crest at elevation 15 feet NGVD29. The flow is controlled by six tainter gates, each 60 feet wide and 21 feet high. In the closed position the top of the gates are at elevation 36 feet NGVD29. The gates are mounted between eight-foot wide piers and are operated by individual electric hoists located on top of the piers. An access bridge for pedestrian traffic connects the top of the piers. The overall length of the gated spillway is 416 feet.

The un-gated spillway section is an ogee type, free overflow with the crest at elevation 33 feet NGVD29 and a length of 500 feet. Plan and elevation drawings of the fixed and gated spillways are shown on Plates 2-3 and 2-4.

b. Reservoir. The reservoir formed by the Claiborne Dam covers an area of 6,290 acres, and has a total volume of 102,480 acre-feet at the full pool elevation of 36 feet NGVD29. The reservoir extends upstream 60.5 miles to the Millers Ferry Lock and Dam and has a shoreline distance of about 216 miles. The reference pool elevation for dredging purposes is 35 feet NGVD29. Area and capacity curves are shown on Plate 2-6 and are tabulated in Table 2-1.

Table 2-1. Area – Capacity Data

POOL ELEV (FEET NGVD29)	TOTAL AREA (ACRES)	TOTAL STORAGE (ACRE-FT)		POOL ELEV (FEET NGVD29)	TOTAL AREA (ACRES)	TOTAL STORAGE (ACRE-FEET)
2	0	0		26	4,490	50,830
3	80	40		27	4,610	55,380
4	180	170		28	4,700	60,030
5	290	410		29	4,800	64,790
6	420	770		30	4,900	69,640
7	570	1,260		31	5,040	74,610
8	720	1,900		32[2]	5,210	79,740
9	900	2,720		33[3,6]	5,410	85,040
10	1,080	3,710		34	5,650	90,570
11	1,290	4,900		35	5,930	96,360
12	1,520	6,300		36[4,5]	6,290	102,480
13	1,760	7,950		37	6,670	.108,950
14	2,010	9,840		38	7,080	115,820
15[1]	2,260	11,970		39	7,530	123,130
16	2,520	14,360		40	7,970	130,880
17	2,810	17,020		41	8,400	139,060
18	3,070	19,960		42	8,840	147,680
19	3,310	23,150		43	9,380	156,790
20	3,510	26,560		44	10,170	166,560
21	3,710	30,170		45	11,180	177,240
22	3,900	33,980		46	12,470	189,060
23	4,070	37,960		47	13,700	202,150
24	4,220	42,110		48	15,000	216,500
25	4,360	46,400		49	16,300	232,150
				50	17,590	249,090

[1] Spillway crest
[2] Emergency drawdown elevation
[3] Miniumum operating pool elevation
[4] Maximum operating pool elevation
[5] Top-of-gates - closed position
[6] Crest of free overflow

c. Earth Dikes. On the right bank, an earth dike joins the abutment of the fixed-crest spillway and runs westwardly about 200 feet to high ground. This dike has a crest elevation of 40 feet NGVD29, which provides a freeboard of four feet above maximum operating pool. The crest will be overtopped by floods with a recurrence frequency of twice a year. The crest and both slopes have grouted riprap for protection from wave action and from high velocities during overtopping periods. The left bank, non-overflow dike begins at the mound adjacent to the lock and extends eastward 2,350 feet to high ground. The crest of this dike is at elevation 60.0 feet

NGVD29, except where it slopes down to the level of the lock esplanade at elevation 51.0 feet NGVD29. Along the upstream face of the dike for 2,000 feet, excess excavated material has been dumped and leveled to elevation 58.0 feet NGVD29. On the downstream side of the dike, excess excavated material has been placed and leveled to elevation 56.0 feet NGVD29. The top of the dike is 32 feet wide and is covered by a paved roadway providing access to the lock area.

d. Lock. The lock is located on the left bank between the gated spillway and the left bank earth dike. The lock chamber is 84 feet wide and has a usable length of about 600 feet. The length from center to center of the gate pintles is 655 feet. The top of the upper stoplog sill and miter sill is at elevation 19 feet NGVD29, 13 feet below the minimum pool elevation of 32 feet NGVD29 and the top of the lower sill is at elevation -8 feet NGVD29, 13 feet below the minimum tailwater at elevation 5 feet NGVD29. The tops of the lock walls and of the upper and lower guide walls are all at elevation 51 feet NGVD29. The lock filling and emptying system consists of two rectangular intake ports located on the river side of the upper-gate blocks, which merge into a 10-foot square culvert in each of the chamber walls, a system of floor culverts located within the lock chamber, and an outlet structure on the riverside of the lock below the lower gate sill. The filling and emptying operation is controlled by reverse tainter valves located in the culverts. The volume of water, in acre-feet, discharged each time the lock is emptied can be determined by multiplying the gross head by 1.264. The lock plan and elevation are shown on Plate 2-5.

e. Lock Control Station. The Control Station is a three-story reinforced concrete building 34 feet long and 32 feet wide located on the lock monolith abutting the gated spillway. Control equipment for operating both the spillway and lock is located on the station's second floor where an unobstructed view of the lock is provided. The third floor is at the same level as, and provides access to, the spillway access bridge.

2-04. Real Estate Acquisition. Land acquisition authorization for the Claiborne Project was enacted under the River and Harbor Act of 2 March 1945, P.L. 79-14. The acreage acquired for all project purposes totals 5,700.050 acres. Of that total acreage, 3,015.470 acres were acquired in fee, 2,681.270 acres acquired by perpetual easement, and 3.310 acres acquired by license. The acquisition guide lines for flowage easements were based upon computations for backwater effect with the dam in place. The guideline adopted from Claiborne Dam to river mile 90.2 is at elevation 37.0 feet NGVD29. The guide line continues along a gradient established by a one-foot effect to elevation 49.0 feet NGVD29 at Millers Ferry Lock and Dam. There are a total of 9 Real Estate Segment Maps traversing Clarke, Monroe, and Wilcox Counties, which depict the 310 tracts acquired and the final acquisition limits based on the aforementioned elevations. Portions of the fee-owned land have been dedicated for intensive wildlife management as part of the Tennessee Tombigbee Waterway Wildlife Mitigation project. An overview of the real estate acquisition areas are shown on Plate 2-7.

2-05. Public Facilities. The Claiborne Project presently offers beaches, campgrounds, picnic areas, trails, hunting, boat launching ramps, and ferry crossings. There are 13 parks within the project area with McDuffie Landing Marina and the Lower Peachtree Parks being used for hunting only. All but two parks are operated by the Corps. Wilcox County operates Black Creek and Gulletts Bluff Parks. The Corps maintains Haines Island Park but Monroe County operates the ferry and maintains the access road there and at Davis Ferry Park. The Claiborne Lake Park facilities are managed from the Operations Project Manager's office at William "Bill" Dannelly Reservoir. The Operations Project Manager can be reached at (334) 682-4655. Table 2-2 and Plates 2-7 and 2-8 show public use areas.

Table 2-2. Claiborne Lake Public Facilities

	Camping	Boat Ramps	Picnic	Play Ground	Swimming Area	Trails
Bells Landing	y	y	y			y
Black Creek		y				
Clifton Ferry		y	y			
Cobbs Landing		y				
Damsite East Bank						
Damsite West Bank	y		y			
Davis Ferry						
Gullets Bluff			y			
Haines Island	y	y	y	y	y	y
Holleys Ferry		y	y			y
Isaac Creek	y	y	y	y	y	y
Silver Creek	y	y	y			y

III - HISTORY OF PROJECT

3-01. Authorization. The original project for the improvement of the Alabama River was authorized by Congress on 18 June 1878 to provide for a navigation channel four feet deep and 200 feet wide from the mouth to Wetumpka and was modified on 13 July 1892 to provide a 6-feet channel. Subsequent acts approved in 1905 and 1910 provided for a channel 4-foot deep at low water from the mouth to Wetumpka by the use of contracting dikes and dredging. This project was 62 percent complete in 1942, the last year that any new work was performed. The 9-foot navigation channel was authorized by the River and Harbor Act of March 2, 1945 (P. L. 79-14). The authorization refers to House Document 77-414. The House Document recommended the authorization of a general plan for the basin "...in accordance with plans being prepared by the Chief of Engineers." The basin plan at that time contemplated a 9-foot deep navigable channel from the mouth of the Alabama River to Rome, Georgia, to be achieved by open river works and locks and dams.

3-02. Planning and Design.

The first comprehensive report on the optimum use of the water resources of the basin was prepared by the Corps in 1934, and was printed as House Document No. 66, 74th Congress, 1st session (308 Report). The plan contemplated five navigation dams on the Alabama River.

A resolution by the Committee on Rivers and Harbors, House of Representatives, passed on 28 April 1936, requested a review to determine if changes in economic conditions warranted modifying House Document No. 66, 74th Congress, with regard to the Alabama River. A resolution of the Committee on Commerce, U. S. Senate, adopted 18 January 1939, requested a review to determine the advisability of constructing reservoirs on the Alabama-Coosa Rivers and tributaries for development of hydroelectric power and improvement for navigation.

The Chief of Engineers in a report submitted on 15 October 1941 and printed as House Document No. 414, 77th Congress, 1st Session, recommended a general plan for the development of the basin. Congress authorized in the River and Harbor Act of 2 March 1945, (P.L. 79-14) the initial and partial accomplishment of this plan. Planning studies for the initially authorized projects on the Alabama River to provide navigation facilities with the maximum hydroelectric power feasible began in 1945.

A site selection report for the entire Alabama River was submitted on 10 December 1945. It recommended dredging the lower river and building the Claiborne, Millers Ferry and Jones Bluff locks and dams with power plants at the latter two projects. The first design memorandum for Claiborne, "General Design No. 1", was submitted on 12 April 1963. This report proposed the Claiborne plan to include a navigation lock, a gated spillway, a fixed spillway, a control station, and earth dikes on both banks. Seven other design memoranda dealing with particular project features were submitted during the next four years.

3-03. Construction. A contract to construct the Claiborne Lock and Dam was awarded to the Arundel and Dixon Companies, as a joint venture, on 22 April 1966. The lock and the gated spillway were completed in 1969 and the second stage cofferdam was placed to allow for fixed crest spillway construction. In November 1969, the pool was raised to elevation 31 feet NGVD29 and navigation through the lock was permitted on 15 November 1969. In early December 1969, the pool was raised to elevation 32 feet NGVD29 and was maintained between elevations 32 and 33 feet NGVD29, except during a brief flood period, until mid-May 1970 when the then full pool of 35.0 feet NGVD29 was attained.

3-04. Related Projects. Claiborne Lock and Dam is the lower of three projects providing navigation from the Port of Mobile, Alabama, to Montgomery, Alabama. The middle project, Millers Ferry Lock and Dam, is upstream at river mile 133.0. Robert F. Henry Lock and Dam Project is further upstream at river mile 236.3. Both Millers Ferry and Robert F. Henry Projects have hydropower capabilities.

The Alabama River Navigation Channel provides navigation from the mouth of the Alabama River upstream to Wetumpka, just north of Montgomery, Alabama. The dredging reference profile for the Alabama River Channel below Claiborne Lock and Dam, modified in the spring of 1988, provides for a 9-foot depth channel with a flow of 7,500 cfs.

3-05. Modifications to Regulations. There have been no modifications to the regulations originally established for the Claiborne Lock and Dam Project.

3-06. Principal Regulation Problems. There have been no significant regulation problems, such as erosion, boils, severe leakage, etc., at Claiborne Project.

IV – WATERSHED CHARACTERISTICS

4-01. General Characteristics. The Alabama-Coosa-Tallapoosa River System drains a small portion of Tennessee, northwestern Georgia, and northeastern and east-central Alabama. The Alabama River Basin has its source in the Blue Ridge Mountains of northwest Georgia. The main headwater tributaries are the Oostanaula and Etowah Rivers, which join near Rome, Georgia, to form the Coosa River. The Coosa River in turn joins the Tallapoosa River near Wetumpka, Alabama, approximately 14 miles north of Montgomery, Alabama, to form the Alabama River. The drainage basin is about 330 miles in length, and averages 70 miles wide with a maximum width of about 125 miles. The basin has a total drainage area of 22,739 square miles of which 21,473 square miles are above Claiborne. The basin above Claiborne is shown on Plate 2-1

4-02. Topography. The ACT River Basin is composed of an unusually wide range of topographic areas. The location of the river basin is within parts of five physiographic provinces: the Blue Ridge Province; the Valley and Ridge Province; the Piedmont Plateau; the Cumberland Plateau; and, the Coastal Plain. Each of these physiographic sub-divisions influences drainage patterns. High rounded mountains and steep narrow valleys characterize the northeastern portion of the basin in the Blue Ridge Province. Overburden is sparse except in the valley flood plains. The topography of the Valley and Ridge Province is alternating valleys and ridges with altitudes varying from approximately 600 to 1,600 feet. The dominant characteristics of the Cumberland Plateau are flat plateaus ranging in altitude from 1,500 to 1,800 feet that bound narrow, northeast southwest rending valleys. Rolling hills and occasional low mountains topographically characterize the Piedmont Province. Altitudes range from 500 to 1,500 feet. Low hills with gentle slopes and broad shallow valleys that contain slow-moving meandering streams with wide floodplains characterize the topography of the Coastal Plain.

The Alabama River has its source in the Blue Ridge Mountains of northwest Georgia. The main headwater tributaries are the Oostanaula and Etowah Rivers which join near Rome, Georgia, to form the Coosa River. The Coosa and Tallapoosa Rivers join in east-central Alabama about 27 stream miles northeast of Montgomery, Alabama to form the Alabama River. The Alabama then flows generally westward for 100 miles to Selma, Alabama and then southwestward 210 miles to its mouth where it joins the Tombigbee River to form the Mobile River. Mobile Bay and the port of Mobile are 45 miles farther south.

The Oostanaula, Etowah, Coosa and Tallapoosa Rivers are the principal tributaries to the Alabama River. The Cahaba River is the largest stream entering the river below its source. Other tributaries include Catoma Creek and Pine Barren, Mulberry and Turkey Creeks.

4-03. Geology and Soils. The formations underlying the watershed range from rugged crystalline rocks to unconsolidated sands, marls, and clays. Claiborne is in the Southern Red Hills Division of the Gulf Coastal Plain Physiographic Province. This province's softer sedimentary formations consist of typical coastal plain deposits of variable inter-bedded limestones, clays, sands and sandstones of the Paleocene and Eocene age. The deposits contrast sharply with the harder rocks of the provinces above. As the rivers leave the hard rocks and enter the softer formations, the difference in erosion characteristics causes rapids to form. This is commonly known as the "Fall Line". This Fall Line crosses the Cahaba River near Centreville, Alabama, the Coosa River near Wetumpka, and the Tallapoosa River near Tallassee, Alabama.

4-04. Sediment. Sedimentation ranges were established for the entire reservoir length and surveyed in 1996 and 2009. Retrogression ranges were also established and surveyed for about 40 miles below Claiborne Dam. Key ranges are resurveyed at regular intervals for any appreciable changes in channel geometry. The latest survey was in 2009 and is retained in the Hydraulic Data and Sedimentation Unit at the Mobile District Office. Sedimentation range locations appear on Plate 4-1 and retrogression range locations on Plate 4-2.

Claiborne Lake is the most downstream of the three Alabama River Lakes. Claiborne Lake can be divided into three major reaches based on the sedimentation trends: The upper third is undergoing light sedimentation, the middle third is undergoing bed scour, and the lower third is undergoing a medium degree of sedimentation. The greater sedimentation near the downstream end of the lake is expected in a run-of-the-river project located immediately below another impoundment project. Shoreline conditions are mixed deposition and erosional. Shorelines are typically well vegetated with gently sloping banks tending to be more depositional, and steeper banks being more erosional.

4-05. Climate.

a. Temperature. The ACT Basin area has long, warm summers, and relatively short, mild winters. In the southern end of the basin, the average annual air temperature is 65 degrees Fahrenheit (°F) with a mean monthly range from 46 °F in January to 80 °F in July and August. In the northern end, the average annual temperature is 62 °F with a mean monthly range from 42 °F in January to 79 °F in July. Extreme temperatures recorded in the basin range from a low of minus 17 °F at Lafayette, Georgia, in January 1940 to a high of 112 °F at Centreille, Alabama, in September 1925. The frost-free season varies from about 200 days in the northern valleys to about 260 days in the southern part of the basin. The normal monthly and annual temperatures for various portions of the Alabama Basin are shown on Table 4-1. Climatologists define a climatic normal as the arithmetic average of a climate element, such as temperature, over a prescribed 30-year time interval. The National Climatic Data Center (NCDC) uses a homogenous and complete dataset with no changes to the collection site or missing values to determine the 30-year normal values. When developing this 30-year normal dataset, the NCDC has standard methods available to them to make adjustments to the dataset for any inhomogeneities or missing data before computing normal values. Extremes and average temperature data at six representative stations throughout the basin are shown on Plate 4-3. The location of the stations is shown on Plate 4-4.

Table 4-1. Normal 30-year Air Temperature for Selected Sites in/near Claiborne Basin
(Based on 1981 to 2010 Normals published by National Weather Service)

Normal Temperature Based on 30-Year Period – 1981 Through 2010 (degrees Fahrenheit)														
Station		**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUNE**	**JULY**	**AUG**	**SEPT**	**OCT**	**NOV**	**DEC**	**ANNUAL**
Greenville (USC00013519)	Max	57.6	61.7	69.1	75.9	83.0	88.3	90.4	90.0	85.7	77.2	68.4	59.4	75.6
	Mean	45.5	49.2	55.7	62.5	70.6	76.8	79.3	79.0	74.4	64.7	55.6	47.5	63.4
	Min	33.4	36.7	42.3	49.1	58.2	65.3	68.2	68.1	63.1	52.2	42.8	35.6	51.3
Evergreen (USC00012758)	Max	58.8	63.0	70.6	77.1	84.2	89.2	90.9	90.6	86.6	78.2	69.3	60.8	76.7
	Mean	47.2	50.7	57.5	64.0	72.1	78.3	80.5	80.2	75.7	66.1	56.9	49.4	64.9
	Min	35.6	38.4	44.3	50.8	59.9	67.4	70.0	69.8	64.9	54.1	44.5	38.0	53.2
Camden 3NW (USC00011301)	Max	56.7	61.4	69.9	77.0	84.2	89.6	91.7	91.4	87.2	77.7	68.0	59.1	76.2
	Mean	46.0	49.9	57.5	64.5	72.3	78.8	81.0	80.7	75.9	65.6	56.2	48.2	64.7
	Min	35.2	38.5	45.2	52.0	60.4	68.0	70.3	69.9	64.6	53.6	44.4	37.3	53.3
Thomasville (USC00018178)	Max	57.3	61.5	69.4	76.5	83.6	89.0	90.9	91.0	86.7	77.5	68.3	59.1	76.0
	Mean	46.3	50.2	57.5	64.1	72.2	78.4	80.8	80.6	75.6	65.7	56.7	48.3	64.8
	Min	35.4	38.8	45.5	51.6	60.8	67.9	70.7	70.1	64.6	53.9	45.2	37.5	53.6
Claiborne Basin	Max	57.6	61.9	69.8	76.6	83.8	89.0	91.0	90.8	86.6	77.7	68.5	59.6	76.1
	Mean	46.3	50.0	57.1	63.8	71.8	78.1	80.4	80.1	75.4	65.5	56.4	48.4	64.5
	Min	34.9	38.1	44.3	50.9	59.8	67.2	69.8	69.5	64.3	53.5	44.2	37.1	52.9

b. Precipitation. The ACT Basin lies in a region of heavy annual rainfall which is fairly well distributed throughout the year. The normal annual precipitation for the Claiborne watershed area is 58.04 inches. Fifty-eight percent of the rainfall occurs during the winter and spring months, 23 percent in the summer, and 19 percent in the fall. The normal monthly and annual precipitations for various stations in or near the Claiborne watershed are shown on Table 4-2. The maximum calendar year rainfall over the ACT Basin was 78 inches in 1929 and the minimum annual was 32 inches in 1954. The highest annual station rainfall recorded in the ACT Basin was 104.03 inches at Flat Top, Georgia, in 1949; the lowest recorded was 22.00 inches at Primrose Farm, Alabama, in 1954. The light snowfall that occasionally occurs seldom covers the ground for more than a few days and has never affected any major flood in the basin. Precipitation extremes and averages for the basin are shown on Plate 4-5.

Table 4-2. Normal 30-year Precipitation for Selected Sites in/near Claiborne Basin
(Based on 1981 to 2010 Normals published by National Weather Service)

Normal Precipitation Based on 30-Year Period – 1981 Through 2010 (inches)														
Station		**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUNE**	**JULY**	**AUG**	**SEPT**	**OCT**	**NOV**	**DEC**	**ANNUAL**
Greenville (USC00013519)	Mean	5.27	4.86	6.10	3.97	3.94	5.00	5.79	4.76	4.17	3.64	5.20	4.66	57.36
Evergreen (USC00012758)	Mean	5.67	5.33	6.14	4.46	4.52	5.52	6.51	5.07	4.31	3.55	4.88	5.06	61.02
Camden 3NW (USC00011301)	Mean	5.54	5.09	5.93	4.12	4.32	4.25	5.56	4.15	3.57	2.86	5.32	5.14	55.85
Thomasville (USC00018178)	Mean	5.58	5.10	5.82	4.03	4.43	4.62	6.12	3.96	4.14	3.54	5.24	5.23	57.81
Claiborne Basin	Mean	5.52	5.10	6.00	4.15	4.30	4.85	6.00	4.49	4.05	3.40	5.16	5.02	58.04

4-06. Storms and Floods.

a. General. Flood-producing storms may occur over the basin anytime but are more frequent during the winter and early spring. These storms are usually of the frontal variety lasting two to four days. Summer storms are the convective type thundershowers with high intensity rainfall over small areas which produce local floods. In the fall, occasional heavy rains may accompany dissipating tropical cyclones.

b. Record Floods. A major storm system in the spring of 1990 produced record floods on the Alabama River. On 16 March 1990, with the river still high from previous rains, the entire basin received very heavy rainfall for two days. For the two day total R. F. Henry reported 9.0 inches, Millers Ferry reported 6.75 inches and Claiborne had 9.5 inches. The upper ACT Basin received an average of 6 to 7 inches during this period. Claiborne discharged a record breaking 255,000 cfs on March 25, 1990, producing a tailwater of 56.6 feet NGVD29. The previous records, a maximum daily discharge of 215,000 cfs and a maximum tailwater of 55.0 feet NGVD29, were caused by an April 1979 storm. The largest known flood for the entire period of record is the historical flood of 1961 with a peak discharge of 267,000 cfs. Another significant flood occurred on 11-16 March 1929, when 10 inches of rainfall over a period of three days was recorded in the vicinity of Auburn, Alabama. A peak discharge was not recorded for the historical flood of April 1886, which is the greatest flood on record for the Millers Ferry Project immediately upstream of Claiborne.

4-07. Runoff Characteristics. The streams contributing flow to the Alabama River above the Claiborne Dam site exhibit wide variations in runoff characteristics. They range from very flashy in the mountainous regions of the Coosa Basin above Rome, Georgia, to very slow rising and falling in the lower reaches. The mean annual discharge for the period October 1930 through September 2008 is 31,934 cfs or about 1.5 cfs per square mile.

Streamflow at Dam Site. The average daily discharges are shown on Plate 4-6 through Plate 4-12. These flows were developed from two USGS gages. The initial gaging station at Claiborne, located 5.7 miles downstream from the Claiborne Dam site at the U. S. Highway 84 Bridge, was established in 1930. This gage was used for discharge and stage measurements from 1930 through September 1975. Because the drainage basin above Claiborne is so large and the area between the dam and the U. S. Highway 84 Bridge is so small, the flow at the

Highway 84 gage is adequate to represent the flow at the dam site. The second and present-day gage is located at the dam site and is used for data from October 1975 thru the present (February 2010.)

Also shown on Plates 4-6 through 4-12 are the unimpaired flow data at Claiborne. This data set represents the flow that would have occurred if it had not been impacted by man. The original unimpaired flow data set developed as part of the Alabama-Coosa-Tallapoosa and Apalachicola Chattahoochee Flint (ACT/ACF) River Basins Comprehensive Water Resources Study, included data at over 50 locations for the 1939 to 1993 period of record and the original report is titled *ACT/ACF Comprehensive Water Resources Study, Surface Water Availability Volume I: Unimpaired Flow*, July 8, 1997. The data set has recently been extended through 2008. This input data has been adjusted for the impacts of the water use, withdrawals, returns, stream regulation and evaporation. Because of the occurrence of negative flows in the daily values, the data has been smoothed using 3-, 5-, or 7-day averaging. This preserves the volume of the flow and eliminates most of the small negative flows in some of the daily flow data.

Mean monthly and annual flows developed from the two USGS gages within the Claiborne watershed are presented on Table 4-3 (found at the end of this Section starting on page T4-10).

4-08. Water Quality. Generally, the surface waters of streams in the Alabama Basin are of good chemical quality. Water quality in Claiborne Lake is influenced by physical dynamics (depth, temperature, flow, etc.). Stratification and turnover are not significant issues due to generally shallow depth. There are also various sources of pollutant loads to the lake including tributaries and upstream contributions, both point and non-point. Upstream sources are dominated by those pollutants entering directly via the Alabama River. Point sources are generally municipal and industrial discharges regulated by the Alabama Department of Environmental Management (ADEM) and agricultural practices contribute the largest percentage of non-point pollutants.

The reservoir has been identified by ADEM in its 2012 Draft 303(d) list as violating State water quality standards for the following uses: swimming (mercury, organic enrichment), fish and wildlife (mercury, organic enrichment, siltation), and public water supply (organic enrichment). ADEM has set a standard for chlorophyll *a* in the lake of a maximum15µg/L during the growing season from April through October. The average chlorophyll *a* measured in the forebay by ADEM during the 2005 wet year was 9.26 µg/L and in the 2000 dry year 11.05 µg/L, all less than the ADEM standard. The ADEM standard for dissolved oxygen is a minimum 5.0 mg/L. Dissolved oxygen levels generally remains above the standard in the forebay; however, during times of low flow and high temperatures it has fallen as low as 4.97 mg/L during the period from 2000-2010. The ADEM standard for water temperature is a maximum 90 °F. Temperatures in Claiborne Lake range generally from 50 °F to 86 °F with occasional peaks of about 90 °F. In shallower embayments, there are greater fluctuations in these parameters and occasionally the standards are not met.

4-09. Channel and Floodway Characteristics. The navigation channel from the mouth of the Alabama River to Montgomery, Alabama has an authorized depth of nine feet and a width of 200 feet. Historically, the major problems in the channel below Claiborne have been stream degradation and the recurring shoaling which follows the annual high flow period. A study in 1987 showed that streambed degradation had affected the navigation channel from Claiborne Lock and Dam to about 15 miles downstream; the report also stated that the degradation process had probably reached an equilibrium condition. In this reach of the river, the degradation had lowered the water surface elevation and caused rock outcrops. In addition, it

was found that there was less flow available than previously anticipated. In response to this report, the dredge reference profile was lowered using a design flow reduced from 8,450 cfs to 7,500 cfs, and a few of many rock outcrops were removed. Periodic dredging and constructing and/or replacing training dikes are performed when funds are available to help maintain the 9-foot channel. There are no major flood damage centers immediately downstream of the Claiborne Project.

4-10. Upstream Structures. Above Claiborne Lock and Dam are ten Alabama Power Company (APC) hydroelectric projects on the Coosa and Tallapoosa Rivers and four Corps projects. Millers Ferry and Robert F. Henry are located on the Alabama River above Claiborne Lock and Dam. Allatoona and Carters are located above the APC Coosa projects. The Hickory Log Creek Project was constructed in 2007 by the City of Canton, Georgia and Cobb County–Marietta Water Authority (CCMWA), and is located approximately 25 miles northeast of Allatoona Dam. Table 4-4 shows the upstream projects and their drainage areas. There are no dams downstream of Claiborne.

Table 4-4. Federal and Non-Federal Projects in ACT Basin

Agency	Alabama River Projects	Drainage Area sq. mi.
COE	Claiborne	21,473
COE	Millers Ferry	20,637
COE	R. F. Henry	16,233
	Coosa River Projects	
APC	*Jordan/Bouldin	10,102
APC	Mitchell	9,778
APC	Lay	9,053
APC	Logan Martin	7,743
APC	Neely Henry	6,596
APC	Weiss	5,270
COE	Allatoona	1,122
COE	Carters	374
Canton/CCMWA	**Hickory Log Creek	8
	Tallapoosa Projects	
APC	Thurlow	3,308
APC	Yates	3,293
APC	Martin	2,984
APC	Harris	1,454

* Jordan Dam is located on the Coosa River at river mile 18.9. Walter Bouldin Dam is located on a by-pass of the Jordan Dam and discharges into a canal which enters the Woodruff Lake at Coosa River mile 4.2.

*** Water is pumped directly from the Etowah River to support project, thus such a small drainage area.

4-11. Economic Data. The watershed surrounding the Claiborne Project consists of Clarke and Monroe Counties within Alabama. The watershed includes both developed urban and residential land uses and rural land uses within the watershed.

a. Population. The 2010 population of the two counties bordering the Claiborne Lock and Dam totaled 48,901. The income data for each county is shown in Table 4-5.

Table 4-5. Income Data per County

County	Population (2010)	Per Capita Income	Persons living below poverty
Clarke County	25,833	17,372	29.2%
Monroe County	23,068	17,652	25.4%
Total	48,901		

b. Agriculture. The Claiborne watershed and basin below consist of approximately 727 farms totaling 177,000 acres. In 2005, the agricultural production in the area totaled $12 million in farm products sold and total farm earnings of $6.7 million. Agriculture in the Claiborne Project watershed and basin consists primarily of livestock, which accounts for a majority of the value of farm products sold. Table 4-6 contains agricultural production information and farm earnings for each of the counties within the Claiborne Lock and Dam watershed and basin below.

Table 4-6. Agricultural Production and Income per County

County	2005 Farm Earnings ($1,000)	Number of Farms	Total Farm Acres (1,000)	Acres Per Farm	Value of Farm Products Sold ($1,000)	Percent Sold From	
						Crops	Livestock
Alabama							
Clarke County	740	284	57	201	2,000	25.9	74.1
Monroe County	5,986	443	120	271	10,000	39.8	60.2
Totals	6,726	727	177	243	12,000		
Source: U.S. Census Bureau, County and City Data Book: 2007							

c. Industry. The leading industrial sectors that provide non-farm employment are local and state government, retail trade, and manufacturing. In 2005, the Claiborne Lock and Dam area counties had 50 manufacturing establishments that provided 5,522 jobs with total earnings of more than $314 million. Table 4-7 shows information on the manufacturing activity for each of the counties in the Claiborne Lock and Dam watershed and basin below.

Table 4-7. Manufacturing Activity per County

County	No. of Manufacturing Establishments	Total Manufacturing Employees	Total Earnings ($1,000)	Value Added by Manufactures ($1,000)
Alabama				
Clarke County	30	1,922	103,476	224,625
Monroe County	20	3,600	210,889	354,898
Totals	50	5,522	314,365	579,523

Source: U.S. Census Bureau, County and City Data Book: 2007

d. Flood Damages. Because the dam is considered a run-of-the-river project, with very little storage, there are no quantifiable flooding impacts from the project. A table of water surface elevations at Claiborne and associated impacts is shown in Table 4-8.

Table 4-8. Flooding Impacts and Associated Claiborne Gage Elevation

Claiborne Gage Ht	**Flooding Impacts**
(ft NGVD29)	
27	Flooding of low lying lands and some roads near the confluence of the Alabama and Tombigbee rivers will occur.
35	Flooding of pasturelands along the lower Alabama river will occur.
40	Considerable flooding of agricultural lands in the area will occur.

Note: Flooding of agricultural lands will begin to gradually subside as the river drops below 40 feet however some overflow will continue until the level drops below 27 feet.

TABLE 4–3. ANNUAL, MONTHLY, AND DAILY FLOW DATA

(Monthly Flow in cfs 1930 - 1975 at USGS Gage 02429500; 1976 - 2011 at USGS Gage 02428400)

YEAR	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	Monthly Max	Monthly Min	Daily Max	Daily Min
1930				30,520	20,090	13,270	11,800	12,690	15,680	14,500	30,980	17,810					
1931	25,710	22,240	24,510	34,140	18,510	11,710	9,650	10,540	8,056	7,420	6,830	31,600	17,576	34,140	6,830	77,700	6,200
1932	53,320	83,060	38,210	39,680	27,680	17,020	23,400	16,290	15,530	17,360	22,390	82,080	36,335	83,060	15,530	157,000	7,850
1933	106,500	73,710	80,510	66,460	25,410	15,090	17,800	13,840	13,150	12,500	12,130	12,340	37,453	106,500	12,130	170,000	10,400
1934	18,850	15,730	63,710	21,900	17,080	20,890	13,950	20,390	14,230	37,400	19,680	20,080	23,658	63,710	13,950	122,000	9,590
1935	30,810	37,000	78,630	50,990	31,490	17,540	12,910	14,270	13,210	9,555	12,910	15,810	27,094	78,630	9,555	122,000	8,460
1936	111,800	119,900	35,150	112,300	23,510	15,090	14,640	18,500	11,980	13,440	11,590	20,540	42,370	119,900	11,590	183,000	9,750
1937	91,630	65,080	57,730	51,730	68,700	18,130	13,550	11,560	17,960	17,460	22,540	18,550	37,885	91,630	11,560	128,000	8,650
1938	20,830	18,540	48,660	150,900	24,340	17,750	26,940	26,240	13,330	9,975	10,050	10,470	31,502	150,900	9,975	227,000	8,800
1939	18,650	54,850	74,390	38,880	20,920	31,200	14,970	83,450	20,320	14,310	11,160	12,640	32,978	83,450	11,160	196,000	9,920
1940	28,010	58,610	50,890	36,030	24,840	19,460	58,550	15,780	10,680	9,153	10,270	19,350	28,469	58,610	9,153	98,600	8,400
1941	29,280	26,240	38,050	23,010	14,400	9,415	26,880	21,920	10,980	8,731	6,894	29,710	20,459	38,050	6,894	86,900	5,380
1942	29,570	42,440	76,800	43,530	16,820	24,430	16,630	22,140	14,600	12,820	11,380	26,930	28,174	76,800	11,380	133,000	9,320
1943	79,040	42,650	88,910	74,660	27,790	15,320	16,600	17,960	12,530	9,717	13,000	13,560	34,311	88,910	9,717	182,000	8,540
1944	29,630	48,390	86,430	126,200	66,680	18,040	13,020	17,010	14,090	9,906	10,810	15,540	37,979	126,200	9,906	168,000	8,390
1945	25,410	53,610	54,530	45,930	56,070	15,890	14,780	12,570	10,330	11,000	12,050	29,700	28,489	56,070	10,330	114,000	8,390
1946	110,900	94,900	84,290	69,960	56,410	43,690	25,960	24,020	19,410	13,130	17,580	17,840	48,174	110,900	13,130	149,000	10,300
1947	87,320	60,660	64,750	77,590	39,490	22,970	18,440	12,210	10,680	9,328	22,890	37,310	38,637	87,320	9,328	163,000	7,760
1948	23,570	89,310	85,630	65,710	17,530	13,600	17,920	23,190	11,960	11,440	45,990	131,800	44,804	131,800	11,440	218,000	8,400
1949	84,440	98,980	61,590	57,010	59,990	25,810	33,580	20,650	18,560	11,750	15,390	15,370	41,927	98,980	11,750	136,000	9,780
1950	25,770	36,160	51,770	27,320	24,220	16,390	23,570	23,790	29,960	13,890	12,810	16,410	25,172	51,770	12,810	84,400	10,000

TABLE 4–3. ANNUAL, MONTHLY, AND DAILY FLOW DATA

(Monthly Flow in cfs 1930 - 1975 at USGS Gage 02429500; 1976 - 2011 at USGS Gage 02428400)

YEAR	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	Monthly Max	Monthly Min	Daily Max	Daily Min
1951	24,300	33,720	40,510	99,190	23,960	13,400	13,980	11,030	9,635	8,823	13,670	41,990	27,851	99,190	8,823	148,000	6,020
1952	42,830	44,010	85,950	46,300	22,110	17,490	9,990	11,590	9,679	8,484	8,590	18,580	27,134	85,950	8,484	107,000	5,900
1953	55,660	56,290	66,050	48,990	70,270	15,750	15,370	11,240	10,030	12,030	10,110	43,980	34,648	70,270	10,030	124,000	6,000
1954	44,780	33,920	34,800	33,460	16,710	11,980	7,738	7,853	7,060	6,133	6,815	7,975	18,269	44,780	6,133	80,500	4,840
1955	22,230	39,990	30,330	73,670	22,940	18,050	15,120	15,380	8,688	8,127	9,621	11,720	22,989	73,670	8,127	135,000	6,940
1956	9,110	50,150	67,850	61,730	19,880	11,140	12,670	7,692	9,224	11,900	9,242	22,770	24,447	67,850	7,692	127,000	5,490
1957	23,330	50,420	36,580	98,490	35,150	19,690	17,700	9,680	13,200	20,330	41,950	52,100	34,885	98,490	9,680	154,000	6,990
1958	32,600	52,250	73,150	46,910	33,670	15,000	27,790	15,400	14,440	13,870	11,620	14,310	29,251	73,150	11,620	118,000	9,400
1959	24,880	48,940	43,750	41,830	19,060	38,790	11,970	9,797	11,240	17,290	18,700	21,440	25,641	48,940	9,797	71,100	8,280
1960	36,080	57,530	65,880	61,300	19,980	12,280	9,414	12,340	10,560	15,690	12,520	16,510	27,507	65,880	9,414	112,000	7,860
1961	18,760	62,330	165,100	86,310	28,540	27,550	28,410	13,470	16,200	9,579	9,784	107,200	47,769	165,100	9,579	266,000	8,350
1962	82,070	65,370	67,350	88,480	20,260	14,460	13,400	9,718	10,320	13,350	17,770	18,070	35,052	88,480	9,718	128,000	7,510
1963	45,900	45,510	70,800	24,740	43,830	23,840	21,250	13,430	9,666	11,050	9,275	23,450	28,562	70,800	9,275	100,000	7,960
1964	47,430	58,660	100,300	144,500	69,750	16,490	15,600	15,000	10,860	22,340	16,240	35,050	46,018	144,500	10,860	192,000	9,000
1965	45,830	71,350	63,880	54,520	14,890	17,050	14,390	12,780	11,200	17,030	11,450	15,880	29,188	71,350	11,200	112,000	9,620
1966	26,090	79,610	87,660	24,590	51,980	17,280	11,050	11,870	11,890	20,210	29,030	24,380	32,970	87,660	11,050	148,000	8,120
1967	38,510	39,400	27,420	10,750	26,140	15,350	30,000	24,760	33,310	18,210	33,580	72,920	30,863	72,920	10,750	96,000	7,250
1968	83,170	25,930	38,050	47,290	35,740	14,380	12,950	14,440	8,291	8,366	12,080	24,690	27,115	83,170	8,291	100,000	5,830
1969	37,990	50,530	40,900	43,050	41,600	17,930	12,050	11,960	16,670	16,100	9,347	18,220	26,362	50,530	9,347	95,300	6,000
1970	29,580	28,300	62,680	43,840	20,040	26,580	9,060	14,140	13,200	10,860	16,690	19,580	24,546	62,680	9,060	140,000	2,850
1971	38,420	70,450	121,500	52,780	34,960	17,490	20,170	25,500	18,010	11,290	10,940	47,190	39,058	121,500	10,940	173,000	6,880

TABLE 4–3. ANNUAL, MONTHLY, AND DAILY FLOW DATA

(Monthly Flow in cfs 1930 - 1975 at USGS Gage 02429500; 1976 - 2011 at USGS Gage 02428400)

YEAR	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	Monthly Max	Monthly Min	Daily Max	Daily Min
1972	99,090	62,700	68,760	27,160	26,290	16,690	18,130	13,410	13,450	8,125	14,360	49,860	34,835	99,090	8,125	161,000	7,240
1973	77,860	54,290	78,490	105,100	76,300	56,530	23,640	15,330	12,170	11,930	15,030	32,560	46,603	105,100	11,930	155,000	7,660
1974	82,800	77,140	32,740	68,120	21,160	20,670	15,600	17,210	22,670	8,860	12,990	40,340	35,025	82,800	8,860	111,000	7,300
1975	79,110	109,400	94,320	84,450	32,950	25,300	29,790	41,240	30,460	57,680	31,170	36,420	54,358	109,400	25,300	169,000	13,400
1976	73,520	50,100	89,740	93,140	53,290	24,820	25,460	14,340	12,790	8,845	14,620	38,950	41,635	93,140	8,845	213,000	6,590
1977	55,950	32,830	99,940	102,500	17,470	12,980	7,843	10,970	14,200	25,590	48,380	28,270	38,077	102,500	7,843	161,000	6,220
1978	66,170	48,410	45,950	24,240	60,290	26,880	9,592	12,670	8,330	6,828	7,612	16,150	27,760	66,170	6,828	128,000	5,630
1979	55,690	59,960	109,500	147,600	43,790	29,120	22,810	15,010	19,410	25,920	35,430	23,770	49,001	147,600	15,010	215,000	7,900
1980	53,100	51,800	112,500	126,000	62,250	19,740	11,810	8,400	7,075	12,900	14,140	13,710	41,119	126,000	7,075	202,000	6,650
1981	9,615	54,070	28,340	46,280	10,050	15,660	8,487	6,988	8,762	6,535	7,712	19,540	18,503	54,070	6,535	130,000	5,540
1982	61,850	91,580	49,370	51,770	34,580	16,240	14,950	13,770	6,973	11,240	16,800	78,030	37,263	91,580	6,973	141,000	6,220
1983	51,390	82,840	79,400	107,400	51,710	26,680	15,980	9,704	13,230	9,991	32,380	93,480	47,849	107,400	9,704	160,000	8,290
1984	77,190	46,720	60,070	54,250	55,010	15,130	15,790	44,030	11,880	11,790	15,940	30,690	36,541	77,190	11,790	117,000	5,560
1985	18,490	64,620	29,070	14,720	17,440	8,572	17,820	18,290	9,252	12,530	14,690	22,390	20,657	64,620	8,572	112,000	6,740
1986	13,870	26,350	40,380	9,129	8,196	7,756	6,506	6,481	5,486	5,398	28,430	41,240	16,602	41,240	5,398	121,000	3,890
1987	53,550	63,430	71,700	27,600	14,490	15,640	13,470	7,970	7,152	6,715	6,609	11,210	24,961	71,700	6,609	119,000	5,130
1988	35,830	32,540	17,020	16,130	8,332	6,985	7,585	5,909	21,490	12,230	27,070	17,190	17,359	35,830	5,909	101,000	4,820
1989	50,440	27,620	72,320	58,910	19,870	62,470	59,580	14,770	15,130	34,850	34,700	55,490	42,179	72,320	14,770	132,000	8,830
1990	86,580	126,000	145,000	40,110	26,110	11,920	11,310	9,006	7,229	9,290	10,870	20,070	41,958	145,000	7,229	255,000	5,610
1991	27,920	49,840	50,520	45,130	75,120	29,670	21,360	12,880	12,630	9,657	19,060	27,390	31,765	75,120	9,657	117,000	7,200
1992	53,820	60,780	55,350	25,320	10,870	19,030	12,130	17,290	18,880	12,120	65,300	80,910	35,983	80,910	10,870	144,000	8,860

TABLE 4–3. ANNUAL, MONTHLY, AND DAILY FLOW DATA

(Monthly Flow in cfs 1930 - 1975 at USGS Gage 02429500; 1976 - 2011 at USGS Gage 02428400)

YEAR	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	Monthly Max	Monthly Min	Daily Max	Daily Min
1993	90,120	55,600	63,640	45,820	22,360	11,560	10,650	10,430	8,253	7,087	15,760	20,530	30,151	90,120	7,087	142,000	5,600
1994	30,740	58,250	61,970	67,130	16,340	14,000	45,430	19,420	16,400	24,830	17,740	48,270	35,043	67,130	14,000	111,000	7,190
1995	35,000	65,840	77,170	22,840	13,250	9,559	8,633	8,374	6,206	49,420	54,100	51,250	33,470	77,170	6,206	139,000	5,170
1996	56,170	87,870	88,820	42,250	20,790	16,260	12,430	13,870	15,810	13,150	18,500	37,840	35,313	88,820	12,430	133,000	7,600
1997	62,450	65,940	81,970	33,740	39,700	47,670	21,350	14,400	9,338	18,950	29,870	47,890	39,439	81,970	9,338	170,000	7,230
1998	85,100	102,600	101,500	57,840	24,000	14,790	9,722	10,480	11,790	14,850	10,400	16,440	38,293	102,600	9,722	205,000	5,350
1999	33,830	55,970	38,190	16,610	15,540	19,860	31,640	8,579	6,477	8,216	7,902	11,060	21,156	55,970	6,477	139,000	5,260
2000	17,630	13,310	29,870	42,700	8,695	6,312	5,859	5,923	5,904	5,484	10,320	14,380	13,866	42,700	5,484	116000	4,050
2001	26,460	34,920	124,500	55,660	13,310	26,480	14,410	12,730	15,850	7,988	9,095	23,260	30,389	124,500	7,988	174000	5,690
2002	36,140	32,020	30,770	22,920	17,250	7,592	7,363	6,860	11,640	16,318	42,907	65,723	24,792	65,723	6,860	126000	4,850
2003	31,174	56,014	68,313	51,030	100,787	55,270	64,597	32,358	13,922	10,050	19,012	23,103	43,803	100,787	10,050	145000	5,060
2004	26,529	60,924	20,045	11,618	14,116	13,034	12,982	8,379	34,814	15,476	51,633	64,855	27,867	64,855	8,379	118000	2,960
2005	26,194	51,161	56,735	79,667	23,926	31,071	58,505	25,065	11,853	9,401	11,730	22,630	33,995	79,667	9,401	167000	5,020
2006	37,090	47,500	41,660	18,490	22,230	7,174	5,828	6,208	5,775	7,570	23,490	16,600	19,968	47,500	5,775	106,000	5,110
2007	35,330	19,690	15,700	9,125	6,063	5,029	4,781	4,575	4,592	4,152	3,653	2,937	9,636	35,330	2,937	80,000	1,540
2008	7,846	25,560	27,670	21,670	15,730	8,020	4,495	18,720	6,934	6119	7775	32113	15,221	32,113	4,495	99,300	2,940
2009	42,530	12,820	68,210	60,400	51,590	12,990	74,545	9,060	37,580	53,270	66,330	100,300	43,795	100,300	9,060	158,750	4,365
2010	69,560	8,280	68,120	23,680	30,010	14,880	7,523	6,942	5,079	5,365	9,484	12,750	27,908	69,560	5,079	145,417	3,042
2011	14,450	24,240	63,910	43,650	10,600	6,113	7,521	5,749	8,687	5,718	10,934	28,158	19,114	63,910	5,718	132,875	2,747

TABLE 4–3. ANNUAL, MONTHLY, AND DAILY FLOW DATA

(Monthly Flow in cfs 1930 - 1975 at USGS Gage 02429500; 1976 - 2011 at USGS Gage 02428400)

YEAR	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	Monthly Max	Monthly Min	Daily Max	Daily Min
														POR	**POR**	**POR**	POR
AVG 1930-1975	48,432	55,783	64,665	60,043	32,829	19,649	18,321	17,506	14,116	13,966	15,911	30,709	32,764	165,100	6,133	266,000	2,850
AVG 1976-2011	42,868	24,992	65,853	43,973	30,194	13,367	26,952	8,732	15,757	19,490	27,358	43,780	30,444	147,600	2,937	255,000	1,540
AVG 1930-2011	43,373	25,159	66,069	45,703	30,813	13,391	26,967	9,362	16,111	19,543	26,359	43,308	30,759	165,100	2,937	266,000	1,540

POR = Period of Record

V - DATA COLLECTION AND COMMUNICATION NETWORKS

5-01. Hydrometeorological Stations.

a. Facilities. Management of water resources requires continuous, real-time knowledge of hydrologic conditions. The Mobile District contracts out the majority of basin data collection and maintenance to the U.S. Geological Survey (USGS) and National Weather Service (NWS) through cooperative stream gaging and precipitation network programs. The USGS, in cooperation with other federal and state agencies, maintains a network of real-time gaging stations throughout the ACT Basin. The stations continuously collect various types of data including stage, flow, and precipitation. The data are stored at the gage location and are transmitted to orbiting satellites. Figure 5-1 shows a typical encoder with wheel tape housed in a stilling well used for measuring river stage or lake elevation. Figure 5-2 shows a typical precipitation station, with rain gage, solar panel, and Geostationary Operational Environmental Satellite (GOES) antenna for transmission of data. The gage locations are discussed in Chapter VI related to hydrologic forecasting.

Reservoir project data are obtained through each project's Supervisory Control and Data Acquisition (SCADA) system and provided to the Water Management Section both daily and in real-time.

Figure 5-1. Encoder with Wheel Tape for Measuring the River Stage or Lake Elevation in the Stilling Well

Figure 5-2. Typical Field Installation of a Precipitation Gage

The Water Management Section employs a staff of hydrologic field technicians and contract work to USGS to operate and maintain Corps' gages throughout the ACT Basin. Corps personnel also maintain precipitation gages at project locations over the ACT Basin.

All rainfall gages equipped as Data Collection Platforms are capable of being part of the reporting network. Data is received from 22 stations in and around the Alabama River Basin from Montgomery, Alabama to Millers Ferry Lock and Dam. The data are recorded in 15-minute intervals and these data are reported hourly. The 10 stations listed in Table 5-1 are considered the rainfall reporting network for the R. F. Henry, Millers Ferry, and Claiborne Projects. The locations of these rainfall stations are shown on Plate 5-1. River conditions above Montgomery,

Alabama are reflected in outflows from Jordan-Bouldin Dam on the Coosa River, and the Thurlow Dam on the Tallapoosa River.

Rainfall and upstream conditions are updated regularly throughout the day. Forecast of runoff are prepared and compared to those prepared by the River Forecast Center.

Table 5-1. Rainfall Reporting Network for the Lower Alabama River Basin

Name	Agency	Agency ID	Latitude	Longitude
Montgomery, AL (at US 31)	USACE	15550	32.41139	-86.4083
Catoma Creek near Montgomery, AL	USACE		32.30722	-86.2994
R.F. Henry L&D near Benton, AL	USACE		32.31667	-86.7833
Selma, AL	USACE	17366	32.40556	-87.0186
Centreville, AL	USACE	11520	32.94500	-87.1392
Suttle, AL	USACE	17963	32.52917	-87.1989
Marion Junction, AL	USACE	15116	32.44389	-87.1803
Below Millers Ferry L&D near Camden, AL	USACE	11301	32.10000	-87.3981
Claiborne L&D near Monroeville, AL	USACE	11690	31.61500	-87.5506

All river stage gages equipped as Data Collection Platforms are capable of being part of the reporting network. Data is available from many stations in and adjacent to the ACT Basin. The river stage gages listed in the section of Table 5-2 titled “River Stage Gages in the Daily Hydrologic Network” are used to plan operations at the Claiborne Project. All of these stage gages are not required for daily operations but the information is available when desired. The locations of these and other river stage gages are shown on Plate 5-2. In addition, river stage gages listed in the section of Table 5-2 titled “Other River Stage Gages within the Alabama River Basin**”** are available if necessary, but do not report daily.

In addition to the automated reporting stations, stage and flow data at APC projects are furnished to the Corps, Mobile District daily by the APC Birmingham office. The APC also receives Data Collection Platform transmissions directly from gages throughout the ACT Basin.

Data from the river-stage station at Claiborne can be received at any time by contacting personnel at the project. Pool and tailwater elevations as well as inflow and outflow at R. F. Henry, Millers Ferry, and Claiborne are reported each morning to the Water Management Section. Most of stations within the basin are maintained by the USGS.

Table 5-2. Reporting Stage Gages Used for Lower Alabama River Basin

USGS Gage	Name	Lat	Long	Drainage Area (sq. miles)	NGVD29 Datum	Flood Stage	Rain Gage
02420000	Alabama River Near Montgomery, AL	32.4114	-86.4083	15,087	97.90	35	No
02421000	Catoma Creek near Montgomery, AL	32.3072	-86.2994	290	151.02	20	No
02421350	Alabama River at R.F. Henry (Head Water)	32.3250	-86.7847	16,233	0.00		Yes
02421351	Alabama River at R.F. Henry (Tail Water)	32.3167	-86.7833	16,233	0.00	122	No
02423000	Alabama River at Selma, AL	32.4056	-87.0186	17,095	61.80	45	No
02424000	Cahaba River at Centreville, AL	32.9450	-87.1392	1,027	180.74	23	No
02424590	Cahaba River at Suttle, AL	32.5292	-87.1989	1,480	97.64	32	No
02425000	Cahaba River at Marion Junction	32.4439	-87.1803	1,766	86.72	36	No
02427505	Alabama River at Millers Ferry (Head Water)	32.1006	-87.3992	20,637	0.00		Yes
02427506	Alabama River at Millers Ferry (Tail Water)	32.1000	-87.3978	20,637	0.00	66	No
02428400	Alabama River at Claiborne (Head Water)	31.6150	-87.5506	21,473	0.00		No
02428401	Alabama River at Claiborne (Tail Water)	31.6134	-87.5506	21,473	0.00	42	No

Data System (WCDS) for the Mobile District that integrates large volumes of hydrometeorological and project data so the basin can be regulated to meet the operational objectives of the system. The WCDS, in combination with the new Corps Water Management System (CWMS), together automate and integrate data acquisition and retrieval to best meet all Corps water management activities.

Data are collected at Corps sites and throughout the ACT Basin through a variety of sources and integrated into one verified and validated central database. The basis for automated data collection at a gage location is the Data Collection Platform. The Data Collection Platform is a computer microprocessor at the gage site. A Data Collection Platform has the capability to interrogate sensors at regular intervals to obtain real-time information (e.g., river stage, reservoir elevation, water and air temperature, precipitation). The Data Collection Platform then saves the information, performs simple analysis of it, and then transmits the information to a fixed geostationary satellite. Data Collection Platforms transmit real-time data at regular intervals to the GOES System operated by the National Oceanic and Atmospheric Administration (NOAA). The GOES Satellite's Data Collection System sends the data directly down to the NOAA Satellite and Information Service in Wallops Island, Virginia. The data are then rebroadcast over a domestic communications satellite (DOMSAT). The Mobile District Water Management Section operates and maintains a Local Readout Ground System (LRGS) that collects the Data Collection Platform-transmitted, real-time data from the DOMSAT. Figure 5-3 depicts a typical schematic of how the system operates.

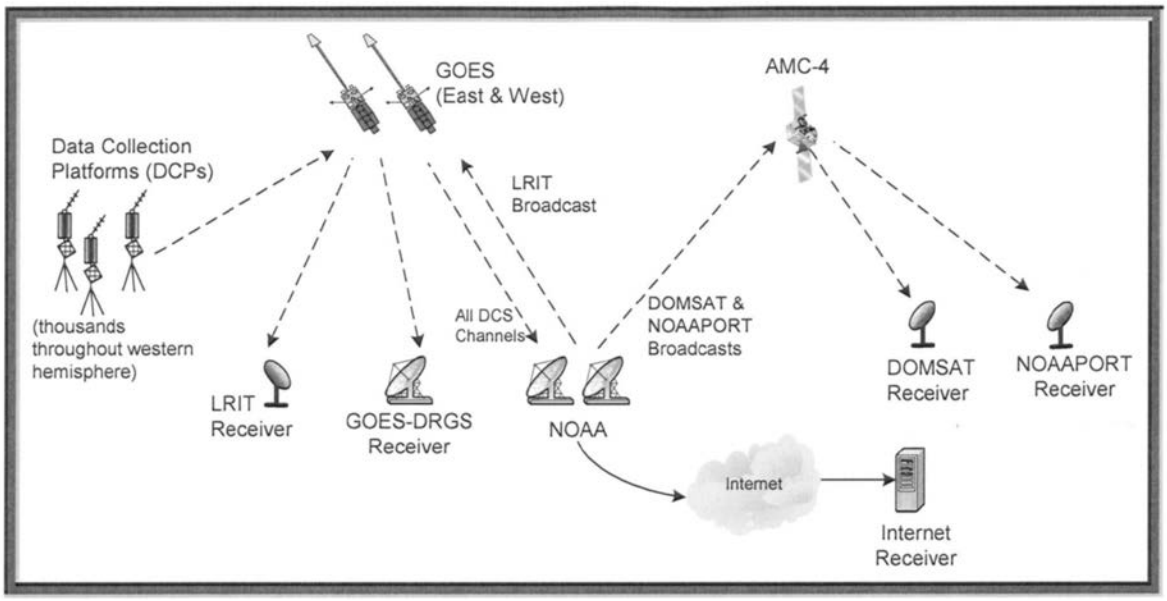


Figure 5-3. Typical Configuration of the GOES System

Typically, reporting stations log 15-minute data that are transmitted every hour. A few remaining gages report every four hours, but they are being transitioned to the hourly increment. All river stage and precipitation gages equipped with a Data Collection Platform and GOES antenna are capable of being part of the reporting network. Telephone is an option for other communications. Data for the project and the Data Collection Platforms are downloaded both daily and hourly through the Corps' server network to the Water Management Section.

c. Maintenance. The Corps, Mobile District has a cooperative program with the USGS and their office in Montgomery, Alabama for both maintenance and the exchange of data for the gages identified in the above paragraphs. Maintenance of the gages is accomplished by the USGS according to the program. If gages appear to be out of service, the following agencies can be contacted for repair:

U.S. Army Corps of Engineers, Mobile District, 109 Saint Joseph Street, Mobile, AL 36602-3630
Phone: (251) 690-2737 Web: http://water.sam.usace.army.mil

USGS Lower Mississippi-Gulf Water Science Center - Alabama, 75 TechnaCenter Drive, Montgomery, Alabama 36117 Phone: (334) 395-4120 Web: http://al.water.usgs.gov

5-02. Water Quality Stations. There are no Corps operated or maintained water quality stations in the Claiborne Project area. However, there are some real-time water quality parameters collected at several of the stream gages maintained by the USGS for general water quality monitoring purposes. The data for these stations can be obtained from the USGS yearly publication, ***Water Resources Data Alabama***. The Alabama Department of Environmental Management also periodically samples water quality throughout the Alabama portion of the basin on a rotating schedule.

5-03. Sediment Stations. In order to provide an adequate surveillance of sedimentation, a network of sediment ranges were established for Claiborne Lake in 1996. Quantitative computations can be made from these ranges to determine the extent and degree of sedimentation and erosion. General conditions and changes have been measured and recorded using this network. The network of sediment stations is shown on Plate 4-1. In order

to monitor degradation and aggradation of the Alabama River, a network of retrogression ranges were established and surveyed for about 40 miles below Claiborne Dam. This network is shown on Plate 4-2.

Sediment surveys were conducted in 2009. Tetra Tech, Inc., was retained to conduct an analysis of the data and determine the extent and degree of sedimentation and erosion that has occurred in the lake and its tributaries over the years, and where appropriate, to speculate on the causes of those changes. This analysis and results are presented in a report entitled; "Sedimentation and Erosion Analysis for Alabama River Lakes". Sedimentation and erosion classifications were developed for each range. Based on the percentage change for the entire cross section, range cross sections were classified for sedimentation as "Heavy" (greater than 15 percent change), "Medium" (5 to 15 percent change), "Light" (0 to 5 percent), and "None" (0 or negative change). Erosion classifications were also developed from bank retreat and advance rates. A bank retreat or advance rate is the average change in location, measured in feet, of the shoreline. It is the area bounded between two cross section profiles at the shore erosion zone (square-feet) divided by the height of shore erosion zone (feet). The shorelines were separated into two groups, erosional and depositional. The erosional group was further divided into three classes by percentile. The 25 percent of shorelines showing the greatest bank retreat were classed as "Acute," the middle 50 percent in bank retreat were classed as "Moderate," and the 25 percent with the least bank retreat were classed as "Slight." Shorelines in the depositional group were classed as "Deposition."

Claiborne Lake is the most downstream of the three Alabama River Lakes. It has no major tributaries with historical sedimentation ranges, thus the analysis results for all 16 ranges represent the main channel of the Alabama River. Results are displayed in Table 5-3. The range numbering starts with 1A below Millers Ferry, in numerical order to range 16 above Claiborne Lock and Dam.

Table 5-3. Sedimentation Range Results for Claiborne Lake

Rangeline	Sedimentation Classification	Shoreline Erosion Classification: 1966 to 2010	
		Left Bank	Right Bank
1A	Light	Deposition	Deposition
2A	None	Acute	Deposition
3A	Light	Deposition	Deposition
4A	Light	Deposition	Moderate
5A	Light	Deposition	Deposition
6A	Light	Deposition	Deposition
7A	None	Acute	Moderate
8A			
9A	None	Moderate	Deposition
10A	None	Slight	Moderate
11A	Medium	Deposition	Deposition
12A	None	Deposition	Deposition
13A	Heavy	Slight	Deposition
14A	Light	Deposition	Moderate
15A	Medium	Moderate	Deposition
16A	None	Slight	Moderate

In general the sedimentation trend along the river is “Light” below Millers Ferry Lock and Dam, scoured bed along the mid portion from range 7A through range 10A, then classed “Medium” for deposition for the lowest third above Claiborne Lock and Dam. The trend for increasing sedimentation while progressing downstream is reasonable for a run-of-the river impoundment located immediately below another impoundment: Reduced sediment load along the upper reach due to sediment being trapped in the upstream impoundment and increased sedimentation along the lowest reach immediately above the downstream dam. However, the cause of the bed scour along the middle reach is not apparent. The average reduction in bed elevation is about three to five feet averaged across the bed width for ranges 7A, through 10A. Although range 8A also exhibits bed scour, it was excluded from the analysis because there was a discrepancy between the alignments of the historical data and the current data. Review of aerial photographs suggests the actual channel width is similar to that of the 1996 survey and there is no indication of changes which would manifest a wider rangeline. The difference in range 8A is likely due to an incorrect azimuth or bearing of the rangeline.

5-04. Recording Hydrologic Data. The Water Control Data Support System (WCDSS) is an integrated system of computer hardware and software packages readily usable by water managers and operators as an aid for making and implementing decisions. An effective decision support system requires efficient data input, storage, retrieval, and capable information processing. Corps-wide standard software and database structure are used for real-time water control. Time series hydrometeorological data are stored and retrieved using the CWMS Oracle database. In the event this database is unavailable, data can alternately be stored in the Hydrologic Engineering Center Data Storage System (HEC-DSS).

To provide stream gage and precipitation data needed to support proper analysis, a DOMSAT Receive Station (DRS) is used to retrieve DCP data from gages throughout the ACF Basin. The DRS equipment and software then receives the DOMSAT data stream, decodes the DCPs of interest and reformats the data for direct ingest into a HEC-DSS database. Reservoir data is received through a link with the Supervisory Control and Data Acquisition (SCADA) system which monitors and records reservoir conditions and operations in real time.

Most reservoir data are transmitted in hourly increments for inclusion in daily log sheets that are retained indefinitely. Gage data are transmitted in increments of 15 minutes, 1-hour, or other intervals. Reservoir data are examined and recorded in water control models every morning (or other times when needed). The data are automatically transferred to forecast models.

Automated timed processes also provide provisional real-time data needed for support of real-time operational decisions. Interagency data exchange has been implemented with the USGS and NWS Southeast River Forecast Center (SERFC). A direct link to SERFC is maintained to provide real-time products generated by NWS offices. Information includes weather and flood forecasts and warnings, tropical storm information, NEXRAD radar rainfall, graphical weather maps and more. Likewise, a direct link to USGS gages in the field allows for direct downloading of USGS data to Corps databases.

5-05. Communication Network.

The global network of the Corps consists of private, dedicated, leased lines between every Division and District office worldwide. Those lines are procured through a minimum of two General Services Administration-approved telephone vendors, and each office has a minimum of two connections, one for each vendor. The primary protocol of the entire Corps network is Ethernet. The reliability of the Corps’ network is considered a command priority and, as such,

supports a dedicated 24 hours per day Network Operations Center. The use of multiple telephone companies supplying the network connections minimizes the risk of a one cable cut causing an outage for any office. Such dual redundancy, plus the use of satellite data acquisition, makes for a very reliable water control network infrastructure.

The Water Management Section has a critical requirement to be available during emergency situations for operation of the ACT Basin and to ensure data acquisition and storage remain functional. The Water Management Section must be able to function in cases of flooding or other disasters, which typically are followed by the loss of commercial electricity. The WCDS servers and the LRGS each have individual UPS (uninterruptable power supply) and a large UPS unit specifically for the portion of Mobile District Office in which the Water Management Section resides to maintain power for operational needs.

In the event of a catastrophic incident that causes loss of communication or complete loss of access to the Mobile District Office and the WCDS and CWMS servers located on site, a Continuity of Operations Program (COOP) site is being set up as a backup to these systems. This site will have servers that mirror the WCDS and CWMS servers located at the Mobile District Office allowing Water Managers to continue operating with no interruption or loss of data. It is currently planned that the COOP site will be located at the South Atlantic Division Office in Atlanta, Georgia.

The primary communication network of the Claiborne Project is a SCADA system network. The SCADA network includes a microwave link between Millers Ferry and Claiborne Dam. The SCADA network also monitors and digitally records real-time project data hourly. The data include physical conditions at the reservoir such as pool elevations, outflow, river stages, generation, and rainfall. Special instructions or deviations are usually transmitted by e-mail, telephone, or fax.

Emergency communication is available at the following numbers:

Water Management Section	251-690-2737
Chief of Water Management	251-690-2730 or 251-509-5368 (cell)
Claiborne Lock Foreman	251-282-4575
or Millers Ferry Powerhouse	334-682-9124

5-06. Communication With Project Office.

a. Regulating Office with Project Office. Communication between the Water Management Section and the project office at Claiborne Lock and Dam is by computer network, commercial telephone, or fax. Communication between the project offices is also done by computer network, telephone, fax, or by Private Access Exchange (PAX) or Southern Link Radio System.

b. Between Project Office and Others. The Water Management Section communicates daily with the NWS and APC to exchange data and forecasting information. The data exchange is made by computer and is supplemented by telephone and facsimile when necessary. The Water Management Section also has a computer link with the NWS's Advanced Weather Interactive Processing System (AWIPS) communication system via the River Forecast Center in Atlanta, Georgia. The Water Management Section and Claiborne use a telephone auto-answer recorded message to provide daily information to the public. Water resources information is available to the public at the Corps' website, http://water.sam.usace.army.mil. The site contains real-time information, historical data and general information that may be of interest to the public.

In order to warn the public of an impending water release downstream, the Claiborne spillway has two horns that are initiated from the Millers Ferry/Jones Bluff Powerhouse SCADA system. The horns are activated by powerhouse operators before a gate is raised from its sill. The horns sound for two minutes, and are verified through audio detectors and electrical current detectors.

5-07. Project Reporting Instructions. Claiborne data is automatically recorded hourly. The data includes pool elevation, tailwater elevation, gate step, and precipitation. A file containing the hourly data is sent via the Data Collection Platform System every four hours. The information is downloaded in the Water Management Section and retained indefinitely. In addition, every morning at 6:00 A.M., instantaneous values of the same parameters are recorded and sent to Millers Ferry and are subsequently downloaded by the Water Management Section through the LDS System.

5-08. Warnings. During floods, dangerous flow conditions, or other emergencies, the proper authorities and the public must be informed. In general, flood warnings are coupled with river forecasting. The NWS has the legal responsibility for issuing flood forecast to the public, and that agency will have the lead role for disseminating the information. For emergencies involving the Claiborne Project, the operator on duty should notify the Water Management Section, Operations Division and the Operations Project Manager at the project. A coordinated effort among those offices and the District's Emergency Management Office will develop notifications to make available to local law enforcement, government officials and emergency management agencies.

5-09. Role of Regulating Office. The Water Management Section of the Mobile District Office is responsible for developing operating procedures for both flood and non-flood conditions. Plans are developed to most fully use the water resources potential of each project with the constraints of authorized functions. Those plans are presented in water control manuals such as this one. Water control manual preparation and updating is a routine operation of the Water Management Section. In addition, the Water Management Section maintains information on current and anticipated conditions, precipitation, and river-stage data to provide the background necessary for best overall operation. The Water Management Section arranges communication channels pertaining to reservoir regulation to the Operations Project Manager and other necessary personnel.

VI – HYDROLOGIC FORECAST

6-01. General. Two forecasts are available for locations along the Alabama River. The NWS's River Forecast Center prepares river forecasts for the general public and for use by the Corps. In addition, the Water Management Section prepares forecasts for internal use. All features of the forecasting procedure are subject to modification and refinement as additional data and operating experience dictate. In general, forecasts are made for Corps projects and control points along the river. Inflows and outflows are estimated for R. F. Henry, Millers Ferry, and Claiborne Projects.

a. Role of Corps. The Water Management Section maintains real-time observation of river and weather conditions in the Mobile District. The Water Management Section has capabilities to make forecasts for several areas in the ACT Basin. Those areas include all the federal projects and other locations. Observation of real-time stream conditions provides guidance of the accuracy of the forecasts. The Corps maintains contact with the River Forecast Center to receive forecast and other data as needed. Daily operation of the ACT River Basin during normal, flood risk management, and drought conservation regulation requires accurate, continual short-range and long-range elevation, streamflow, and river-stage forecasting. These short-range inflow forecasts are used as input in computer model simulations so that project release determinations can be optimized to achieve the regulation objectives stated in this manual. The Water Management Section continuously monitors the weather conditions occurring throughout the ACT Basin and the forecasts issued by the NWS. Whenever possible, the NWS weather and hydrologic forecasts are used. The Water Management Section develops forecasts that are used to meet the regulation objectives of the Corps ACT Reservoirs. In addition, the Water Management Section provides weekly hydropower generation forecasts using current power plant capacity, latest hydrological conditions, and system water availability.

b. Role of Other Agencies. The NWS is responsible for preparing and disseminating all public forecasts relating to precipitation, temperatures, and other meteorological elements related to weather and weather-related forecasting in the ACT Basin. The Water Management Section uses the NWS as a key source of information for weather forecasts. The meteorological forecasting provided by the NWS is considered critical to the Corps' water resources management mission. The 24- and 48-hour Quantitative Precipitation Forecasts (QPFs) are invaluable in providing guidance for basin release determinations. Using precipitation forecasts and subsequent runoff directly relates to project release decisions.

(1) The NWS is the federal agency responsible for preparing and issuing streamflow and river-stage forecasts for public dissemination. That role is the responsibility of SERFC co-located in Peachtree City, Georgia with the Peachtree City Weather Forecast Office (WFO). SERFC is responsible for the supervision and coordination of streamflow and river-stage forecasting services provided by the NWS WSFOs in Peachtree City, Georgia, and Birmingham, Alabama. SERFC routinely prepares and distributes 5-day streamflow and river-stage forecasts at key gaging stations along the Coosa, Tallapoosa, and Alabama Rivers. Streamflow forecasts are available at additional forecast points during periods above normal rainfall. In addition, SERFC provides a revised regional QPF based on local expertise beyond the NWS Hydrologic Prediction Center QPF. SERFC also provides the Water Management Section with flow forecasts for selected locations upon request. Table 6-1 lists the forecast stations in the Alabama River Basin.

(2) The Corps and SERFC have a cyclical procedure for providing forecast data between federal agencies. As soon as reservoir release decisions have been planned and scheduled for the following days, the release decision data are sent to SERFC. Taking release decision data coupled with local inflow forecasts at forecast points along the ACT System, SERFC can provide forecasts of inflow into Corps projects. Having revised inflow forecasts from SERFC, the Corps has up-to-date forecast data to make the following days' release decisions.

(3) Alabama Power Company (APC) provides hourly discharge data from APC's Jordan, Bouldin, and Thurlow Projects and provides a 7-day forecast of average daily releases from Jordan, Bouldin, and Thurlow Projects.

Table 6-1. Southeast River Forecast Center Forecast Locations for Alabama River Basin

Daily Stage/Elevation Forecasts (Feet NGVD29)				
	Station	**Station ID**	**Action Stage***	**Flood Stage****
	Montgomery	MGMA1	26	35
	R. F. Henry TW	TYLA1	122	122
	Millers Ferry TW	MRFA1	61	66
	Claiborne TW	CLBA1	35	42
Daily 24-hour Inflow in Morning (10 a.m.) State Forecast Discussion				
Reservoir		**Station ID**		
R. F. Henry		TYLA1		
Millers Ferry		MRFA1		
Additional Stage Forecasts Only for Significant Rises				
River/Creek	**Station**	**Station ID**	**Action Stage**	**Flood Stage**
Coosa	Weiss Dam	CREA1		564
Coosa	Gadsden	GAPA1		511
Coosa	Logan Martin Dam	CCSA1		465
Coosa	Childersburg	CHLA1		402
Coosa	Wetumpka	WETA1	40	45
Tallapoosa	Wadley	WDLA1		13
Tallapoosa	Milstead	MILA1	15	40
Tallapoosa	Tallapoosa Wt Pit	MGYA1	15	25
Catoma Creek	Montgomery	CATA1	16	20
Alabama	Selma	SELA1	30	45
Cahaba	Cahaba Hts	CHGA1		14
Cahaba	Centreville	CKLA1	20	23
Cahaba	Suttle	SUTA1	28	32
Cahaba	Marion Junction	MNJA1	15	36

* Action Stage – The stage which some type of mitigation action in preparation for possible significant hydrologic activity occurs.
** Flood Stage – The stage for which a rise in water surface level begins to impact lives, property, or commerce.

6-02. Flood Condition Forecasts. During flood conditions, forecasts are made for two conditions: rainfall that has already fallen, and for potential rainfall (or expected rainfall). Decisions can be made on the basis of known events and *what if* scenarios. The Water Management Section prepares forecasts and receives the official forecasts from SERFC.

a. Requirements. Accurate flood forecasting requires a knowledge of antecedent conditions, rainfall and runoff that has occurred, and tables or unit hydrographs to apply the runoff to existing flow conditions. Predictive QPF data are needed for *what if* scenarios.

b. Methods. For determining flood conditions at the Claiborne Project, the observed hourly discharges out of Robert F. Henry and Millers Ferry Projects, along with APC's Jordan, Bouldin, and Thurlow Projects and the APC's daily 7-day forecast for the Coosa and Tallapoosa Rivers are used.

6-03. Conservation Purpose Forecasts. The Claiborne Project is essentially a run-of-the-river project and has no practical conservation storage in the reservoir. Therefore, it is unnecessary to forecast for conservation purposes at this project.

6-04. Long-Range Forecasts.

a. Requirements. The Alabama River Projects are modified run-of-the-river projects and have no practical conservation storage in the reservoirs. Therefore, it is unnecessary to forecast for conservation purposes at these projects. However, the Corps does utilize available information from the NWS and projected release forecast from Alabama Power Company projects on the Coosa and Tallapoosa Rivers to aid in the operation of the system and for planning studies.

b. Methods. In extreme conditions, three-month and six-month forecasts can be produced based on observed hydrology and comparative percentage hydrology inflows into the ACT Basin. One-month and three-month outlooks for temperature and precipitation produced by the NWS Climate Prediction Center are used in long-range planning for prudent water management of the ACT Projects.

6-05. Drought Forecast.

a. Requirements. Engineering Regulation (ER) 1110-2-1941, Drought Contingency Plans, dated 15 September 1981, called for developing drought contingency plans for all Corps' reservoirs. Drought recognition and drought forecast information can be used in conjunction with the drought contingency plan.

b. Methods. Various products are used to detect the extent and severity of basin drought conditions. One key indicator is the U.S. Drought Monitor. The Palmer Drought Severity Index is also used as a regional drought indicator. The index is a soil moisture algorithm calibrated for relatively homogeneous regions and may lag emerging droughts by several months. The Alabama Office of State Climatologist also produces a Lawn and Garden Index which gives a basin-wide ability to determine the extent and severity of drought. The runoff forecasts developed for both short and long-range time periods reflect drought conditions when appropriate. There is also a heavy reliance on latest ENSO (El Niño/La Niña-Southern Oscillation) forecast modeling to represent the potential impacts of La Nina on drought conditions and spring inflows. Long-range models are used with greater frequency during drought conditions to forecast potential impacts to reservoir elevations, ability to meet minimum flows, and water supply availability. A long-term, numerical model, Extended Streamflow Prediction developed by the NWS, provides probabilistic forecasts of streamflow on the basis of

climatic conditions, streamflow, and soil moisture. Extended Streamflow Prediction results are used in projecting possible future drought conditions. Other parameters and models can indicate a lack of rainfall and runoff and the degree of severity and continuance of a drought.

c. Reference Documents. The drought contingency plan for the Claiborne Project is summarized in Section 7-13 below. The complete ACT Drought Contingency Plan is provided in Exhibit D.

VII - WATER CONTROL PLAN

7-01. General Objectives. The original congressionally authorized purpose for the Claiborne Lock and Dam as contained in its authorizing legislation was navigation. Several other project purposes have been added through general authorizations including water quality, recreation, and fish and wildlife conservation and mitigation. The regulation plan seeks to balance the needs of all project purposes at the Claiborne Project and at other projects in the ACT Basin and is intended for use in day-to-day, real-time water management decision making and for training new personnel.

7-02. Constraints.

a. Full Discharge Capacity. The full discharge capacity of the spillway (gated and fixed) at elevation 36.0 feet NGVD29 is 70,763 cfs. Once the spillway capacity is reached a free overflow condition will prevail. There will be little difference in the water surface upstream and downstream of the dam. The river may continue to rise just as it would in the absence of any structure.

b. Head Limitation. Design criteria for stability against overturning and sliding of the Claiborne structures make it imperative that the head, difference between headwater and tailwater elevation, not exceed 30 feet at any time.

c. Location on the System. Claiborne is the most downstream of the three federal projects on the system below Montgomery, Alabama. Power generation pulses, sometimes sub-daily, at Millers Ferry, approximately 60 miles upstream, and Robert F. Henry (Jones Bluff Powerhouse) further upstream require constant monitoring to provide proper gate operation to maintain a pool between 32.0 and 36.0 feet NGVD29, and provide adequate flow releases for downstream use. Although there is little storage in the pool, one project purpose is to reregulate Millers Ferry releases. The gates must be adjusted gradually to smooth the flow, allowing the tailwater to rise gradually and to prevent erosion below the dam.

7-03. Overall Plan for Water Control. The Claiborne Lock and Dam Project is a run-of-river project, meaning that it does not store inflows except to reregulate them over a short period; usually over a 24-hour period. The purpose of the project is to reregulate flows from Millers Ferry Dam downstream for navigation. The three projects, Claiborne, Millers Ferry and Robert F. Henry Locks and Dams provide a stair step, low water navigation channel from Claiborne, Alabama, upstream to Montgomery, Alabama. A minimum Claiborne pool of 32.0 feet NGVD29 provides navigation up to Millers Ferry. The reservoir elevation at Claiborne will be allowed to fluctuate between a normal operating range of 36.0 and 34.0 feet NGVD29; however, the upper pool may be allowed to fluctuate down to 33.0 feet NGVD29 for short periods to allow for maximum flow reregulating opportunities.

7-04. Spillway Gate Operation. Except in high flow conditions, spillway gate settings will require nearly constant monitoring. They will be adjusted as specified in Sections 7-12 and 7-13 to maintain the pool level between limiting elevations 32.0 and 36.0 feet NGVD29. The upper pool can rise to elevation 36.5 feet NGVD29 temporarily so long as the top of all gates are 0.25 feet above the level of the upper pool. The six spillway gates are numbered in sequence beginning at the left bank or east end of the spillway, adjacent to the lock. Plates 7-1 through 7-18 show the gate operation schedule and spillway discharge. Efforts should be made to prevent the top of the gates from being submerged to prevent logs and debris from collecting on the gates, thus making them difficult or too heavy to operate. The target discharge rate to release

through the Claiborne Dam spillway gates is based on the upcoming day's Millers Ferry Powerhouse generation schedule and Claiborne pool elevation, as shown on Plate 7-19. The combined discharge curves for the Claiborne Dam spillway, lock, and overbank dikes is shown on Plate 7-20.

The following paragraphs outline methods for regulating the pool under various conditions. Claiborne's pool elevation will be maintained above elevation 32.0 feet NGVD29 to allow for 13-foot depth over the upper miter sill and allow sufficient depth for a 9-foot navigation channel into the Millers Ferry Lock approach upstream. There are two distinct modes of flow regulation of the Claiborne Project. During most of the year, roughly May through December, average daily outflow from the upstream Millers Ferry Project will be less than 28,000 day-second-feet (dsf) and will be in the form of peak power releases for varying hours of the day. When such moderate to low flows exist, Claiborne will operate as a flow re-regulator as described in paragraphs a and b below. Operation for higher flows is described in paragraphs c and d.

a. Moderate and Low Flow Regulation. The available storage at Claiborne will be used to reregulate daily releases from Millers Ferry into a steady release from Claiborne to insure stable navigable depths downstream while maintaining a pool above elevation 32.0 feet NGVD29. During moderate to low flows a target continuous discharge from Claiborne will be the objective with the Claiborne pool fluctuating to meet this goal. This target flow is linked to Millers Ferry upcoming day's generation schedule, Claiborne's pool level at crest, and the gate schedule operation. When the Claiborne pool has crested (usually between 10 p.m. and 4 a.m.) the Locktender can take Millers upcoming day generation total (in megawatt hours) and the Claiborne crest elevation and referring to Plate 7-19 can locate the target flow. The Claiborne Locktender on duty should begin to change the gate settings on the hour following the time the Claiborne upper pool crests, and should make gate changes every hour until the new discharge is reached. The maximum number of gate step changes per hour can be determined according to Plate 7-19. To release the target discharge, the Claiborne Locktender can set gates according to the gate schedule in the following manner. If the upper pool is rising, the Locktender should set the gates so the discharge is just less than the target flow. If the upper pool is falling, the gates should be set at the discharge just greater than the target flow. Experienced lock personnel may deviate from this guide to make smooth transitions in outflows from Claiborne while maintaining the Claiborne upper pool within the limits of 36.0 to 32.0 feet NGVD29. This procedure may be modified as necessary when required by events at Millers Ferry or significant rainfall between Claiborne and Millers Ferry.

b. Low Flows. A low flow period at Claiborne is when the average weekly flow drops below 10,000 cfs. During this time the outflow at Claiborne will be regulated as nearly as possible to a uniform continuous flow equal to that average weekly flow. In extreme low flow (less than 7,000 cfs) the Water Management Section may request the lockmaster to closely maintain a target tailwater elevation superseding guidelines shown on Plate 7-19. In such situations the Water Management Section will closely monitor the Claiborne pool and make adjustments in outflows from Millers Ferry to maintain the Claiborne pool within acceptable limits.

c. High Water and Floods. During high water, the Claiborne Lake elevation is maintained by passing the inflow through the spillway gates and over the free overflow section until the full discharge capacity of the spillway is reached. When the inflow exceeds about 67,000 cfs, all gates will be fully opened and there will be no control over the outflow. The pool and tailwater levels will continue to rise as flow increases closely emulating a natural river condition. When the pool peaks and recedes to elevation 35.0 feet NGVD29 the spillway gates are once again operated to control the reservoir level and outflows. Any departures from this operation should be coordinated with the Water Management Section. Plate 7-20 shows the total spillway and

overbank discharge for pool levels above elevation 32 feet NGVD29. The tailwater rating curve for Claiborne Lock and Dam is on Plate 7-21 and the headwater and tailwater rating curves for Millers Ferry are on Plate 7-22.

d. Indefinite Generation at Millers Ferry. Whenever the Claiborne personnel are notified that the Millers Ferry Powerhouse will continue to operate three turbines (90 mw) indefinitely, the Locktender will open six gates per hour until gate step #60 is reached or until the upper pool level reaches 36.0 feet NGVD29. The Locktender will make whatever gate setting necessary to gradually return the pool to near elevation 35.0 feet NGVD29.

e. Changes in Millers Ferry Schedule. Every effort is made to generate at Millers Ferry according to the schedule set the previous day. However, it may become necessary to change Millers Ferry's generation schedule. If this should happen, multiply the amount of change in generation (mwh) by 20. Add this amount to the current target outflow and change the Claiborne discharge to this amount. It may be necessary to change gate openings according to note "Maximum Gate Settings" on Plate 7-19.

7-05. Standing Instructions to Project Operator. Standing Instructions to the Project Operator for Water Control can be found on Exhibit C in the back of this manual. It describes the operator's duties and responsibilities for reservoir regulation including operating procedures, data collecting, and data reporting.

7-06. Flood Risk Management. There is no dedicated flood storage in the Claiborne Project, but flowage easements have been obtained encompassing all lands subjected to an increased frequency of flooding from operation of the project.

7-07. Recreation. The Claiborne Lock and Dam project is an important part of the Alabama River Lakes (ARL) recreational resource, providing both economic and social benefits for the region and the Nation. The ARL is composed of the Claiborne, Millers Ferry, and Robert F. Henry Projects. The ARL contains 33,852 acres of land and 576 miles of shoreline, most of which is available for public use. A wide variety of recreational opportunities are provided at the lake including boating, fishing, camping, picnicking, water skiing, and sightseeing. Mobile District park rangers and other project personnel conduct numerous environmental and historical education tours and presentations, as well as water safety instructional sessions each year for the benefit of area students and project visitors. The Operations Project Manager will be responsible for contacting various lakeshore interests and keeping the public informed of lake conditions during drawdown periods. The Operations Project Manager will close beaches and boat ramps as necessary, patrol the lake, mark hazards, and perform other necessary tasks to mitigate the effects of low lake levels.

7-08. Water Quality. Claiborne Lock and Dam operating to provide a 24-hour continuous flow is beneficial to the assimilative characteristics of the river. Several industries on the Alabama River have designed effluent discharges based on the 7Q10 flow of 6,600 cfs mentioned previously. When flows recede to this level, conditions will be closely monitored so adequate warning can be given to the users if it becomes necessary to reduce flows further. The following paragraphs explain the procedures to follow should the flows drop below 6,600 cfs.

7-09. Fish and Wildlife. Both sport and commercial fisheries experienced a net gain from the Claiborne impoundment. The pool fluctuates one to three feet, but these fluctuations are less severe than the pre-impoundment conditions. A more stable pool during the spring spawning season is beneficial to the production of largemouth bass, crappie, and other sunfishes. Potential spawning sites are provided by the increased shoreline. Flow regulation for navigation

benefit downstream fisheries. Wildlife management measures are not feasible within the small area controlled under easements along the shoreline. However, portions of fee-owned land have been dedicated for intensive wildlife management as part of the Tennessee-Tombigbee Waterway Wildlife Mitigation Project.

When Alabama River flow and project conditions allow, the Corps operates the lock from February through May to facilitate downstream/upstream passage of migratory fishes. While there can be slight differences in the locking technique each year, generally two fish locking cycles are performed each day between 8 AM and 4 PM, depending on facility staffing; one in the morning and one in the afternoon.

7-10. Water Supply. Water withdrawals in Alabama are made pursuant to water withdrawal permits issued by the Alabama Department of Environmental Management. Based upon information provided by the Alabama Office of Water Resources in 2010, there is one major withdrawal that occurs from Claiborne Lake, International Paper at Pine Hill. Claiborne Lake is a run-of-the-river project and essentially has no conservation storage; thus, no water storage contracts.

7-11. Hydroelectric Power. Claiborne Lock and Dam Project does not have hydropower.

7-12. Navigation.

Navigation is an important use of water resources in the ACT Basin. The Alabama River, from Montgomery, Alabama, downstream to the Mobile, Alabama, area, provides a navigation route for commercial barge traffic, serving as a regional economic resource. A minimum flow is required to ensure usable water depths to support navigation. Congress has authorized continuous navigation on the river, when sufficient water is available. The three Corps locks and dams on the Alabama River and a combination of dredging, river training works, and flow augmentation together support navigation depths on the river. The lack of regular dredging and routine maintenance has led to inadequate depths at times in the Alabama River navigation channel.

When supported by maintenance dredging, ACT Basin reservoir storage, and hydrologic conditions, adequate flows will provide a reliable navigation channel. In so doing, the goal of the water control plan is to ensure a predictable minimum navigable channel in the Alabama River for a continuous period that is sufficient for navigation use. Figure 7-1 shows the effect of dredging on flow requirements for different navigation channel depths using 2004 – 2010 survey data. As shown on Figure 7-1, pre-dredging conditions exist between November and April; dredging occurs between May and August; and post-dredging conditions exist from September through October, until November rainfall causes shoaling to occur somewhere along the navigation channel.

A 9-foot-deep by 200-foot-wide navigation channel is authorized on the Alabama River to Montgomery, Alabama. When a 9.0-foot channel cannot be met, a shallower 7.5-foot channel would still allow for light loaded barges moving through the navigation system. A minimum depth of 7.5 feet can provide a limited amount of navigation. Under low flow conditions, even the 7.5-foot depth has not been available at all times.

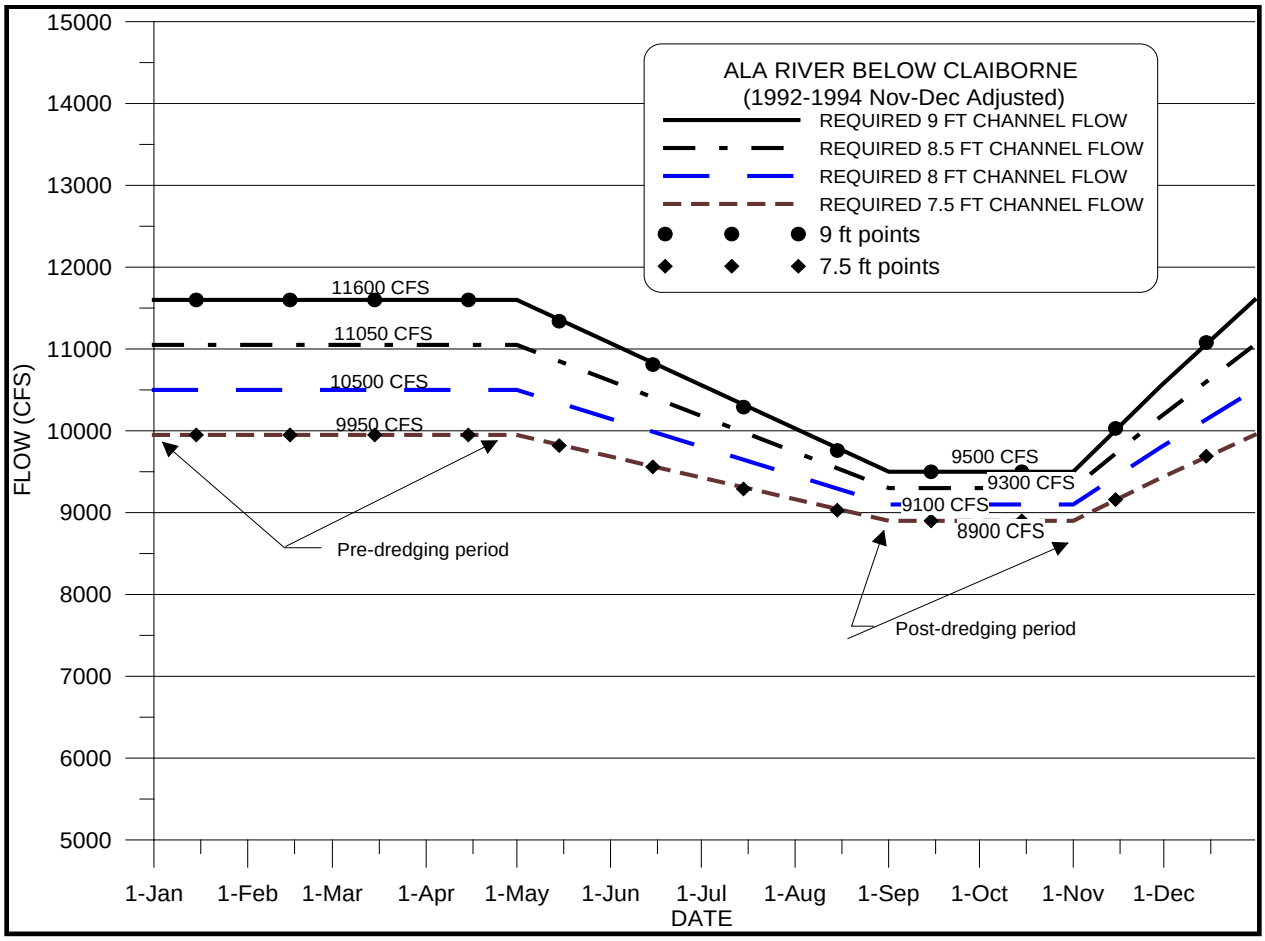


Figure 7-1. Flow-Depth Pattern (Navigation Template) Using 2004 – 2010 Survey Data

Flow releases from upstream APC projects have a direct influence on flows needed to support navigation depths on the lower Alabama River. Flows for navigation are most needed in the unregulated part of the lower Alabama River below Claiborne Lock and Dam. When flows are available, R. F. Henry, Millers Ferry, and Claiborne are regulated to maintain stable pool levels, coupled with the necessary channel maintenance dredging, to support sustained use of the authorized navigation channel and to provide the full navigation depth of 9 feet. When river conditions or funding available for dredging of the river indicates that project conditions (9-foot channel) will probably not be attainable in the low water season, the three Alabama River projects are operated to provide flows for a reduced project channel depth as determined by surveys of the river. APC operates it reservoirs on the Coosa and Tallapoosa Rivers (specifically flows from their Jordan, Bouldin, and Thurlow (JBT) projects) to provide a minimum navigation flow target in the Alabama River at Montgomery, Alabama. The monthly minimum navigation flow targets are shown in Table 7-1. However, flows may be reduced if conditions warrant. Additional intervening flow or drawdown discharge from the R. F. Henry and Millers Ferry Projects must be used to provide a usable depth for navigation and/or meet the 7Q10 flow of 6,600 cfs below Claiborne Dam. However, the limited storage afforded in both the R. E. "Bob" Woodruff and William "Bill" Dannelly Lakes can only help meet the 6,600 cfs level at Claiborne Lake for a short period. As local inflows diminish or the storage is exhausted, a lesser amount would be released depending on the amount of local inflows. Table 7-2 and Figure 7-2 show the required basin inflow for a 9.0-foot channel; Table 7-3 and Figure 7-3 show the required basin inflow for a 7.5-foot channel.

During low-flow periods, it is not always possible to provide the authorized 9-foot deep by 200-foot-wide channel dimensions. In recent years, funding for dredging has been reduced resulting in higher flows being required to provide the design navigation depth. In addition, recent droughts in 2000 and 2007 had a severe impact on the availability of navigation depths in the Alabama River.

Historically, navigation has been supported by releases from storage in the ACT Basin. Therefore, another critical component in the water control plan for navigation involves using an amount of storage from APC storage projects similar to that which has historically been used, but in a more efficient manner.

The ACT Basin navigation regulation plan is based on storage and flow/stage/channel depth analyses using basin inflows and average storage usage by APC (e.g., navigation operations would not be predicated on use of additional storage) during normal hydrologic conditions. Under that concept, the Corps and APC make releases that support navigation when basin inflows meet or exceed seasonal targets for either the 9.0-foot or 7.5-foot channel templates. Triggers are also identified (e.g., when basin inflow are less than required natural flows) to change operational goals between the 9.0-foot and 7.5-foot channels. Similarly, basin inflow triggers are identified when releases for navigation are suspended and only 4,640 cfs releases would occur. During drought operations, releases to support navigation are suspended until system recovery occurs as defined in the ACT Basin Drought Contingency Plan (Exhibit D).

Table 7-1. Monthly Navigation Flow Target in CFS

Month	9.0-ft target below Claiborne Lake (from Navigation Template) (cfs)	9.0-ft Jordan, Bouldin, Thurlow goal (cfs)	7.5-ft target below Claiborne Lake (from Navigation Template) (cfs)	7.5-ft Jordan, Bouldin, Thurlow goal (cfs)
Jan	11,600	9,280	9,950	7,960
Feb	11,600	9,280	9,950	7,960
Mar	11,600	9,280	9,950	7,960
Apr	11,600	9,280	9,950	7,960
May	11,340	9,072	9.820	7,856
Jun	10,810	8,648	9,560	7,648
Jul	10,290	8,232	9,290	7,432
Aug	9,760	7,808	9,030	7,224
Sep	9,500	7,600	8,900	7,120
Oct	9,500	7,600	8,900	7,120
Nov	10,030	8,024	9,160	7,328
Dec	11,080	8,864	9,690	7,752

Table 7-2. Basin Inflow Above APC Projects Required to Meet a 9.0-Foot Navigation Channel

Month	APC navigation Target (cfs)	Monthly historic storage usage (cfs)	Required basin inflow (cfs)
Jan	9,280	–994	10,274
Feb	9,280	–1,894	11,174
Mar	9,280	–3,028	12,308
Apr	9,280	–3,786	13,066
May	9,072	–499	9,571
Jun	8,648	412	8,236
Jul	8,232	749	7,483
Aug	7,808	1,441	6,367
Sep	7,600	1,025	6,575
Oct	7,600	2,118	5,482
Nov	8,024	2,263	5,761
Dec	8,864	1,789	7,075

Table 7-3. Basin Inflow Above APC Projects Required to Meet a 7.5-Foot Navigation Channel

Month	APC navigation Target (cfs)	Monthly historic storage usage (cfs)	Required basin inflow (cfs)
Jan	7,960	–994	8,954
Feb	7,960	–1,894	9,854
Mar	7,960	–3,028	10,988
Apr	7,960	–3,786	11,746
May	7,856	–499	8,355
Jun	7,648	412	7,236
Jul	7,432	749	6,683
Aug	7,224	1,441	5,783
Sep	7,120	1,025	6,095
Oct	7,120	2,118	5,002
Nov	7,328	2,263	5,065
Dec	7,752	1,789	5,963

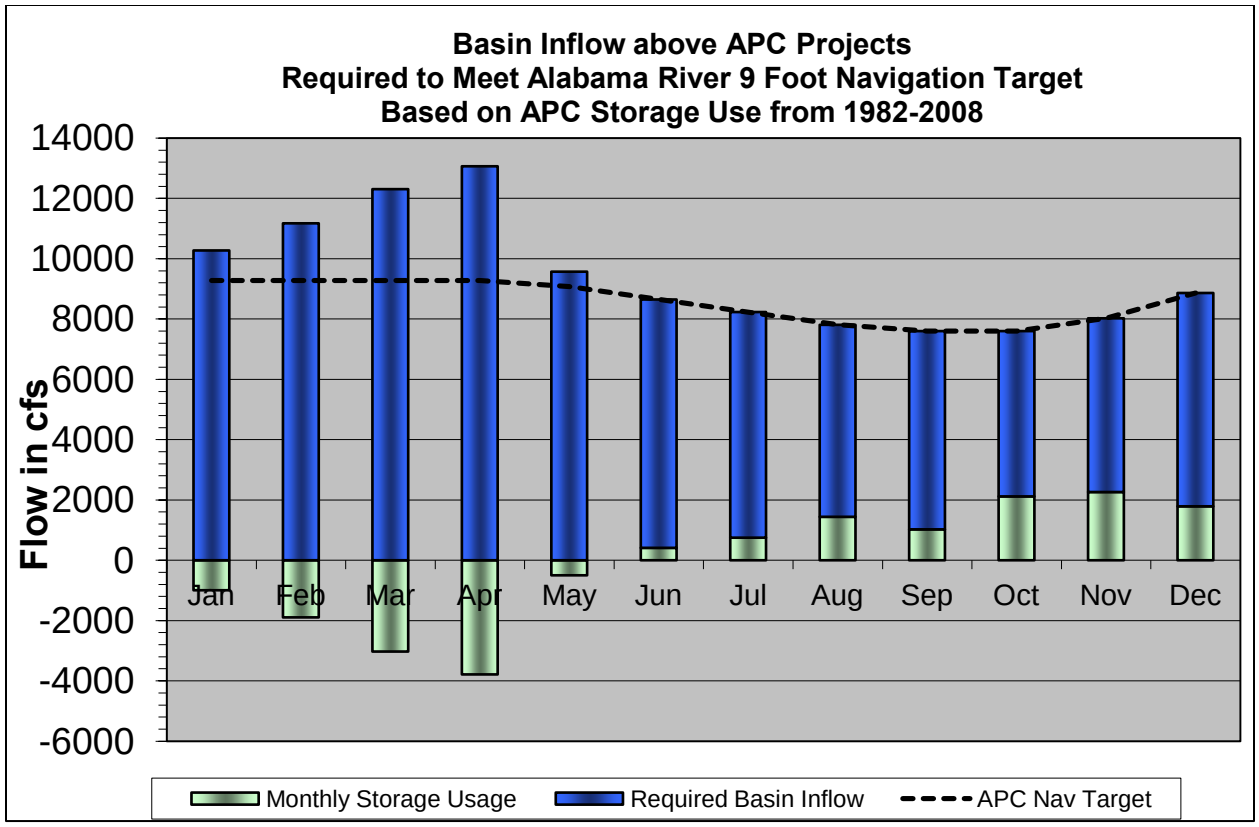


Figure 7-2. Flow Requirements from Rainfall (or Natural Sources) and Reservoir Storage to Achieve the JBT Goal for Navigation Flows for a 9-Foot Channel

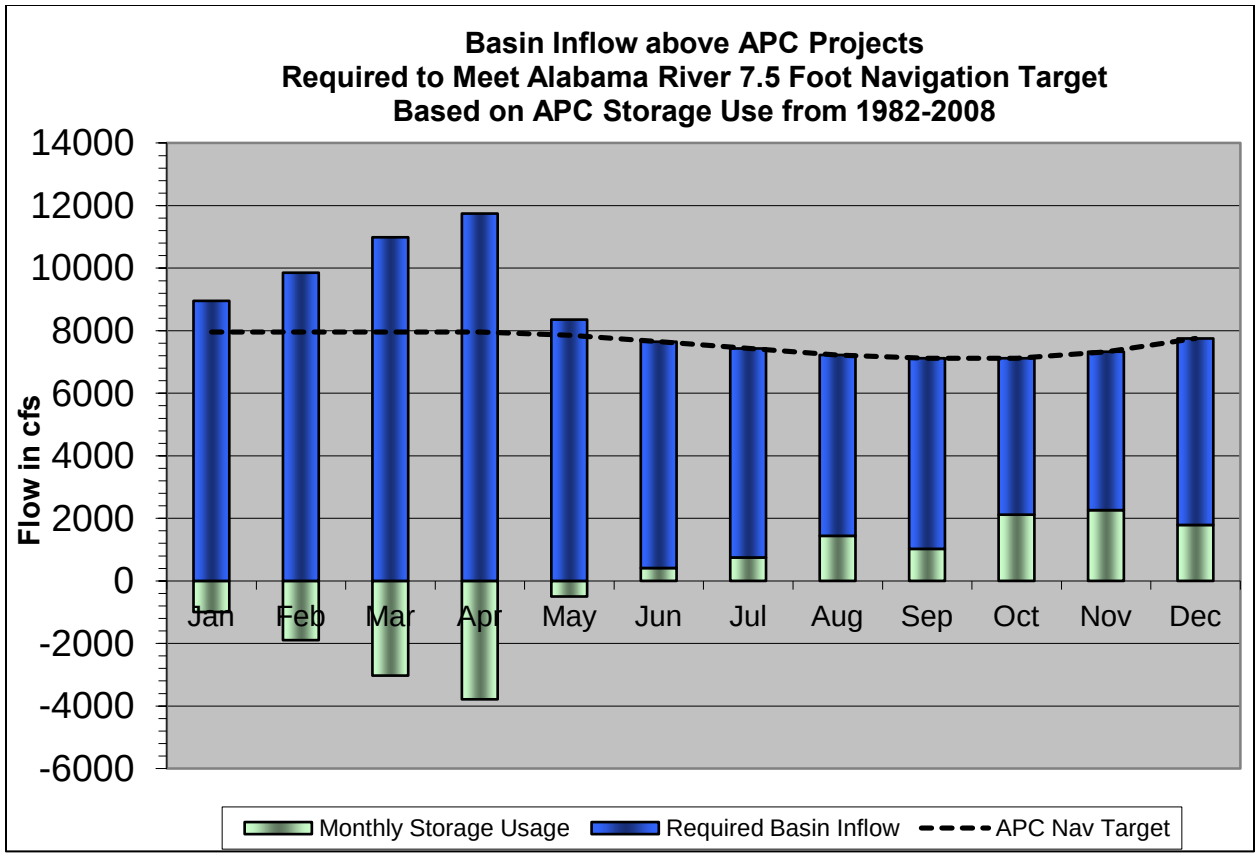


Figure 7-3. Flow Requirements from Rainfall (or Natural Sources) and Reservoir Storage to Achieve the JBT Goal for Navigation Flows for A 7.5-Foot Channel

During normal flow periods, no special water control procedures are required for navigation other than maintaining the proper pool level. Claiborne's pool elevation will be maintained above elevation 32.0 feet NGVD29 to allow for 13-foot depth over the upper miter sill and allow sufficient depth for a 9-foot navigation channel into the Millers Ferry Lock approach upstream.

During high flow periods, Navigation will be discontinued through the Claiborne Lock when the tailwater reaches elevation 47.0 feet NGVD29, which leaves just 4.0 feet of freeboard on the lower guide wall. The discharge at this elevation will be approximately 130,000 cfs which is expected to occur on an average of once every 1.8 years.

In the event that the Mobile District Water Management Section (EN-HW) determines upcoming reductions in water releases may impact the available navigation channel depth, they shall contact the Black Warrior/Tombigbee - Alabama/Coosa Project Office (OP-BA), and the Mobile District Navigation Section (OP-TN), to coordinate the impact. EN-HW shall provide the Claiborne tailwater gage forecast to OP-BA and OP-TN. Using this forecast and the latest available project channel surveys, OP-BA and OP-TN will evaluate the potential impact to available navigation depths. Should this evaluation determine that the available channel depth is adversely impacted, OP-BA and OP-TN will work together, providing EN-HW with their determination of the controlling depth. Thereafter, OP-BA and OP-TN will coordinate the issuance of a navigation bulletin. The notices will be issued as expeditiously as possible to give

barge owners, and other waterway users, sufficient time to make arrangements to light load or remove their vessels before action is taken at upstream projects to reduce flows. The bulletin will be posted to the Mobile District Navigation website at

http://navigation.sam.usace.army.mil/docs/index.asp?type=nn

Although special releases will not be standard practice, they could occur for a short duration to assist maintenance dredging and commercial navigation for special shipments if basin hydrologic conditions are adequate. The Corps will evaluate such requests on a case by case basis, subject to applicable laws and regulations and the basin conditions.

7-13. Drought Contingency Plan.

Flow in the Alabama River is largely controlled by APC impoundments on the Coosa and Tallapoosa Rivers above Robert F. Henry Lock and Dam. Under normal flows the APC impoundments will provide sufficient releases from the Coosa and Tallapoosa Rivers to meet a continuous minimum seven-day average flow of 4,640-cfs (32,480 dsf/7 days). However, additional intervening flow or drawdown discharge from R. F. Henry and Millers Ferry Projects must be used to provide a usable depth for navigation or meet the 7Q10 flow of 6,600-cfs at Claiborne Lock and Dam.

In accordance with ER 1110-2-1941, Drought Contingency Plans, dated 15 September 1981, an ACT Basin Drought Contingency Plan (DCP) has been developed to implement water control regulation drought management actions. Drought operations will be in compliance with the plan for the entire ACT Basin as outlined in Exhibit D. Pertinent requirements of the DCP relative to the Claiborne Project are summarized below.

Based upon experience gained during previous droughts, and in particular the 2006 - 2008 drought, a basin-wide DCP was developed and is comprised of three components - headwater operations at Allatoona Lake and Carters Lake in Georgia; operations at APC projects on the Coosa and Tallapoosa Rivers; and downstream operations at Corps projects below Montgomery, Alabama. Drought operations for the APC projects were initially developed as a separate plan by the APC (*A*PCDOP) in cooperation with the State of Alabama and the Corps as a result of the 2006 – 2008 drought. The specifics of the APCDOP, as incorporated into the overall ACT Basin DCP, are shown on Table 7-5.

Operational guidelines have been developed on the basis of a Drought Intensity Level (DIL). The DIL is a drought indicator, ranging from DIL 1 to DIL 3, determined by the combined number of drought triggers that occur. The three drought triggers are: (1) basin inflow; (2) composite conservation storage in APC reservoirs; and (3) state line flow. Additional information on the drought triggers can be found in Exhibit D. Drought management actions would become increasingly more austere when two triggers occur (Drought Level 2) or all three occur (Drought Level 3). Table 7-4 lists the three drought operation intensity levels applicable to APC projects.

Table 7-4. ACT Basin Drought Intensity Levels

Drought Intensity Level (DIL)	Drought Level	No. of Triggers Occurring
DIL 1	Moderate Drought	1
DIL 2	Severe Drought	2
DIL 3	Exceptional Drought	3

Drought management measures for ACT Basin-wide drought regulation consists of three major components:

- Headwater regulation at Allatoona Lake and Carters Lake in Georgia
- Regulation at APC projects on the Coosa and Tallapoosa Rivers
- Regulation at Corps projects downstream of Montgomery, Alabama on the Alabama River

The headwater regulation component includes water control actions in accordance with established action zones, minimum releases, and hydropower generation releases as described in the *ACT River Basin Master Water Control Manual*, Appendices A and H. Regulation of APC projects will be in accordance with Table 7-5 in which the drought response will be triggered by one or more of three indicators - state line flows, basin inflow, or composite conservation storage. Corps operation of its Alabama River projects downstream of Montgomery, Alabama, will respond to drought operations of the APC projects upstream.

No storage is provided in the Claiborne Lock and Dam pool for regulating releases during periods of low inflow. The regulation plan will tend to smooth out peaking releases from the Millers Ferry Project and give a lower Claiborne Dam outflow of somewhat longer duration than would occur with constant-pool operation. During extended periods of powerhouse shutdown or low-capacity generation, the Claiborne Dam spillway will be operated to pass the inflow, with pool held constant at elevation of 36 to 32 feet NGVD29. Any regulating releases from upstream projects will thus be expedited through the Claiborne Dam pool.

Table 7-5. ACT Basin Drought Management Matrix

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Drought Level Response[a]	Normal Operations											
	DIL 1: Low Basin Inflows or Low Composite or Low State Line Flow											
	DIL 2: DIL 1 criteria + (Low Basin Inflows or Low Composite or Low State Line Flow)											
	DIL 3: Low Basin Inflows + Low Composite + Low State Line Flow											
Coosa River Flow[b]	Normal Operation: 2,000 cfs			4,000 (8,000)		4,000 – 2,000	Normal Operation: 2,000 cfs					
	Jordan 2,000 +/-cfs			4,000 +/- cfs		6/15 Linear Ramp down	Jordan 2,000 +/-cfs			Jordan 2,000 +/-cfs		
	Jordan 1,600 to 2,000 +/-cfs			2,500 +/- cfs		6/15 Linear Ramp down	Jordan 2,000 +/-cfs			Jordan 1,600 to 2,000 +/-cfs		
	Jordan 1,600 +/-cfs			Jordan 1,600 to 2,000 +/-cfs			Jordan 2,000 +/-cfs			Jordan 1,600 to 2,000 +/-cfs		Jordan 1,600 +/-cfs
Tallapoosa River Flow[c]	Normal Operations: 1200 cfs											
	Greater of: 1/2 Yates Inflow or 2 x Heflin Gage(Thurlow releases > 350 cfs)				1/2 Yates Inflow					1/2 Yates Inflow		
	Thurlow 350 cfs				1/2 Yates Inflow					Thurlow 350 cfs		
	Maintain 400 cfs at Montgomery WTP (Thurlow release 350 cfs)						Thurlow 350 cfs			Maintain 400 cfs at Montgomery WTP (Thurlow release 350 cfs)		
Alabama River Flow[d]	Normal Operation: Navigation or 4,640 cfs flow											
	4,200 cfs (10% Cut) - Montgomery				4,640 cfs - Montgomery					Reduce: Full – 4,200 cfs		
	3,700 cfs (20% Cut) - Montgomery					4,200 cfs (10% Cut) - Montgomery				Reduce: 4,200 cfs-> 3,700 cfs Montgomery (1 week ramp)		
	2,000 cfs Montgomery				3,700 cfs Montgomery		4,200 cfs (10% Cut) - Montgomery			Reduce: 4,200 cfs -> 2,000 cfs Montgomery (1 month ramp)		
Guide Curve Elevation	Normal Operations: Elevations follow Guide Curves as prescribed in License (Measured in Feet)											
	Corps Variances: As Needed; FERC Variance for Lake Martin											
	Corps Variances: As Needed; FERC Variance for Lake Martin											
	Corps Variances: As Needed; FERC Variance for Lake Martin											

a. Note these are base flows that will be exceeded when possible.
b. Jordan flows are based on a continuous +/- 5% of target flow.
c. Thurlow flows are based on continuous +/- 5% of target flow: flows are reset on noon each Tuesday based on the prior day's daily average at Heflin or Yates.
d. Alabama River flows are 7-Day Average Flow.

7-14. Flood Emergency Action Plans. The Corps is responsible for developing Flood Emergency Action Plans for the ACT System. The plans are included in the Operations and Maintenance Manuals for each system project. Example data available are emergency contact information and flood inundation information.

7-15. Other.

a. Operation for Passing Drift. Occasional operation of the spillway gates will be required for passing accumulations of drift. Instructions and limitations for that type of operation are described in the *Operation and Maintenance Manual* for the Claiborne Project. Because the permissible gate openings increase with tailwater elevations, such an operation will usually be performed during the reregulation of peaking power releases. Such manipulation of gates within the prescribed limits should not materially affect the drawdown or recovery operation.

b. Correlation with Other Projects. The correlation of operations at the Claiborne Dam and Millers Ferry and Robert F. Henry Projects has been described in Paragraph 7-03, "Overall Plan for Water Control", further details of the operation are also given in Paragraph 7-03.

7-16. Deviation from Normal Regulation. The District Commander is occasionally requested to deviate from normal regulation. Prior approval for a deviation is required from the Division Engineer except as noted in subparagraph a below.

Deviation requests usually fall into the following categories:

a. Emergencies. Examples of some emergencies that can be expected to occur at a project are drowning and other accidents, failure of the operation facilities, chemical spills, treatment plant failures, and other temporary pollution problems. Water control actions necessary to abate the problem are taken immediately unless such action would create equal or worse conditions. The Mobile District will notify the SAD office as soon as practicable.

b. Unplanned Deviations. Unplanned instances can create a temporary need for deviations from the normal regulation plan. Unplanned deviations may be classified as either major or minor but do not fall into the category of emergency deviations. Construction accounts for many of the minor deviations and typical examples include utility stream crossings, bridge work, and major construction contracts. Minor deviations can also be necessary to carry out maintenance and inspection of facilities. The possibility of the need for a major deviation mostly occurs during extreme flood events. Requests for changes in release rates generally involve periods ranging from a few hours to a few days, with each request being analyzed on its own merits. In evaluating the proposed deviation, consideration must be given to impacts on project and system purposes, upstream watershed conditions, potential flood threat, project condition, and alternative measures that can be taken. Approval for unplanned deviations, either major or minor, will be obtained from the Division Office by telephone or electronic mail prior to implementation.

c. Planned Deviations. Each condition should be analyzed on its merits. Sufficient data on flood potential, lake and watershed conditions, possible alternative measures, benefits to be expected, and probable effects on other authorized and useful purposes, together with the district recommendation, will be presented by letter or electronic mail to the division for review and approval.

7-17. Rate of Release Change. There are no restrictions on releases from Claiborne Dam during normal operations. During high flows, it is desirable to uniformly lower discharge downstream as allowable by conditions and equipment to lessen the impacts of the erosive nature of high flows.

VIII - EFFECT OF WATER CONTROL PLAN

8-01. General. Claiborne Lock and Dam is a run-of-the-river project with very little storage capacity between the limiting pool elevations of 36.0 to 32.0 feet NGVD29. The Claiborne Dam is primarily a navigation structure. The project's minimum reservoir level, elevation 32 feet NGVD29, provides navigation depths up to the Millers Ferry Lock and Dam. Claiborne also reregulates the peaking power releases from the upstream Millers Ferry Project providing navigable depths in the channel below Claiborne. Other purposes provided by the project include water quality, public recreation and fish and wildlife conservation and mitigation. While access and some facilities are available at the project for public recreation and fish and wildlife conservation and mitigation, water is typically not specifically managed for these purposes.

The impacts of the *ACT Master Water Control Manual* and its Appendices, including this water control manual, have been fully evaluated in an Environmental Impact Statement (EIS) that was published in November 2014. A Record of Decision (ROD) for the action was signed in May 2015. During the preparation of the EIS, a review of all direct, secondary and cumulative impacts was made. As detailed in the EIS, the decision to prepare the Water Control Manual and the potential impacts was coordinated with Federal and State agencies, environmental organizations, Indian tribes, and other stakeholder groups and individuals having an interest in the basin. The ROD and EIS are public documents and references to their accessible locations are available upon request.

8-02. Flood Risk Management. Claiborne Lock and Dam Project does not contain reservoir flood risk management storage; therefore, the project has no flood damage reduction capabilities.

a. Spillway Design Flood. The duration of the spillway design flood is approximately 24 days with a peak inflow of 814,800 cfs. Peak outflow is 788,500 cfs. The peak elevation is 78.2 feet NGVD29. The effects of the spillway design flood are shown on Plate 8-1.

b. The Standard Project Flood. The standard project flood would cause a peak pool elevation of 69.1 feet NGVD29 and a maximum discharge of 486,000 cfs. Peak inflow is 494,500 cfs. The effects of the standard project flood are shown on Plate 8-2.

c. Historic Floods. The impacts of the project on hydrographs for the flood of record, February 1961, and the flood of March 1990 are shown on Plates 8-3 and 8-4. The standard project flood series is shown on Plate 8-2 and the spillway design flood series on Plate 8-1.

8-03. Recreation. The Claiborne Lock and Dam Project is an important part of the Alabama River Lakes (ARL) recreational resource, providing both economic and social benefits for the region and the Nation. The ARL is composed of the Claiborne, Millers Ferry, and Robert F. Henry Projects. The ARL contains 35,632 acres of water plus an additional 12,788 acres of land, most of which are available for public use. Pool elevations of 125 feet NGVD29 at R.F. Henry, 80 feet NGVD29 at Millers Ferry, and 35 feet NGVD29 at Claiborne were used to determine total acres of water. A wide variety of recreational opportunities are provided at the lake including boating, fishing, camping, picnicking, water skiing, and sightseeing. Mobile District park rangers and other project personnel conduct numerous environmental and historical education tours and presentations, as well as water safety instructional sessions each year for the benefit of area students and project visitors. The ARL receives more than 3,400,000 recreational visitors per year. The local and regional economic benefits of recreation are significant. Annual recreational visitor spending within 30 miles of the project totals $88 million.

8-04. Water Quality. All the ACT Basin projects, including Claiborne Lock and Dam, operate to meet the objective of maintaining water quality. At Claiborne Lock and Dam, which operates as a run-of-the-river project, inflows to the project are continuously released downstream. The continuous releases provide a benefit for maintaining downstream water quality.

8-05. Fish and Wildlife. The relatively stable pool at Claiborne is beneficial to certain species of fish and wildlife. However, the project also creates a physical barrier to fish and other aquatic organisms' passage. The reservoir is relatively deep and slow moving compared to pre-impounded conditions. This results in a change in physical conditions, such as velocities, temperature, and substrate, as well as feeding and spawning habitat that cannot be tolerated by many species. The dam and reservoir along with other Corps and APC dams and reservoirs in the basin have resulted in declines in many fish and mussel populations. The described lockages in this Appendix and the Millers Ferry Appendix for fish passage are being implemented in order to provide improved opportunities for migration for many species.

8-06. Water Supply. There is one major withdrawal that occurs from Claiborne Lake, International Paper at Pine Hill. The Claiborne Lock and Dam Project also reregulates the power waves from Millers Ferry Powerhouse to some extent and provides a more uniform flow for existing M&I water supply users downstream of the project.

8-07. Hydroelectric Power. Claiborne Lock and Dam Project has no hydropower units; however, water control operations at the project tend to enhance power production at the upstream Millers Ferry Dam. An early or pre-generation drawdown at Claiborne tends to lower the tailwater elevation at Millers Ferry Dam, providing an increase in head and enhanced hydropower generating efficiency.

8-08. Navigation.

The Alabama River from Montgomery, Alabama downstream to the Mobile, Alabama area provides a navigation route for commercial barge traffic, serving as a regional economic resource. A minimum flow is required to ensure usable water depths to support navigation. Congress has authorized continuous navigation on the river, when sufficient water is available. There are three locks and dams on the Alabama River, and a combination of dredging, river training works, and flow augmentation from upstream storage projects, which together support navigation depths on the river.

The Alabama River is a terminus on the inland waterway system. It is accessed by the Black Warrior Tombigbee Waterway and Mobile Harbor and the Gulf Intracoastal Waterway (GIWW). Its major value as a water transportation resource is its ability to carry traffic to and from inland waterway points in Mississippi, Louisiana, and Texas. Traffic on the Alabama River is linked to resources originating along the river, which makes barge transportation essential and convenient for moving these resources.

Because of river bends and shoaling at the bends, typical tow size is a four-barge tow, except during very low water conditions when tow sizes can be reduced to two barges.

Flows for navigation are most needed in the unregulated part of the lower Alabama River below Claiborne Lock and Dam. When flows are available, Claiborne Lock and Dam is operated to provide the full navigation depth of nine feet. When river conditions or funding available for dredging of the river indicates that project conditions (9-foot channel) will probably not be attainable in the low water season, the dam is operated to provide flows for a reduced project channel depth as determined by surveys of the river. In recent years funding for

dredging has been cut resulting in higher flows or minimized channel (150 feet wide) being required to provide the design navigation depth. In addition to annual seasonal low flow impacts, droughts have a severe impact on the availability of navigation depths in the Alabama River.

A 9-foot deep by 200-foot wide navigation channel is authorized on the Alabama River to Montgomery, Alabama. A minimum depth of 7.5 feet can provide a limited amount of navigation. Under low-flow conditions, even the 7.5-foot depth has not been available at all times. Over the period from 1976 to 1993, based upon river stage, the 7.5-foot navigation channel was available 79 percent of the time and the 9-foot navigation channel was available 72 percent of the time. Since 1993, the percentage of time that these depths have been available has declined further. Full navigation channel availability on the Alabama River is dependent upon seasonal flow conditions and channel maintenance. The ACT Basin water control plan will provide a 9-foot channel, based upon river stage, approximately 90 percent of the time in January and over 50 percent of the time in September. A 7.5-foot channel, based upon river stage, is expected approximately 90 percent of the time in January and 56 percent of the time in September. Because of higher flows in the winter and spring, channel availability is much higher from December through May.

Figure 8-1 depicts the historic annual channel depth availabilities for the Alabama River below Claiborne Lock and Dam, based upon river stage, computed for 1970-2010.

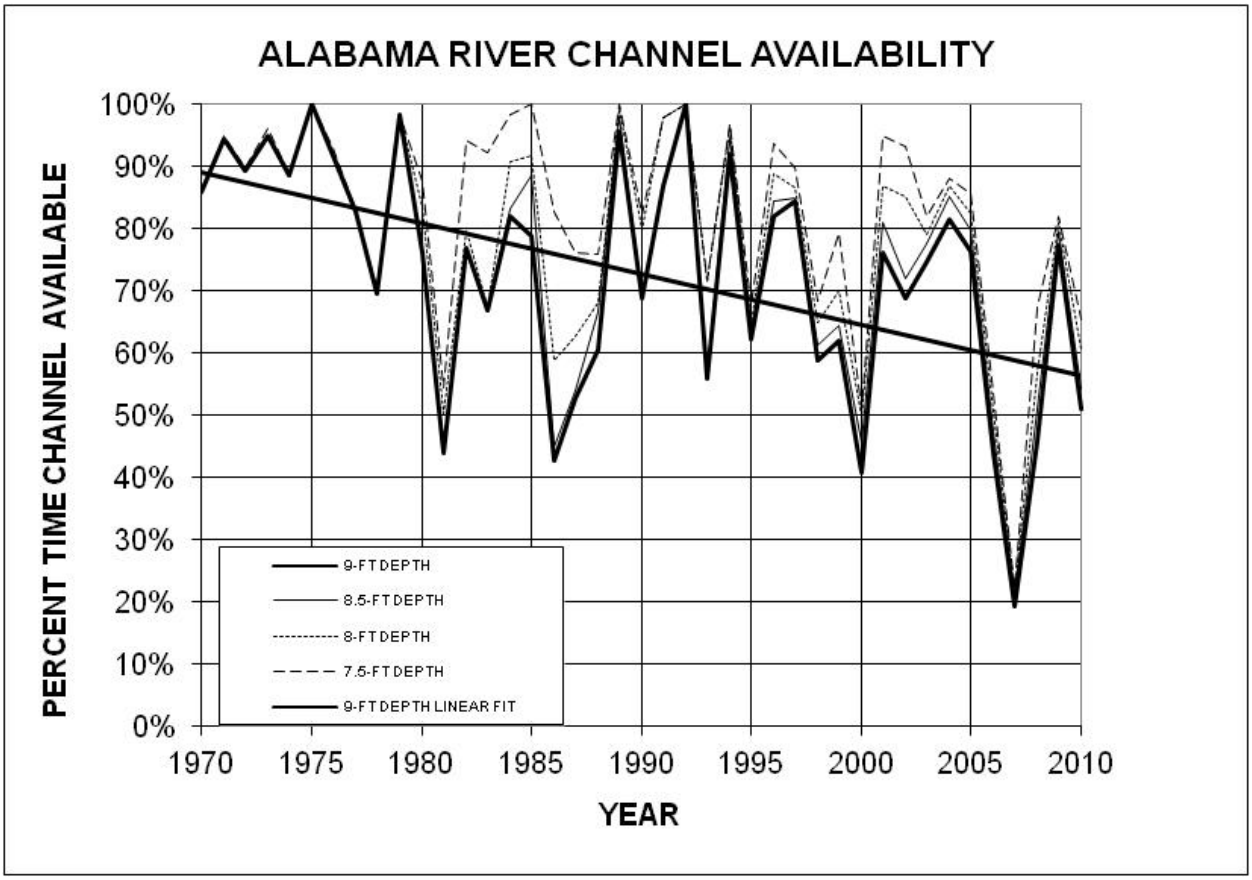


Figure 8-1. Alabama River Channel Availability below Claiborne, 1970 to 2010

Extreme high-flow conditions also limit availability of the project for commercial navigation, principally related to the ability to use the navigation locks at the three locks and dams on the Alabama River. Those conditions are temporary and far more short term (usually lasting no more than a few days) than low-water limitations resulting from extended periods of drought and low basin inflows. At Robert F. Henry Lock and Dam, use of the navigation lock is discontinued when the headwater above the dam reaches elevation 131.0 feet NGVD29. That elevation equates to a flow of about 156,000 cfs, which occurs on average about once every three years. At Millers Ferry Lock and Dam, use of the navigation lock is discontinued when the tailwater below the dam reaches elevation 81.0 feet NGVD29. That tailwater elevation equates to a flow of about 220,000 cfs, which occurs on average about once every 18 years. At Claiborne Lake, use of the navigation lock is temporarily discontinued when the tailwater below the dam reaches elevation 47.0 feet NGVD29. That tailwater elevation equates to a flow of about 130,000 cfs, which occurs on average about once every 1.8 years. Table 8-1 contains calendar years 2011-2003 lock usage from the Corps' Lock Performance Monitoring System regarding navigation activity through Claiborne Lock and Dam. The Lock Performance Monitoring System data contain the number of lockages of commercial and noncommercial vessels and tonnages of various commodities passing through the lock.

Table 8-1. Navigation Activity at Claiborne Lock and Dam

Lockages/vessels (number)	CY2011	CY2010	CY2009	CY2008	CY2007	CY2006	CY2005	CY2004	CY2003
Barges Empty	1	11	100	37	17	15	44	34	49
Barges Loaded	1	10	93	40	35	17	49	31	46
Commercial Lockages	2		61	34	44	23	72	47	66
Commercial Vessels	4	1	62	42	54	28	76	55	75
Non-Commercial Lockages	9	17	14	34	25	4	17	45	8
Non-Commercial Vessels	9	17	14	34	25	4	17	45	8
Recreational Lockages	174	138	158	150	190	213	210	307	180
Recreational Vessels	200	181	189	187	255	310	265	483	251
Total Lockages	185	155	233	218	259	240	299	399	254
Total Vessels	213	199	265	263	334	342	358	583	334
Commodities (tons)						22		500	
Crude Material Except Fuels (tons)			117,278	65,564	27,650	45,900	141,047	68,181	117,250
Equipment and Machinery (tons)	22	3,050		100	3,544	315	680	4,143	300
Total, All Commodities (tons)	22	3,050	117,278	62,664	31,194	46,215	141,749	118,050	68,645

8-09. Droughts and Seasonal Low Flow Regulation. The development of drought plans has become increasingly important as more demands are placed on the water resources of the basin. During low flow conditions, the system may not be able to fully support all project purposes. The purpose of drought planning is to minimize the effect of drought, to develop methods for identifying drought conditions, and to develop both long- and short-term measures to be used to respond to and mitigate the effects of drought conditions. Response to drought conditions involves all the government reservoirs in the basin. Certain flow rates into the Alabama River are prescribed in the water control plan on the basis of available storage in the reservoirs, and other factors. The plan is described in Chapter VII of this appendix.

8-10. Flood Emergency Action Plans. Because the Claiborne Lock and Dam Project is not a flood risk management project, no major actions occur that are related to flood risk management. However, flowage easements have been obtained encompassing all lands subjected to an increased frequency of flooding from operation of the project. Normally, all operations are directed by the Mobile District Office. If a storm of flood-producing magnitude event occurs and all communications are disrupted between the Mobile District Office and project personnel at the Claiborne Lock and Dam, emergency operating procedures, as previously described in Chapter VII of this appendix, will begin. If communication is broken after some instructions have been received from the Mobile District Office, those instructions will be followed for as long as they are applicable.

8-11. Frequencies. Table 8-2 below presents the monthly and annual discharge duration analysis for Claiborne Lock and Dam. The annual peak flow frequency curve is shown on Plate 8-5 and annual stage frequency on Plate 8-6. The headwater/tailwater stage frequency is shown on Plate 8-7.

Table 8-2. Monthly and Annual Discharge Duration Data

Monthly and Annual Discharge Duration Analysis (Apr 1930 - Jan 2010)

Combined Records

USGS Gage 02429500 Alabama River at Claiborne, ALA (Hwy 84) Apr 1930 - Sep 1975

USGS Gage 02428400 Alabama River at Claiborne L&D nr Monroeville, ALA Oct 1975 - Jan 2010

DISCHARGE IN CFS

Percent Time Equaled or Exceeded	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
0.1	169,000	203,768	261,120	225,872	167,000	128,400	140,080	193,120	107,400	120,042	157,600	215,520	211,000
1	149,000	169,000	198,200	193,960	128,000	90,000	94,220	78,960	69,800	73,840	105,000	158,400	152,000
2	138,420	144,360	171,200	166,000	118,000	73,000	76,240	53,560	47,800	59,536	89,200	131,400	132,000
5	120,000	124,400	141,000	148,000	98,100	51,600	47,200	32,300	30,300	35,305	58,300	96,400	104,000
10	98,050	106,000	121,000	121,400	67,100	33,900	32,300	23,700	21,600	24,200	40,500	76,900	80,100
15	86,615	91,900	108,000	100,000	50,000	27,500	27,400	20,000	17,800	18,800	30,800	60,200	61,100
25	67,100	75,500	89,500	78,200	35,000	20,500	19,800	16,400	14,500	14,700	20,800	38,900	38,800
50	35,000	47,200	53,300	38,800	21,600	14,900	13,600	12,300	10,900	10,400	12,500	21,300	18,300
80	19,200	24,600	28,600	19,000	12,800	10,300	8,880	8,490	7,440	7,526	8,810	12,700	10,300
90	14,300	18,000	20,400	12,900	9,920	7,890	6,980	6,920	6,500	6,469	7,170	10,400	8,020
95	10,800	14,300	15,100	10,200	8,160	6,920	5,830	6,050	5,740	5,660	6,510	8,420	6,770
99	7,480	9,322	8,742	7,245	6,390	5,290	4,440	4,700	4,590	4,668	4,300	3,438	5,070

IX - WATER CONTROL MANAGEMENT

9-01. Responsibilities and Organization. The Claiborne Lock and Dam is a federal structure operated by the Corps. It is part of the Alabama River Navigation System. Many agencies in federal and state governments are responsible for developing and monitoring water resources in the ACT Basin. Some of the federal agencies are the Corps, U.S. Environmental Protection Agency, National Parks Service, U.S. Coast Guard, USGS, U.S. Department of Energy, U.S. Department of Agriculture, U.S. Fish and Wildlife, NOAA. In addition to the Federal agencies, the State of Alabama is involved through the Alabama Department of Environmental Management, Alabama Office of Water Resources.

a. U.S. Army Corps of Engineers. Authority for water control regulation of the Claiborne Lock and Dam project has been delegated to the South Atlantic Division (SAD) Commander. The responsibility for water control regulation activities has been entrusted to the Mobile District, Engineering Division, Water Management Section. Water control actions for Claiborne are regulated to meet the federally authorized project purposes in coordination with federally authorized ACT Basin-wide system purposes. It is the responsibility of the Water Management Section to develop water control regulation procedures for the Claiborne Lock and Dam Project, including all foreseeable conditions. The Water Management Section monitors the project for compliance with the approved water control plan. Claiborne Lock and Dam is owned and operated by the Corps. The Corps, Mobile District operates the Claiborne Lock and Dam Project. Reservoir operation and maintenance are under the supervision of Operations Division. The project falls under the direction of the Operations Project Manager located at Tuscaloosa, Alabama. The lock is operated 24 hours a day, 7 days a week. The Water Management Section in the Engineering Division monitors the project for compliance with the approved water control plan and makes operational decisions based upon that plan. When necessary, the Water Management Section instructs the powerhouse operators and lockmaster regarding normal procedures and emergencies for unusual circumstances. Lock personnel are responsible for daily adjusting the flow at the project to buffer out power generation surges from the Millers Ferry Project 60 miles upstream, and to maintain pool elevations for navigation, and to provide flow downstream for navigation and other purposes. Instructions for this are included in Exhibit C, Standing Instructions to Project Operator. These instructions contain directions for reporting to higher authority.

b. Other Federal Agencies. Other federal agencies work closely with the Corps to provide their agency support for the various project purposes of the Claiborne project and to meet the federal requirements for which they might be responsible. The responsibilities and interagency coordination between the Corps and the federal agencies are discussed in Paragraph 9-02.

c. State Agencies. The Alabama Office of Water Resources (OWR) administers programs for river basin management, river assessment, water supply assistance, water conservation, flood mapping, the National Flood Insurance Program and water resources development. Further, OWR serves as the state liaison with federal agencies on major water resources related projects, conducts any special studies on instream flow needs, and administers environmental education and outreach programs to increase awareness of Alabama's water resources.

The Alabama Department of Environmental Management Drinking Water Branch works closely with the more than 700 water systems in Alabama that provide safe drinking water to four million citizens.

The Alabama Chapter of the Soil and Water Conservation Society fosters the science and the art of soil, water, and related natural resource management to achieve sustainability.

d. Stakeholders. Many non-federal stakeholder interest groups are active in the ACT Basin. The groups include lake associations, M&I water users, navigation interests, environmental organizations, and other basin-wide interests groups. Coordinating water management activities with the interest groups, state and federal agencies, and others is accomplished as required on an ad-hoc basis and on regularly scheduled water management teleconferences when needed to share information regarding water control regulation actions and gather stakeholder feedback. The *ACT Master Water Control Manual* includes a list of state and federal agencies and active stakeholders in the ACT Basin that have participated in the ACT Basin water management teleconferences and meetings.

e. Alabama Power Company. The APC owns and operates hydropower projects within the State, and controls most of the storage in the ACT Basin, as shown below in Table 9-1. Claiborne Lake is a run-of-the-river project and essentially has no conservation storage.

Table 9-1. ACT Basin Conservation Storage Percent by Acre-Feet

Project	Storage (acre-feet)	Percentage
* Allatoona	284,580	10.8%
* Carters	157,402	6.0%
Weiss	263,417	10.0%
H. Neely Henry	118,210	4.5%
Logan Martin	144,383	5.5%
Lay	92,352	3.5%
Mitchell	51,577	1.9%
Jordan/Bouldin	19,057	0.7%
Harris	207,317	7.9%
Martin	1,202,340	45.7%
Yates	6,928	0.3%
* R. F. Henry (R. E. “Bob” Woodruff)	36,450	1.4%
* Millers Ferry (William “Bill” Dannelly)	46,704	1.8%

* Federal project

Claiborne Project receives outflow from the Millers Ferry Project immediately upstream and schedules operation based on these releases and local or intervening flow. The scheduled outflows from Millers Ferry primarily determine the operation of Claiborne.

9-02. Interagency Coordination.

a. Local Press and Corps Bulletins. The local press includes any periodic publications in or near the Claiborne Lock and Dam Watershed and the ACT Basin. Grove Hill, Jackson, Monroeville and Montgomery, Alabama have daily or periodic publications. The papers often publish articles related to the rivers and streams. Their representatives have direct contact with

the Corps through the Public Affairs Office. In addition, they can access the Corps Web pages. The Corps and the Mobile District publish e-newsletters regularly which are made available to the general public via email and postings on various websites. Complete, real-time information is available at the Mobile Districts' Water Management homepage http://water.sam.usace.army.mil/.

b. National Weather Service. NWS is the federal agency in NOAA that is responsible for weather and weather forecasts. The NWS along with its River Forecast Center maintains a network of reporting stations throughout the Nation. It continuously provides current weather conditions and forecasts. It prepares river forecasts for many locations including the ACT Basin. Often, it prepares predictions on the basis of *what if* scenarios. Those include rainfall that is possible but has not occurred. In addition, the NWS provides information on hurricane tracts and other severe weather conditions. It monitors drought conditions and provides the information. Information is available through the Internet, the news, and the Mobile District's direct access.

c. U. S. Geological Survey. The USGS is an unbiased, multidisciplinary science organization that focuses on biology, geography, geology, geospatial information, and water. The agency is responsible for the timely, relevant, and impartial study of the landscape, natural resources, and natural hazards. Through the Corps-USGS Cooperative Gaging program, the USGS maintains a comprehensive network of gages in the Claiborne Watershed and ACT Basin. The USGS Water Science Centers in Georgia and Alabama-Birmingham publish real-time reservoir levels, river and tributary stages, and flow data through the USGS NWIS Web site. The Water Management Section uses the USGS to operate and maintain project water level gaging stations at each federal reservoir to ensure the accuracy of the reported water levels.

d. U. S. Fish and Wildlife Service. The USFWS is an agency of the Department of the Interior whose mission is working with others to conserve, protect and enhance fish, wildlife, plants, and their habitats for the continuing benefit of the American people. The USFWS is the responsible agency for the protection of federally listed threatened and endangered species and federally designated critical habitat in accordance with the Endangered Species Act of 1973. The USFWS also coordinates with other federal agencies under the auspices of the Fish and Wildlife Coordination Act. The Corps, Mobile District, with support from the Water Management Section, coordinates water control actions and management with USFWS in accordance with both laws.

9-03. Framework for Water Management Changes. Special interest groups often request modifications of the basin water control plan or project specific water control plan. The Claiborne Project and other ACT Basin Projects were constructed to meet specific, authorized purposes, and major changes in the water control plans would require modifying, either the project itself or the purposes for which the projects were built. However, continued increases in the use of water resources demand constant monitoring and evaluating reservoir regulations and reservoir systems to insure their most efficient use. Within the constraints of Congressional authorizations and engineering regulations, the water control plan and operating techniques are often reviewed to see if improvements are possible without violating authorized project functions. When deemed appropriate, temporary variances to the water control plan approved by SAD can be implemented to provide the most efficient regulation while balancing the multiple purposes of the ACT Basin-wide System.

EXHIBIT A

SUPPLEMENTARY PERTINENT DATA

EXHIBIT A
SUPPLEMENTARY PERTINENT DATA

GENERAL

Dam Site Location	
State	Alabama
Basin	Alabama-Coosa-Tallapoosa
Miles above mouth of Alabama River	81.78
Drainage area Millers Ferry to Claiborne, square miles	836
Total drainage area above Claiborne dam site, square miles	21,473
Type of Project	Navigation
Objective of Regulation	Navigation
Project Owner	United States of America
Operating Agency/Regulatiing Agency	U.S. Army Corps of Engineers

STREAM FLOW AT DAM SITE

Period of record	1931-2008*
Period of record (Dam in place)	1975-2010
Average annual flow for period of record (1931-2008) - cfs	32,218
Minimum monthly flow in period of record (Sep 2007) – cfs	2,397
Maximum monthly flow in period of record (Mar 1961) – cfs	165,100
Minimum daily flow in period of record (17 Oct 2007) - cfs	1,540
Maximum flow during period of record (7 Mar 1961) – cfs	267,000
Max estimated flow for flood of historical record, Flood of Mar 1929 – cfs	270,000
Peak stage for period of record, Flood of Feb-Mar 1961, ft NGVD29 - cfs	58.9
Estimated peak stage for flood of historical record, Flood of March 1929- ft NGVD 29	59.0

* 1930-1975 based on records at USGS gage 02429500 at Claiborne, 5.77 miles downstream from Claiborne Dam. 1975-2008 based on records at USGS gage 02428400 at dam site.

REGULATED FLOODS

Maximum flood of record (Feb-Mar 1961)*	
Peak Inflow – cfs	257,700
Regulated peak outflow – cfs	257,700
Regulated peak headwater - feet NGVD29	58.8
Maximum flood of continuous record (Feb-Mar 1961) - feet NGVD29	58.2

REGULATED FLOODS – (CONT'D)

Standard Project Flood Series	
Peak inflow to full reservoir – cfs	494,500
Regulated peak outflow – cfs	486,000
Regulated peak headwater – feet NGVD29	69.1
Spillway Design Flood Series	
Peak inflow to full reservoir – cfs	814,800
Regulated peak outflow – cfs	788,500
Regulate peak headwater – feet NGVD29	78.2

* Computed flow with Robert F. Henry and APC Dams assumed in operation.

RESERVOIR

Maximum operating pool elevation – feet NGVD29	36.0
Minimum operating pool elevation – feet NGVD29	33.0
Emergency drawdown elevation – feet NGVD@(	32.0
Maximum head – feet	30.0
Area at pool elevation 36.0 – acres	6,290
Area acquired in fee simple – acres	3,015
Area acquired by easement – acres	2,681
Area cleared – acres	1,500
Maximum elevation of clearing – feet NGVD29	38.0
Total volume to elevation 36.0 – acre-feet	102,480
Length – miles	60.5
Shoreline distance at elevation 36.0 – miles	216

LOCK

Nominal size of chamber - feet	84 x 600
Distance center to center of gate pintles -, feet	655.0
Maximum lift - feet	30.0
Elevation of upper stop-log sill - feet NGVD29	19.0
Elevation of upper miter sill - feet NGVD29	19.0
Elevation of lower stop-log sill - feet NGVD29	-8.0
Elevation of lower miter sill - feet NGVD29	-8.0
Elevation of chamber floor - feet NGVD29	-9.0
Elevation of top of floor culverts - feet NGVD29	-10.0
Elevation of top of upper and lower approach walls - feet NGVD29	51.0

LOCK (CONT'D)

Elevation of top of chamber walls - feet NGVD29	51.0
Freeboard on lock walls when lock becomes inoperative - feet	4.0
Percent of time inoperative	2.0
Type of upper gate	horizontally-framed miter
Height of upper gate - feet	32.0
Type of lower gate	horizontally-framed miter
Height of lower gate - feet	59.0
Type of culvert valves	reverse tainter
Dimensions of culverts at valves - feet	10 x 10
Dimensions of culverts at lateral - feet	10 x 13
Elevation of culvert ceilings between valves - feet NGVD29	-1.0
Minimum submergence of culvert valves - feet	6.0
Type of filling and emptying system	middle third laterals

GATED SPILLWAY

Total length, including end piers - feet	416
Net length - feet	360
Elevation of crest – feet NGVD29	15.0
Number of piers, including end piers	7
Width of piers - feet	8
Type of gates	Tainter
Number of gates	6
Length of gates - feet	60.0
Height of gates - feet	21.0
Maximum discharge capacity – cfs	67,111
Elevation of top of gates in closed position – feet NGVD29	36.0
Elevation of low steel of gates in fully open position – feet NGVD29	66.0
Elevation of trunnion – feet NGVD29	48.0
Elevation of access bridge – feet NGVD29	75.0
Elevation of stilling basin apron – feet NGVD29	variable -5 to -10
Height of end sill - feet	5.0
Type of stilling basin	roller basin

FIXED CREST SPILLWAY

Length - feet	500
Elevation of ogee crest – feet NGVD29	33.0
Type of stilling basin	roller bucket

EARTH DIKES

Right Bank Dike

Total length – feet	200
Top elevation – feet NGVD29	40.0
Top width – feet	25.0
Side slopes	1 v to 3 h
Thickness of riprap on slopes – inches	24
Thickness of filter blanket – inches	9
Top elevation of steel pile cutoff wall – feet NGVD29	36
Maximum swellhead when dike is overtopped, feet	0.6
Recurrence interval of flood which will overtop dike, years	0.5
Freeboard, top of dike above normal upper pool, feet	5

Left Bank Dike

Total length including esplanade and ramp - feet	2,350
Top elevation – feet NGVD29	60.0
Top width - feet	32.0
Side slopes	1v to 4 h
Maximum swellhead when dike is overtopped - feet	0.6
Freeboard, top of dike above headwater for maximum flood of continuous record (Feb-Mar 1961) - feet	1.2

EXHIBIT B

UNIT CONVERSIONS

AREA CONVERSION

UNIT	m^2	km^2	ha	in^2	ft^2	yd^2	mi^2	ac
1 m^2	1	10^{-6}	10^{-4}	1550	10.76	1.196	3.86×10^{-7}	2.47×10^{-4}
1 km^2	10^6	1	100	1.55×10^9	1.076×10^7	1.196×10^6	0.3861	247.1
1 ha	10^4	0.01	1	1.55×10^7	1.076×10^7	1.196×10^4	3.86×10^{-3}	2,471
1 in^2	6.45×10^{-4}	6.45×10^{10}	6.45×10^{-8}	1	6.94×10^{-3}	7.7×10^{-4}	2.49×10^{-10}	1.57×10^7
1 ft^2	.0929	9.29×10^{-8}	9.29×10^{-6}	144	1	0.111	3.59×10^{-8}	2.3×10^{-5}
1 yd^2	0.8361	8.36×10^{-7}	8.36×10^{-5}	1296	9	1	3.23×10^{-7}	2.07×10^{-4}
1 mi^2	2.59×10^6	2.59	259	4.01×10^9	2.79×10^7	3.098×10^6	1	640
1 ac	4047	0.004047	0.4047	6.27×10^6	43560	4840	1.56×10^{-3}	1

LENGTH CONVERSION

UNIT	cm	m	km	in.	ft	yd	mi
cm	1	0.01	0.0001	0.3937	0.0328	0.0109	6.21×10^{-6}
m	100	1	0.001	39.37	3.281	1.094	6.21×10^{-4}
km	10^5	1000	1	39,370	3281	1093.6	0.621
in.	2.54	0.0254	2.54×10^{-5}	1	0.0833	0.0278	1.58×10^{-5}
ft	30.48	0.3048	3.05×10^{-4}	12	1	0.33	1.89×10^{-4}
yd	91.44	0.9144	9.14×10^{-4}	36	3	1	5.68×10^{-4}
mi	1.01×10^5	1.61×10^3	1.6093	63,360	5280	1760	1

FLOW CONVERSION

UNIT	m^3/s	m^3/day	l/s	ft^3/s	ft^3/day	ac-ft/day	gal/min	gal/day	mgd
m^3/s	1	86,400	1000	35.31	3.05×10^6	70.05	1.58×10^4	2.28×10^7	22.824
m^3/day	1.16×10^{-5}	1	0.0116	4.09×10^{-4}	35.31	8.1×10^{-4}	0.1835	264.17	2.64×10^{-4}
l/s	0.001	86.4	1	0.0353	3051.2	0.070	15.85	2.28×10^4	2.28×10^{-2}
ft^3/s	0.0283	2446.6	28.32	1	8.64×10^4	1.984	448.8	6.46×10^5	0.646
ft^3/day	3.28×10^{-7}	1233.5	3.28×10^{-4}	1.16×10^{-5}	1	2.3×10^{-5}	5.19×10^{-3}	7.48	7.48×10^{-6}
ac-ft/day	0.0143	5.451	14.276	0.5042	43,560	1	226.28	3.26×10^5	0.3258
gal/min	6.3×10^{-5}	0.00379	0.0631	2.23×10^{-3}	192.5	4.42×10^{-3}	1	1440	1.44×10^{-3}
gal/day	4.3×10^{-8}	3785	4.38×10^{-4}	1.55×10^{-6}	11,337	3.07×10^{-6}	6.94×10^{-4}	1	10^{-6}
mgd	0.0438		43.82	1.55	1.34×10^5	3.07	694	10^6	1

VOLUME CONVERSION

UNIT	liters	m^3	in^3	ft^3	gal	ac-ft	million gal
liters	1	0.001	61.02	0.0353	0.264	8.1×10^{-7}	2.64×10^{-7}
m^3	1000	1	61,023	35.31	264.17	8.1×10^{-4}	2.64×10^{-4}
in^3	1.64×10^{-2}	1.64×10^{-5}	1	5.79×10^{-4}	4.33×10^{-3}	1.218×10^{-8}	4.33×10^{-9}
ft^3	28.317	0.02832	1728	1	7.48	2.296×10^{-5}	7.48×10^6
gal	3.785	3.78×10^{-3}	231	0.134	1	3.07×10^{-6}	10^6
ac-ft	1.23×10^6	1233.5	75.3×10^6	43,560	3.26×10^5	1	0.3260
million gallon	3.785×10^6	3785	2.31×10^8	1.34×10^5	10^6	3.0684	1

COMMON CONVERSIONS

1 million gallons per day (MGD) = 1.55 cfs
1 day-second-ft (DSF) = 1.984 acre-ft = 1 cfs for 24 hours
1 cubic foot per second of water falling 8.81 feet = 1 horsepower
1 cubic foot per second of water falling 11.0 feet at 80% efficiency = 1 horsepower
1 inch of depth over one square mile = 2,323,200 cubic feet
1 inch of depth over one square mile = 0.0737 cubic feet per second for one year.

Claiborne Coordinate Comparison

Station	NAVD88 Elevation (feet)	NGVD29 Elevation (feet)	Diff NAVD88 NGVD29 (feet)	Remarks
6-21E	50.873			Set Corps of Engineers Brass Disk (Elevation obtain from OPUS DB)
6-21F	50.792			Set Corps of Engineers Brass Disk
Lower River	51.001	51.175	-0.174	Lower River 1971, Corps of Engineers disk set in concrete near downstream gauge house. "Questionable Stability"
RM-1	50.715	50.851	-0.136	USGS RM-1. Top of angle iron in concrete lockwall
RP-1	53.240	53.415	-0.175	USGS RP-1. Chiseled arrow in concrete
RP-2	50.917	51.079	-0.162	USGS RP-2. 2 hack marks near ladder gate
TBM A	51.915			Chiseled "x" in top of bolt on base of light pole near downstream gauge. 16 foot of downstream lock gate.
TBM B	51.839			Chiseled "x" in top of bolt on base of light pole near downstream gauge
TBM C	65.698			Chiseled square in outer metal lip of pipe for upstream gauge
TBM D	63.288			Top of doorstop behind door leading into kitchen.
DS GAUGE	54.105			Shot on downstream gauge datum point. Digital readout 17.00, read 16.78 on metal tape. Both readings at 10:07 AM May 25, 2010
US GAUGE	65.885			Shot on upstream gauge datum point. Digital readout 33.48, read 33.272 on metal tape. Both readings at 11:03 AM on May 25, 2010

SURVEY DATASHEET (Version 1.0)

PID: BBBX98
Designation: 6-21E
Stamping: 6-21E
Stability: Monument will probably hold position well
Setting: Massive structures (other than listed below)
Description: LOCATED ON THE ALABAMA RIVER, AT THE CLAIBORNE LOCK AND DAM, IN THE VACINITY OF THE DOWNSTREAM LOCK GATE. MONUMENT IS LOCATED 11.60 FEET SOUTHEAST OF A BRASS DISK STAMPED "6-506 1988", 10.30 FEET SOUTHEAST OF A METAL CLEET, 7.95 FEET EAST OF THE DOWNSTREAM SIDE LADDER ENCLOSURE AND 6.15 FEET NORTHWEST OF A CORNER POST FOR THE METAL HANDRAIL.
MONUMENT IS A STANDARD U.S. ARMY CORPS OF ENGINEERS BRASS DISK SET IN LOCK WALL.
Observed: 2010-05-27T19:36:00Z
Source: OPUS - page5 0909.08

Close-up View

REF_FRAME: NAD_83 (CORS96)	EPOCH: 2002.0000	SOURCE: NAVD88 (Computed using GEOID09)	UNITS: m	SET PROFILE	DETAILS

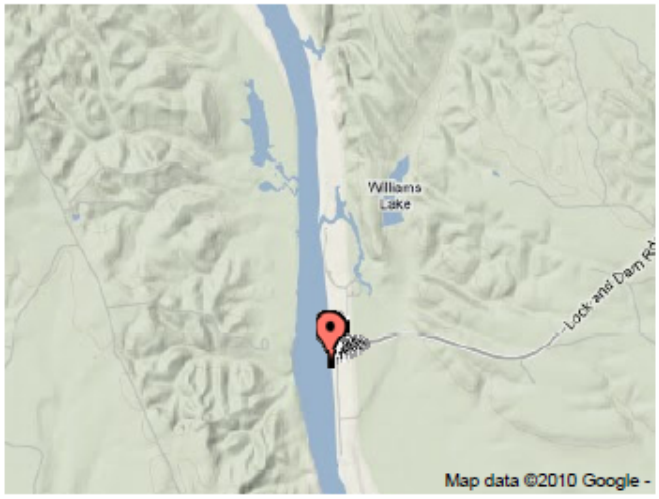
LAT:	31° 36' 47.07203"	± 0.025 m
LON:	-87° 32' 59.21812"	± 0.010 m
ELL HT:	-12.391	± 0.025 m
X:	232424.415	± 0.010 m
Y:	-5431689.541	± 0.020 m
Z:	3323964.210	± 0.033 m
ORTHO HT:	15.506	± 0.028 m

	UTM 16	**SPC** 102(AL W)
NORTHING:	3497680.492m	178824.680m
EASTING:	447852.821m	595276.533m
CONVERGENCE:	-0.28819181°	-0.02609517°
POINT SCALE:	0.99963354	0.99993361
COMBINED FACTOR:	0.99963548	0.99993555

CONTRIBUTED BY

mchaney
Maptech Inc


Horizon View



The numerical values for this position solution have satisfied the quality control criteria of the National Geodetic Survey. The contributor has verified that the information submitted is accurate and complete.

Claiborne Lock and Dam

EXHIBIT C

STANDING INSTRUCTION TO THE PROJECT OPERATOR FOR WATER CONTROL

CLAIBORNE LOCK AND DAM

EXHIBIT C

STANDING INSTRUCTIONS TO PROJECT OPERATOR FOR RESERVOIR REGULATION AT CLAIBORNE LOCK AND DAM

1. DATA COLLECTION

a. Rainfall. Measure and record rainfall each morning at 0600.

b. Pool and Tailwater Elevations. Read and record the pool and tailwater elevation each morning at 0600 and every time the spillway gate is changed.

c. Spillway Gate Openings. Record the spillway gate settings each morning at 0600 and immediately after each gate setting change.

2. DATA REPORTING

a. Daily Reports. Furnish the following data each morning to the Millers Ferry operator:

1. The 0600 rainfall measurement.
2. The 0600 pool elevation.
3. The 0600 tailwater elevation.
4. The 0600 spillway gate setting.

b. Monthly Reports. Complete WS Form B-91 and send to National Weather Service, 11 West Oxmoore Road, Suite 417, Birmingham, Alabama 35209, and to Department of the Army, U.S. Army Engineer District, Mobile, P.O. Box 2288, Attention: Water Management Section, Mobile, Alabama, 36628-0001

3. OPERATING INSTRUCTIONS

a. Normal Conditions. Follow instructions in Chapter VII, Water Control Plan, of this Water Control Manual.

b. Emergency Conditions. If communications with Millers Ferry and the Mobile District Office are disrupted and the Millers Ferry generation schedule cannot be obtained, use the latest schedule received from Millers Ferry and follow the normal operating instructions in Chapter VII of this manual until communications are restored.

c. Flood Conditions. During floods maintain the reservoir level near elevation 35.0 feet NGVD29 by operating the spillway gates to pass the inflow until all gates are fully opened and there is no control over the outflow. When the inflow exceeds the discharge capacity of the spillway at elevation 35.0 feet NGVD29 with all gates fully opened, the pool level will rise above elevation 35.0 feet NGVD29 and continue to rise until the inflow peaks and begins to recede. Keep gates in the fully open position until the pool level recedes to elevation 35.0 feet NGVD29, and then operate as necessary to maintain the reservoir level near 35.0 feet NGVD29. Experienced lock personnel may deviate from this guide to make smooth transitions in outflows from Claiborne while maintaining the Claiborne upper pool within the limits of 32.0 - 36.0 feet NGVD29.

d. Spillway Gate Operation. Operate the spillway gates according to the Water Control Plan Section 7-04, referring to Plate 7-1 through Plate 7-19 for gate settings and target flows.

The upper pool, under normal conditions, can rise to elevation 36.5 feet NGVD29 as long as the top of all gates are 0.25 feet above the reservoir level. All spillway gates must be within 0.75 feet of each other. The six spillway gates are sequentially numbered beginning at the left bank (east end of the spillway) adjacent to the lock. This procedure may be modified by experienced personnel as necessary when required by events such as; sub-daily power generation events at Millers Ferry, or significant rainfall between Claiborne and Millers Ferry.

e. Head Limitation. To prevent the Claiborne structures from sliding or overturning it is imperative that the difference between headwater elevation and tailwater elevation does not exceed 30 feet at any time.

EXHIBIT D

Alabama-Coosa-Tallapoosa (ACT) River Basin,

Drought Contingency Plan

DROUGHT CONTINGENCY PLAN

FOR

ALABAMA-COOSA-TALLAPOOSA RIVER BASIN

ALLATOONA DAM AND LAKE
CARTERS DAM AND LAKE
ALABAMA POWER COMPANY COOSA RIVER PROJECTS
ALABAMA POWER COMPANY TALLAPOOSA RIVER PROJECTS
ALABAMA RIVER PROJECTS

US Army Corps of Engineers ®

South Atlantic Division

Mobile District

May 2015

DROUGHT CONTINGENCY PLAN
FOR THE
ALABAMA-COOSA-TALLAPOOSA RIVER BASIN

I – INTRODUCTION

1-01. Purpose of Document. The purpose of this Drought Contingency Plan (DCP) is to provide a basic reference for water management decisions and responses to water shortage in the Alabama-Coosa-Tallapoosa (ACT) River Basin induced by climatological droughts. As a water management document it is limited to those drought concerns relating to water control management actions for federal U.S. Army Corps of Engineers (Corps) and Alabama Power Company (APC) dams. This DCP does not prescribe all possible actions that might be taken in a drought situation due to the long-term nature of droughts and unique issues that may arise. The primary value of this DCP is in documenting the overall ACT Basin Drought Management Plan for the system of Corps and APC projects; in documenting the data needed to support water management decisions related to drought regulation; and in defining the coordination needed to manage the ACT project's water resources to ensure that they are used in a manner consistent with the needs which develop during a drought. This DCP addresses the water control regulation of the five Corps impoundments and the APC Coosa and Tallapoosa projects (Table 1) in regard to water control regulation during droughts. Details of the drought management plan as it relates to each project and its water control regulation during droughts are provided in the water control manual within the respective project appendix to the ACT Basin Master Water Control Manual.

II – AUTHORITIES

2-01. Authorities. The following list provides the policies and guidance that are pertinent to the development of drought contingency plans and actions directed therein.

A. ER 1110-2-1941, "Drought Contingency Plans", dated 15 Sep 1981. This regulation provides policy and guidance for the preparation of drought contingency plans as part of the Corps of Engineers' overall water management activities.

B. ER 1110-2-8156, "Preparation of Water Control Manuals", dated 31 Aug 1995. This document provides a guide for preparing water control manuals for individual water resource projects and for overall river basins to include drought contingency plans.

C. ER 1110-2-240, "Water Control Management", dated 8 Oct 1982. This regulation prescribes the policies and procedures to be followed in water management activities including special regulations to be conducted during droughts. It also sets the responsibility and approval authority in development of water control plans.

D. EM 1110-2-3600, "Management of Water Control Systems", dated 30 Nov 1987. This guidance memorandum requires that the drought management plan be incorporated into the project water control manuals and master water control manuals. It also provides guidance in formulating strategies for project regulation during droughts.

Table 1. Reservoir impoundments within the ACT River Basin

River/Project Name	Owner/State/ Year Initially Completed	Total storage at Full Pool (acre-feet)	Conservation Storage (acre-feet)	Percentage of ACT Basin Conservation Storage (%)
Coosawattee River				
Carters Dam and Lake	Corps/GA/1974	383,565	141,402	5.9
Carters Reregulation Dam	Corps/GA/1974	17,500	16,000	0.1
Etowah River				
Allatoona Dam and Lake	Corps/GA/1949	367,471	284,580	10.8
Hickory Log Creek Dam	CCMWA/Canton/ 2007	17,702	NA	NA
Coosa River				
Weiss Dam and Lake	APC/AL/1961	306,655	263,417	10.0
H. Neely Henry Dam and Lake	APC/AL/1966	120,853	118,210	4.5
Logan Martin Dam and Lake	APC/AL/1964	273,467	144,383	5.5
Lay Dam and Lake	APC/AL/1914	262,887	92,352	3.5
Mitchell Dam and Lake	APC/AL/1923	170,783	51,577	1.9
Jordan Dam and Lake	APC/AL/1928	236,130	19,057	0.7
Walter Bouldin Dam	APC/AL/1967	236,130	NA	--
Tallapoosa River				
Harris Dam and Lake	APC/AL/1982	425,721	207,317	7.9
Martin Dam and Lake	APC/AL/1926	1,628,303	1,202,340	45.7
Yates Dam and Lake	APC/AL/1928	53,908	6,928	0.3
Thurlow Dam and Lake	APC/AL/1930	17,976	NA	--
Alabama River				
Robert F. Henry Lock and Dam/R.E. “Bob” Woodruff Lake	Corps/AL/1972	247,210	36,450	1.4
Millers Ferry Lock and Dam/William “Bill” Dannelly Lake	Corps/AL/1969	346,254	46,704	1.8
Claiborne Lock and Dam and Lake	Corps/AL/1969	102,480	NA	--

III – DROUGHT IDENTIFICATION

3-01. <u>Definition</u>. Drought can be defined in different ways - meteorological, hydrological, agricultural, and socioeconomic. In this DCP, the definition of drought used in the *National Study of Water Management During Drought* is used:

> “Droughts are periods of time when natural or managed water systems do not provide enough water to meet established human and environmental uses because of natural shortfalls in precipitation or streamflow.”

That definition defines drought in terms of its impact on water control regulation, reservoir levels, and associated conservation storage. Water management actions during droughts are intended to balance the water use and water availability to meet water use needs. Because of hydrologic variability, there cannot be 100 percent reliability that all water demands are met. Droughts occasionally will be declared and mitigation or emergency actions initiated to lessen the stresses placed on the water resources within a river basin. Those responses are tactical measures to conserve the available water resources (USACE 2009).

3-02. Drought Identification. There is no known method of predicting how severe or when a drought will occur. There are, however, indicators that are useful in determining when conditions are favorable: below normal rainfall; lower than average inflows; and low reservoir levels, especially immediately after the spring season when rainfall and runoff conditions are normally the highest. When conditions indicate that a drought is imminent, the Corps Water Management Section (WMS) and APC will increase the monitoring of the conditions and evaluate the impacts on reservoir projects if drought conditions continue or become worse for 30-, 60-, or 90-day periods. Additionally, WMS and APC will determine if a change in operating criteria would aid in the total regulation of the river system and if so, what changes would provide the maximum benefits from any available water.

Various products are used to detect and monitor the extent and severity of basin drought conditions. One key indicator is the U.S. Drought Monitor available through the U.S. Drought Portal, www.drought.gov. The National Weather Service (NWS) Climate Prediction Center (CPC) also develops short-term (6- to 10-day and 8- to 14-day) and long-term (1-month and 3-month) precipitation and temperature outlooks and a U.S. Seasonal Drought Outlook, which are useful products for monitoring dry conditions. The Palmer Drought Severity Index is also used as a drought reference. The Palmer index assesses total moisture by using temperature and precipitation to compute water supply and demand and soil moisture. It is considered most relevant for non-irrigated cropland and primarily reflects long-term drought. However, the index requires detailed data and cannot reflect an operation of a reservoir system. The Alabama Office of the State Climatologist also produces a Lawn and Garden Moisture Index for Alabama, Florida, Georgia, and South Carolina, which gives a basin-wide ability to determine the extent and severity of drought conditions. The runoff forecasts developed for both short- and long-range periods reflect drought conditions when appropriate. There is also a heavy reliance on the latest El Niño Southern Oscillation (ENSO) forecast modeling to represent the potential effects of La Niña on drought conditions and spring inflows. Long-range models are used with greater frequency during drought conditions to forecast potential effects on reservoir elevations, ability to meet minimum flows, and water supply availability. A long-term, numerical model, Extended Streamflow Prediction, developed by the NWS, provides probabilistic forecasts of streamflow and reservoir stages on the basis of climatic conditions, streamflow, and soil moisture. Extended Streamflow Prediction results are used in projecting possible future drought conditions. Other parameters and models can indicate a lack of rainfall and runoff and the degree of severity and continuance of a drought. For example, models using data of previous droughts or a percent of current to mean monthly flows with several operational schemes have proven helpful in forecasting reservoir levels for water management planning purposes. Other parameters considered during drought management are the ability of the various lakes to meet the demands placed on storage, the probability that lake elevations will return to normal seasonal levels, basin streamflows, basin groundwater table levels, and the total available storage to meet hydropower marketing system demands.

3-03. Historical Droughts. Drought events have occurred in the ACT Basin with varying degrees of severity and duration. Five of the most significant historical basin wide droughts

occurred in 1940-1941, 1954-1958, 1984-1989, 1999-2003, and 2006-2009. The 1984 to 1989 drought caused water shortages across the basin in 1986. This resulted in the need for the Corps to make adjustments in the water management practices. Water shortages occurred again from 1999 through 2002 and during 2007 through 2008. The 2006 to 2009 drought was the most devastating recorded in Alabama and western Georgia. Precipitation declines began in December 2005. These shortfalls continued through winter 2006-07 and spring 2007, exhibiting the driest winter and spring in the recorded period of record. The Corps and APC had water levels that were among the lowest recorded since the impoundments were constructed. North Georgia received less than 75 percent of normal precipitation (30-year average). The drought reached peak intensity in 2007, resulting in a D-4 Exceptional Drought Intensity (the worst measured) throughout the summer of 2007.

3-04. Severity. Water shortage problems experienced during droughts are not uniform throughout the ACT River Basin. Even during normal, or average, hydrologic conditions, various portions of the basin experience water supply problems. The severity of the problems are primarily attributed to the pattern of human habitation within the basin; the source of water utilized (surface water vs. ground water); and the characteristics of the water resources available for use. During droughts, these problems can be intensified. A severe drought in the basin develops when a deficiency of rainfall occurs over a long time period and has a typical duration of 18 to 24 months. The number of months of below normal rainfall is more significant in determining the magnitude of a drought in the basin than the severity of the deficiency in specific months. However, the severity of the rainfall deficiency during the normal spring wet season has a significant impact on the ability to refill reservoirs after the fall/winter drawdown period. Another confounding factor which influences droughts in the basin is the variability of rainfall over the basin, both temporarily and spatially.

IV – BASIN AND PROJECT DESCRIPTION

4-01. Basin Description. The headwater streams of the Alabama-Coosa-Tallapoosa (ACT) River Basin rise in the Blue Ridge Mountains of Georgia and Tennessee and flow southwest, combining at Rome, Georgia, to form the Coosa River. The confluence of the Coosa and Tallapoosa Rivers in central Alabama forms the Alabama River near Wetumpka, Alabama. The Alabama River flows through Montgomery and Selma and joins with the Tombigbee River at the mouth of the ACT Basin to form the Mobile River about 45 miles above Mobile, Alabama. The Mobile River flows into Mobile Bay at an estuary of the Gulf of Mexico. The total drainage area of the ACT Basin is approximately 22,739 square miles: 17,254 square miles in Alabama; 5,385 square miles in Georgia; and 100 square miles in Tennessee. A detailed description of the ACT River Basin is provided in the ACT Master Water Control Manual, Chapter II – Basin Description and Characteristics.

4-02. <u>Project Description</u>. The Corps operates five projects in the ACT Basin: Allatoona Dam and Lake on the Etowah River; Carters Dam and Lake and Reregulation Dam on the Coosawattee River; and Robert F. Henry Lock and Dam, Millers Ferry Lock and Dam, and Claiborne Lock and Dam on the Alabama River. Claiborne is a lock and dam without any appreciable water storage behind it. Robert F. Henry and Millers Ferry are operated as run-of-river projects and only very limited pondage is available to support hydropower peaking and other project purposes. APC owns and operates eleven hydropower dams in the ACT Basin; seven dams on the Coosa River and four dams on the Tallapoosa River. Figure 1 depicts the percentage of conservation storage of each project in the ACT Basin. Figure 2 shows the project locations within the basin. Figure 3 provides a profile of the basin and each project.

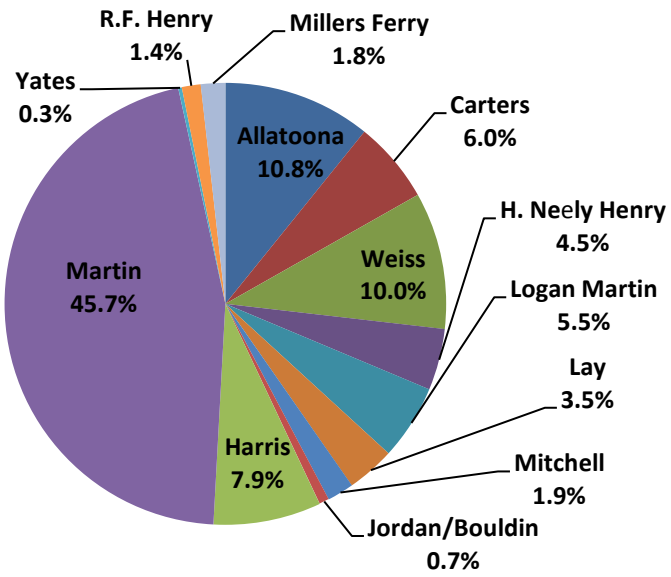


Figure 1. Alabama-Coosa-Tallapoosa River Basin Percent Conservation Storage

A. **General.** Of the 16 reservoirs (considering Jordan Dam and Lake and Bouldin Dam as one reservoir and Carters Lake and Carters Reregulation Dam as one reservoir), Lake Martin on the Tallapoosa River has the greatest amount of storage, containing 45.7 percent of the conservation storage in the ACT Basin. Allatoona Lake, R.L. Harris Lake, Weiss Lake, and Carters Lake are the next four largest reservoirs in terms of storage. APC controls approximately 80 percent of the available conservation storage; Corps projects (Robert F. Henry Lock and Dam, Millers Ferry Lock and Dam, Allatoona Lake, and Carters Lake) control 20 percent. The two most upstream Corps reservoirs, Allatoona Lake and Carters Lake, account for 16.8 percent of the total basin conservation storage.

Figure 2. Alabama-Coosa-Tallapoosa River Basin Project Location Map

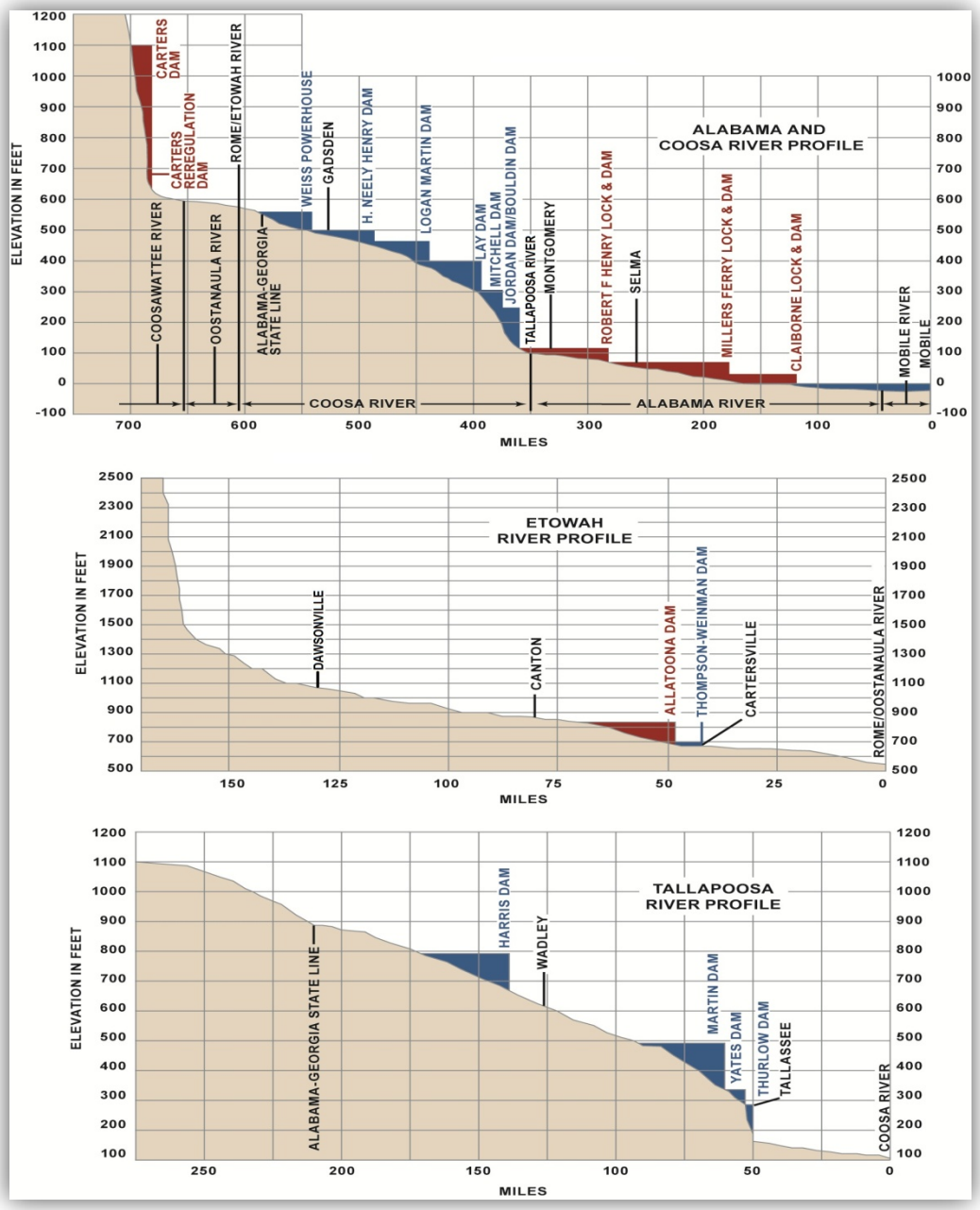


Figure 3. Alabama-Coosa-Tallapoosa River Basin Profile Map

B. **Allatoona Dam and Lake**. The Corps' Allatoona Dam on the Etowah River creates the 11,862 acres Allatoona Lake. The project's authorization, general features, and purposes are described in the Allatoona Dam and Lake Water Control Manual. The Allatoona Lake top of conservation pool is elevation 840 feet NGVD29 during the late spring and summer months (May through August); transitions to elevation 835 feet NGVD29 in the fall (October through mid-November); transitions to a winter drawdown to elevation 823 feet NGVD29 (1-15 January); and refills back to elevation 840 feet NGVD29 during the winter and spring wet season as shown in the water control plan guide curve (Figure 4). However, the lake level may fluctuate significantly from the guide curve over time, dependent primarily upon basin inflows but also influenced by project operations, evaporation, withdrawals, and return flows. A minimum flow of about 240 cfs is continuously released through a small unit, which generates power while providing a constant flow to the Etowah River downstream. Under drier conditions when basin inflows are reduced, project operations are adjusted to conserve storage in Allatoona Lake while continuing to meet project purposes in accordance with four action zones as shown on Figure 4.

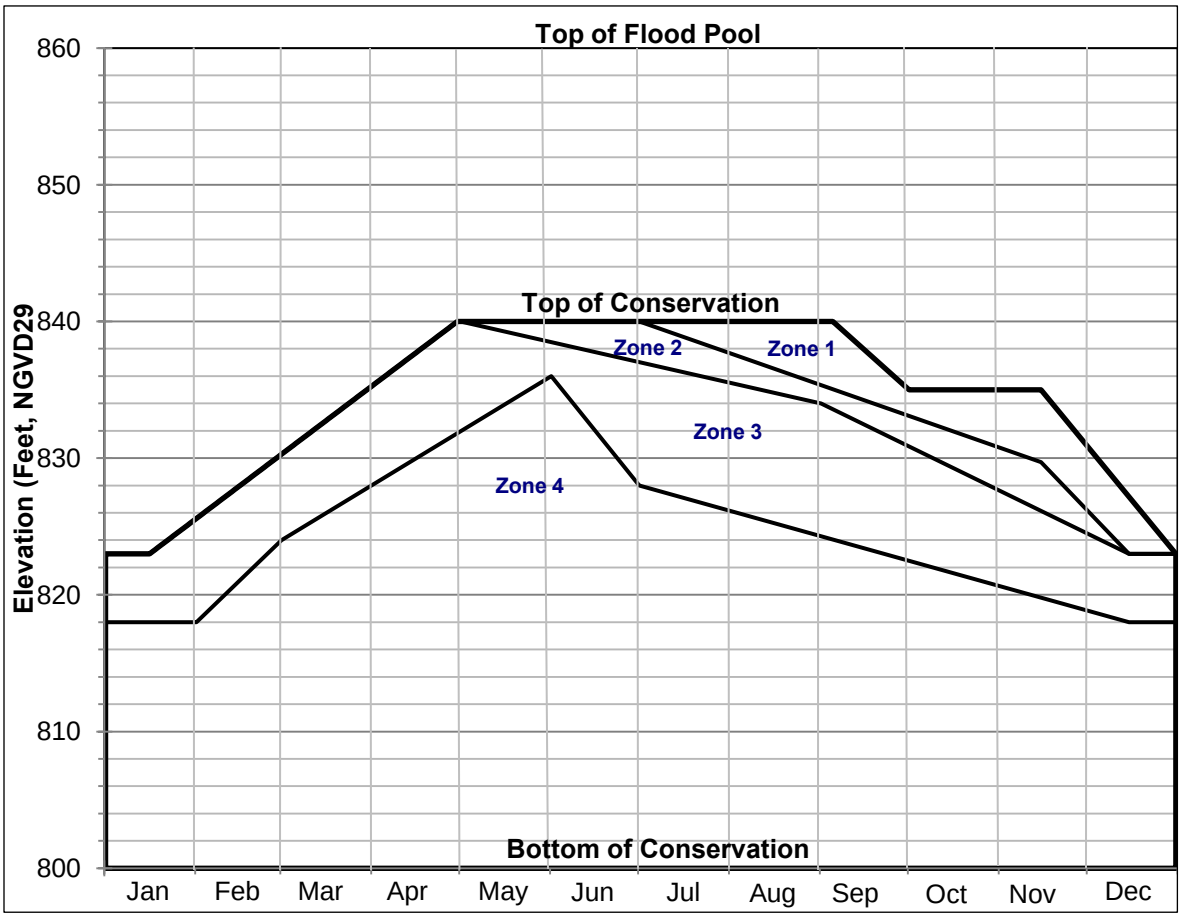


Figure 4. Allatoona Lake Guide Curve and Action Zones

C. **Carters Dam and Lake and Reregulation Dam**. Carters Lake is formed by Carters Dam, a Corps' reservoir on the Coosawattee River in northwest Georgia upstream of Rome, Georgia. The Carters project is a pumped-storage peaking facility that utilizes a Reregulation Dam and storage pool in conjunction with the main dam and lake. The project's authorization, general features, and purposes are described in the Carters Dam and Lake and Regulation Dam water control manual. The Carters Lake top of conservation pool is elevation 1,074 feet NGVD29 from 1 May to 1 November; transitioning to elevation 1,072 feet NGVD29 between 1 November

and 1 December; remains at elevation 1,072 feet NGVD 29 from 1 December to April; then transitioning back to 1,074 feet NGVD29 between 1 April and 1 May. This is shown in the water control plan guide curve (Figure 5). As expected with a peaking/pumped storage operation, both Carters Lake and the reregulation pool experience frequent elevation changes. Typically, water levels in Carters Lake vary no more than 1 to 2 feet per day. The reregulation pool will routinely fluctuate by several feet (variable) daily as the pool receives peak hydropower discharges from Carters Lake and serves as the source for pumpback operations into Carters Lake during non-peak hours. The reregulation pool will likely reach both its normal maximum elevation of 696 feet NGVD29 and minimum elevation of 677 feet NGVD29 at least once each week. However, the general trend of the lake level may fluctuate significantly from the guide curve over time, dependent primarily upon basin inflows but also influenced by project operations and evaporation. Carters Regulation Dam provides a seasonal varying minimum release to the Coosawattee River for downstream fish and wildlife conservation. Under drier conditions when basin inflows are reduced, project operations are adjusted to conserve storage in Carters Lake while continuing to meet project purposes in accordance with action zones as shown on Figure 5. In Zone 2, Carters Regulations Dam releases are reduced to 240 cfs.

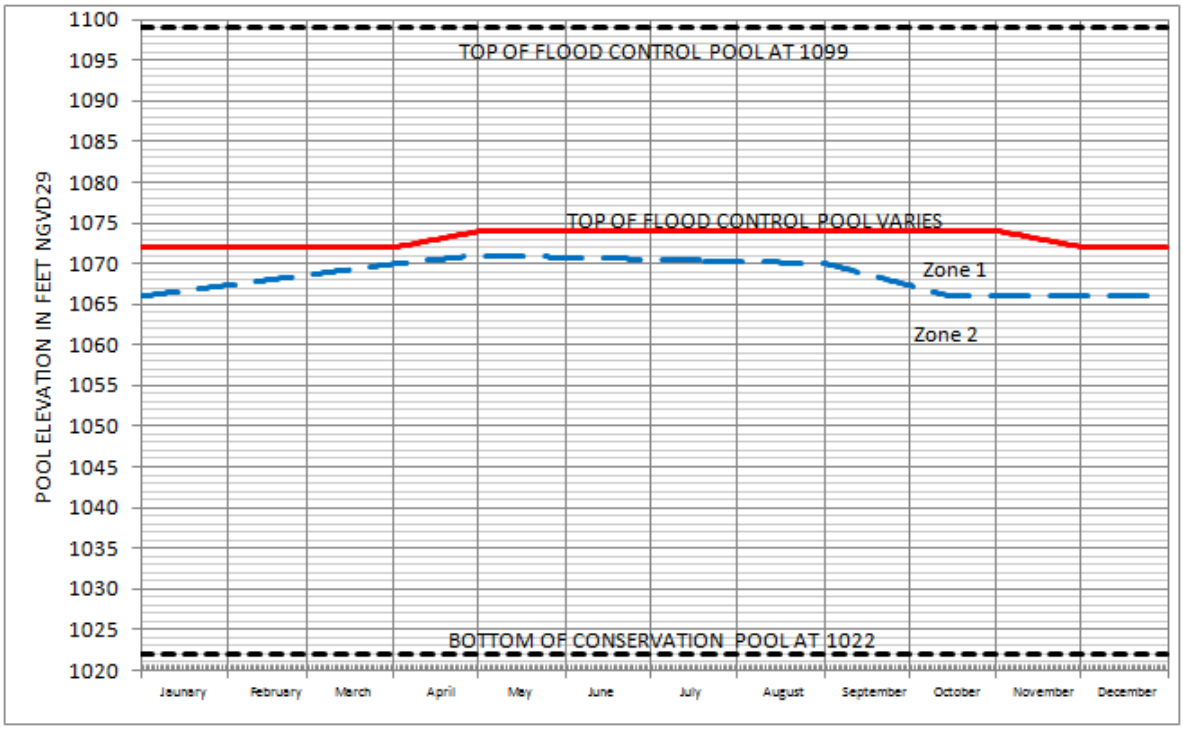


Figure 5. Carters Lake Guide Curve and Action Zones

D. **APC Coosa River Projects**. APC owns and operates the Coosa Hydro system of projects at Weiss Lake, H. Neely Henry Lake, Logan Martin Lake, Lay Lake, Mitchell Lake, and Jordan/Bouldin Dam and Lake on the Coosa River in the ACT Basin. APC Coosa River projects function mainly to generate electricity by hydropower. In addition, the upper three projects (Weiss, H. Neely Henry, and Logan Martin) operate pursuant to Public Law 83-436 regarding the requirement for the projects to be operated for flood risk management and navigation in accordance with reasonable rules and regulations of the Secretary of the Army. The rules and regulations are addressed in a memorandum of understanding between the Corps and APC (Exhibit B of the *Master Water Control Manual, Alabama-Coosa-Tallapoosa (ACT) River Basin,*

Alabama, Georgia), in individual water control manuals for the three projects, and in this ACT Basin DCP. The Weiss Lake is on the Coosa River in northeast Alabama, about 80 mi northeast of Birmingham, Alabama, and extends into northwest Georgia for about 13 miles upstream on the Coosa River. The dam impounds a 30,027 acres reservoir (Weiss Lake) at the normal summer elevation of 564 feet NGVD29 as depicted in the regulation guide curve shown in Figure 6 (source APC). The H. Neely Henry Lake is on the Coosa River in northeast Alabama, about 60 miles northeast of Birmingham, Alabama. The dam impounds an 11,200 acres reservoir at the normal summer elevation of 508 feet NGVD29 as depicted in the regulation guide curve shown in Figure 7 (source APC). The Logan Martin Lake is in northeast Alabama on the Coosa River, about 40 miles east of Birmingham, Alabama. The dam impounds a 15,269-acre reservoir at the normal summer elevation of 465 feet NGVD29 as depicted in the regulation guide curve shown in Figure 8 (source APC). The projects' authorizations, general features, and purposes are described in the Weiss, H. Neely Henry, and Logan Martin water control manual appendices to the ACT Basin Master Water Control Manual.

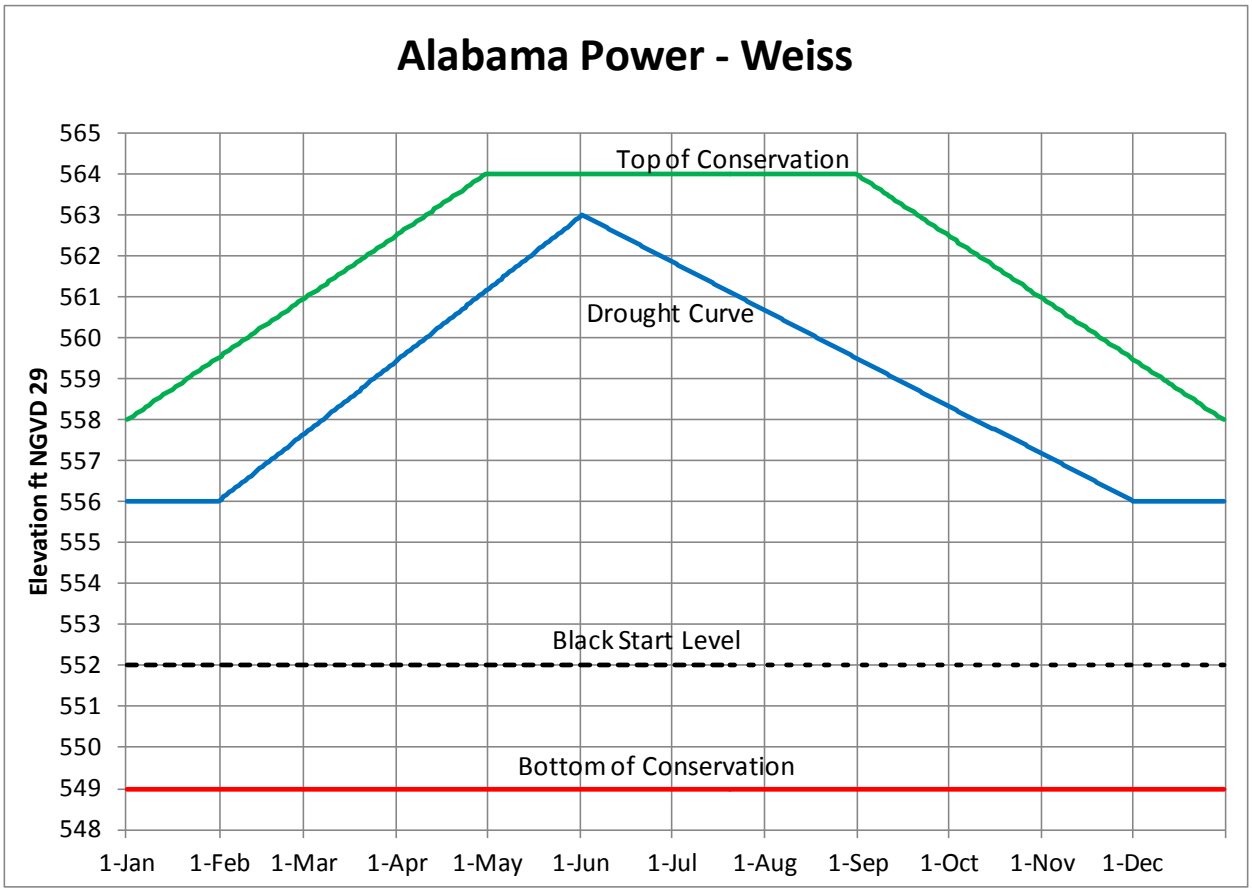


Figure 6. Weiss Lake Guide Curve

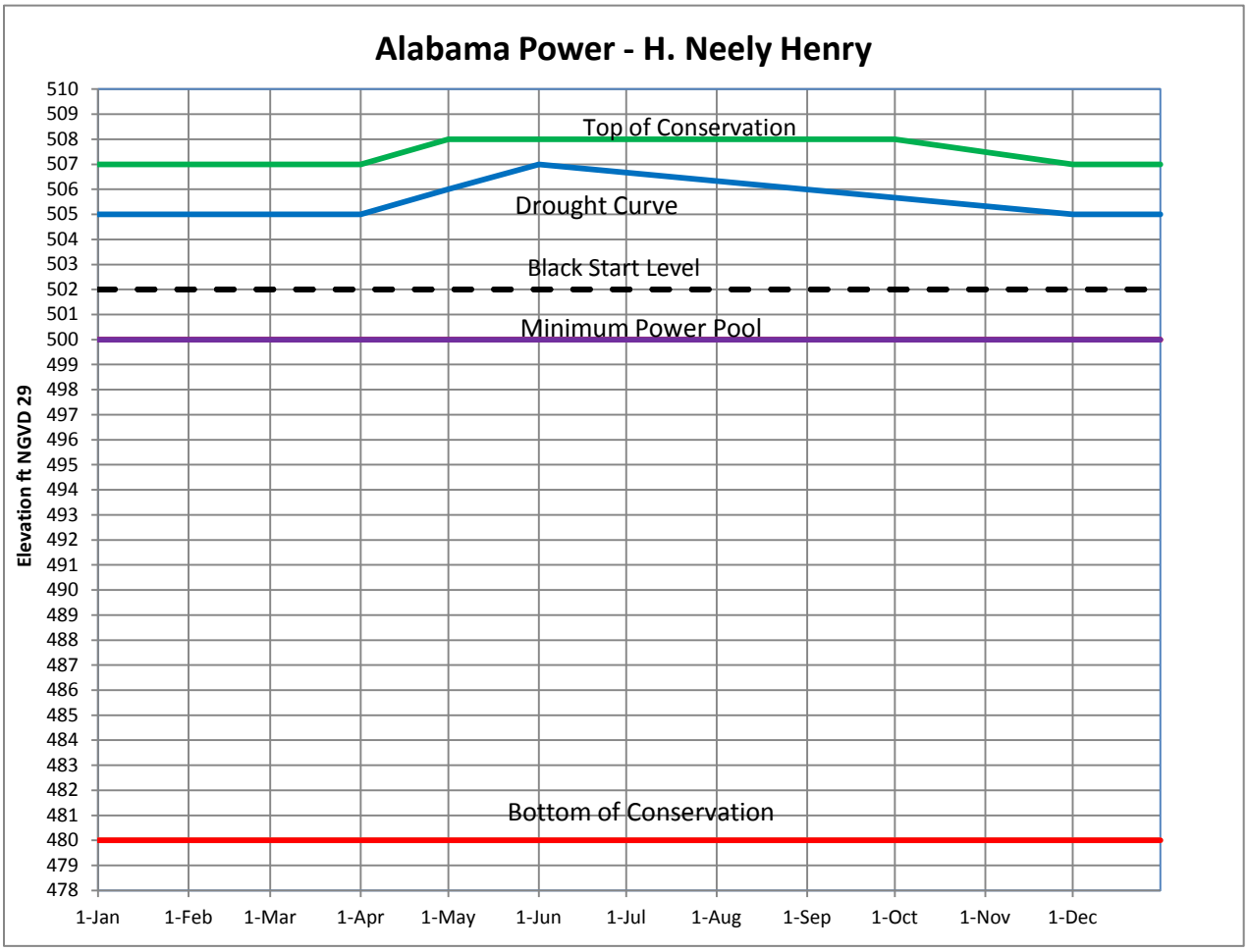


Figure 7. H. Neely Henry Lake Guide Curve

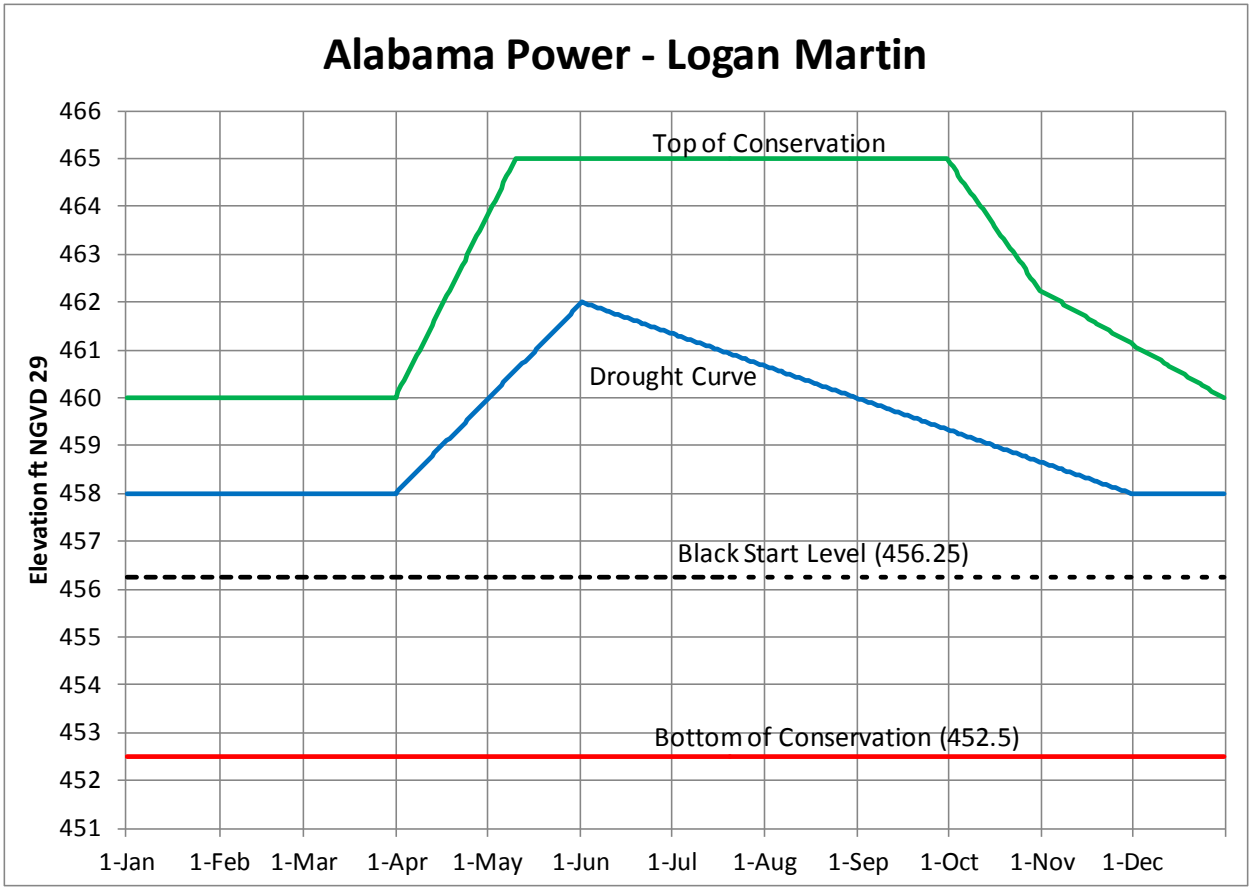


Figure 8. Logan Martin Lake Guide Curve

The downstream Coosa River APC run-of-river hydropower projects (Lay Dam and Lake, Mitchell Dam and Lake, and Jordan/Bouldin Dams and Lake) have no appreciable storage and are operated in conjunction with the upstream Coosa projects to meet downstream flow requirements and targets in support of the ACT Basin Drought Plan and navigation.

E. **APC Tallapoosa River Projects**. APC owns and operates the Tallapoosa River system of projects at Harris Dam and Lake, Martin Dam and Lake, Yates Dam, and Thurlow Dam in the ACT Basin. APC Tallapoosa River projects function mainly to generate electricity by hydropower. In addition, the Robert L. Harris Project operates pursuant to 33 CFR, Chapter II, Part 208, Section 208.65 regarding the requirement for the project to be operated for flood risk management and navigation in accordance with reasonable rules and regulations of the Secretary of the Army. The rules and regulations prescribed are described in a memorandum of understanding between the Corps and APC, individual water control manuals for the APC projects, and this DCP.

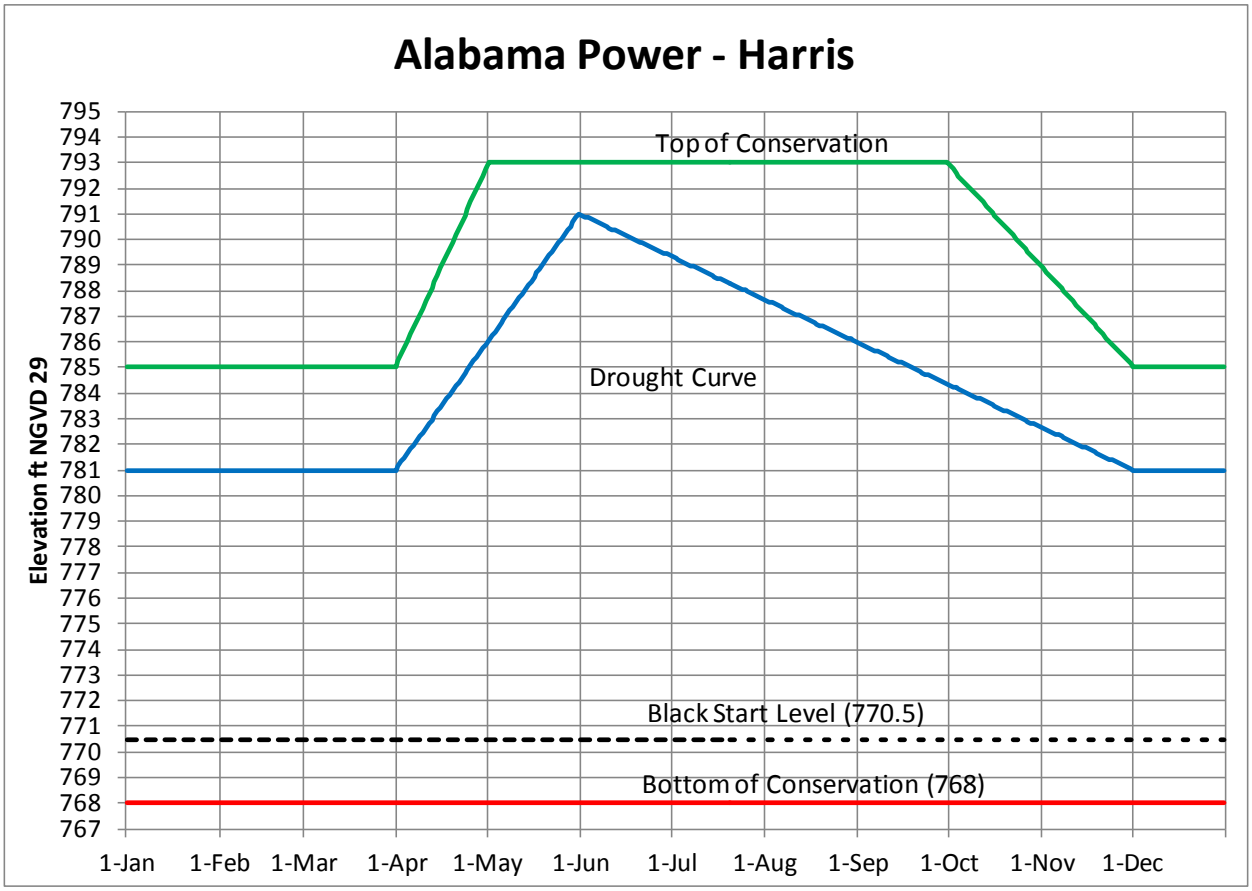


Figure 9. Robert L. Harris Lake Guide Curve

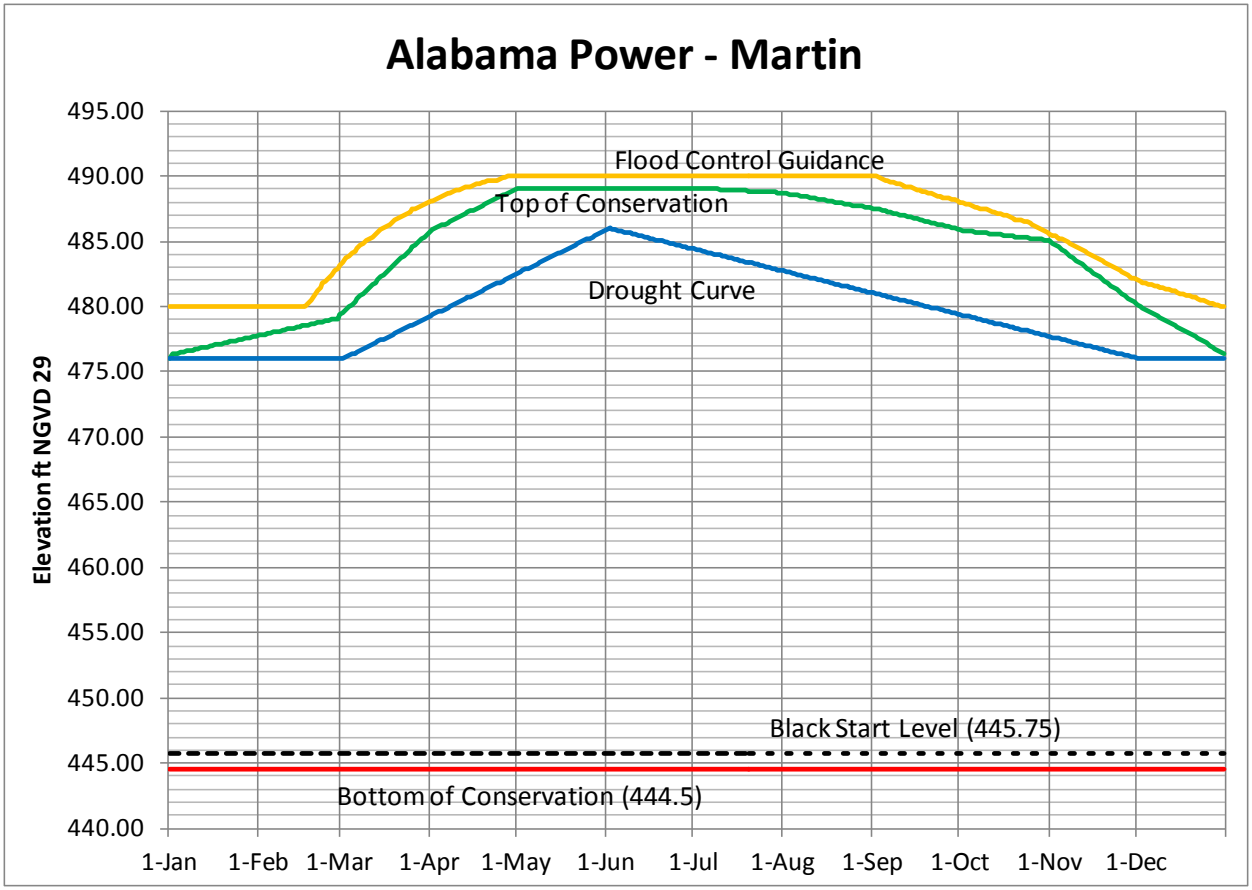


Figure 10. Martin Lake Guide Curve

F. **Corps Alabama River Projects**. The Corps operates three run-of-river lock and dam projects (Robert F. Henry, Millers Ferry, Claiborne) on the Alabama River in the lower ACT Basin to support commercial navigation. Claiborne Lake, together with R.E. "Bob" Woodruff Lake and William "Bill" Dannelly Lake, are collectively referred to as the Alabama River Lakes. The primary location used for communicating the available reliable navigation depth is the Claiborne Lock and Dam tailwater elevation. The water surface elevation is related to the available navigation depth based on the latest hydrographic surveys of the lower Alabama River reach downstream of Claiborne.

(1) Robert F. Henry. The R.E. "Bob" Woodruff Lake is created by the Robert F. Henry Lock and Dam on the Alabama River at river mile 236.3. R.E. "Bob" Woodruff Lake extends from the Robert F. Henry Lock and Dam upstream to the Walter Bouldin Dam. In addition to hydropower and navigation, R.E. "Bob" Woodruff Lake provides recreation and fish and wildlife conservation. R.E. "Bob" Woodruff Lake is 77 miles long and averages 1,300 feet wide. It has a surface area of 12,510 acres and a storage capacity of 234,200 acre-feet at a normal pool elevation of 126 feet NGVD29. Lake levels are typically fairly stable with minimal fluctuation between the operating pool elevation limits, 123 feet NGVD29 to 126 feet NGVD29. The emergency drawdown pool elevation is 122 feet NGVD29. An authorized 9-foot-deep by 200-foot-wide navigation channel exists over the entire length of the lake. The Jones Bluff hydropower plant generating capacity is 82 MW (declared value). The lake is a popular recreation destination, receiving up to two million visitors annually.

(2) Millers Ferry. The William "Bill" Dannelly Lake is created by the Millers Ferry Lock and Dam on the Alabama River at river mile 133. William "Bill" Dannelly Lake is 103 miles long and averages almost 1,400 feet wide. The reservoir has a surface area of 18,500 acres and a storage capacity of 346,254 acre-feet at a normal full pool elevation of 80 feet NGVD29. Lake levels remain fairly stable on a day-to-day basis with minimal fluctuation between the operating pool elevation limits, 79 feet NGVD29 to 80 feet NGVD29. It has an authorized 9-foot-deep by 200-foot-wide navigation channel which extends the entire length of the reservoir. The facility is a multipurpose reservoir constructed by the Corps for both navigation and hydropower. The reservoir also provides recreational benefits and has lands managed for wildlife mitigation. The Millers Ferry hydropower plant generating capacity is 90 MW (declared value). The reservoir provides ample recreation opportunities. Recreation visitors number three million annually.

(3) Claiborne. Claiborne Lake is created by the Claiborne Lock and Dam on the Alabama River at river mile 72.5. The lake is similar to a wide river, averaging about 800 feet wide, with a surface area of 6,290 acres. Claiborne Lake extends 60 miles upstream to the Millers Ferry Lock and Dam. Storage capacity in the lake is 102,480 acre-feet at a maximum elevation of 36 feet NGVD29. The operating pool elevation limits are between 32 feet NGVD29 and 36 feet NGVD29. The lake has an authorized 9-foot-deep, 200-foot-wide navigation channel extending its entire length. The primary purpose of the Corps project is navigation. No hydropower generating capability exists at the project. The lake also provides recreation benefits and lands managed for wildlife mitigation.

G. As other ACT water management objectives are addressed, lake levels might decline during prime recreation periods. Drought conditions will cause further drawdowns in lake levels. While lake levels will be slightly higher than what would naturally occur if no specific drought actions are taken, reservoir levels will decline thus triggering impacts associated with reaching initial recreation and water access limited levels. Large reservoir drawdowns impact recreational use: access to the water for boaters and swimmers is inhibited; submerged hazards (e.g., trees, shoals, boulders) become exposed or nearly exposed, posing safety issues; and exposed banks and lake bottoms become unsightly and diminish the recreation experience. Consequently certain levels are identified in each Corps impoundment at which recreation would be affected. The *Initial Impact level* (IIL) represents the level at which recreation impacts are first observed (i.e., some boat launching ramps are unusable, most beaches are unusable or minimally usable, and navigation hazards begin to surface). The *Recreation Impact level* (RIL) defines the level at which major impacts on concessionaires and recreation are observed (more ramps are not usable, all beaches are unusable, boats begin having problems maneuvering in and out of marina basin areas, loss of retail business occurs). The level at which severe impacts are observed in all aspects of recreational activities is called the *Water Access Limited level* (WAL). At this point, all or almost all boat ramps are out of service, all swimming beaches are unusable, major navigation hazards occur, channels to marinas are impassable and/or wet slips must be relocated, and a majority of private boat docks are unusable. The individual project water control manuals describe the specific impact levels at each project and provide information regarding the effects of the water control plans on recreation.

V – WATER USES AND USERS

5-01. Water Uses and Users.

A. Uses – The ACT Basin rivers and lakes provide for wastewater dilution, M&I water supply, fish and wildlife propagation, hydropower generation, and recreational boating and fishing.

B. Users – The following tables list the surface water uses and water users within Georgia and Alabama in the ACT Basin.

Table 2. Surface water use: ACT Basin (Georgia 2005)

Water use category	Quantity (mgd)	% of total
Total Use	788.98	100%
Public Supply	154.78	19.6%
Domestic and Commercial	0.30	0.0%
Industrial and Mining	32.49	4.1%
Irrigation	11.31	1.4%
Livestock	16.18	2.1%
Thermoelectric Power Generation	573.92	72.8%

Table 3. M&I surface water withdrawal permits in the ACT Basin (Georgia)

River basin	Permit holder	Permit number	County	Source water	Permit limit max day (mgd)	Permit limit monthly average (mgd)
Coosa River Basin (Georgia)—upstream counties to downstream counties						
Coosa	Dalton Utilities, Conasauga R	155-1404-01	Whitfield	Conasauga River	49.400	40.300
Coosa	Dalton Utilities, Mill Creek	155-1404-02	Whitfield	Mill Creek	13.200	7.500
Coosa	Dalton Utilities, Coahulla Cr	155-1404-03	Whitfield	Coahulla Creek	6.000	5.000
Coosa	Dalton Utilities, Freeman Sprngs	155-1404-04	Whitfield	Freeman Springs	2.000	1.500
Coosa	Dalton Utilities - River Road	155-1404-05	Whitfield	Conasauga River	35.000	18.000
Coosa	Chatsworth WW Commission	105-1405-01	Murray	Holly Creek	1.100	1.000
Coosa	Chatsworth WW Commission	105-1405-02	Murray	Eton Springs	1.800	1.800
Coosa	Chatsworth WW Commission	105-1409-01	Murray	Carters Lake	2.550	2.300
Coosa	Chatsworth, City of	105-1493-02	Murray	Coosawattee River	2.200	2.000
Coosa	Ellijay, City of - Ellijay R	061-1407-01	Gilmer	Ellijay River	0.550	0.450
Coosa	Ellijay - Gilmer County W & S Authority	061-1408-01	Gilmer	Cartecay River	4.000	4.000
Coosa	Calhoun, City of	064-1411-03	Gordon	Big Spring	7.000	6.000
Coosa	Calhoun, City of	064-1412-01	Gordon	City Of Calhoun Spring	0.638	0.537
Coosa	Calhoun, City of	064-1492-02	Gordon	Oostanaula River	6.200	3.000

Table 3 (continued). M&I surface water withdrawal permits in the ACT Basin (Georgia)

River basin	Permit holder	Permit number	County	Source water	Permit limit max day (mgd)	Permit limit monthly average (mgd)
Coosa	Calhoun, City of	064-1493-01	Gordon	Coosawattee River	18.000	16.000
Coosa	Jasper, City of	112-1417-02	Pickens	Long Swamp Creek	1.000	1.000
Coosa	Bent Tree Community, Inc.	112-1417-03	Pickens	Chestnut Cove Creek and unnamed creek	0.250	0.230
Coosa	Bent Tree Community, Inc.	112-1417-04	Pickens	Lake Tamarack	0.250	0.230
Coosa	Big Canoe Utilities Company, Inc.	112-1417-05	Pickens	Lake Petit	1.000	1.000
Coosa	Big Canoe Utilities Company, Inc.	112-1417-06	Pickens	Blackwell Creek	2.650	2.650
Coosa	Etowah Water & Sewer Authority	042-1415-01	Dawson	Etowah River	5.500	4.400
Coosa	Cherokee County Water & Sewerage Auth	028-1416-01	Cherokee	Etowah River	43.200	36.000
Coosa	Gold Kist, Inc	028-1491-03	Cherokee	Etowah River	5.000	4.500
Coosa	Canton, City of	028-1491-04	Cherokee	Etowah River	23.000	18.700
Coosa	Canton, City of (Hickory Log Creek)	028-1491-05	Cherokee	Etowah River	39.000	39.000
Coosa	Bartow County Water Department	008-1411-02	Bartow	Bolivar Springs	0.800	0.800
Coosa	Adairsville, City of	008-1412-02	Bartow	Lewis Spring	5.100	4.100
Coosa	New Riverside Ochre Company, Inc.	008-1421-01	Bartow	Etowah River	5.000	5.000
Coosa	New Riverside Ochre Company, Inc.	008-1421-02	Bartow	Etowah River	6.000	6.000
Coosa	Emerson, City of	008-1422-02	Bartow	Moss Springs	0.630	0.500
Coosa	Gerdau AmeriSteel US, Inc. – Cartersville Steel Mill	008-1423-01	Bartow	Pettit Creek	2.000	1.500
Coosa	Baroid Drilling Fluids, Inc.	008-1423-02	Bartow	Etowah River	3.400	2.500
Coosa	Cartersville, City of	008-1423-04	Bartow	Etowah River	26.420	23.000
Coosa	Georgia Power Co. - Plant Bowen	008-1491-01	Bartow	Etowah River	520.000	85.000
Coosa	CCMWA	008-1491-05	Bartow	Allatoona Lake	86.000	78.000
Coosa	Cartersville, City of	008-1491-06	Bartow	Allatoona Lake	21.420	18.000
Coosa	La Fayette, City of Dry Creek	146-1401-01	Walker	Dry Creek	1.000	0.900
Coosa	La Fayette, City of Big Spring	146-1401-02	Walker	Big Spring	1.650	1.310
Coosa	Mount Vernon Mills - Riegel Apparel Div.	027-1401-03	Chattooga	Trion Spring	9.900	6.600
Coosa	Summerville, City of	027-1402-02	Chattooga	Raccoon Creek	3.000	2.500
Coosa	Summerville, City of	027-1402-04	Chattooga	Lowe Spring	0.750	0.500
Coosa	Mohawk Industries, Inc.	027-1402-05	Chattooga	Chattooga R./ Raccoon Cr.	4.500	4.000
Coosa	Oglethorpe Power Corp.	057-1402-03	Floyd	Heath Creek	3,838.000	3,030.000
Coosa	Floyd County - Brighton Plant	057-1414-02	Floyd	Woodward Creek	0.800	0.700
Coosa	Cave Spring, City of	057-1428-06	Floyd	Cave Spring	1.500	1.300

Table 3 (continued). M&I surface water withdrawal permits in the ACT Basin (Georgia)

River basin	Permit holder	Permit number	County	Source water	Permit limit max day (mgd)	Permit limit monthly average (mgd)
Coosa	Floyd County	057-1428-08	Floyd	Old Mill Spring	4.000	3.500
Coosa	Berry Schools, The (Berry College)	057-1429-01	Floyd	Berry (Possum Trot) Reservoir	1.000	0.700
Coosa	Inland-Rome Inc.	057-1490-01	Floyd	Coosa River	34.000	32.000
Coosa	Georgia Power Co. - Plant Hammond	057-1490-02	Floyd	Coosa River	655.000	655.000
Coosa	Rome, City of	057-1492-01	Floyd	Oostanaula & Etowah R	18.000	16.400
Coosa	Rockmart, City of	115-1425-01	Polk	Euharlee Creek	2.000	1.500
Coosa	Vulcan Construction Materials, L.P.	115-1425-03	Polk	Euharlee Creek	0.200	0.200
Coosa	Cedartown, City of	115-1428-04	Polk	Big Spring	3.000	2.600
Coosa	Polk County Water Authority	115-1428-05	Polk	Aragon, Morgan, Mulco Springs	1.600	1.100
Coosa	Polk County Water Authority	115-1428-07	Polk	Deaton Spring	4.000	4.000
Tallapoosa River Basin (Georgia)						
Tallapoosa	Haralson County Water Authority	071-1301-01	Haralson	Tallapoosa River	3.750	3.750
Tallapoosa	Bremen, City of	071-1301-02	Haralson	Beech Creek & Bremen Reservoir (Bush Creek)	0.800	0.580
Tallapoosa	Bowdon, City of Indian	022-1302-01	Carroll	Indian Creek	0.400	0.360
Tallapoosa	Southwire Company	022-1302-02	Carroll	Buffalo Creek	2.000	1.000
Tallapoosa	Villa Rica, City of	022-1302-04	Carroll	Lake Paradise & Cowens Lake	1.500	1.500
Tallapoosa	Carrollton, City of	022-1302-05	Carroll	Little Tallapoosa River	12.000	12.000
Tallapoosa	Bowdon, City of Lake Tysinger	022-1302-06	Carroll	Lake Tysinger	1.000	1.000

Source: GAEPD 2009a

Table 4. M&I surface water withdrawals in the ACT Basin (Georgia)

Basin (subbasin)	Withdrawal by	County	Withdrawal (mgd)
Coosa River Basin (Georgia)			
Coosa (Conasauga)	Dalton Utilities	Whitfield	35.38
Coosa (Conasauga)	City of Chatsworth	Murray	1.26
Coosa (Coosawattee)	Ellijay-Gilmer County Water System	Gilmer	3.12
Coosa (Coosawattee)	City of Fairmount	Gordon	0.06
Coosa (Oostanaula)	City of Calhoun	Gordon	9.10
Coosa (Etowah)	Big Canoe Corporation	Pickens	0.48
Coosa (Etowah)	City of Jasper	Pickens	1.00
Coosa (Etowah)	Bent Tree Community	Pickens	0.07

Table 4 (continued). M&I surface water withdrawals in the ACT Basin (Georgia)

Basin (subbasin)	Withdrawal by	County	Withdrawal (mgd)
Coosa (Etowah)	Lexington Components Inc (Rubber)	Pickens	0.01
Coosa (Etowah)	Etowah Water and Sewer Authority	Dawson	1.50
Coosa (Etowah)	Town of Dawsonville	Dawson	0.10
Coosa (Etowah)	City of Canton	Cherokee	2.83
Coosa (Etowah)	Cherokee County Water System	Cherokee	15.81
Coosa (Etowah)a	Gold Kist, Inc.	Cherokee	1.94
Coosa (Etowah)	City of Cartersville	Bartow	13.26
Coosa (Etowah)	New Riverside Ochre Company, Inc (Chemicals)	Bartow	1.67
Coosa (Etowah)	Gerdau AmeriSteel US, Inc. – Cartersville Steel Mill (Primary metals)	Bartow	0.16
Coosa (Etowah)	Georgia Power Co – Plant Bowen	Bartow	38.92
Coosa (Etowah)	CCMWA	Bartow	44.42
Coosa (Upper Coosa)	City of Lafayette	Walker	1.20
Coosa (Upper Coosa)	City of Summerville	Chattooga	2.05
Coosa (Upper Coosa)	Mount Vernon Mills – Riegel Apparel Division (Textiles)	Chattooga	2.74
Coosa (Oostanaula)	City of Cave Spring (Domestic/Commercial)	Floyd	0.30
Coosa (Etowah / Oostanaula)	City of Rome	Floyd	9.98
Coosa (Upper Coosa)	Floyd County Water System	Floyd	2.57
Coosa (Upper Coosa)	Inland-Rome Inc. (Paper)	Floyd	25.74
Coosa (Upper Coosa)	Georgia Power Co - Plant Hammond	Floyd	535.00
Coosa (Upper Coosa)	Polk County Water Authority	Polk	2.22
Coosa (Etowah)	Vulcan Construction Materials	Polk	0.09
Tallapoosa River Basin (Georgia)			
Tallapoosa (Upper)	City of Bremen	Haralson	0.32

Table 4 (continued). M&I surface water withdrawals in the ACT Basin (Georgia)

Basin (subbasin)	Withdrawal by	County	Withdrawal (mgd)
Tallapoosa (Upper)	Haralson County Water Authority	Haralson	2.05
Tallapoosa (Upper)	City of Bowdon	Carroll	0.75
Tallapoosa (Upper)	Southwire Company	Carroll	0.09
Tallapoosa (Upper)	City of Carrollton	Carroll	5.37
Tallapoosa (Upper)	City of Temple	Carroll	0.26
Tallapoosa (Upper)	City of Villa Rica	Carroll	0.58
Tallapoosa (Upper)	Carroll County Water System	Carroll	4.08

Table 5. Surface water use - ACT Basin (Alabama, 2005) (mgd)

ACT subbasin	HUC	Public supply	Industrial	Irrigation	Livestock	Thermo-electric	Total, by Subbasin
Upper Coosa	03150105	2.12	0	3.10	0.40	0	5.62
Middle Coosa	03150106	33.24	65.83	7.91	0.87	142.68	250.53
Lower Coosa	03150107	10.96	0.89	5.10	0.35	812.32	829.62
Upper Tallapoosa	03150108	0.90	0	0.15	0.40	0	1.45
Middle Tallapoosa	03150109	19.09	0	0.52	0.32	0	19.93
Lower Tallapoosa	03150110	38.22	2.23	4.22	0.28	0	44.95
Upper Alabama	03150201	10.40	30.63	3.84	0.84	4.14	49.85
Cahaba	03150202	52.90	0	3.49	0.25	0	56.64
Middle Alabama	03150203	0	21.04	1.73	0.48	0	23.25
Lower Alabama	03150204	0	54.61	0.64	0.02	0	55.27
Total - By Use Category		167.83	175.23	30.70	4.21	959.14	1337.11

Source: Hutson et al. 2009

Table 6. M&I surface water withdrawals in the ACT Basin (Alabama)

Basin (subbasin)	Withdrawal by	County	Withdrawal (mgd)
Coosa River Basin (Alabama)			
Coosa (Upper)	Centre Water Works & Sewer Board	Cherokee	1.19
Coosa (Upper)	Piedmont Water Works & Sewer Board	Calhoun	0.93
Coosa (Middle)	Jacksonville Water Works & Sewer Board	Calhoun	1.34
Coosa (Middle)	Anniston Water Works & Sewer Board	Calhoun	0.08
Coosa (Middle)	Fort Payne Water Works Board	DeKalb	8.10
Coosa (Middle)	Goodyear Tire and Rubber Company	Etowah	9.87
Coosa (Middle)	Gadsden Water Works & Sewer Board	Etowah	14.86
Coosa (Middle)	Alabama Power Co – Gadsden Steam Plant	Etowah	142.68
Coosa (Middle)	SIC 32 – Unnamed Stone, Glass, Clay, and/or Concrete Products	St. Clair	3.49
Coosa (Middle)	Talladega/Shelby Water Treatment Plant	Talladega	6.44
Coosa (Middle)	Talladega County Water Department	Talladega	0.81
Coosa (Middle)	Talladega Water Works & Sewer Board	Talladega	1.62
Coosa (Middle)	Bowater Newsprint, Coosa Pines Operation	Talladega	52.47
Coosa (Lower)	Sylacauga Utilities Board	Talladega	3.25
Coosa (Lower)	SIC 22 – Unnamed Textile	Talladega	0.89
Coosa (Lower)	Goodwater Water Works & Sewer Board	Coosa	0.46
Coosa (Lower)	Alabama Power Co – E.C. Gaston Plant	Shelby	812.32
Coosa (Lower)	Clanton Waterworks & Sewer Board	Chilton	1.79
Coosa (Lower)	Five Star Water Supply	Elmore	5.46
Tallapoosa River Basin (Alabama)			
Tallapoosa (Upper)	Heflin Water Works	Cleburne	0.51
Tallapoosa (Upper)	Wedowee Gas, Water, and Sewer	Randolph	0.39
Tallapoosa (Middle)	Roanoke Utilities Board	Randolph	1.29
Tallapoosa (Middle)	Clay County Water Authority	Clay	1.87
Tallapoosa (Middle)	Lafayette	Chambers	0.53
Tallapoosa (Middle)	Central Elmore Water & Sewer Authority	Elmore	4.83
Basin (subbasin)	**Withdrawal by**	**County**	**Withdrawal (mgd)**
Tallapoosa (Middle)	Alexander City Water Department	Tallapoosa	10.57
Tallapoosa (Lower)	West Point Home, Inc	Lee	2.23
Tallapoosa (Lower)	Opelika Water Works Board	Lee	2.61
Tallapoosa (Lower)	Auburn Water Works Board	Lee	5.75

Table 6. (continued) M&I surface water withdrawals in the ACT Basin (Alabama)

Basin (subbasin)	Withdrawal by	County	Withdrawal (mgd)
Tallapoosa (Lower)	Tallassee	Tallapoosa	1.98
Tallapoosa (Lower)	Tuskegee Utilities	Macon	2.71
Tallapoosa (Lower)	Montgomery Water Works & Sewer Board	Montgomery	25.17
Alabama River Basin			
Alabama (Upper)	Montgomery Water Works & Sewer Board	Montgomery	10.40
Alabama (Upper)	International Paper	Autauga	30.63
Alabama (Upper)	Southern Power Co – Plant E. B. Harris	Autauga	4.14
Alabama (Cahaba)	Birmingham Water Works & Sewer Board	Shelby	52.90
Alabama (Middle)	International Paper – Pine Hill	Wilcox	21.04
Alabama (Lower)	Alabama River Pulp Company	Monroe	54.61

Source: Hutson et al. 2009

VI. – CONSTRAINTS

6-01. **General**. The availability of water resources in the ACT Basin is constrained by existing water supply storage contracts, Corps water control manuals, minimum flow requirements from Allatoona and Carters Dams, APC FERC licenses, Corps-APC Memorandum of Understanding, and industrial water quality flow needs. Existing water supply storage contracts do not include the use of the inactive storage pool and would require developing and implementing an emergency storage contract in order to access this water resource. Each Corps project has a water control manual that specifies operational requirements for varying basin conditions and requires a deviation approval to operate outside the parameters established by the manual. The Allatoona Project has a minimum flow release requirement of 240 cfs for downstream purposes. The Carters Project has a seasonally varying minimum flow release requirement that ranges from 250 – 865 cfs during normal conditions and a minimum of 240 cfs during low flow conditions. The APC projects are operated under FERC licenses which define specific operational requirements for each project and require approval from FERC and possibly the Corps and State agencies before any revised operations could be implemented. The Corps and APC projects are also operated under the rules and regulations found in the Corps-APC Memorandum of Understanding, which describes operational requirements for flood conditions and navigation within the ACT Basin. Some industrial NPDES permits within the ACT Basin have water quality discharge limitations which are impacted by the volume of water flow in the river.

VII – DROUGHT MANAGEMENT PLAN

7-01. **General**. The Drought Contingency Plan (DCP) for the ACT Basin implements drought conservation actions on the basis of composite system storage, state line flows, and basin inflow as triggers to drive drought response actions. The DCP also recognizes that a basin-wide drought plan must incorporate variable hydropower generation requirements from its headwater projects in Georgia (Allatoona Dam and Carters Dam), a reduction in the level of

navigation service provided on the Alabama River as storage across the basin declines, and that environmental flow requirements must still be met to the maximum extent practicable. The ACT basin-wide drought plan is composed of three components — Headwater regulation at Allatoona Lake and Carters Lake in Georgia; Regulation at APC projects on the Coosa and Tallapoosa Rivers; and Downstream Alabama River regulation at Corps projects downstream of Montgomery, Alabama.

A. **Headwater Regulation for Drought at Allatoona Lake and Carters Lake**. Drought regulation at Allatoona Lake and Carters Lake consists of progressively reduced hydropower generation as pool levels decline in accordance with the conservation storage action zones established in the projects' water control plans. For instance, when Allatoona Lake is operating in normal conditions (Conservation storage Zone 1); hydropower generation typically ranges from 0 to 4 hours per day. However, as the pool drops to lower action zones during drought conditions, generation could be reduced to 0 to 2 hours per day. As Carters Lake pool level might drop into a conservation storage Zone 2, seasonal varying minimum target flows would be reduced to 240 cfs. The water control manual for each project describes the drought water control regulation plan in more detail.

B. **Drought Regulation at APC Projects on the Coosa, Tallapoosa, and Alabama River**. Regulation guidelines for the Coosa, Tallapoosa, and Alabama Rivers have been defined in a drought regulation matrix (Table 7) on the basis of a Drought Intensity Level (DIL). The DIL is a drought indicator, ranging from one to three. The DIL is determined on the basis of three basin drought criteria (or triggers). A DIL from 1 to 3 indicates some level of drought conditions. The DIL increases as more of the drought indicator thresholds (or triggers) occur. The drought regulation matrix defines minimum average daily flow requirements on a monthly basis for the Coosa, Tallapoosa, and Alabama Rivers as a function of the DIL and time of year. The combined occurrences of the drought triggers determine the DIL. Three intensity levels for drought operations are applicable to APC projects.

DIL 1 — (moderate drought) 1 of 3 triggers occur
DIL 2 — (severe drought) 2 of 3 triggers occur
DIL 3 — (exceptional drought) all 3 triggers occur

(1) Drought Indicators. The indicators used to determine drought intensity include the following:

1. **Low basin inflow**. The total basin inflow needed is the sum of the total filling volume plus 4,640 cfs. The total filling volume is defined as the volume of water required to return the pool to the top of the conservation guide curve and is calculated using the area-capacity tables for each project. Table 8 lists the monthly low basin inflow criteria. The basin inflow value is computed daily and checked on the first and third Tuesday of the month. If computed basin inflow is less than the value required, the low basin inflow indicator is triggered. The basin inflow is total flow above the APC projects excluding Allatoona Lake and Carters Lake. It is the sum of local flows, minus lake evaporation and diversions. Figure 11 illustrates the local inflows to the Coosa and Tallapoosa Basins. The basin inflow computation differs from the navigation basin inflow, because it does not include releases from Allatoona Lake and Carters Lake. The intent is to capture the hydrologic condition across APC projects in the Coosa and Tallapoosa Basins.

Table 7. ACT Basin Drought Regulation Plan Matrix

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Drought Level Response[a]	Normal Operations											
	DIL 1: Low Basin Inflows or Low Composite or Low State Line Flow											
	DIL 2: DIL 1 criteria + (Low Basin Inflows or Low Composite or Low State Line Flow)											
	DIL 3: Low Basin Inflows + Low Composite + Low State Line Flow											
Coosa River Flow[b]	Normal Operation: 2,000 cfs			4,000 (8,000)		4,000 – 2,000	Normal Operation: 2,000 cfs					
	Jordan 2,000 +/-cfs			4,000 +/- cfs		6/15 Linear Ramp down	Jordan 2,000 +/-cfs			Jordan 2,000 +/-cfs		
	Jordan 1,600 to 2,000 +/-cfs			2,500 +/- cfs		6/15 Linear Ramp down	Jordan 2,000 +/-cfs			Jordan 1,600 to 2,000 +/-cfs		
	Jordan 1,600 +/-cfs			Jordan 1,600 to 2,000 +/-cfs			Jordan 2,000 +/-cfs			Jordan 1,600 to 2,000 +/-cfs		Jordan 1,600 +/-cfs
Tallapoosa River Flow[c]	Normal Operations: 1200 cfs											
	Greater of: 1/2 Yates Inflow or 2 x Heflin Gage(Thurlow Lake releases > 350 cfs)				1/2 Yates Inflow					1/2 Yates Inflow		
	Thurlow Lake 350 cfs				1/2 Yates Inflow					Thurlow Lake 350 cfs		
	Maintain 400 cfs at Montgomery WTP (Thurlow Lake release 350 cfs)						Thurlow Lake 350 cfs			Maintain 400 cfs at Montgomery WTP (Thurlow Lake release 350 cfs)		
Alabama River Flow[d]	Normal Operation: Navigation or 4,640 cfs flow											
	4,200 cfs (10% Cut) - Montgomery				4,640 cfs - Montgomery					Reduce: Full – 4,200 cfs		
	3,700 cfs (20% Cut) - Montgomery					4,200 cfs (10% Cut) - Montgomery				Reduce: 4,200 cfs-> 3,700 cfs Montgomery (1 week ramp)		
	2,000 cfs Montgomery				3,700 cfs Montgomery		4,200 cfs (10% Cut) - Montgomery			Reduce: 4,200 cfs -> 2,000 cfs Montgomery (1 month ramp)		
Guide Curve Elevation	Normal Operations: Elevations follow Guide Curves as prescribed in License (Measured in Feet)											
	Corps Variances: As Needed; FERC Variance for Lake Martin											
	Corps Variances: As Needed; FERC Variance for Lake Martin											
	Corps Variances: As Needed; FERC Variance for Lake Martin											

a. Note these are based on flows that will be exceeded when possible.
b .Jordan flows are based on a continuous +/- 5% of target flow.
c. Thurlow Lake flows are based on continuous +/- 5% of target flow: flows are reset on noon each Tuesday based on the prior day's daily average at Heflin or Yates.
d. Alabama River flows are 7-Day Average Flow.

Table 8. Low Basin Inflow Guide (in cfs-days)

Month	Coosa Filling Volume	Tallapoosa Filling Volume	Total Filling Volume	Minimum JBT Target Flow	Required Basin Inflow
Jan	628	0	628	4,640	5,268
Feb	626	1,968	2,594	4,640	7,234
Mar	603	2,900	3,503	4,640	8,143
Apr	1,683	2,585	4,269	4,640	8,909
May	248	0	248	4,640	4,888
Jun			0	4,640	4,640
Jul			0	4,640	4,640
Aug			0	4,640	4,640
Sep	–612	–1,304	–1,916	4,640	2,724
Oct	–1,371	–2,132	–3,503	4,640	1,137
Nov	–920	–2,748	–3,667	4,640	973
Dec	–821	–1,126	–1,946	4,640	2,694

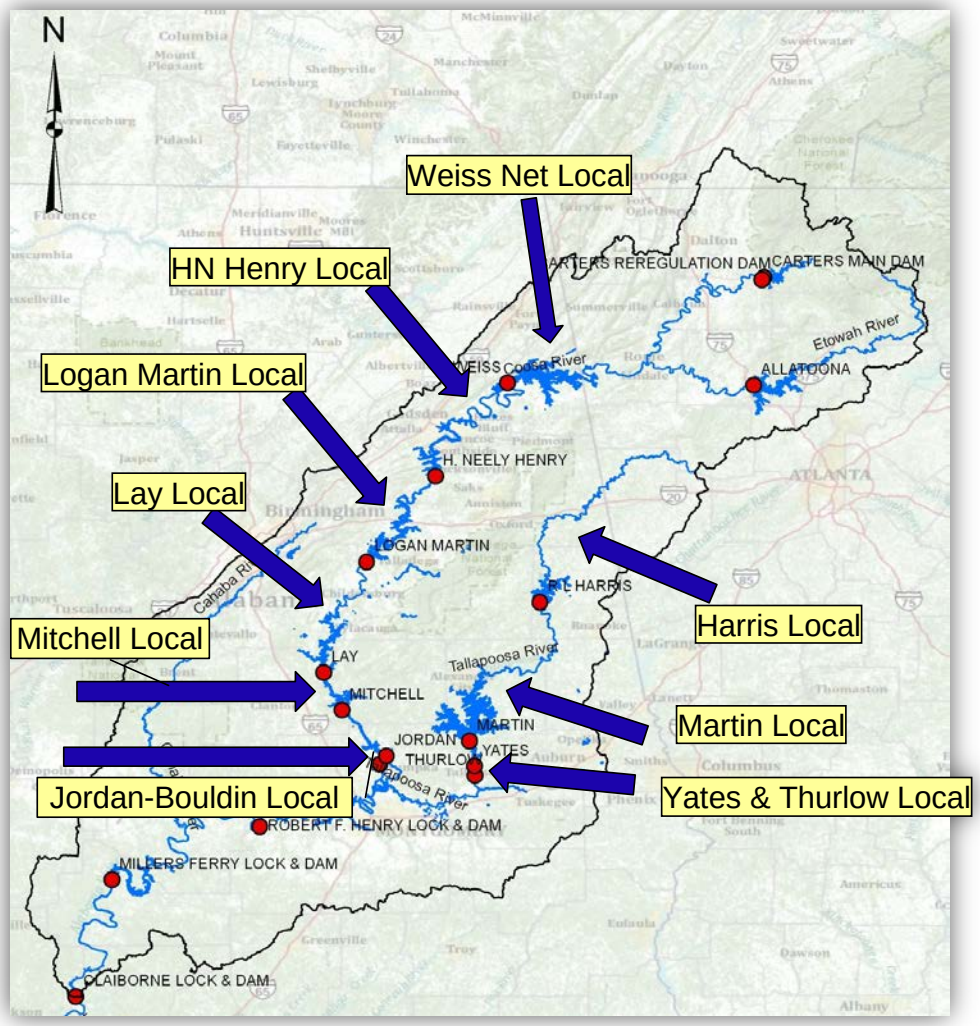


Figure 11. ACT Basin Inflows

2. **Low composite conservation storage**. Low composite conservation storage occurs when the APC projects' composite conservation storage is less than or equal to the storage available within the drought contingency curves for the APC reservoirs. Composite conservation storage is the sum of the amounts of storage available at the current elevation for each reservoir down to the drought contingency curve at each APC major storage project. The reservoirs considered for the trigger are R.L. Harris Lake, H. Neely Henry Lake, Logan Martin Lake, Lake Martin, and Weiss Lake. Figure 12 plots the APC composite zones. Figure 13 plots the APC low composite conservation storage trigger. If the actual active composite conservation storage is less than or equal to the active composite drought zone storage, the low composite conservation storage indicator is triggered. That computation is performed on the first and third Tuesday of each month, and is considered along with the low state line flow trigger and basin inflow trigger.

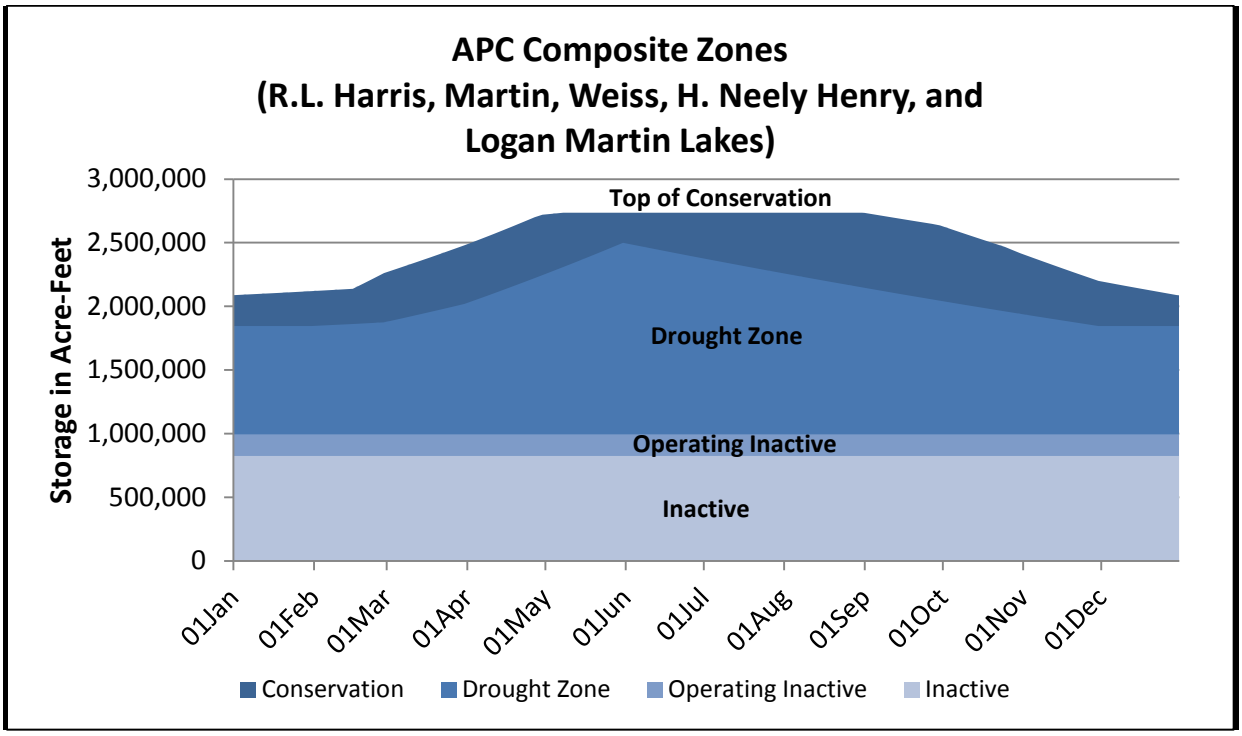


Figure 12. APC Composite Zones

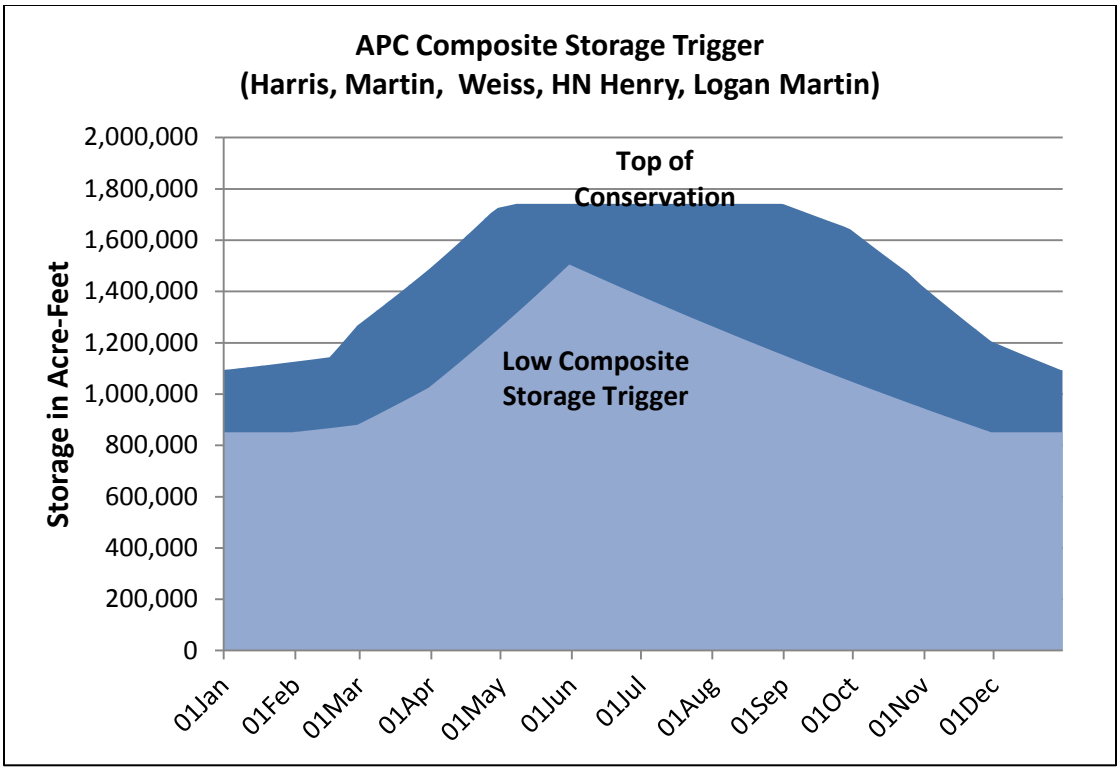


Figure 13. APC Low Composite Conservation Storage Drought Trigger

3. **Low state line flow**. A low state line flow trigger occurs when the Mayo's Bar USGS gage measures a flow below the monthly historical 7Q10 flow. The 7Q10 flow is defined as the lowest flow over a 7-day period that would occur once in 10 years. Table 9 lists the Mayo's Bar 7Q10 value for each month (determined from observed flows from 1949 – 2006). The lowest 7-day average flow over the past 14 days is computed and checked at the first and third Tuesday of the month. If the lowest 7-day average value is less than the Mayo's Bar 7Q10 value, the low state line flow indicator is triggered. If the result is greater than or equal to the trigger value from Table 9, the flow is considered normal, and the state line flow indicator is not triggered. The term state line flow is used in developing the drought management plan because of the proximity of the Mayo's Bar gage to the Alabama-Georgia state line and because it relates to flow data upstream of the Alabama-based APC reservoirs. State line flow is used only as a source of observed data for one of the three triggers and does not imply that flow targets exist at that geographic location. The ACT Basin drought matrix does not include or imply any Corps regulation that would result in water management decisions at Carters Lake or Allatoona Lake.

Table 9. State Line Flow Triggers

Month	Mayo's Bar (7Q10 in cfs)
Jan	2,544
Feb	2,982
Mar	3,258
Apr	2,911
May	2,497
Jun	2,153
Jul	1,693
Aug	1,601
Sep	1,406
Oct	1,325
Nov	1,608
Dec	2,043

Note: Based on USGS Coosa River at Rome Gage (Mayo's Bar, USGS 02397000) observed flow from 1949 to 2006

(2) Drought Regulation. The DIL is computed on the first and third Tuesday of each month. Once a drought operation is triggered, the DIL can only recover from drought condition at a rate of one level per period. For example, as the system begins to recover from an exceptional drought with DIL 3, the DIL must be stepped incrementally back to zero to resume normal operations. In that case, even if the system triggers return to normal quickly, it will still take at least a month before normal operations can resume - conditions can improve only to DIL 2 for the next 15 days, then DIL 1 for the next 15 days, before finally returning to normal operating conditions.

For normal operations, the matrix shows a Coosa River flow between 2,000 cfs and 4,000 cfs with peaking periods up to 8,000 cfs occurring. The required flow on the Tallapoosa River is a constant 1,200 cfs throughout the year. The navigation flows on the Alabama River are applied to the APC projects. The required navigation depth on the Alabama River is subject to the basin inflow.

For DIL 1, the Coosa River flow varies from 2,000 cfs to 4,000 cfs. On the Tallapoosa River, the required flow is the greater of one-half of the inflow into Yates Lake or twice the Heflin USGS gage from January thru April. For the remainder of the year, the required flow is one-half of Yates Lake inflow. The required flows on the Alabama River are reduced from the amounts required for DIL 0.

For DIL 2, the Coosa River flow varies from 1,600 cfs to 2,500 cfs. On the Tallapoosa River, the minimum is 350 cfs for part of the year and one-half of Yates Lake inflow for the remainder of the year. The requirement on the Alabama River is between 3,700 cfs and 4,200 cfs.

For DIL 3, the flows on the Coosa River range from 1,600 cfs to 2,000 cfs. A constant flow of 350 cfs on the Tallapoosa River is required. It is assumed an additional 50 cfs will occur between Thurlow Lake and the City of Montgomery water supply intake. Required flows on the Alabama River range from 2,000 cfs to 4,200 cfs

In addition to the flow regulation for drought conditions, the DIL affects the flow regulation to support navigation operations. Under normal operations, the APC projects are operated to meet the needed navigation flow target or 4,640 cfs flow as defined in the navigation measure section. Once drought operations begin, flow regulation to support navigation operations is suspended.

7-02. Extreme Drought Conditions. An extreme drought condition exists when the remaining composite conservation storage is depleted, and additional emergency actions may be necessary. When conditions have worsened to this extent, utilization of the inactive storage must be considered. Such an occurrence would typically be contemplated in the second or third year of a drought. Inactive storage capacities have been identified for the two federal projects with significant storage (Figures 14 and 15). The operational concept established for the extreme drought impact level and to be implemented when instituting the use of inactive storage is based on the following actions:

(1) Inactive storage availability is identified to meet specific critical water use needs within existing project authorizations.

(2) Emergency uses and users will be identified in accordance with emergency authorizations and through stakeholder coordination. Typical critical water use needs within the basin are associated with public health and safety.

(3) Weekly projections of the inactive storage water availability to meet the critical water uses in the ACT Basin will be utilized when making water control decisions regarding withdrawals and water releases from the federal reservoirs.

(4) The inactive storage action zones will be developed and instituted as triggers to meet the identified priority water uses (releases will be restricted as storage decreases).

(5) Dam safety considerations will always remain the highest priority. The structural integrity of the dams due to static head limitations will be maintained.

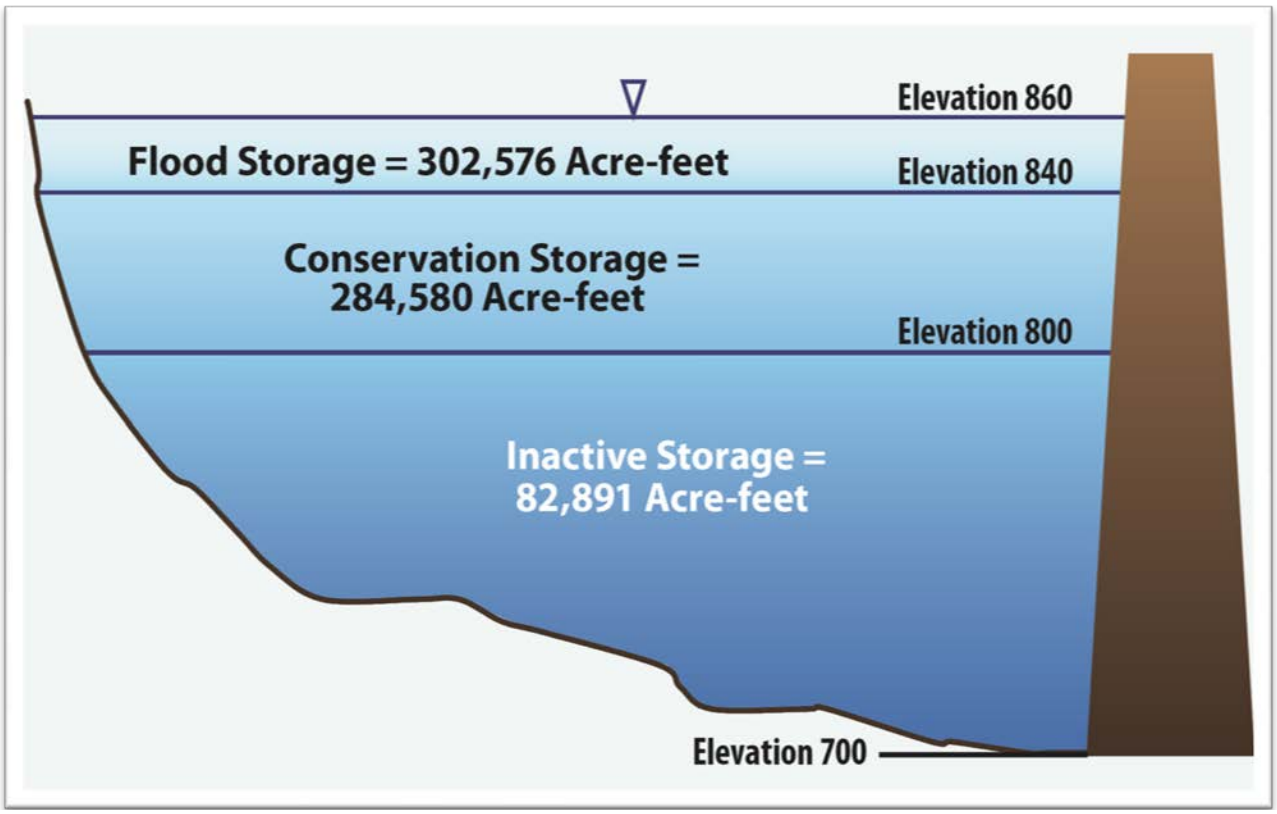


Figure 14. Storage in Allatoona Lake

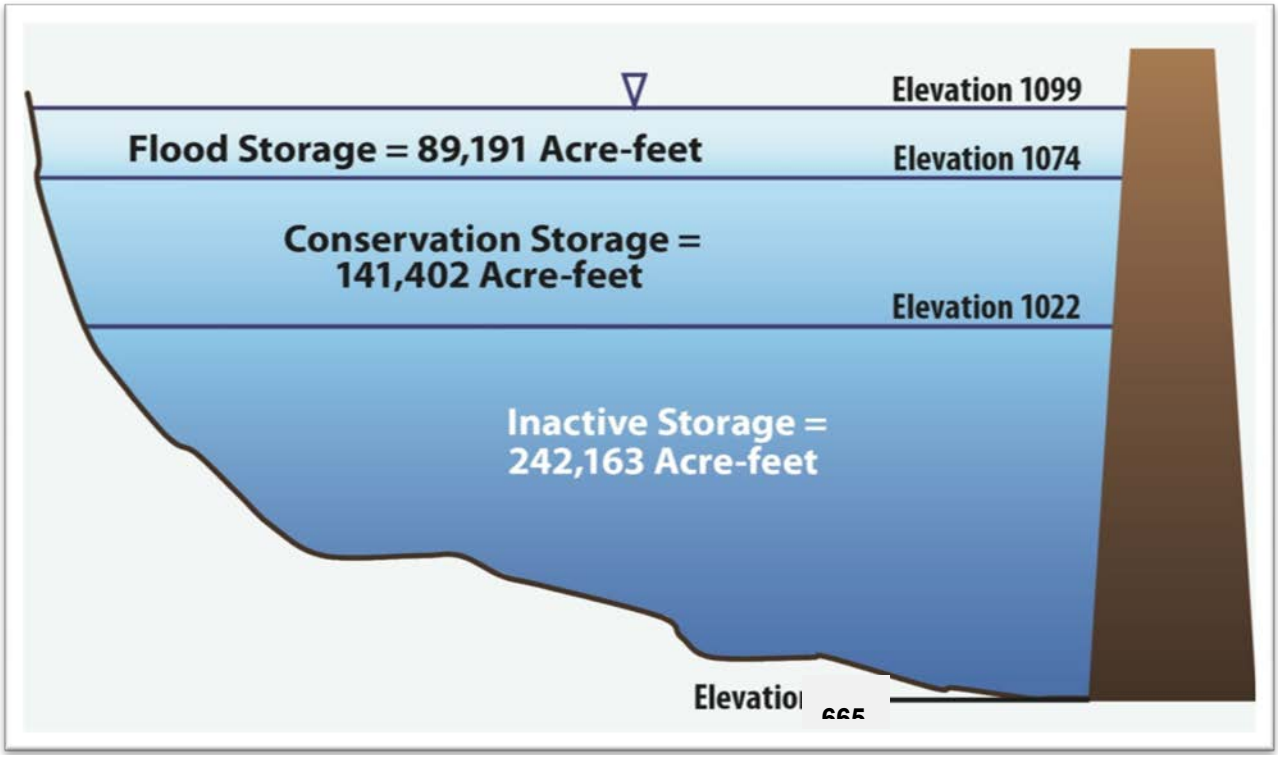


Figure 15. Storage in Carters Lake (excluding reregulation pool)

VIII – DROUGHT MANAGEMENT COORDINATION AND PROCEDURES

8-01. USACE Coordination. It is the responsibility of the Mobile District Water Management Section and APC to monitor climatological and hydrometeorological conditions at all times to make prudent water management decisions. The Water Management Section makes daily decisions and coordinates with APC every two weeks or more often if conditions warrant and with other district representatives from the various areas for which the river systems are operated -- hydropower, recreation, navigation, environmental, and others to exchange information concerning the operation of the river system. This coordination includes conducting weekly meetings with these other district elements. Daily water management decisions regarding water availability, lake level forecasts, and storage forecasts are determined using the information obtained along with current project and basin hydrometeorological data. A weekly District River System Status report is prepared that summarizes the conditions in each of the river basins. When conditions become evident that normal low flow conditions are worsening, the Water Management Section will elevate the district coordination to a heightened awareness. When drought conditions are imminent, Emergency Management representatives will be notified of the conditions and will be included in the regular coordination activities.

8-02. Interagency Coordination. The Water Management Section will support the environmental team regarding actions that require coordination with the U.S. Fish and Wildlife Service (USFWS) for monitoring threatened and endangered species and with the Environmental Protection Agency (EPA), Georgia Environmental Protection Division (GAEPD), and Alabama Department of Environmental Management (ADEM) regarding requests to lower minimum flow targets below Claiborne Dam.

8-03. Public Information and Coordination. When conditions determine that a change in the water control actions from normal regulation to drought regulation is imminent, it is important that various users of the system are notified so that any environmental or operational preparations can be completed prior to any impending reduction in reservoir discharges, river levels, and reservoir pool levels. In periods of severe drought within the ACT Basin it will be within the discretion of the Division Commander to approve the enactment of ACT Basin Water Management conference calls. The purposes of the calls are to share ongoing water management decisions with basin stakeholders and to receive stakeholder input regarding needs and potential impacts to users within the basin. Depending upon the severity of the drought conditions, the calls will be conducted at regular monthly or bi-weekly intervals. Should issues arise, more frequent calls would be implemented.

a. Local Press and Corps Bulletins. The local press consists of periodic publications in or near the ACT Basin. Montgomery, Columbus, and Atlanta have some of the larger daily papers. The papers often publish articles related to the rivers and streams. Their representatives have direct contact with the Corps through the Public Affairs Office. In addition, they can access the Corps Web pages for the latest project information. The Corps and the Mobile District publish e-newsletters regularly which are made available to the general public via email and postings on various websites. Complete, real-time information is available at the Mobile District's Water Management homepage http://water.sam.usace.army.mil/. The Mobile District Public Affairs Office issues press releases as necessary to provide the public with information regarding Water Management issues and activities and also provides information via the Mobile District web site.

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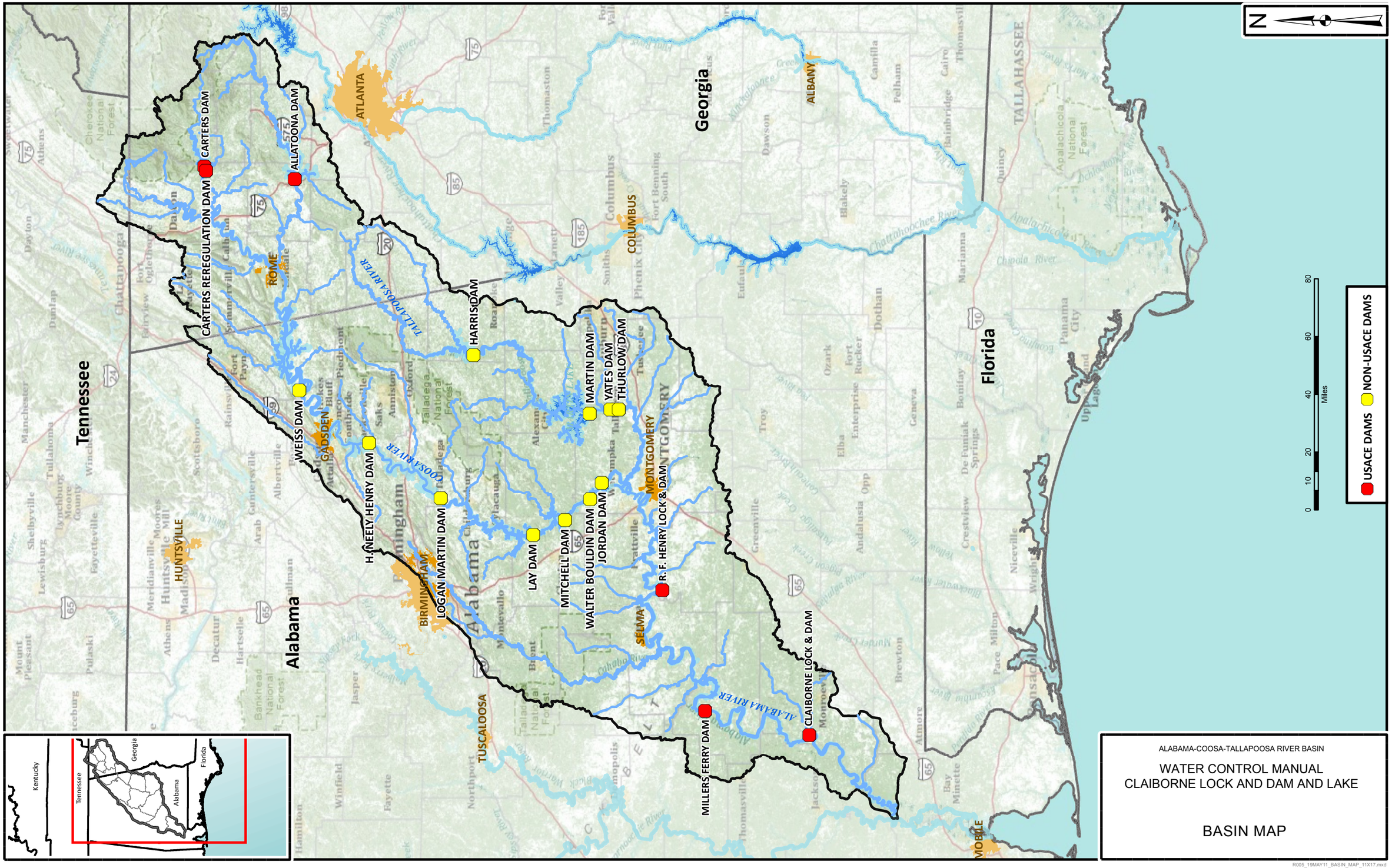
PLATES



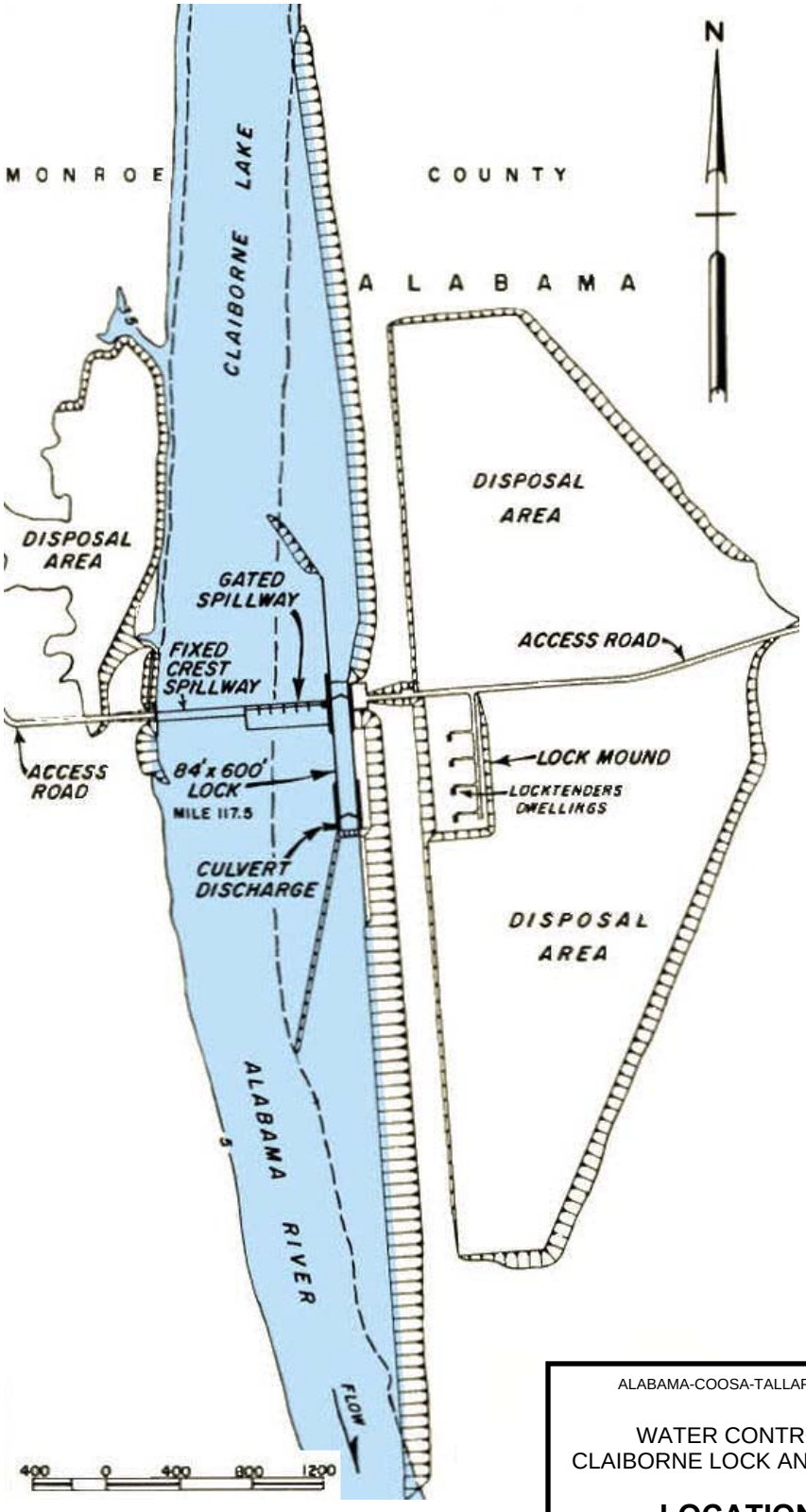
ALABAMA-COOSA-TALLAPOOSA RIVER BASIN

WATER CONTROL MANUAL
CLAIBORNE LOCK AND DAM AND LAKE

BASIN MAP

R005_19MAY11_BASIN_MAP_11X17.mxd

APPENDIX F PLATE 2-1

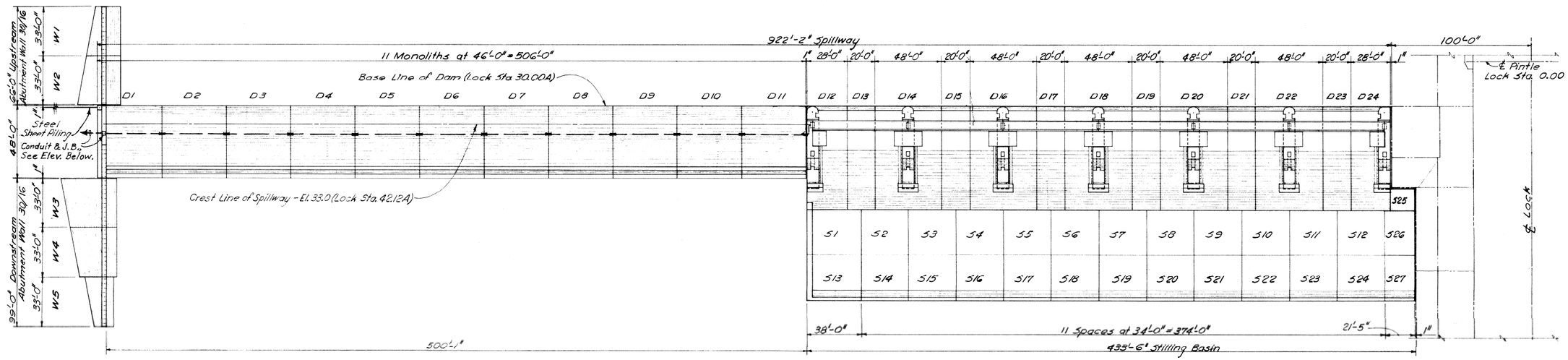


ALABAMA-COOSA-TALLAPOOSA RIVER BASIN

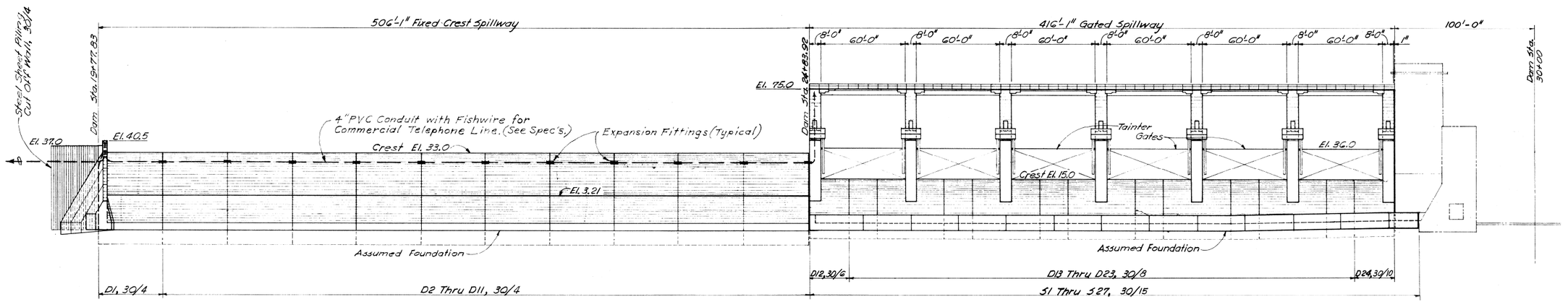
WATER CONTROL MANUAL
CLAIBORNE LOCK AND DAM AND LAKE

LOCATION MAP

APPENDIX F PLATE 2-2



PLAN

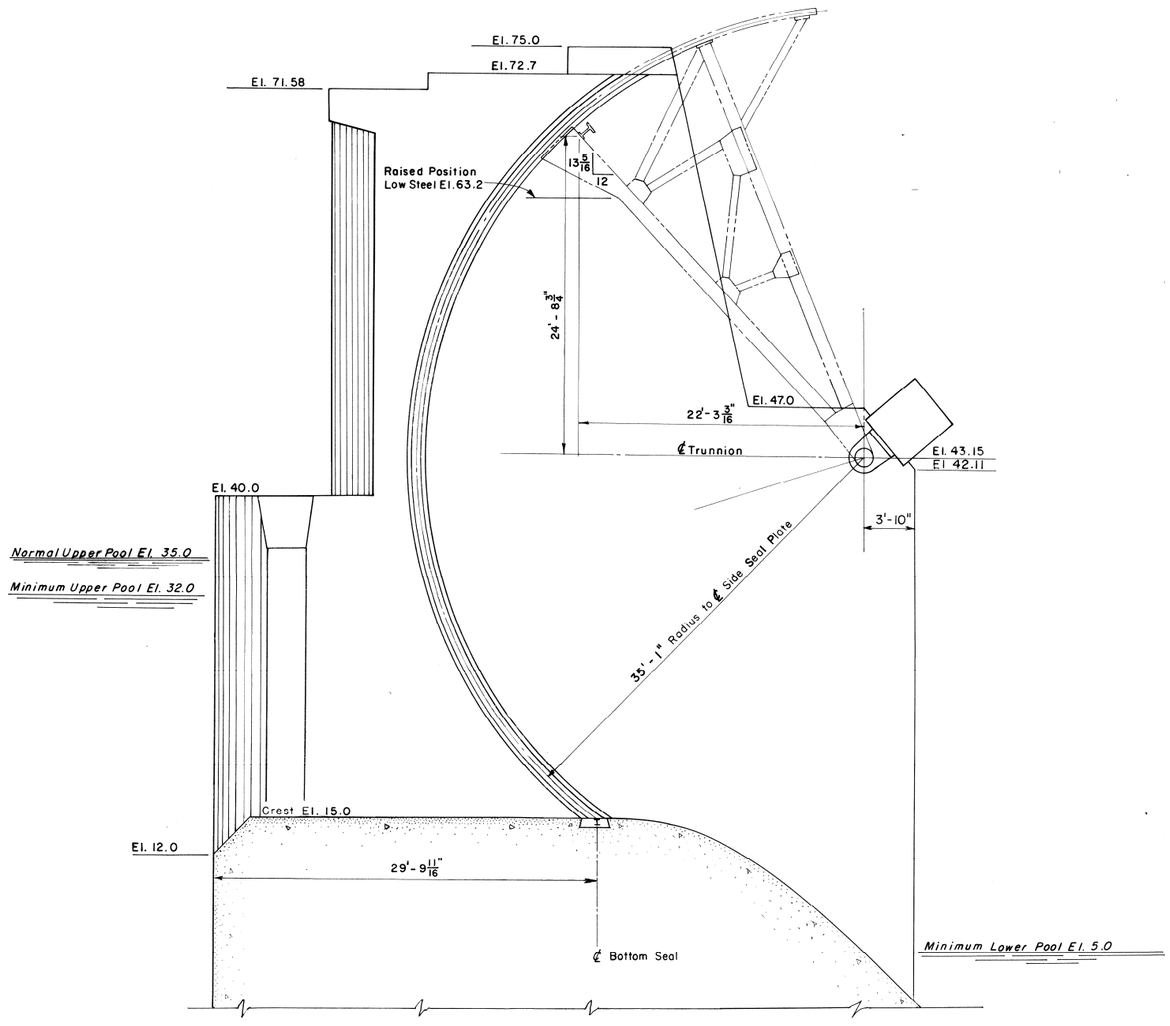


DOWNSTREAM ELEVATION

ALABAMA-COOSA-TALLAPOOSA RIVER BASIN

WATER CONTROL MANUAL
CLAIBORNE LOCK AND DAM AND LAKE

SPILLWAY PLAN AND ELEVATION

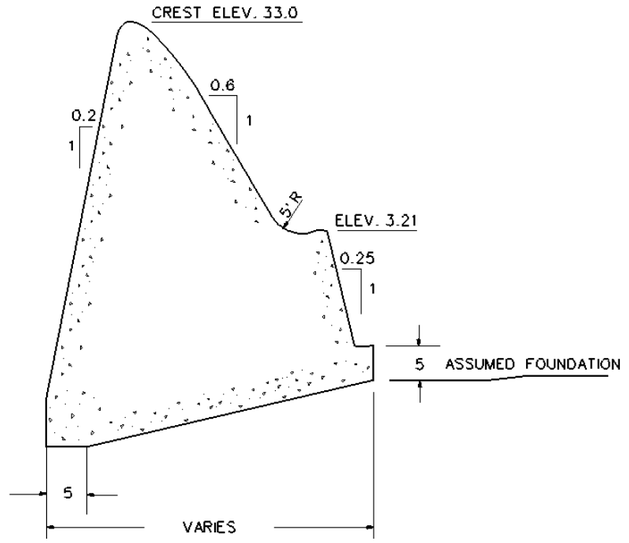


ELEVATION

ELEVATION

INTERMEDIATE PIER ON GATED SPILLWAY

END PIER SIMILAR



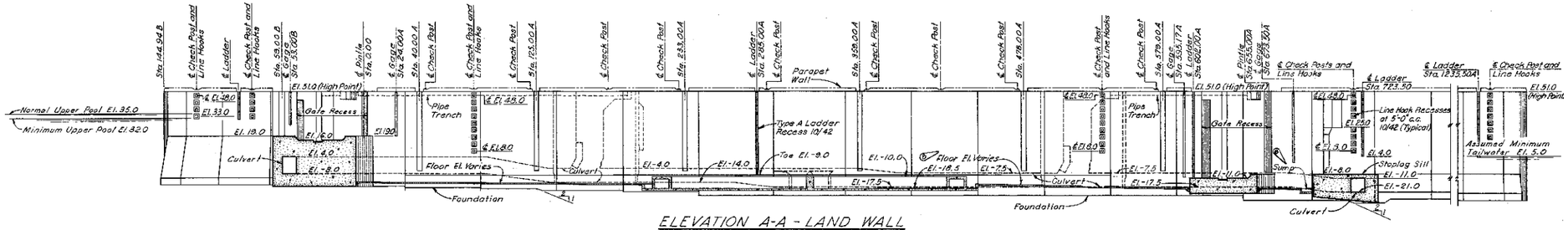
TYPICAL SECTION

FIXED CREST SPILLWAY

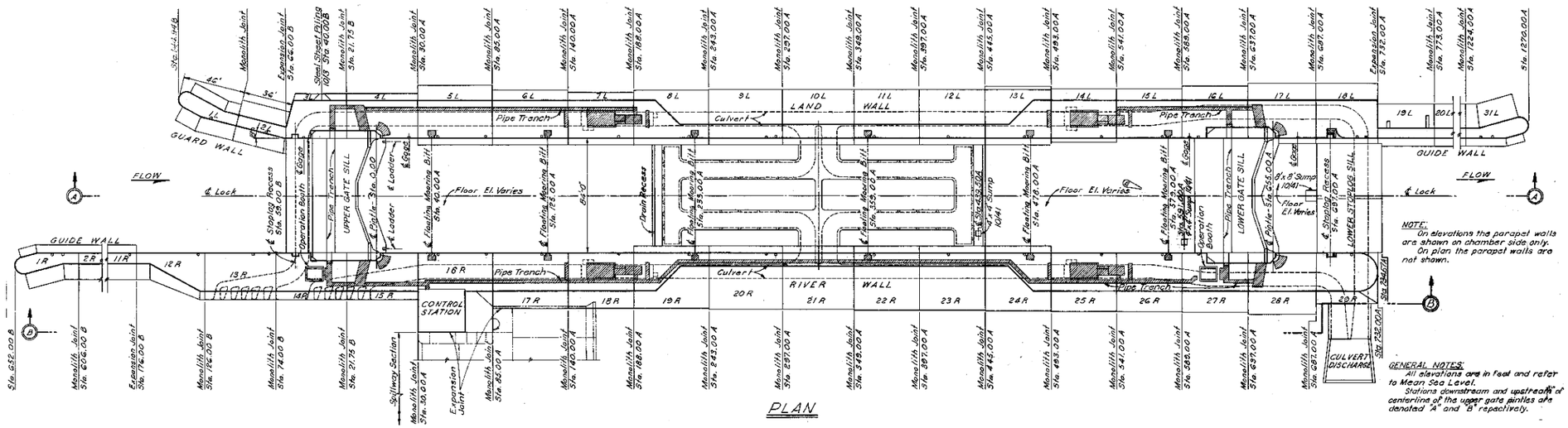
ALABAMA-COOSA-TALLAPOOSA RIVER BASIN

WATER CONTROL MANUAL
CLAIBORNE LOCK AND DAM AND LAKE

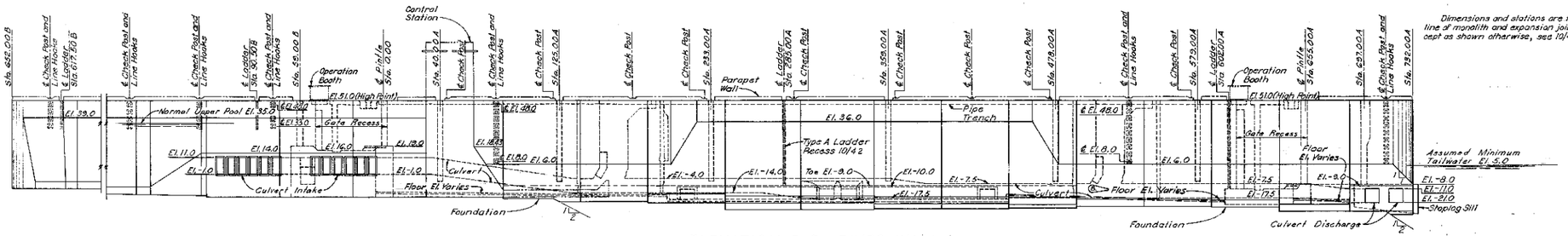
SECTIONS



ELEVATION A-A - LAND WALL



PLAN



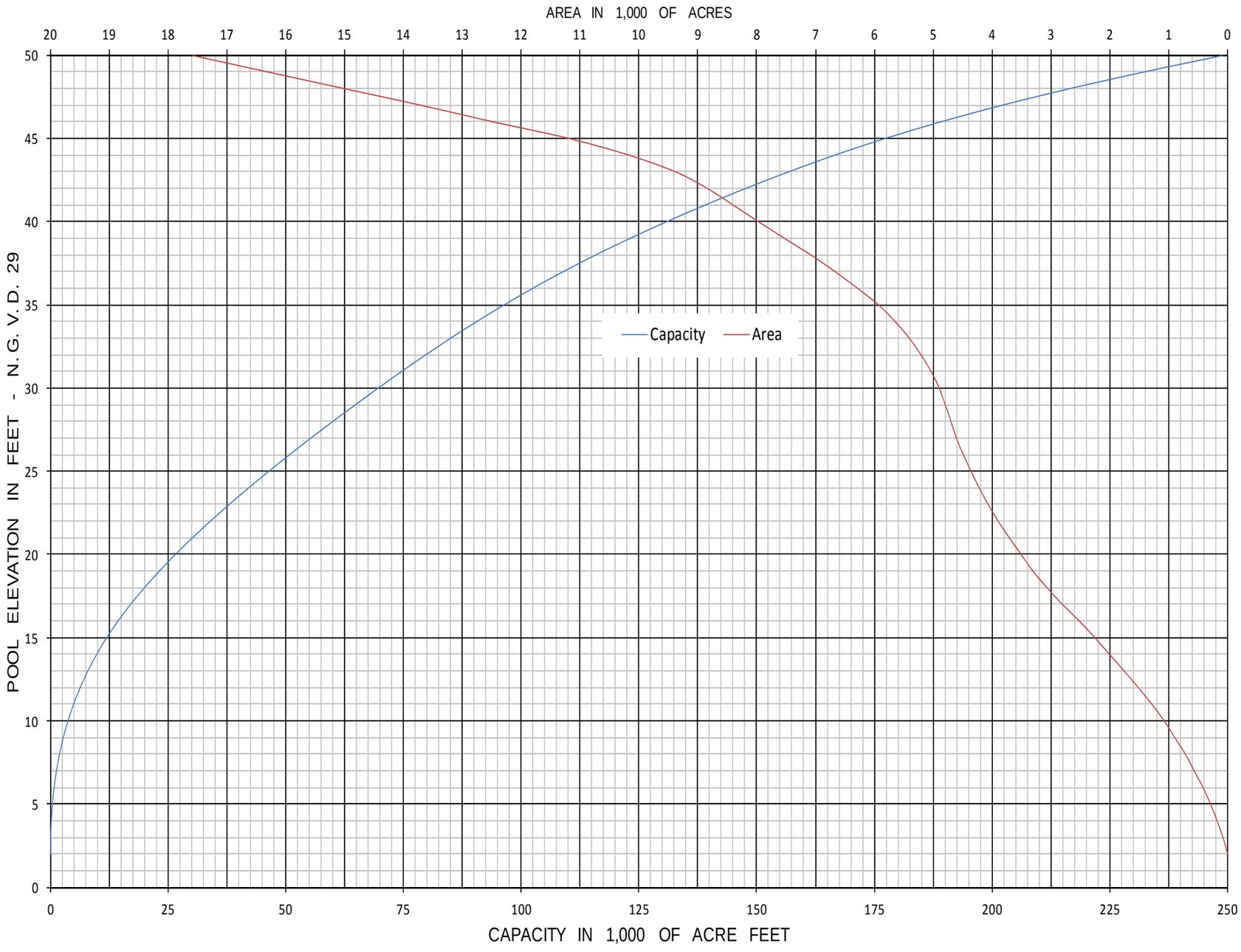
ELEVATION B-B RIVER WALL

ALABAMA-COOSA-TALLAPOOSA RIVER BASIN

WATER CONTROL MANUAL
CLAIBORNE LOCK AND DAM AND LAKE

LOCK PLAN AND ELEVATIONS

APPENDIX F PLATE 2-5



AREA CAPACITY TABLE

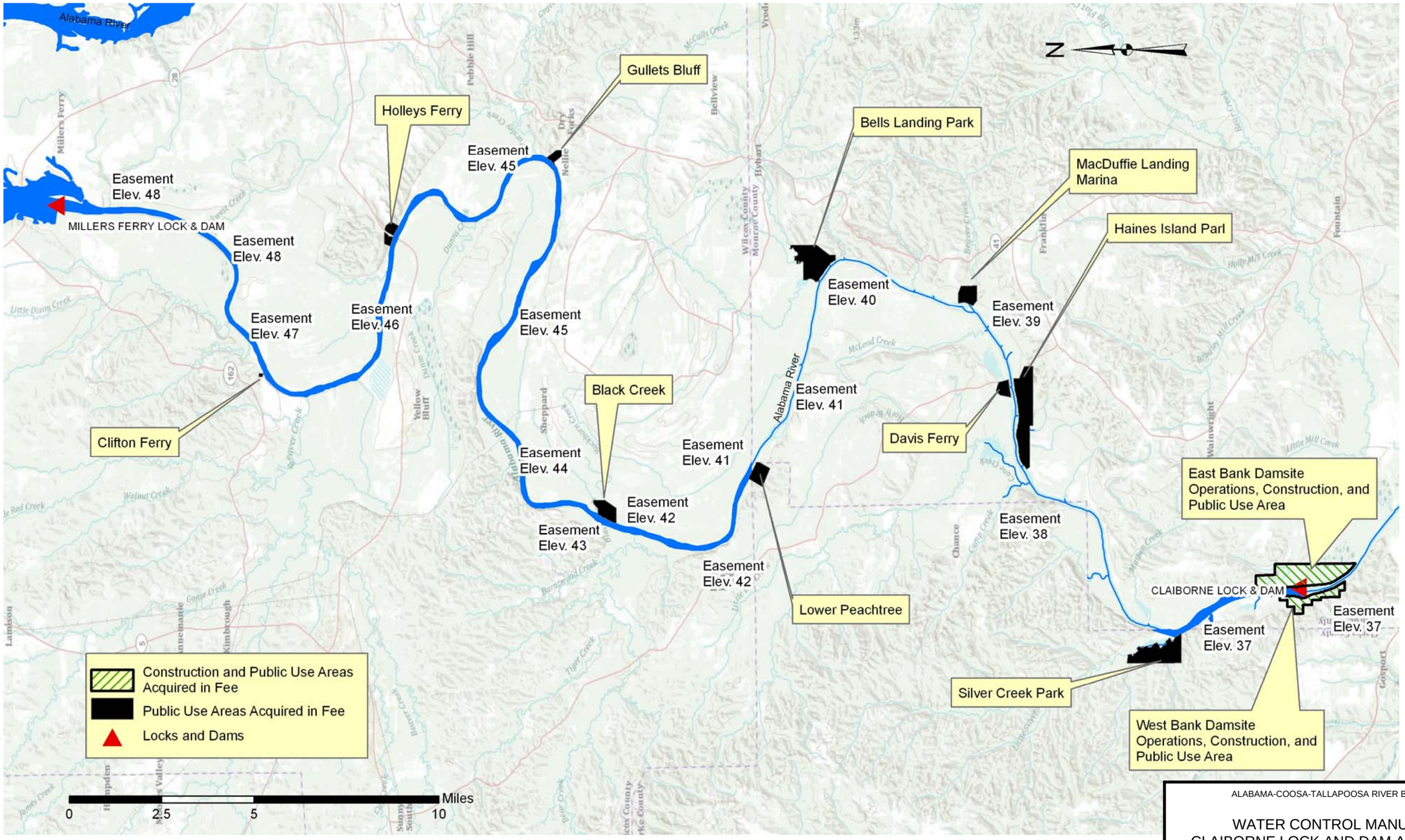
Pool Elevation (Feet)	Total Area (Acres)	Total Storage (Acre-Feet)	Pool Elevation (Feet)	Total Area (Acres)	Total Storage (Acre-Feet)
2	0	0	27	4610	55380
3	80	40	28	4700	60030
4	180	170	29	4800	64790
5	290	410	30	4900	69640
6	420	770	31	5040	74610
7	570	1260	[2]32	5210	79740
8	720	1900	33	5410	85040
9	900	2720	34	5650	90570
10	1080	3710	35	5930	96360
11	1290	4900	[1,4]36	6290	102480
12	1520	6300	37	6670	108950
13	1760	7950	38	7080	115820
14	2010	9840	39	7530	123130
[3]15	2260	11970	40	7970	130880
16	2520	14360	41	8400	139060
17	2810	17020	42	8840	147680
18	3070	19960	43	9380	156790
19	3310	23150	44	10170	166560
20	3510	26560	45	11180	177240
21	3710	30170	46	12470	189060
22	3900	33980	47	13700	202150
23	4070	37960	48	15000	216500
24	4220	42110	49	16300	232150
25	4360	46400	50	17590	249090
26	4490	50830			

[1] Top of conservation
[2] Minimum conservation
[3] Spillway crest elevation
[4] Top of gates – closed position

ALABAMA-COOSA-TALLAPOOSA RIVER BASIN

WATER CONTROL MANUAL
CLAIBORNE LOCK AND DAM AND LAKE

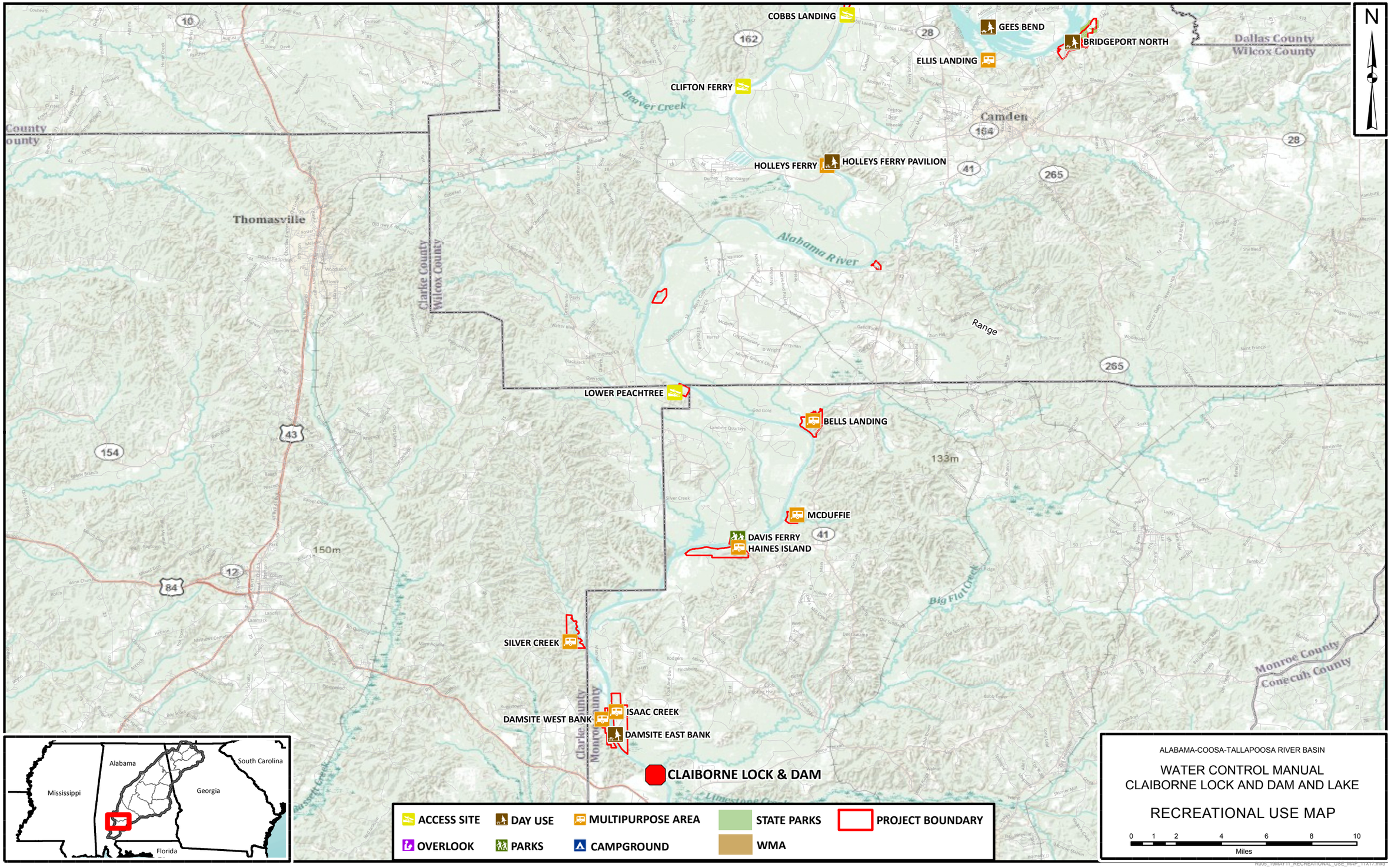
AREA CAPACITY CURVES



ALABAMA-COOSA-TALLAPOOSA RIVER BASIN

WATER CONTROL MANUAL
CLAIBORNE LOCK AND DAM AND LAKE

REAL ESTATE ACQUISITION AND PUBLIC USE AREAS



ALABAMA-COOSA-TALLAPOOSA RIVER BASIN

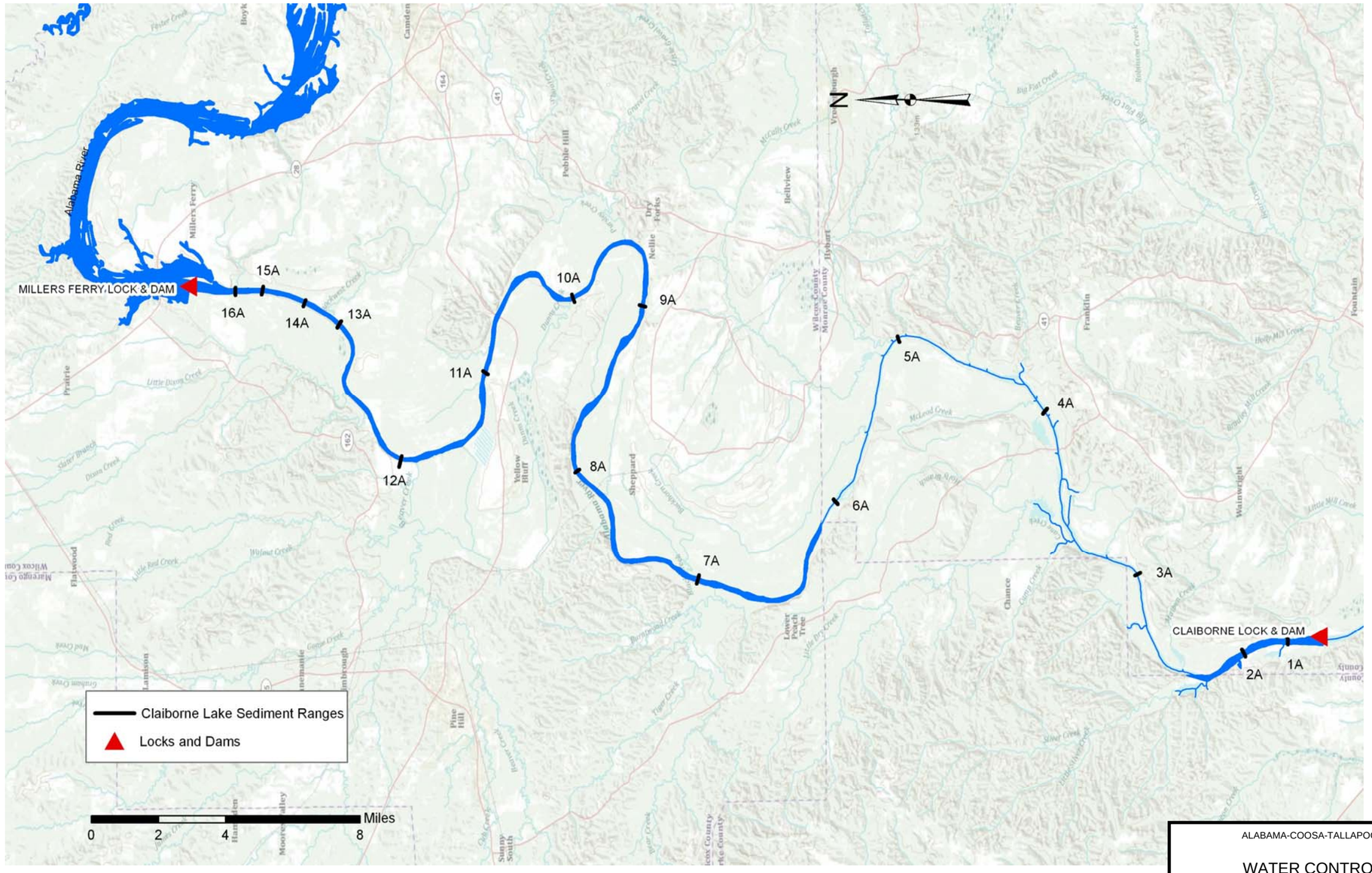
WATER CONTROL MANUAL
CLAIBORNE LOCK AND DAM AND LAKE

RECREATIONAL USE MAP

0 1 2 4 6 8 10
Miles

R00S_19MAY11_RECREATIONAL_USE_MAP_11X17.mxd

APPENDIX F PLATE 2-8

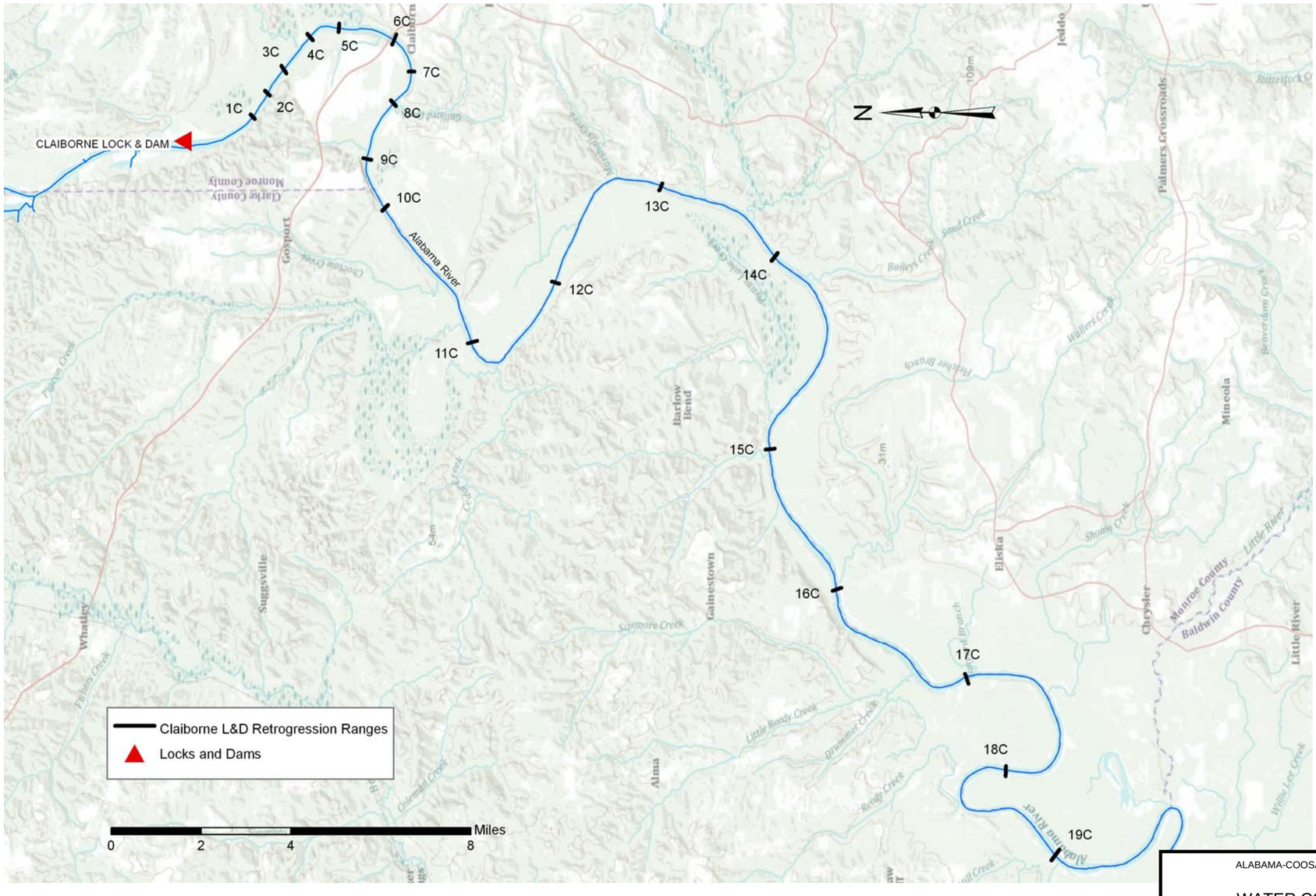


ALABAMA-COOSA-TALLAPOOSA RIVER BASIN

WATER CONTROL MANUAL
CLAIBORNE LOCK AND DAM AND LAKE

SEDIMENT RANGES

APPENDIX F PLATE 4-1



ALABAMA-COOSA-TALLAPOOSA RIVER BASIN

WATER CONTROL MANUAL
CLAIBORNE LOCK AND DAM AND LAKE

RETROGRESSION RANGES

APPENDIX F PLATE 4-2

Station:((097600) ROME,GA
From Year=1893 To Year=2009
Temperature Averages and Daily Extremes

	Monthly Averages			Daily Extremes			
	Max.	Min.	Mean	High	Date	Low	Date
	(F)	(F)	(F)	(F)		(F)	
January	52.5	31.7	42.1	84	1/1/1917	-9	1/21/1985
February	56.4	33.3	44.9	85	2/25/1930	-5	2/13/1899
March	65.2	40.1	52.7	92	3/22/1907	8	3/07/1899
April	74.1	47.7	60.9	95	4/24/1925	23	4/1/1987
May	81.4	56.1	68.8	103	5/30/1914	33	5/2/1963
June	87.7	64.2	75.9	107	6/28/1931	42	6/1/1930
July	90.1	67.9	79	109	7/20/1913	51	7/1/1923
August	89.5	67.2	78.3	105	8/16/2007	51	8/31/1946
September	84.7	61.1	72.9	107	9/5/1925	32	9/30/1967
October	75.2	48.6	62		10/31/1905	23	10/30/1910
November	63.2	38.8	51	87	11/2/1961	4	11/25/1950
December	54	33	43.6	80	12/7/1951	-2	12/25/1983
Annual	72.8	49.1	61	95.8	10/31/1905	-9	1/21/1985

Station:(017020) ROCKFORD 3 ESE
From Year=1954 To Year=2009
Temperature Averages and Daily Extremes

	Monthly Averages			Daily Extremes			
	Max.	Min.	Mean	High	Date	Low	Date
	(F)	(F)	(F)	(F)		(F)	
January	54.2	31.8	43.1	80	1/30/1957	-6	1/21/1985
February	58.7	34.3	46.5	82	2/14/1962	6	2/17/1958
March	67.2	41	54.1	87	3/14/1955	11	3/3/1980
April	75.7	48.7	62.2	90	4/18/1955	24	4/1/1987
May	81.9	56.3	69.1	98	5/20/1962	33	5/13/1960
June	87.7	63.2	75.4	102	6/6/1985	37	6/3/1956
July	89.6	66.8	78.2	103	7/13/1980	50	7/6/1972
August	89.3	66.1	77.7	107	8/7/1956	49	8/30/1968
September	84.9	61.4	73.1	101	9/4/1954	37	9/29/1967
October	75.7	49.9	62.8	98	10/5/1954	23	10/31/1954
November	65.8	40.8	53.3	87	11/1/1961	12	11/30/1976
December	57.2	34.2	45.7	79	12/13/1971	-4	12/13/1962
Annual	74	49.5	61.8	107	8/7/1956	-6	1/21/1985

Station:(015439) MILSTEAD
From Year=1902 To Year=2009
Temperature Averages and Daily Extremes

	Monthly Averages			Daily Extremes			
	Max.	Min.	Mean	High	Date	Low	Date
	(F)	(F)	(F)	(F)		(F)	
January	57.2	34	45.6	80	1/22/1999	-3	1/21/1985
February	61.3	36.7	49	83	2/16/1989	9	2/5/1996
March	69.1	42.8	56	87	3/21/1982	15	3/3/1980
April	75.7	49.1	62.4	91	4/22/1987	27	4/1/1987
May	83.2	58.5	70.9	97	5/24/1996	41	5/1/1996
June	89	66.7	77.8	102	6/7/1985	45	6/1/1984
July	91.4	70.3	80.8	106	7/30/1986	57	7/2/2008
August	91.1	69.3	80.2	107	8/18/2007	56	8/29/1992
September	86.4	63.4	75.1	101	9/17/1980	38	9/22/1983
October	77.1	51.2	64.2	93	10/8/1990	28	10/29/2001
November	68.6	42.6	55.6	88	11/1/1984	21	11/30/1979
December	59.1	35.9	47.5	81	12/3/1982	7	12/24/1989
Annual	75.8	51.7	63.8	107	8/18/2007	-3	1/21/1985

Station:(091640) CARROLLTON
From Year=1904 To Year=2009
Temperature Averages and Daily Extremes

	Monthly Averages			Daily Extremes			
	Max.	Min.	Mean	High	Date	Low	Date
	(F)	(F)	(F)	(F)		(F)	
January	53.3	31.7	42.6	81	1/12/1949	-9	1/21/1985
February	57.2	33.7	45.5	80	2/16/1954	2	2/14/1905
March	65.5	39.9	52.7	93	3/12/1955	8	3/4/1943
April	74.1	47.3	60.7	92	4/24/1965	24	4/1/1987
May	81.1	55.6	68.3	97	5/21/1941	30	5/9/1984
June	86.7	63	74.9	101	6/19/1944	36	6/6/1974
July	88.8	66.8	77.8	103	7/13/1980	49	7/19/1999
August	88.1	65.9	77	102	8/21/1983	48	8/29/1968
September	82.9	60.2	71.6	100	9/1/1951	32	9/30/1967
October	73.8	48.2	61	97	10/5/1954	23	10/31/1954
November	64.1	38.9	51.4	86	11/2/1974	2	11/25/1950
December	55.3	33.2	44.2	81	12/21/1971	0	12/13/1962
Annual	72.6	48.7	60.6	103	7/13/1980	-9	1/21/1985

Station:(015121) MARION JUNCTION 2 NE
From Year=1950 To Year=2009
Temperature Averages and Daily Extremes

	Monthly Averages			Daily Extremes			
	Max.	Min.	Mean	High	Date	Low	Date
	(F)	(F)	(F)	(F)		(F)	
January	55.9	33.8	44.8	88	1/4/1965	-1	1/21/1985
February	60.2	36.7	48.5	85	2/13/1962	7	2/3/1951
March	67.9	43.5	55.7	87	3/25/1954	14	3/3/1980
April	75.9	50.8	63.3	92	4/19/2006	30	4/7/1950
May	83.1	59.4	71.3	97	5/31/1951	39	5/4/1971
June	89	66.6	77.8	104	6/28/1954	40	6/1/1984
July	91.4	69.7	80.5	108	7/25/1952	52	7/16/1967
August	90.9	69	79.9	106	8/28/1954	56	8/22/1956
September	86.2	63.4	74.8	102	9/5/1954	36	9/30/1967
October	76.9	51.2	64.1	99	10/5/1954	23	10/30/1952
November	67	41.3	54.1	89	11/2/1961	11	11/25/1950
December	58.4	35.4	46.9	83	12/9/1978	0	12/26/1983
Annual	75.2	51.7	63.5	108	7/25/1952	-1	1/21/1985

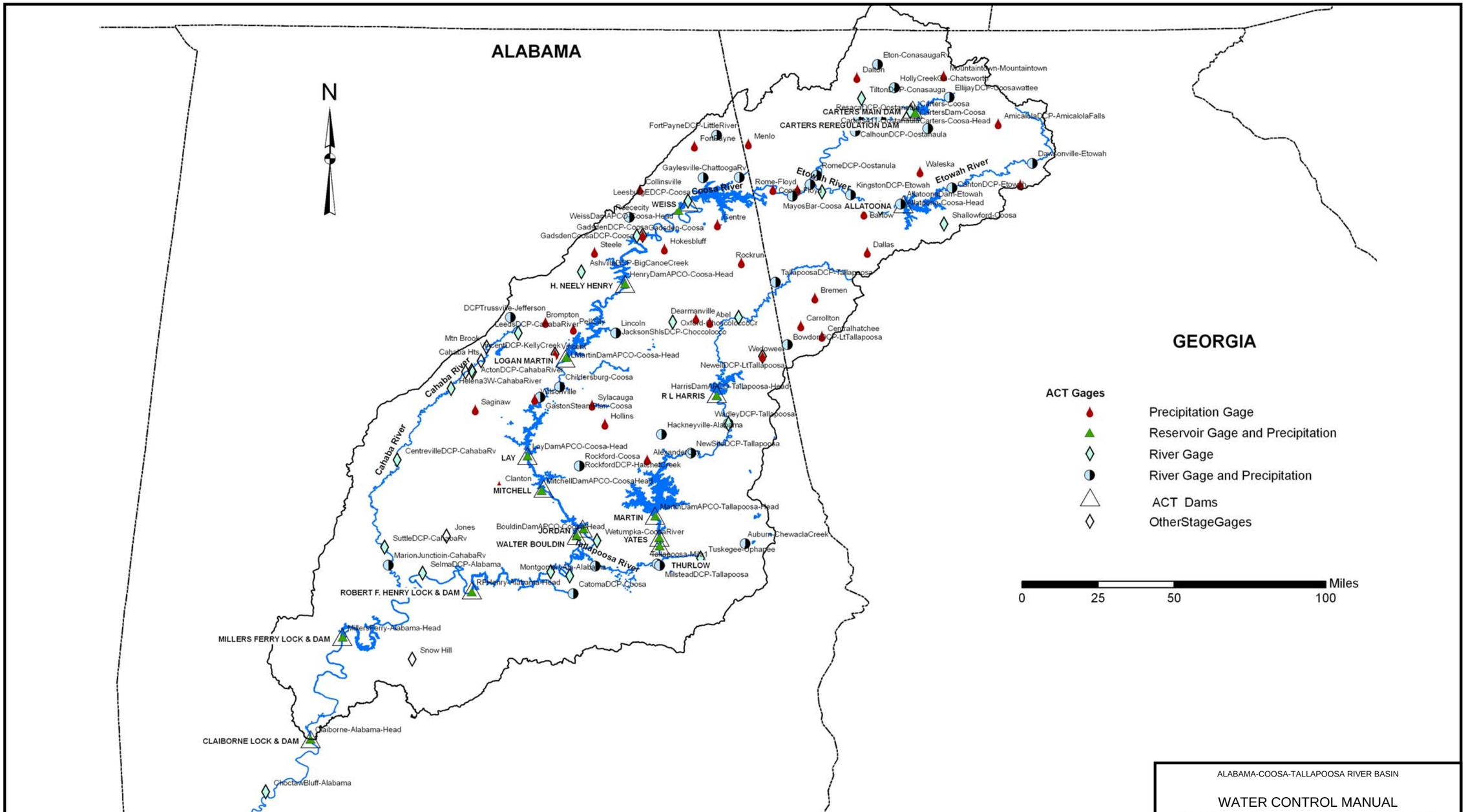
Station:(013154) GADSDEN STEAM PLANT
From Year=1953 To Year=2009
Temperature Averages and Daily Extremes

	Monthly Averages			Daily Extremes			
	Max.	Min.	Mean	High	Date	Low	Date
	(F)	(F)	(F)	(F)		(F)	
January	51.1	30.7	40.9	76	1/29/1975	-6	1/20/1985
February	56.1	33.7	44.9	82	2/13/1962	1	2/1/1966
March	65	40.6	52.8	88	3/11/1974	11	3/5/1960
April	74.4	48.9	61.7	91	4/18/1955	22	4/4/1987
May	81.3	57.3	69.3	99	5/24/1970	33	5/13/1960
June	87.4	65.1	76.2	102	6/27/1954	42	6/3/1956
July	90.3	69.1	79.7	103	7/1/1954	52	7/11/1963
August	90.1	68.1	79.1	105	8/16/1954	52	8/31/1954
September	84.5	62	73.2	102	9/3/1954	33	9/30/1967
October	74.5	49.6	62.1	96	10/5/1954	23	10/30/1954
November	63.6	40	51.8	87	11/1/2000	14	11/24/1970
December	54.7	33.4	44	78	12/3/1982	1	12/13/1962
Annual	72.7	49.9	61.3	105	8/16/1954	-6	1/20/1985

ALABAMA-COOSA-TALLAPOOSA RIVER BASIN

WATER CONTROL MANUAL
CLAIBORNE LOCK AND DAM AND LAKE

BASIN TEMPERATURE AVERAGES AND EXTREMES



ALABAMA-COOSA-TALLAPOOSA RIVER BASIN

WATER CONTROL MANUAL
CLAIBORNE LOCK AND DAM AND LAKE

REPORTING GAGES

Station:(097600) ROME From Year=1893 To Year=2009
Precipitation Averages and Daily Extremes

	Monthly Averages					1 Day Maximum	
	Mean	High	Year	Low	Year	Date	
	(in.)	(in.)		(in.)		(in.)	
January	4.99	12.42	1947	0.85	1981	4.65	1/16/1954
February	5.09	13.45	1903	0.74	1906	5.3	2//1921
March	5.97	17.98	1980	1.07	1918	6.22	3/26/1901
April	4.54	13.6	1979	0.3	1915	4.3	4/5/1957
May	3.98	11.33	2003	0.22	2007	2.99	5/3/1964
June	4.31	10.85	1989	0.23	1988	3.31	6/6/1930
July	4.84	14.76	1916	0.87	1960	4.05	7/12/1999
August	4.19	14.54	1992	0.49	1987	4.92	8/22/1992
September	3.51	11.33	1957	0	1897	4.95	9/25/1997
October	2.96	10.37	1995	0	1938	6.67	10/26/1997
November	3.74	16.26	1948	0.36	1924	5.58	11/19/1906
December	4.82	16.47	1932	0.58	1980	5.96	12/12/1961
Annual	52.93	77.65	1932	28.71	2007	6.67	10/26/1997

Station:(017020) ROCKFORD 3 ESE From Year=1904 To Year=2009
Precipitation Averages and Daily Extremes

	Monthly Averages					1 Day Maximum	
	Mean	High	Year	Low	Year	Date	
	(in.)	(in.)		(in.)		(in.)	
January	5.3	13.8	1972	0.27	1986	4.7	1/26/1976
February	5.59	13.9	1961	1.73	1968	4.23	2/10/1981
March	6.62	13.81	1980	0.73	2007	7.04	3/16/1990
April	5.15	14.49	1964	0.26	1986	6	4/5/1957
May	4.31	10.38	1973	0.15	1965	3.68	5/8/1973
June	4.02	10.4	1989	0.1	1988	3.84	6/19/1989
July	5.98	12.85	1975	2.02	1983	4.45	7/29/2009
August	4.21	10.57	2008	0.42	1988	4.3	8/2/1984
September	4.1	14.78	1988	0.22	1987	6.36	9/16/1988
October	2.88	8.93	1970	0	1963	3.48	10/10/1970
November	4.12	10.37	1986	0.91	1969	4.7	11/15/2006
December	5.01	17.05	1961	1.05	1980	5.9	12/10/1961
Annual	57.3	86.01	1975	31.14	2007	7.04	3/16/1990

Station:(015439) MILSTEAD From Year=1902 To Year=2009
Precipitation Averages and Daily Extremes

	Monthly Averages					1 Day Maximum	
	Mean	High	Year	Low	Year	Date	
	(in.)	(in.)		(in.)		(in.)	
January	4.82	14.36	1936	0.48	1927	4.4	1/16/1925
February	5.11	18.39	1961	1.43	1938	9.27	2/25/1961
March	6.04	16.41	1929	0.51	2004	5.78	3/17/1990
April	4.62	18.4	1964	0.24	1986	5.54	4/8/1964
May	3.84	14.85	1978	0.12	1965	4.9	5/4/1978
June	3.85	14.37	1989	0.58	1925	4.34	6/5/1928
July	5.1	14.98	1916	1.43	1976	4.75	7/8/1996
August	4.12	17.13	1961	0.36	1980	10.98	8/31/1961
September	3.57	9.78	1998	0.2	1908	5.7	9/25/1956
October	2.6	13.16	1995	0	1904	6.6	10/5/1995
November	3.74	20.71	1948	0.18	1924	9.33	11/27/1948
December	4.92	12.81	1953	1.08	1955	5.58	12/4/1953
Annual	52.32	83.6	1919	29.76	1954	10.98	8/31/1961

Station:(091640) CARROLLTON From Year=1904 To Year=2009
Precipitation Averages and Daily Extremes

	Monthly Averages					1 Day Maximum	
	Mean	High	Year	Low	Year	Date	
	(in.)	(in.)		(in.)		(in.)	
January	4.75	13.11	1972	0.84	1981	3.96	5/27/1996
February	4.91	11.85	1961	0.73	1978	5.65	2/3/1982
March	5.82	14	1976	0.6	1907	5.34	3/16/1956
April	4.43	13.71	1979	0.14	1986	4.55	4/5/1957
May	4.11	11.37	2003	0.58	1941	6.23	5/27/1981
June	3.94	10.13	2003	0.24	2009	4.65	6/1/1979
July	4.88	13.66	2005	0.18	1952	4.8	7/21/1958
August	3.5	10.28	1960	0.26	1968	4.5	8/17/1939
September	3.53	12.47	2002	0	1904	5.58	9/22/2002
October	2.86	11.04	1995	0	1904	4.52	10/5/1995
November	3.98	18.41	1948	0.48	1939	4.72	11/15/2006
December	4.57	13.28	1961	0.8	1979	3.47	12/31/1973
Annual	51.28	67.8	1982	30.48	207	6.23	5/27/1981

Station:(015121) MARION JUNCTION 2 NE From Year=1950 To Year=2009
Precipitation Averages and Daily Extremes

	Monthly Averages					1 Day Maximum	
	Mean	High	Year	Low	Year	Date	
	(in.)	(in.)		(in.)		(in.)	
January	5.04	12.4	1972	1.44	1954	4.55	1/25/1990
February	4.83	14.54	1961	0.88	1950	4.4	2/25/2001
March	5.98	12.98	1976	0.9	2004	6.4	3/16/1990
April	4.87	13.21	1964	0.24	1986	7.63	4/6/1964
May	3.78	8.54	1978	0.11	2007	4	5/28/1997
June	4.28	12.47	1997	0.72	1986	4.68	6/30/1997
July	4.93	13.27	2005	0.37	1951	4.37	7/12/2005
August	3.76	10.42	2008	0.19	1957	3.79	8/2/2009
September	3.66	9.12	2002	0.17	2008	4.9	9/14/1963
October	2.84	9.1	1959	0	1963	4.32	10/5/1995
November	3.93	13.15	1986	0.69	1950	5.15	11/15/2006
December	5.14	17.15	1961	0.98	1980	4.82	12/10/1961
Annual	53.04	76.31	61	27.43	54	7.63	4/6/1964

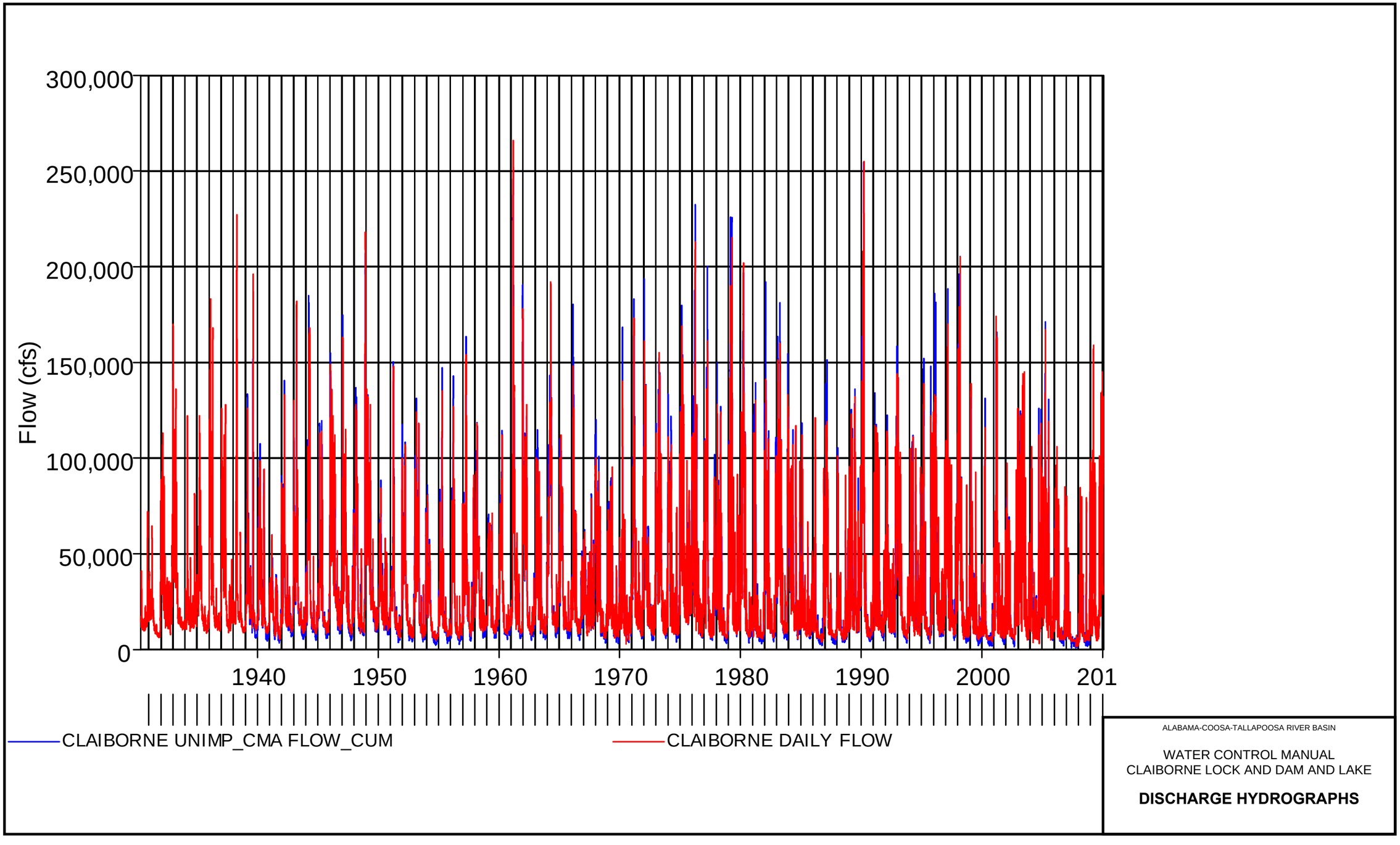
Station:(013154) GADSDEN STEAM PLANT From Year=1953 To Year=2009
Precipitation Averages and Daily Extremes

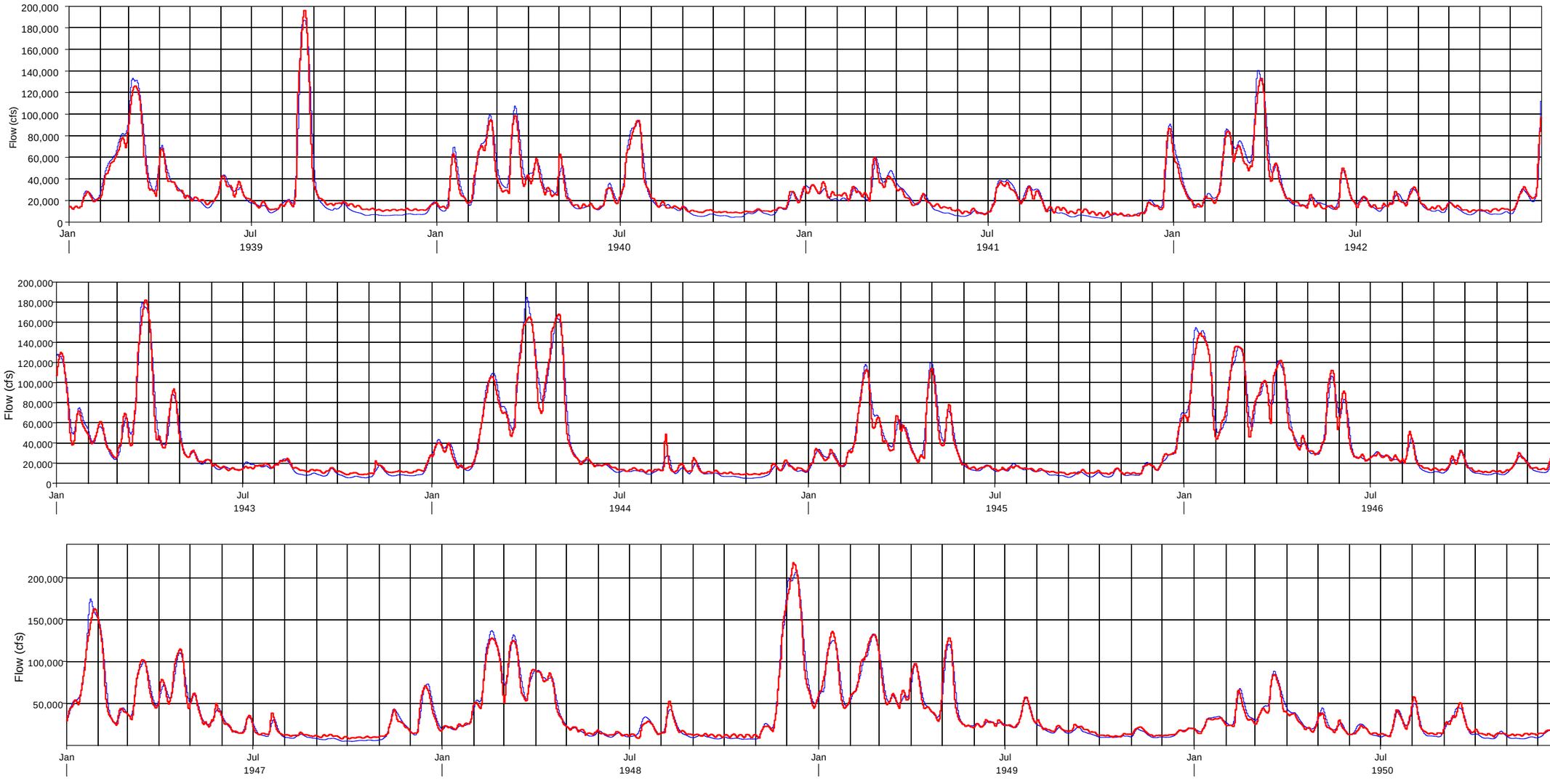
	Monthly Averages					1 Day Maximum	
	Mean	High	Year	Low	Year	Date	
	(in.)	(in.)		(in.)		(in.)	
January	5.26	9.01	1996	1.14	2005	5.2	1/6/2009
February	4.83	13.54	1961	0.62	1968	4.75	2/21/1961
March	5.84	17.41	1980	0.93	2006	4.98	3/4/1979
April	5.13	12.65	1979	0.57	1986	4.6	4/13/1979
May	4.62	11.11	2009	0.48	2007	3.5	5/1/2009
June	4.12	10.3	1994	0.13	1988	3.1	6/25/1999
July	4.88	14.73	2005	1.01	1960	3.36	7/9/1958
August	3.58	9.52	1992	0.1	1983	3.63	8/26/2008
September	3.6	9.55	1957	0.02	1954	5.1	9/16/2004
October	3.03	9	1995	0	1963	4.98	10/26/1997
November	4.42	14.38	2004	1.3	1981	5.6	11/24/2004
December	4.73	13.05	1961	0.43	1980	5.85	12/12/1961
Annual	54.04	69.71	1979	36.56	1954	5.85	12/12/1961

ALABAMA-COOSA-TALLAPOOSA RIVER BASIN

WATER CONTROL MANUAL
CLAIBORNE LOCK AND DAM AND LAKE

BASIN PRECIPITATION EXTREMES


300,000
250,000
200,000
150,000
100,000
50,000
0
Flow (cfs)
1940
1950
1960
1970
1980
1990
2000
201
CLAIBORNE UNIMP_CMA FLOW_CUM
CLAIBORNE DAILY FLOW
ALABAMA-COOSA-TALLAPOOSA RIVER BASIN
WATER CONTROL MANUAL
CLAIBORNE LOCK AND DAM AND LAKE
DISCHARGE HYDROGRAPHS



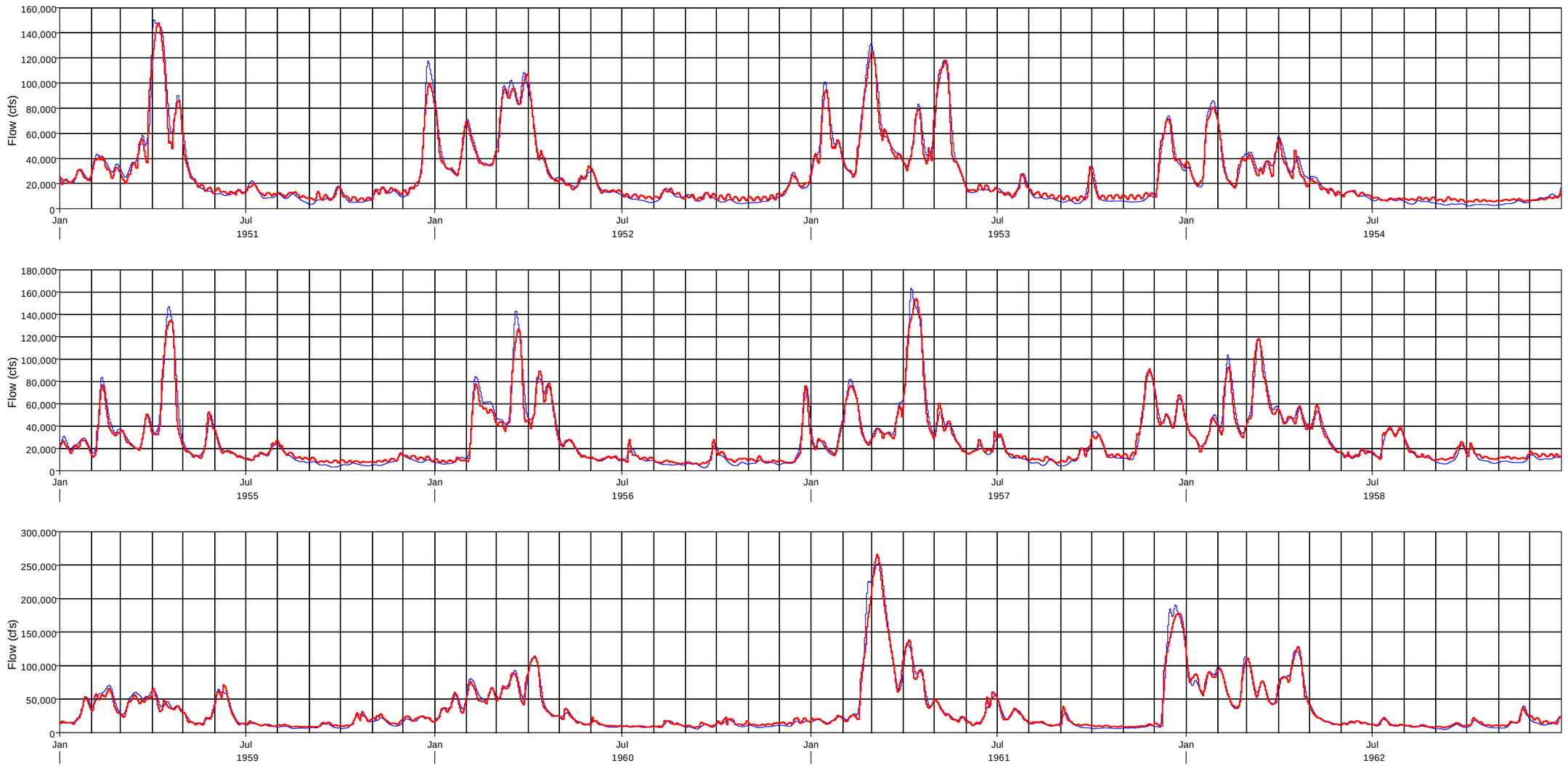
MEAN FLOW (USGS GAGE 02429500) ALABAMA RIVER AT CLAIBORNE AL (US 84)

UNIMPAIRED FLOW (CLAIBORNE UNIMP_CMA FLOW_CUM)

ALABAMA-COOSA-TALLAPOOSA RIVER BASIN

WATER CONTROL MANUAL
CLAIBORNE LOCK AND DAM AND LAKE

DISCHARGE HYDROGRAPHS



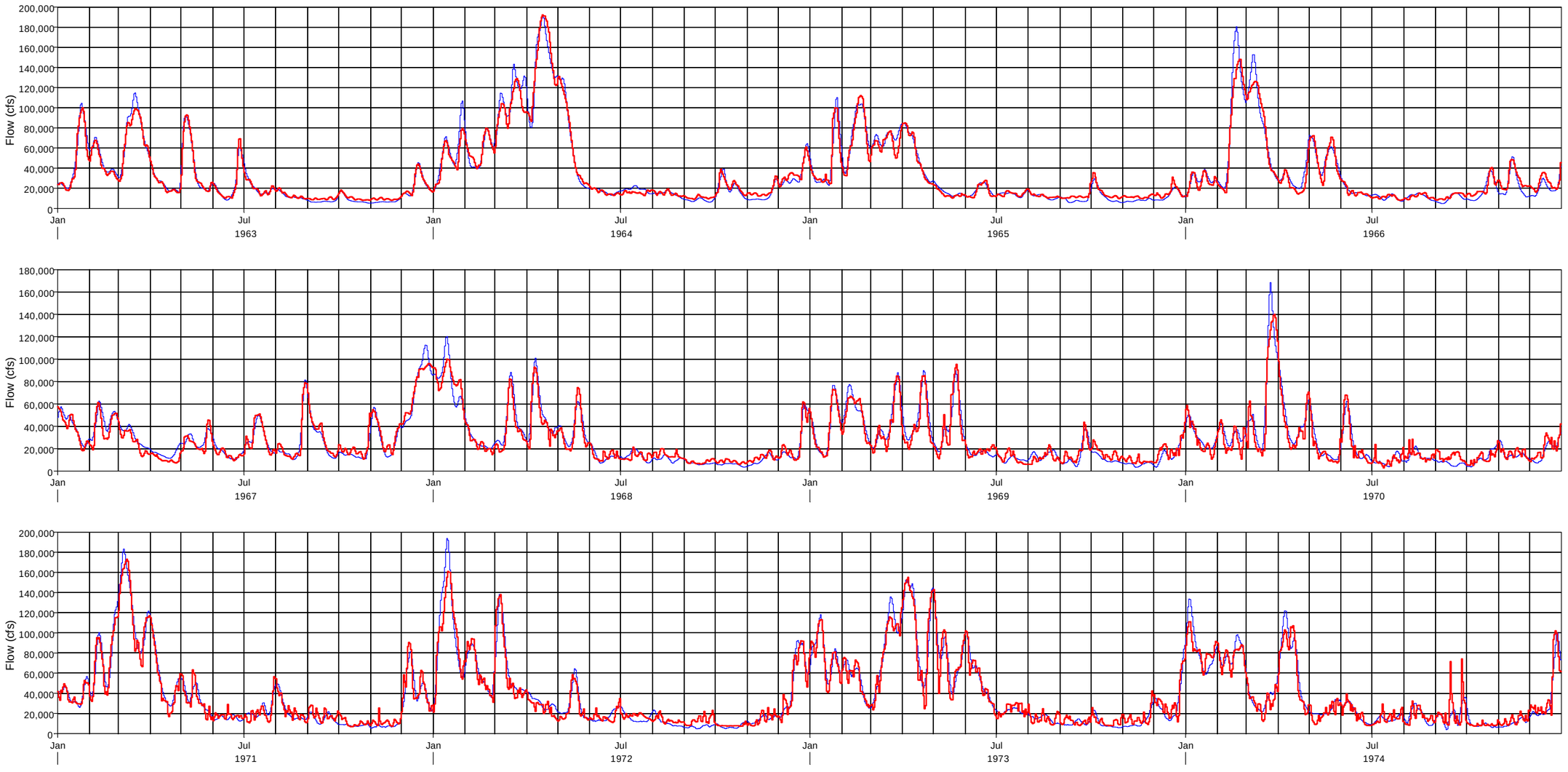
MEAN FLOW (USGS GAGE 02429500) ALABAMA RIVER AT CLAIBORNE AL (US 84)

UNIMPAIRED FLOW (CLAIBORNE UNIMP_CMA FLOW_CUM)

ALABAMA-COOSA-TALLAPOOSA RIVER BASIN

WATER CONTROL MANUAL
CLAIBORNE LOCK AND DAM AND LAKE

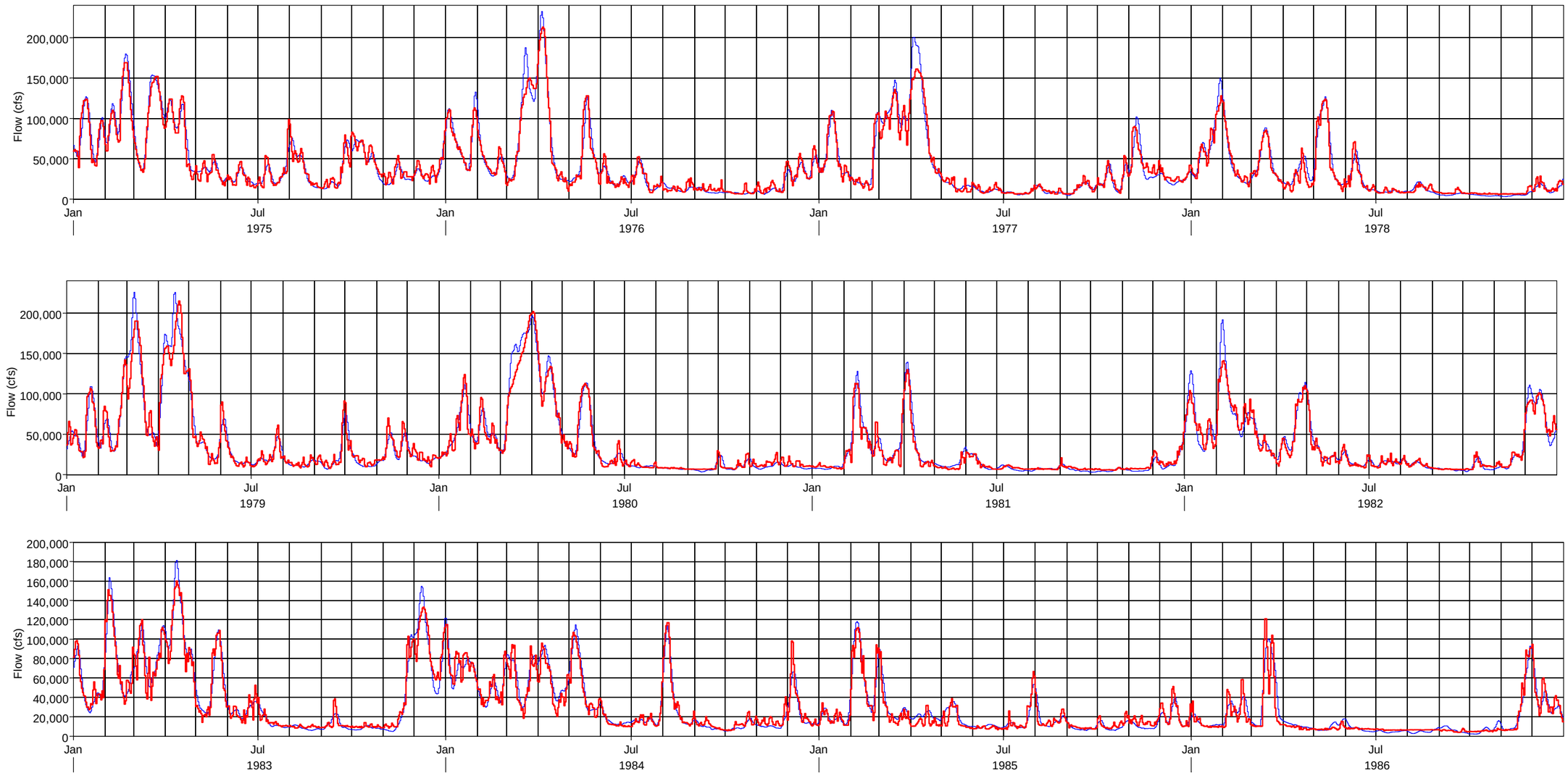
DISCHARGE HYDROGRAPHS



ALABAMA-COOSA-TALLAPOOSA RIVER BASIN

WATER CONTROL MANUAL
CLAIBORNE LOCK AND DAM AND LAKE

DISCHARGE HYDROGRAPHS



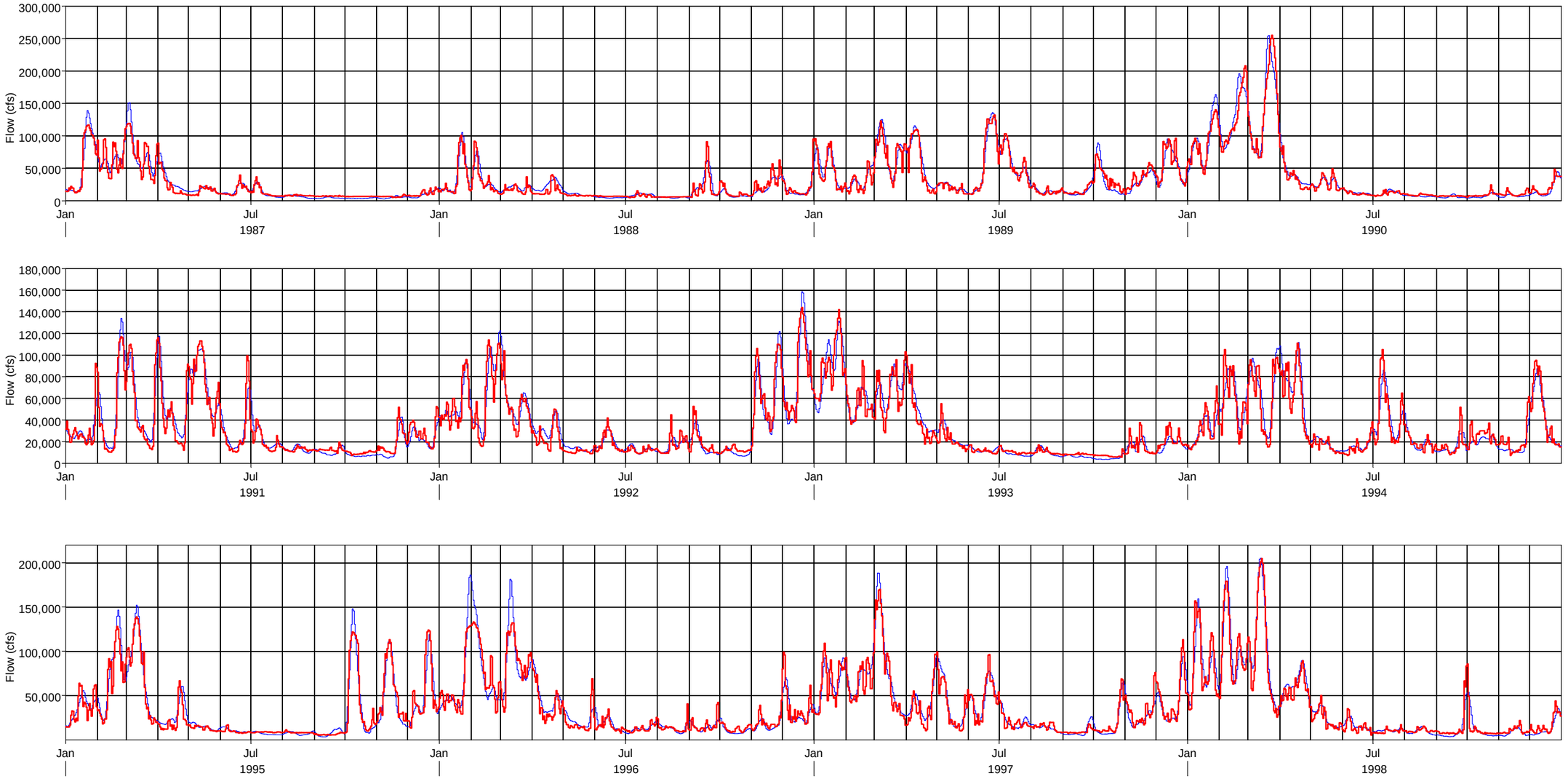
MEAN FLOW (USGS GAGE 02428400) ALABAMA RIVER AT CLAIBORNE L&D NEAR MONROEVILLE

UNIMPAIRED FLOW (CLAIBORNE UNIMP_CMA FLOW_CUM)

ALABAMA-COOSA-TALLAPOOSA RIVER BASIN

WATER CONTROL MANUAL
CLAIBORNE LOCK AND DAM AND LAKE

DISCHARGE HYDROGRAPHS



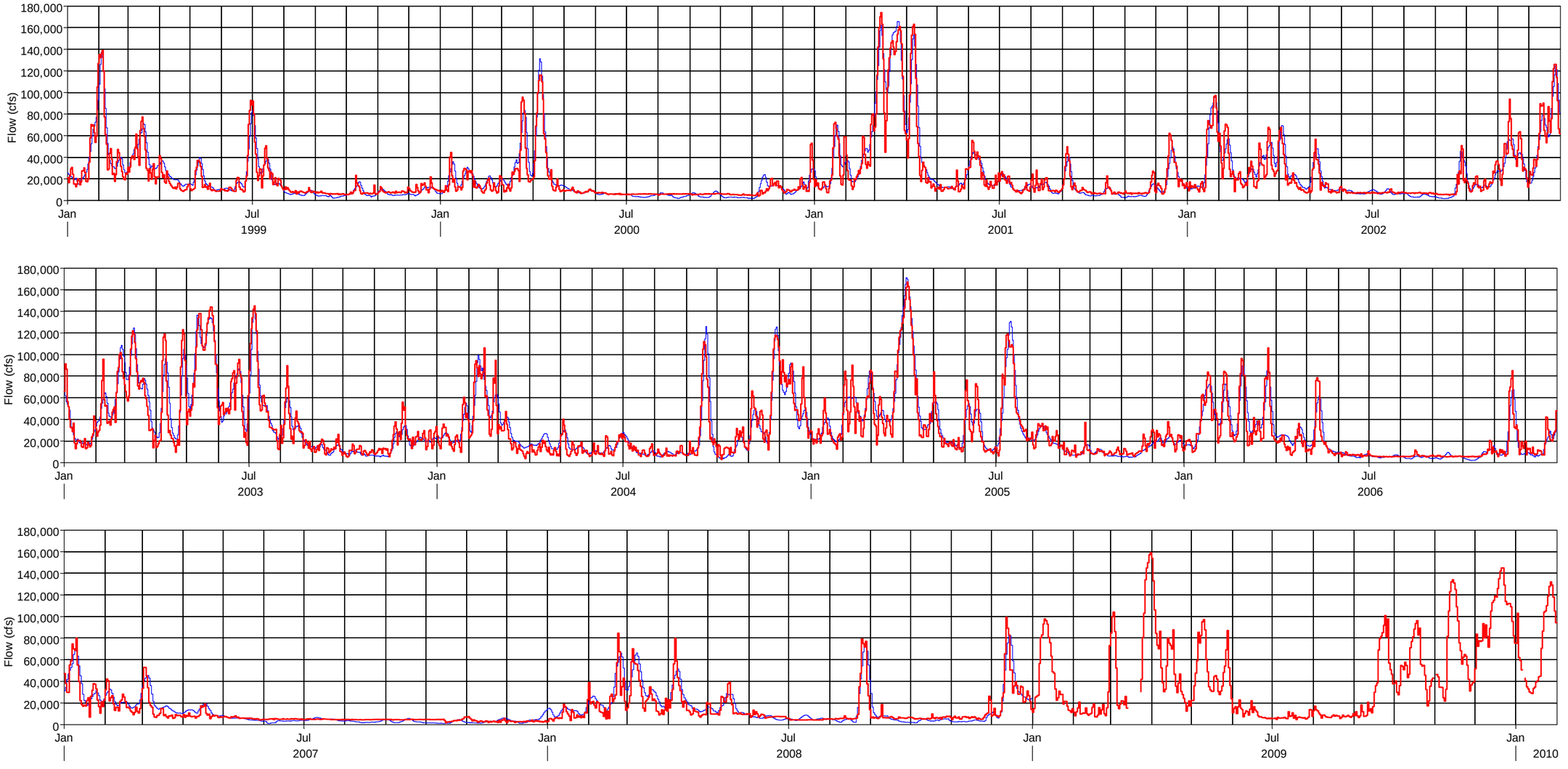
MEAN FLOW (USGS GAGE 02428400) ALABAMA RIVER AT CLAIBORNE L&D NEAR MONROEVILLE

UNIMPAIRED FLOW (CLAIBORNE UNIMP_CMA FLOW_CUM)

ALABAMA-COOSA-TALLAPOOSA RIVER BASIN

WATER CONTROL MANUAL
CLAIBORNE LOCK AND DAM AND LAKE

DISCHARGE HYDROGRAPHS



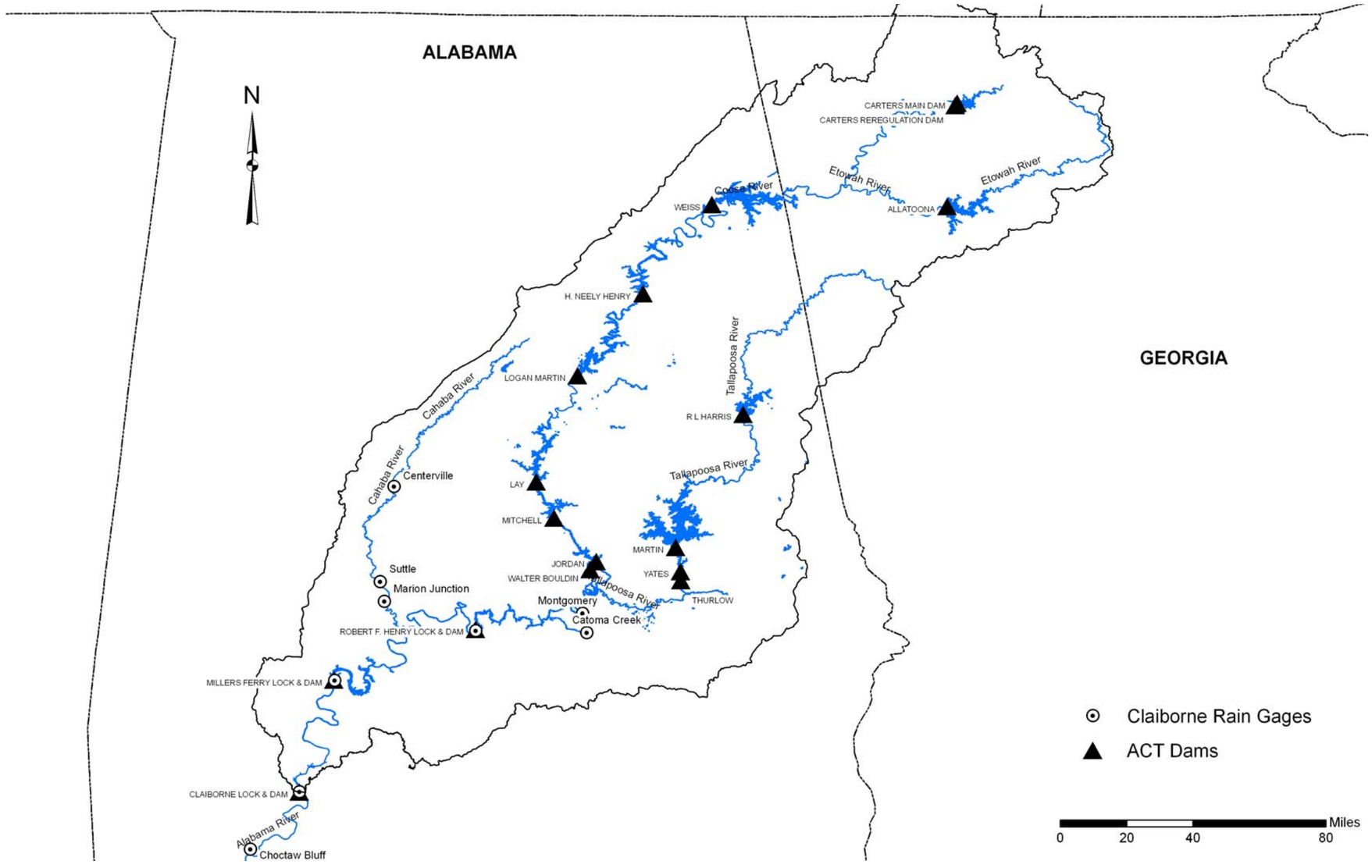
MEAN FLOW (USGS GAGE 02428400) ALABAMA RIVER AT CLAIBORNE L&D NEAR MONROEVILLE

UNIMPAIRED FLOW (CLAIBORNE UNIMP_CMA FLOW_CUM)

ALABAMA-COOSA-TALLAPOOSA RIVER BASIN

WATER CONTROL MANUAL
CLAIBORNE LOCK AND DAM AND LAKE

DISCHARGE HYDROGRAPHS

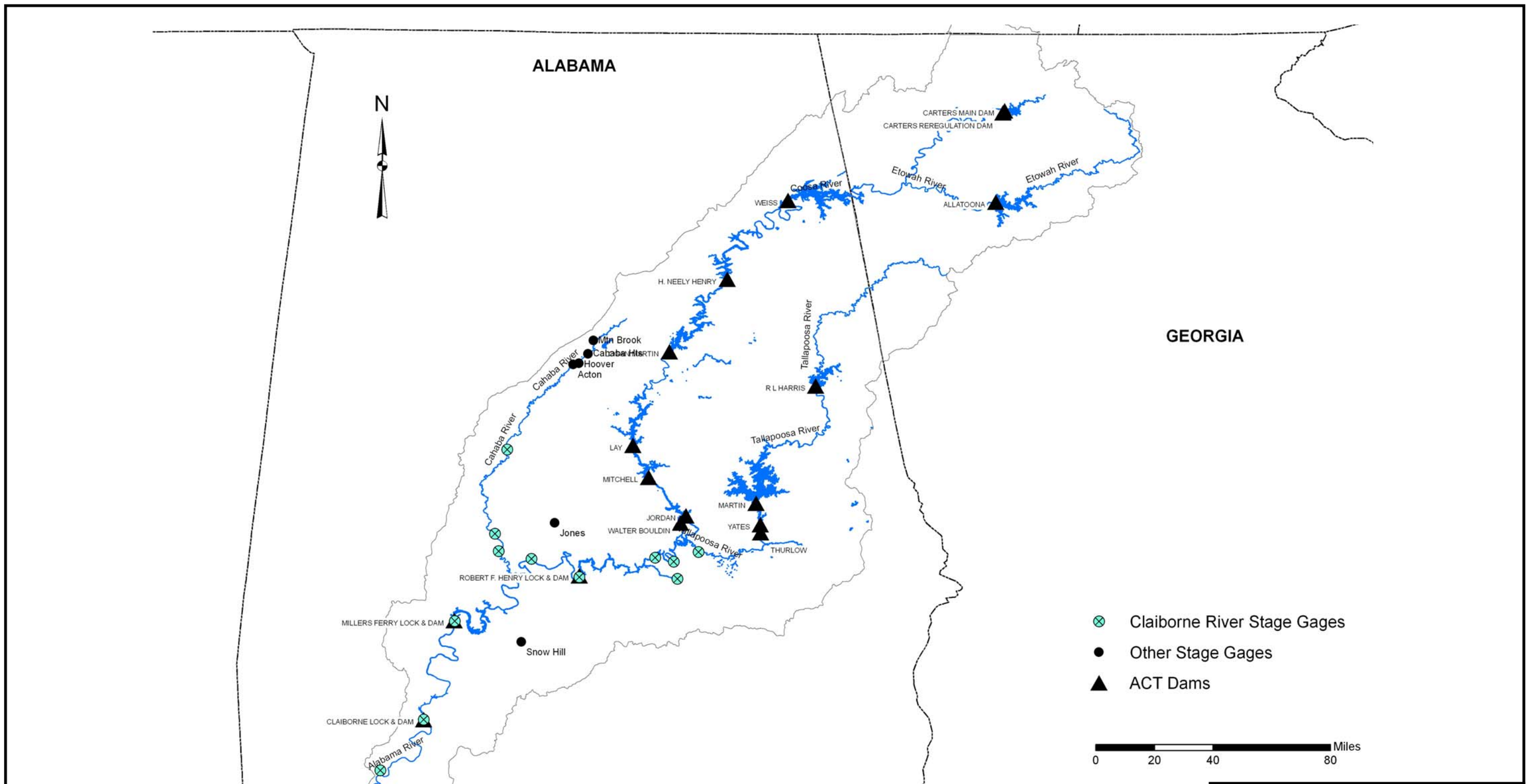


ALABAMA-COOSA-TALLAPOOSA RIVER BASIN

WATER CONTROL MANUAL
CLAIBORNE LOCK AND DAM AND LAKE

REPORTING RAIN GAGES

APPENDIX F PLATE 5-1



ALABAMA-COOSA-TALLAPOOSA RIVER BASIN

WATER CONTROL MANUAL
CLAIBORNE LOCK AND DAM AND LAKE

REPORTING RIVER GAGES

APPENDIX F PLATE 5-2

GATE STEP NO.	GATE OPENING IN FEET						SPILLWAY DISCHARGE IN CFS									
	GATE NUMBER						POOL ELEVATION IN FT NGVD29									
	1	2	3	4	5	6	31	31.1	31.2	31.3	31.4	31.5	31.6	31.7	31.8	31.9
1	0.25	0	0	0	0	0	410	411	412	413	414	416	417	418	419	420
2	0.25	0.25	0	0	0	0	820	822	824	827	829	832	834	837	839	842
3	0.25	0.25	0.25	0	0	0	1230	1233	1237	1240	1244	1248	1251	1255	1259	1263
4	0.25	0.25	0.25	0.25	0	0	1640	1644	1649	1654	1659	1664	1669	1674	1679	1684
5	0.25	0.25	0.25	0.25	0.25	0	2050	2056	2062	2068	2074	2080	2083	2092	2098	2104
6	0.25	0.25	0.25	0.25	0.25	0.25	2459	2466	2474	2481	2489	2497	2504	2511	2519	2526
7	0.5	0.25	0.25	0.25	0.25	0.25	2858	2867	2876	2885	2894	2903	2911	2920	2929	2939
8	0.5	0.5	0.25	0.25	0.25	0.25	3258	3268	3279	3288	3298	3309	3319	3329	3339	3349
9	0.5	0.5	0.5	0.25	0.25	0.25	3658	3669	3680	3692	3703	3715	3726	3737	3749	3760
10	0.5	0.5	0.5	0.5	0.25	0.25	4057	4070	4083	4096	4109	4122	4134	4146	4159	4171
11	0.5	0.5	0.5	0.5	0.5	0.25	4457	4471	4485	4499	4513	4528	4541	4555	4569	4583
12	0.5	0.5	0.5	0.5	0.5	0.5	4857	4872	4887	4903	4918	4934	4949	4964	4979	4994
13	0.75	0.5	0.5	0.5	0.5	0.5	5252	5268	5285	5601	5318	5335	5351	5367	5383	5399
14	0.75	0.75	0.5	0.5	0.5	0.5	5646	5664	5682	5700	5718	5736	5753	5770	5788	5805
15	0.75	0.75	0.75	0.5	0.5	0.5	6040	6059	6078	6097	6116	6136	6154	6173	6192	6211
16	0.75	0.75	0.75	0.75	0.5	0.5	6435	6455	6475	6496	6516	6537	6557	6577	6597	6617
17	0.75	0.75	0.75	0.75	0.75	0.5	6829	6850	6872	6893	6915	6937	6958	6979	7001	7022
18	0.75	0.75	0.75	0.75	0.75	0.75	7223	7246	7269	7292	7315	7338	7360	7383	7405	7428
19	1	0.75	0.75	0.75	0.75	0.75	7559	7592	7626	7660	7694	7728	7751	7775	7799	7823
20	1	1	0.75	0.75	0.75	0.75	7930	7967	8005	8042	8080	8118	8143	8168	8193	8218
21	1	1	1	0.75	0.75	0.75	8302	8343	8381	8425	8466	8507	8533	8559	8586	8612
22	1	1	1	1	0.75	0.75	8673	8717	8762	8807	8852	8897	8924	8951	8979	9006
23	1	1	1	1	1	0.75	9045	9093	9141	9189	9237	9286	9314	9343	9372	9401
24	1	1	1	1	1	1	9416	9468	9520	9572	9624	9676	9703	9736	9766	9796
25	1.25	1	1	1	1	1	9790	9839	9889	9938	9988	10038	10069	10100	10131	10162
26	1.25	1.25	1	1	1	1	10164	10211	10258	10305	10352	10400	10432	10464	10497	10529
27	1.25	1.25	1.25	1	1	1	10538	10582	10627	10672	10717	10762	10795	10828	10862	10895
28	1.25	1.25	1.25	1.25	1	1	10911	10953	10995	11038	11080	11123	11157	11192	11227	11262
29	1.25	1.25	1.25	1.25	1.25	1	11285	11325	11365	11405	11445	11485	11520	11556	11592	11628
30	1.25	1.25	1.25	1.25	1.25	1.25	11659	11696	11734	11771	11809	11847	11884	11921	11958	11995
31	1.5	1.25	1.25	1.25	1.25	1.25	12004	12042	12081	12120	12159	12198	12236	12274	12312	12350
32	1.5	1.5	1.25	1.25	1.25	1.25	12349	12389	12429	12469	12509	12549	12588	12627	12667	12706
33	1.5	1.5	1.5	1.25	1.25	1.25	12695	12736	12777	12818	12859	12900	12940	12981	13021	13062
34	1.5	1.5	1.5	1.5	1.25	1.25	13040	13082	13124	13167	13209	13252	13293	13335	13376	13418
35	1.5	1.5	1.5	1.5	1.5	1.25	13386	13429	13472	13516	13559	13603	13645	13688	13731	13774
36	1.5	1.5	1.5	1.5	1.5	1.5	13731	13775	13820	13864	13909	13954	13998	14042	14086	14130
37	1.75	1.5	1.5	1.5	1.5	1.5	14045	14090	14136	14182	14228	14274	14319	14364	14409	14454
38	1.75	1.75	1.5	1.5	1.5	1.5	14360	14406	14453	14500	14547	14594	14640	14686	14732	14778
39	1.75	1.75	1.75	1.5	1.5	1.5	14675	14722	14770	14818	14866	14914	14961	15008	15055	15102
40	1.75	1.75	1.75	1.75	1.5	1.5	14989	15038	15087	15136	15185	15234	15282	15330	15379	15427
41	1.75	1.75	1.75	1.75	1.75	1.5	15304	15354	15404	15454	15504	15555	15604	15653	15702	15751
42	1.75	1.75	1.75	1.75	1.75	1.75	15619	15670	15751	15772	15823	15875	15925	15972	16026	16076
43	2	1.75	1.75	1.75	1.75	1.75	15904	15956	16008	16060	16112	16165	16216	16267	16319	16370
44	2	2	1.75	1.75	1.75	1.75	16189	16242	16295	16349	16402	16456	16508	16560	16613	16665
45	2	2	2	1.75	1.75	1.75	16474	16528	16582	16637	16691	16746	16799	16852	16906	16959
46	2	2	2	2	1.75	1.75	16759	16814	16869	16925	16980	17036	17090	17144	17199	17253
47	2	2	2	2	2	1.75	17044	17100	17156	17213	17269	17326	17381	17436	17492	17547
48	2	2	2	2	2	2	17330	17387	17444	17501	17558	17616	17672	17728	17785	17841

ALABAMA-COOSA-TALLAPOOSA RIVER BASIN

WATER CONTROL MANUAL
CLAIBORNE LOCK AND DAM AND LAKE

GATE OPENING SCHEDULE

GATE STEP NO.	GATE OPENING IN FEET						SPILLWAY DISCHARGE IN CFS									
	GATE NUMBER						POOL ELEVATION IN FT NGVD29									
	1	2	3	4	5	6	31	31.1	31.2	31.3	31.4	31.5	31.6	31.7	31.8	31.9
49	2.25	2	2	2	2	2	17606	17664	17722	17781	17839	17898	17955	18012	18069	18126
50	2.25	2.25	2	2	2	2	17883	17942	18001	18060	18119	18179	18237	18295	18354	18412
51	2.25	2.25	2.25	2	2	2	18159	18219	18279	18340	18400	18461	18520	18579	18638	18697
52	2.25	2.25	2.25	2.25	2.25	2	18435	18496	18557	18619	18680	18742	18802	18862	18922	18982
53	2.25	2.25	2.25	2.25	2.25	2	18712	18774	18836	18899	18961	19024	19085	19146	19207	19553
54	2.25	2.25	2.25	2.25	2.25	2.25	18988	19051	19114	19178	19241	19305	19367	19429	19491	19834
55	2.5	2.25	2.25	2.25	2.25	2.25	19260	19324	19388	19453	19517	19582	19645	19708	19771	20115
56	2.5	2.5	2.25	2.25	2.25	2.25	19632	19697	19662	19728	19793	19869	19923	19907	20051	20397
57	2.5	2.5	2.5	2.25	2.25	2.25	19805	19871	19937	20004	20070	20137	20202	20267	20332	20678
58	2.5	2.5	2.5	2.5	2.5	2.25	20077	20144	20211	20279	20346	20414	20480	20546	20612	20959
59	2.5	2.5	2.5	2.5	2.5	2.25	20349	20417	20485	20554	20622	20691	20758	20825	20892	21240
60	2.5	2.5	2.5	2.5	2.5	2.5	20621	20690	20759	20829	20898	20968	21036	21104	21172	21516
61	2.75	2.5	2.5	2.5	2.5	2.5	20888	20958	21028	21099	21169	21240	21309	21378	21447	21792
62	2.75	2.75	2.5	2.5	2.5	2.5	21155	21226	21297	21369	21440	21512	21582	21652	21722	22068
63	2.75	2.75	2.75	2.5	2.5	2.5	21422	21494	21566	21639	21711	21784	21855	21926	21997	22344
64	2.75	2.75	2.75	2.75	2.5	2.5	21689	21762	21835	21909	21982	22056	22128	22200	22272	22620
65	2.75	2.75	2.75	2.75	2.75	2.5	21956	22030	22104	22179	22253	22328	22401	22474	22547	22896
66	2.75	2.75	2.75	2.75	2.75	2.75	22223	22298	22373	22449	22524	22600	22674	22748	22822	23164
67	3	2.75	2.75	2.75	2.75	2.75	22482	22558	22634	22711	22787	22964	22939	23014	23089	23432
68	3	3	2.75	2.75	2.75	2.75	22741	22818	22895	22973	23050	23128	23204	23280	23356	23700
69	3	3	3	2.75	2.75	2.75	23000	23078	23156	23235	23313	23392	23469	23546	23623	23967
70	3	3	3	3	2.75	2.75	23259	23338	23417	23496	23575	23655	23733	23811	23889	24235
71	3	3	3	3	3	2.75	23518	23598	23678	23758	23838	23919	23998	24077	24156	24503
72	3	3	3	3	3	3	23777	23858	23939	24020	24101	24183	24263	24343	24423	25478
73	4	3	3	3	3	3	24718	24803	24888	24973	25057	25143	25227	25310	25394	26453
74	4	4	3	3	3	3	25659	25748	25836	25925	26014	26103	26190	26278	26365	27428
75	4	4	4	3	3	3	26600	26693	26785	26878	26970	27063	27154	27245	27337	28402
76	4	4	4	4	3	3	27541	27637	27734	27830	27926	28023	28118	28212	28308	29377
77	4	4	4	4	4	3	28482	28582	28682	28783	28883	28983	29081	29180	29279	30200
78	4	4	4	4	4	4	29423	29527	29631	29735	29839	29943	30045	30147	30250	30900
79	5	4	4	4	4	4	30180	30285	30390	30494	30599	30704	30800	30896	30993	31700
80	5	5	4	4	4	4	30937	31043	31148	31253	31359	31464	31554	31644	31735	32300
81	5	5	5	4	4	4	31695	31801	31907	32013	32119	32225	32309	32393	32478	33050
82	5	5	5	5	4	4	32452	32558	32665	32772	32878	32986	33064	33142	33221	33800
83	5	5	5	5	5	4	33209	33316	33424	33531	33638	33746	33818	33890	33963	34400
84	5	5	5	5	5	5	33966	34074	34182	34290	34398	34507	34573	34639	34706	35000
85	6	5	5	5	5	5	34511	34622	34732	34843	34953	35065	35149	35232	35317	35700
86	6	6	5	5	5	5	35057	35170	35283	35396	35509	35623	35724	35825	35927	36200
87	6	6	6	5	5	5	35602	35718	35833	35949	36064	36181	36300	36419	36538	36900
88	6	6	6	6	5	5	36147	36265	36383	36501	36619	36738	36875	37012	37149	37300
89	6	6	6	6	6	5	36693	36813	36934	37054	37175	37296	37451	37605	37759	37950
90	6	6	6	6	6	6	37238	37361	37484	37607	37730	37854	38026	38198	38370	38542
91	7	6	6	6	6	6	37743	37870	37997	38124	38251	38378	38534	38690	38846	39002
92	7	7	6	6	6	6	38249	38379	38510	38641	38771	38903	39042	39182	39322	39461
93	7	7	7	6	6	6	38754	38889	39023	39158	39292	39427	39551	39674	39798	39921
94	7	7	7	7	6	6	39259	39398	39536	39674	39813	39951	40059	40166	40273	40381
95	7	7	7	7	7	6	39765	39907	40049	40191	40333	40476	40567	40658	40749	40840
96	7	7	7	7	7	7	40270	40416	40562	40708	40854	41000	41075	41150	41225	41300

ALABAMA-COOSA-TALLAPOOSA RIVER BASIN

WATER CONTROL MANUAL
CLAIBORNE LOCK AND DAM AND LAKE

GATE OPENING SCHEDULE

GATE STEP NO.	GATE OPENING IN FEET						SPILLWAY DISCHARGE IN CFS									
	GATE NUMBER						POOL ELEVATION IN FT NGVD29									
	1	2	3	4	5	6	31	31.1	31.2	31.3	31.4	31.5	31.6	31.7	31.8	31.9
97	8	7	7	7	7	7	40642	40787	40932	41077	41222	41367	41452	41538	41624	41708
98	8	8	7	7	7	7	41014	41158	41302	41446	41590	41734	41830	41925	42022	42117
99	8	8	8	7	7	7	41386	41529	41672	41815	41959	42102	42207	42313	42421	42525
100	8	8	8	8	7	7	41757	41899	42041	42184	42326	42469	42584	42701	42819	42933
101	8	8	8	8	8	7	42129	42270	42411	42553	42694	42836	42962	43088	43218	43342
102	8	8	8	8	8	8	42501	42641	42781	42922	43062	43203	43339	43476	43616	43750
103	9	8	8	8	8	8	42781	42929	43077	43226	43374	43523	43673	43825	43979	44128
104	9	9	8	8	8	8	43061	43217	43373	43529	43685	43842	44007	44176	44341	44505
105	9	9	9	8	8	8	43341	43505	43669	43833	43997	44162	44342	44522	44704	44883
106	9	9	9	9	8	8	43620	43792	43964	44137	44309	44481	44676	44871	45067	45261
107	9	9	9	9	9	8	43900	44080	44260	44440	44620	44801	45010	45219	45429	45638
108	9	9	9	9	9	9	44180	44368	44556	44744	44932	45120	45344	45568	45792	46016
109	10	9	9	9	9	9	44435	44631	44828	45025	45222	45418	45647	45876	46104	46333
110	10	10	9	9	9	9	44689	44895	45100	45306	45511	45717	45950	46183	46416	46650
111	10	10	10	9	9	9	44944	45158	45372	45587	45801	46015	46253	46491	46729	46967
112	10	10	10	10	9	9	45199	45421	45644	45867	46090	46313	46555	46798	47041	47283
113	10	10	10	10	10	9	45153	45685	45916	46147	46380	46612	46858	47106	47353	47600
114	10	10	10	10	10	10	45708	45948	46188	46429	46669	46910	47161	47413	47665	47917
115	11	10	10	10	10	10	45967	46210	46453	46697	46940	47183	47433	47683	47922	48183
116	11	11	10	10	10	10	46225	46471	46717	46964	47210	47457	47704	47952	48200	48448
117	11	11	11	10	10	10	46485	46733	46982	47232	47481	47730	47976	48222	48468	48714
118	11	11	11	11	10	10	46743	46995	47247	47499	47751	48003	48247	48491	48735	48979
119	11	11	11	11	11	10	47001	47256	47544	47767	48022	48277	48519	48761	49003	49245
120	11	11	11	11	11	11	47260	47518	47779	48034	48292	48550	48790	49030	49270	49510
121	12	11	11	11	11	11	47486	47746	48006	48266	48526	48785	49024	49261	49499	49737
122	12	12	11	11	11	11	47716	47974	48236	48498	48759	49020	49257	49493	49728	49964
123	12	12	12	11	11	11	47939	48203	48466	48730	48993	49256	49491	49724	49958	50191
124	12	12	12	12	11	11	48165	48431	48696	48961	49227	49491	49724	49955	50187	50415
125	12	12	12	12	12	11	48392	48659	48926	49193	49460	49726	49958	50187	50416	50645
126	12	12	12	12	12	12	48618	48887	49156	49625	49694	49961	50191	50418	50645	50872
127	13	12	12	12	12	12	48808	49081	49353	49825	49897	50168	50393	50616	50839	51061
128	13	13	12	12	12	12	48999	49274	49549	49825	50100	50374	50595	50813	51035	51251
129	13	13	13	12	12	12	49189	49468	49746	50025	50303	50581	50797	51011	51226	51440
130	13	13	13	13	12	12	49379	49661	49943	50224	50506	50787	50998	51209	51419	51629
131	13	13	13	13	13	12	49570	49855	50139	50424	50709	50994	51200	51406	51613	51819
132	13	13	13	13	13	13	49760	50048	50336	50624	50912	51200	51402	51601	51806	52008
133	14	13	13	13	13	13	49923	50211	50499	50787	51075	51363	51562	51761	51959	52158
134	14	14	13	13	13	13	50089	50374	50662	50950	51237	51525	51721	51917	52113	52309
135	14	14	14	13	13	13	50250	50537	50825	51113	51400	51688	51881	52074	52266	52459
136	14	14	14	14	13	13	50416	50700	50987	51275	51563	51851	52040	52230	52419	52609
137	14	14	14	14	14	13	50579	50863	51150	51438	51725	52013	52200	52387	52573	52760
138	14	14	14	14	14	14	50739	51026	51313	51601	51888	52176	52359	52543	52726	52910
139	FULL	14	14	14	14	14	51032	51318	51604	51891	52177	52464	52664	52864	53061	53264
140	FULL	FULL	14	14	14	14	51324	51609	51895	52181	52466	52752	52968	53185	53402	53619
141	FULL	FULL	FULL	14	14	14	51617	51901	52186	52471	52755	53040	53273	53507	53740	53973
142	FULL	FULL	FULL	FULL	14	14	51909	52193	52476	52760	53044	53328	53578	53828	54077	54327
143	FULL	FULL	FULL	FULL	FULL	14	52202	52484	52767	53050	53333	53616	53882	54149	54415	54682
144	FULL	FULL	FULL	FULL	FULL	FULL	52494	52779	53058	53340	53622	53901	54187	54470	54753	55036

ALABAMA-COOSA-TALLAPOOSA RIVER BASIN

WATER CONTROL MANUAL
CLAIBORNE LOCK AND DAM AND LAKE

GATE OPENING SCHEDULE

GATE STEP NO.	GATE OPENING IN FEET						SPILLWAY DISCHARGE IN CFS									
	GATE NUMBER						POOL ELEVATION IN FT NGVD29									
	1	2	3	4	5	6	32	32.1	32.2	32.3	32.4	32.5	32.6	32.7	32.8	32.9
1	0.25	0	0	0	0	0	422	423	424	426	427	429	430	431	432	433
2	0.25	0.25	0	0	0	0	845	847	849	852	854	857	859	861	863	865
3	0.25	0.25	0.25	0	0	0	1267	1270	1274	1278	1282	1286	1289	1292	1295	1298
4	0.25	0.25	0.25	0.25	0	0	1689	1674	1699	1704	1709	1715	1719	1723	1727	1731
5	0.25	0.25	0.25	0.25	0.25	0	2111	2117	2123	2130	2136	2143	2148	2153	2158	2163
6	0.25	0.25	0.25	0.25	0.25	0.25	2534	2541	2549	2556	2564	2572	2578	2584	2590	2596
7	0.5	0.25	0.25	0.25	0.25	0.25	2947	2955	2964	2973	2982	2991	2998	3005	3013	3020
8	0.5	0.5	0.25	0.25	0.25	0.25	3359	3369	3379	3389	3399	3409	3418	3427	3436	3446
9	0.5	0.5	0.5	0.25	0.25	0.25	3772	3783	3794	3805	3816	3828	3838	3848	3858	3868
10	0.5	0.5	0.5	0.5	0.25	0.25	4184	4196	4208	4221	4233	4246	4257	4269	4281	4293
11	0.5	0.5	0.5	0.5	0.5	0.25	4597	4610	4627	4637	4651	4665	4678	4691	4704	4717
12	0.5	0.5	0.5	0.5	0.5	0.5	5009	5024	5039	5054	5069	5084	5098	5113	5127	5142
13	0.75	0.5	0.5	0.5	0.5	0.5	5416	5432	5448	5464	5480	5497	5512	5528	5544	5560
14	0.75	0.75	0.5	0.5	0.5	0.5	5823	5840	5857	5875	5892	5910	5927	5944	5961	5978
15	0.75	0.75	0.75	0.5	0.5	0.5	6230	6248	6267	6285	6304	6323	6341	6359	6377	6395
16	0.75	0.75	0.75	0.75	0.5	0.5	6637	6656	6676	6696	6716	6736	6755	6774	6794	6813
17	0.75	0.75	0.75	0.75	0.75	0.5	7044	7065	7086	7107	7128	7149	7169	7190	7210	7231
18	0.75	0.75	0.75	0.75	0.75	0.75	7451	7473	7495	7517	7539	7562	7593	7605	7627	7649
19	1	0.75	0.75	0.75	0.75	0.75	7847	7870	7893	7917	7940	7964	7987	8010	8033	8056
20	1	1	0.75	0.75	0.75	0.75	8243	8267	8292	8316	8341	8366	8390	8414	8438	8462
21	1	1	1	0.75	0.75	0.75	8639	8664	8690	8716	8742	8768	8793	8818	8844	8869
22	1	1	1	1	0.75	0.75	9034	9061	9088	9115	9142	9170	9196	9223	9250	9277
23	1	1	1	1	1	0.75	9430	9458	9486	9515	9546	9572	9600	9628	9656	9684
24	1	1	1	1	1	1	9826	9855	9885	9914	9944	9974	10003	10032	10064	10090
25	1.25	1	1	1	1	1	10194	10224	10255	10286	10317	10348	10378	10408	10438	10468
26	1.25	1.25	1	1	1	1	10562	10593	10625	10657	10689	10721	10752	10783	10815	10846
27	1.25	1.25	1.25	1	1	1	10929	10962	10995	11028	11061	11094	11126	11159	11191	11224
28	1.25	1.25	1.25	1.25	1	1	11297	11331	11365	11399	11433	11468	11501	11535	11568	11602
29	1.25	1.25	1.25	1.25	1.25	1	11664	11699	11734	11770	11805	11841	11875	11910	11945	11980
30	1.25	1.25	1.25	1.25	1.25	1.25	12032	12068	12104	12141	12177	12214	12250	12286	12322	12358
31	1.5	1.25	1.25	1.25	1.25	1.25	12389	12426	12464	12501	12539	12577	12614	12651	12688	12725
32	1.5	1.5	1.25	1.25	1.25	1.25	12746	12784	12823	12862	12901	12940	12978	13016	13054	13092
33	1.5	1.5	1.5	1.25	1.25	1.25	13103	13142	13182	13222	13262	13302	13341	13380	13420	13459
34	1.5	1.5	1.5	1.5	1.25	1.25	13460	13501	13542	13583	13624	13665	13705	13745	13786	13826
35	1.5	1.5	1.5	1.5	1.5	1.25	13817	13859	13901	13943	13985	14027	14068	14110	14151	14193
36	1.5	1.5	1.5	1.5	1.5	1.5	14174	14217	14260	14303	14346	14390	14432	14475	14517	14560
37	1.75	1.5	1.5	1.5	1.5	1.5	14500	14544	14588	14632	14676	14721	14764	14808	14851	14895
38	1.75	1.75	1.5	1.5	1.5	1.5	14825	14870	14915	14961	15006	15052	15096	15141	15185	15230
39	1.75	1.75	1.75	1.5	1.5	1.5	15151	15197	15243	15290	15336	15383	15428	15474	15520	15566
40	1.75	1.75	1.75	1.75	1.5	1.5	15476	15523	15571	15618	15666	15714	15760	15807	15854	15901
41	1.75	1.75	1.75	1.75	1.75	1.5	15802	15850	15898	15947	15996	16045	16092	16140	16188	16236
42	1.75	1.75	1.75	1.75	1.75	1.75	16127	16176	16226	16276	16326	16376	16424	16473	16522	16571
43	2	1.75	1.75	1.75	1.75	1.75	16422	16472	16523	16574	16625	16676	16725	16775	16825	16875
44	2	2	1.75	1.75	1.75	1.75	16717	16768	16820	16872	16924	16976	17026	17077	17128	17179
45	2	2	2	1.75	1.75	1.75	17013	17065	17117	17170	17223	17276	17327	17379	17431	17483
46	2	2	2	2	1.75	1.75	17308	17361	17414	17468	17521	17575	17627	17680	17733	17786
47	2	2	2	2	2	1.75	17603	17657	17711	17766	17820	17875	17928	17982	18036	18090
48	2	2	2	2	2	2	17898	17953	18008	18064	18119	18175	18229	18284	18339	18397

ALABAMA-COOSA-TALLAPOOSA RIVER BASIN

WATER CONTROL MANUAL
CLAIBORNE LOCK AND DAM AND LAKE

GATE OPENING SCHEDULE

GATE STEP NO.	GATE OPENING IN FEET						SPILLWAY DISCHARGE IN CFS									
	GATE NUMBER						POOL ELEVATION IN FT NGVD29									
	1	2	3	4	5	6	32	32.1	32.2	32.3	32.4	32.5	32.6	32.7	32.8	32.9
49	2.25	2	2	2	2	2	18184	18240	18296	18353	18409	18466	18521	18577	18633	18689
50	2.25	2.25	2	2	2	2	18471	18528	18585	18643	18700	18758	18814	18870	18927	18984
51	2.25	2.25	2.25	2	2	2	18757	18815	18873	18932	18990	19049	19106	19164	19222	19279
52	2.25	2.25	2.25	2.25	2.25	2	19043	19102	19161	19221	19280	19340	19398	19457	19516	19574
53	2.25	2.25	2.25	2.25	2.25	2	19330	19390	19450	19511	19571	19632	19691	19750	19810	19869
54	2.25	2.25	2.25	2.25	2.25	2.25	19616	19677	19738	19800	19861	19923	19983	20043	20104	20164
55	2.5	2.25	2.25	2.25	2.25	2.25	19898	19960	20022	20085	20147	20210	20271	20332	20394	20455
56	2.5	2.5	2.25	2.25	2.25	2.25	20180	20242	20306	20370	20433	20497	20559	20621	20684	20746
57	2.5	2.5	2.5	2.25	2.25	2.25	20463	20525	20591	20655	20719	20784	20847	20910	20974	21037
58	2.5	2.5	2.5	2.5	2.5	2.25	20745	20808	20875	20940	21005	21071	21135	21199	21263	21327
59	2.5	2.5	2.5	2.5	2.5	2.25	21027	21090	21159	21225	21291	21358	21423	21488	21553	21628
60	2.5	2.5	2.5	2.5	2.5	2.5	21309	21373	21443	21510	21577	21645	21711	21777	21843	21909
61	2.75	2.5	2.5	2.5	2.5	2.5	21586	21651	21722	21790	21858	21927	21994	22061	22128	22195
62	2.75	2.75	2.5	2.5	2.5	2.5	21863	21930	22001	22070	22139	22208	22276	22344	22412	22480
63	2.75	2.75	2.75	2.5	2.5	2.5	22140	22208	22280	22350	22420	22490	22559	22628	22697	22766
64	2.75	2.75	2.75	2.75	2.5	2.5	22416	22486	22558	22629	22700	22772	22841	22911	22981	23051
65	2.75	2.75	2.75	2.75	2.75	2.5	22693	22765	22837	22909	22981	23053	23124	23195	23266	23337
66	2.75	2.75	2.75	2.75	2.75	2.75	22970	23043	23116	23189	23262	23335	23406	23478	23550	23622
67	3	2.75	2.75	2.75	2.75	2.75	23239	23313	23387	23461	23535	23609	23681	23753	23826	23899
68	3	3	2.75	2.75	2.75	2.75	23508	23582	23657	23732	23807	23882	23955	24029	24103	24176
69	3	3	3	2.75	2.75	2.75	23777	23852	23928	24004	24080	24156	24230	24304	24379	24454
70	3	3	3	3	2.75	2.75	24045	24122	24199	24275	24352	24429	24504	24579	24655	24731
71	3	3	3	3	3	2.75	24314	24391	24469	24547	24625	24703	24779	24855	24932	25008
72	3	3	3	3	3	3	24583	24661	24740	24818	24897	24976	25053	25130	25208	25285
73	4	3	3	3	3	3	25562	25643	25726	25808	25891	25973	26054	26135	26216	26297
74	4	4	3	3	3	3	26540	26626	26712	26798	26884	26970	27055	27139	27224	27308
75	4	4	4	3	3	3	27519	27608	27698	27788	27878	27968	28056	28144	28232	28320
76	4	4	4	4	3	3	28498	28590	28684	28777	28871	28965	29056	29148	29240	29332
77	4	4	4	4	4	3	29476	29573	29670	29767	29865	29962	30057	30153	30248	30343
78	4	4	4	4	4	4	30455	30555	30656	30757	30858	30959	31058	31157	31256	31355
79	5	4	4	4	4	4	31186	31296	31408	31519	31630	31742	31837	31932	32028	32123
80	5	5	4	4	4	4	31916	32037	32159	32281	32403	32525	32616	32708	32799	32891
81	5	5	5	4	4	4	32647	32779	32911	33043	33175	33308	33395	33483	33571	33659
82	5	5	5	5	4	4	33378	33520	33662	33805	33947	34090	34174	34258	34342	34426
83	5	5	5	5	5	4	34108	34261	34414	34567	34720	34873	34953	35034	35114	35194
84	5	5	5	5	5	5	34839	35002	35165	35329	35492	35656	35732	35809	35885	35962
85	6	5	5	5	5	5	35485	35634	35782	35932	36081	36230	36316	36402	36488	36574
86	6	6	5	5	5	5	36131	36265	36399	36535	36669	36804	36899	36995	37090	37186
87	6	6	6	5	5	5	36777	36897	37017	37138	37258	37379	37483	37588	37693	37798
88	6	6	6	6	5	5	37422	37528	37634	37740	37846	37953	38067	38181	38296	38410
89	6	6	6	6	6	5	38068	38160	38251	38343	38435	38527	38650	38774	38898	39022
90	6	6	6	6	6	6	38714	38791	38868	38946	39023	39101	39234	39367	39501	39634
91	7	6	6	6	6	6	39158	39265	39373	39481	39589	39698	39830	39963	40097	40230
92	7	7	6	6	6	6	39601	39739	39878	40017	40155	40294	40427	40559	40693	40825
93	7	7	7	6	6	6	40045	40214	40383	40552	40721	40891	41023	41156	41289	41421
94	7	7	7	7	6	6	40488	40688	40887	41087	41287	41487	41619	41752	41884	42017
95	7	7	7	7	7	6	40932	41162	41392	41623	41853	42084	42216	42348	42480	42612

ALABAMA-COOSA-TALLAPOOSA RIVER BASIN

WATER CONTROL MANUAL
CLAIBORNE LOCK AND DAM AND LAKE

GATE OPENING SCHEDULE

GATE STEP NO.	GATE OPENING IN FEET						SPILLWAY DISCHARGE IN CFS									
	GATE NUMBER						POOL ELEVATION IN FT NGVD29									
	1	2	3	4	5	6	32	32.1	32.2	32.3	32.4	32.5	32.6	32.7	32.8	32.9
96	7	7	7	7	7	7	41375	41636	41897	42158	42419	42680	42812	42944	43076	43208
97	8	7	7	7	7	7	41794	42051	42309	42566	42824	43081	43219	43357	43496	43634
98	8	8	7	7	7	7	42212	42466	42720	42974	43228	43483	43627	43771	43915	44059
99	8	8	8	7	7	7	42631	42882	43132	43383	43633	43884	44064	44184	44335	44485
100	8	8	8	8	7	7	43050	43297	43544	43791	44038	44285	44441	44597	44754	44910
101	8	8	8	8	8	7	43468	43712	43955	44199	44442	44687	44849	45011	45174	45336
102	8	8	8	8	8	8	43887	44127	44367	44607	44847	45088	45256	45424	45593	45761
103	9	8	8	8	8	8	44279	44504	44728	44953	45177	45406	45572	45741	45911	46080
104	9	9	8	8	8	8	44671	44980	45089	45298	45507	45717	45887	46058	46229	46399
105	9	9	9	8	8	8	45064	45257	45451	45644	45838	46032	46203	46375	46547	46718
106	9	9	9	9	8	8	45456	45634	45812	45990	46168	46346	46519	46691	46864	47037
107	9	9	9	9	9	8	45848	46010	46173	46335	46498	46661	46834	47008	47182	47356
108	9	9	9	9	9	9	46240	46387	46534	46681	46828	46975	47150	47325	47500	47675
109	10	9	9	9	9	9	46562	46704	46846	46988	47130	47272	47450	47628	47806	47984
110	10	10	9	9	9	9	46883	47020	47157	47295	47432	47569	47750	47931	48112	48292
111	10	10	10	9	9	9	47205	47337	47469	47602	47734	47867	48050	48234	48418	48601
112	10	10	10	10	9	9	47526	47653	47781	47908	48036	48164	48350	48536	48723	48910
113	10	10	10	10	10	9	47848	47970	48092	48215	48338	48461	48650	48839	49029	49218
114	10	10	10	10	10	10	48169	48286	48404	48522	48640	48758	48950	49142	49335	49527
115	11	10	10	10	10	10	48433	48552	48672	48792	48912	49032	49230	49429	49629	49827
116	11	11	10	10	10	10	48686	48817	48939	49061	49183	49305	49511	49716	49922	50127
117	11	11	11	10	10	10	48960	49083	49207	49331	49455	49579	49791	50003	50216	50428
118	11	11	11	11	10	10	49229	49349	49475	49601	49727	49853	50071	50290	50509	50728
119	11	11	11	11	11	10	49487	49614	49742	49870	49998	50156	50352	50577	50806	51028
120	11	11	11	11	11	11	49750	49880	50010	50140	50270	50400	50632	50864	51096	51328
121	12	11	11	11	11	11	49975	50112	50249	50386	50514	50661	50985	51129	51363	51597
122	12	12	11	11	11	11	50200	50344	50488	50633	50777	50921	51158	51394	51630	51867
123	12	12	12	11	11	11	50425	50576	50728	50879	51031	51182	51421	51659	51898	52136
124	12	12	12	12	11	11	50650	50808	50967	51125	51284	51443	51683	51924	52165	52405
125	12	12	12	12	12	11	50875	51040	51206	51372	51538	51703	51946	52189	52132	52675
126	12	12	12	12	12	12	51100	51272	51445	51618	51791	51964	52209	52454	52699	52944
127	13	12	12	12	12	12	51285	51468	51652	51836	52020	52100	52450	52750	52943	53189
128	13	13	12	12	12	12	51470	51664	51859	52053	52248	52300	52691	52920	53187	53435
129	13	13	13	12	12	12	51655	51860	52066	52271	52477	52700	52932	53150	53431	53680
130	13	13	13	13	12	12	51840	52056	52272	52489	52705	52900	53172	53300	53674	53925
131	13	13	13	13	13	12	52025	52252	52479	52706	52934	53100	53413	53700	53918	54171
132	13	13	13	13	13	13	52210	52448	52686	52924	53162	53300	53654	53850	54162	54416
133	14	13	13	13	13	13	52357	52609	52861	53113	53365	53650	53868	54050	54372	54624
134	14	14	13	13	13	13	52505	52770	53036	53302	53567	53800	54083	54300	54583	54833
135	14	14	14	13	13	13	52652	52932	53211	53491	53770	54000	54297	54600	54793	55041
136	14	14	14	14	13	13	52799	53093	53386	53679	53973	54250	54511	54800	55003	55249
137	14	14	14	14	14	13	52977	53254	53561	53868	54175	54500	54726	55010	55214	55458
138	14	14	14	14	14	14	53094	53415	53736	54057	54378	54699	54940	55250	55424	55666
139	FULL	14	14	14	14	14	53465	53780	54094	54409	54723	55038	55285	55534	55783	56031
140	FULL	FULL	14	14	14	14	53836	54144	54452	54760	55068	55376	55621	55886	56141	56397
141	FULL	FULL	FULL	14	14	14	54207	54509	54810	55112	55416	55715	55976	56238	56500	56762
142	FULL	FULL	FULL	FULL	14	14	54578	54873	55168	55463	55758	56053	56321	56590	56859	57127
143	FULL	FULL	FULL	FULL	FULL	14	54979	55238	55526	55815	56103	56392	56667	56942	57217	57493
144	FULL	FULL	FULL	FULL	FULL	FULL	55320	55602	55884	56166	56448	56730	57012	57294	57576	57858

ALABAMA-COOSA-TALLAPOOSA RIVER BASIN

WATER CONTROL MANUAL
CLAIBORNE LOCK AND DAM AND LAKE

GATE OPENING SCHEDULE

GATE STEP NO.	GATE OPENING IN FEET						SPILLWAY DISCHARGE IN CFS									
	GATE NUMBER						POOL ELEVATION IN FT NGVD29									
	1	2	3	4	5	6	33	33.1	33.2	33.3	33.4	33.5	33.6	33.7	33.8	33.9
1	0.25	0	0	0	0	0	434	575	716	857	998	1140	1335	1530	1725	1920
2	0.25	0.25	0	0	0	0	868	1010	1152	1295	1437	1580	1776	1972	2169	2365
3	0.25	0.25	0.25	0	0	0	1302	1445	1588	1732	1875	2019	2216	2414	2611	2809
4	0.25	0.25	0.25	0.25	0	0	1735	1879	2024	2169	2315	2459	2657	2856	3055	3254
5	0.25	0.25	0.25	0.25	0.25	0	2169	2315	2461	2607	2753	2899	3099	3299	3499	3699
6	0.25	0.25	0.25	0.25	0.25	0.25	2603	2750	2897	3044	3191	3339	3540	3741	3942	4143
7	0.5	0.25	0.25	0.25	0.25	0.25	3029	3177	3325	3473	3622	3771	3974	4177	4380	4593
8	0.5	0.5	0.25	0.25	0.25	0.25	3454	3604	3753	3903	4052	4202	4408	4613	4818	5024
9	0.5	0.5	0.5	0.25	0.25	0.25	3880	4031	4181	4332	4483	4634	4842	5049	5257	5464
10	0.5	0.5	0.5	0.5	0.25	0.25	4306	4457	4609	4761	4913	5066	5475	5485	5695	5904
11	0.5	0.5	0.5	0.5	0.5	0.25	4731	4884	5037	5191	5344	5497	5709	5921	6133	6345
12	0.5	0.5	0.5	0.5	0.5	0.5	5157	5311	5465	5620	5774	5929	6143	6357	6572	6785
13	0.75	0.5	0.5	0.5	0.5	0.5	5576	5731	5887	6043	6198	6354	6568	6782	6997	7211
14	0.75	0.75	0.5	0.5	0.5	0.5	5995	6151	6308	6465	6622	6779	6993	7208	7422	7637
15	0.75	0.75	0.75	0.5	0.5	0.5	6414	6572	6730	6888	7046	7204	7419	7633	7848	8063
16	0.75	0.75	0.75	0.75	0.5	0.5	6833	6992	7151	7310	7469	7629	7844	8058	8274	8488
17	0.75	0.75	0.75	0.75	0.75	0.5	7252	7415	7573	7733	7893	8054	8269	8484	8699	8914
18	0.75	0.75	0.75	0.75	0.75	0.75	7671	7832	7994	8155	8317	8479	8694	8909	9125	9340
19	1	0.75	0.75	0.75	0.75	0.75	8079	8241	8405	8567	8730	8893	9109	9325	9543	9759
20	1	1	0.75	0.75	0.75	0.75	8487	8651	8815	8978	9143	9307	9524	9725	9960	10177
21	1	1	1	0.75	0.75	0.75	8896	9060	9226	9390	9556	9721	9940	10158	10378	10596
22	1	1	1	1	0.75	0.75	9304	9469	9636	9802	9968	10135	10355	10574	10795	11015
23	1	1	1	1	1	0.75	9712	9879	10047	10213	10381	10549	10770	10991	11216	11433
24	1	1	1	1	1	1	10120	10288	10457	10625	10794	10963	11185	11407	11630	11852
25	1.25	1	1	1	1	1	10499	10668	10838	11008	11178	11348	11571	11794	12018	12241
26	1.25	1.25	1	1	1	1	10878	11048	11219	11390	11561	11732	11957	12181	12406	12630
27	1.25	1.25	1.25	1	1	1	11257	11429	11601	11773	11945	12117	12343	12568	12794	13020
28	1.25	1.25	1.25	1.25	1	1	11636	11809	11982	12155	12328	12502	12728	12955	13182	13409
29	1.25	1.25	1.25	1.25	1.25	1	12015	12189	12363	12538	12712	12886	13114	13342	13570	13798
30	1.25	1.25	1.25	1.25	1.25	1.25	12394	12569	12744	12920	13095	13271	13500	13729	13958	14187
31	1.5	1.25	1.25	1.25	1.25	1.25	12762	12938	13115	13292	13468	13645	13875	14105	14335	14565
32	1.5	1.5	1.25	1.25	1.25	1.25	13130	13308	13485	13663	13840	14018	14249	14481	14715	14943
33	1.5	1.5	1.5	1.25	1.25	1.25	13499	13677	13856	14035	14213	14392	14624	14857	15089	15321
34	1.5	1.5	1.5	1.5	1.25	1.25	13867	14046	14226	14406	14586	14766	14999	15232	15465	15699
35	1.5	1.5	1.5	1.5	1.5	1.25	14235	14416	14597	14778	14958	15139	15373	15608	15842	16077
36	1.5	1.5	1.5	1.5	1.5	1.5	14603	14783	14967	15149	15331	15513	15748	15984	16219	16455
37	1.75	1.5	1.5	1.5	1.5	1.5	14939	15122	15305	15488	15671	15854	16090	16327	16563	16800
38	1.75	1.75	1.5	1.5	1.5	1.5	15275	15459	15643	15827	16011	16196	16433	16670	16908	17145
39	1.75	1.75	1.75	1.5	1.5	1.5	15615	15797	15982	16167	16352	16537	16775	17014	17252	17491
40	1.75	1.75	1.75	1.75	1.5	1.5	15948	16134	16320	16506	16692	16878	17117	17357	17596	17836
41	1.75	1.75	1.75	1.75	1.75	1.5	16284	16471	16658	16845	17032	17220	17460	17700	17941	18181
42	1.75	1.75	1.75	1.75	1.75	1.75	16620	16808	16996	17185	17372	17561	17802	18043	18285	18526
43	2	1.75	1.75	1.75	1.75	1.75	16925	17114	17303	17492	17681	17871	18113	18255	18597	18839
44	2	2	1.75	1.75	1.75	1.75	17230	17419	17609	17799	17989	18180	18426	18666	18910	19153
45	2	2	2	1.75	1.75	1.75	17535	17725	17916	18107	18298	18490	18734	18978	19222	19466
46	2	2	2	2	1.75	1.75	17839	18031	18223	18415	18607	18799	19044	19289	19534	19779
47	2	2	2	2	2	1.75	18144	18336	18529	18722	18915	19109	19355	19601	19847	20093
48	2	2	2	2	2	2	18449	18642	18836	19030	19224	19418	19665	19912	20159	20406

ALABAMA-COOSA-TALLAPOOSA RIVER BASIN

WATER CONTROL MANUAL
CLAIBORNE LOCK AND DAM AND LAKE

GATE OPENING SCHEDULE

GATE STEP NO.	GATE OPENING IN FEET						SPILLWAY DISCHARGE IN CFS									
	GATE NUMBER						POOL ELEVATION IN FT NGVD29									
	1	2	3	4	5	6	33	33.1	33.2	33.3	33.4	33.5	33.6	33.7	33.8	33.9
49	2.25	2	2	2	2	2	18745	18939	19134	19329	19524	19719	19967	20215	20462	20710
50	2.25	2.25	2	2	2	2	19041	19236	19432	19628	19823	20019	20268	20517	20766	21015
51	2.25	2.25	2.25	2	2	2	19337	19533	19730	19927	20123	20320	20570	20820	21069	21319
52	2.25	2.25	2.25	2.25	2.25	2	19633	19830	20027	20225	20423	20621	20871	21122	21372	21623
53	2.25	2.25	2.25	2.25	2.25	2	19929	20127	20325	20524	20722	20921	21173	21425	21676	21928
54	2.25	2.25	2.25	2.25	2.25	2.25	20225	20424	20623	20823	21022	21222	21474	21727	21979	22232
55	2.5	2.25	2.25	2.25	2.25	2.25	20517	20717	20917	21118	21318	21519	21772	22025	22278	22532
56	2.5	2.5	2.25	2.25	2.25	2.25	20808	21009	21210	21412	21613	21815	22068	22324	22578	22832
57	2.5	2.5	2.5	2.25	2.25	2.25	21100	21302	21504	21707	21909	22112	22367	22622	22877	23133
58	2.5	2.5	2.5	2.5	2.5	2.25	21392	21595	21798	22001	22204	22108	22664	22920	23176	23433
59	2.5	2.5	2.5	2.5	2.5	2.25	21683	21887	22091	22296	22500	22705	22962	23219	23476	23733
60	2.5	2.5	2.5	2.5	2.5	2.5	21975	22180	22385	22590	22795	23001	23259	23517	23775	24033
61	2.75	2.5	2.5	2.5	2.5	2.5	22262	22467	22673	22879	23085	23292	23551	23810	24069	24328
62	2.75	2.75	2.5	2.5	2.5	2.5	22548	22755	22962	23168	23375	23583	23843	24103	24363	24623
63	2.75	2.75	2.75	2.5	2.5	2.5	22835	23042	23250	23458	23666	23874	24135	24396	24657	24918
64	2.75	2.75	2.75	2.75	2.5	2.5	23121	23329	23538	23747	23956	24165	24426	24688	24950	25212
65	2.75	2.75	2.75	2.75	2.75	2.5	23408	23617	23827	24036	24246	24456	24718	24981	25244	25507
66	2.75	2.75	2.75	2.75	2.75	2.75	23694	23904	24115	24325	24536	24747	25010	25274	25538	25802
67	3	2.75	2.75	2.75	2.75	2.75	23972	24160	24348	24536	24725	24913	25198	25483	25769	26054
68	3	3	2.75	2.75	2.75	2.75	24250	24416	24852	24747	24913	25080	25386	25693	25999	26306
69	3	3	3	2.75	2.75	2.75	24529	24672	24815	24959	25102	25246	25574	25902	26230	26559
70	3	3	3	3	2.75	2.75	24807	24927	25048	25170	25291	25412	25761	26111	26461	26811
71	3	3	3	3	3	2.75	25085	25183	25282	25384	25479	25579	25949	26321	26641	27063
72	3	3	3	3	3	3	25363	25439	25515	25592	25668	25745	26137	26530	26922	27315
73	4	3	3	3	3	3	26378	26472	26566	26661	26755	26879	27204	27559	27913	28268
74	4	4	3	3	3	3	27393	27505	27617	27729	27841	27954	28270	28588	28904	29222
75	4	4	4	3	3	3	28409	28538	28668	28798	28928	29058	29337	29617	29896	30175
76	4	4	4	4	3	3	29424	29571	29718	29867	30014	30162	30404	30645	30887	31128
77	4	4	4	4	4	3	30439	30604	30769	30935	31101	31267	31470	31674	31878	32082
78	4	4	4	4	4	4	31454	31637	31820	32004	32187	32371	32537	32703	32869	33035
79	5	4	4	4	4	4	32218	32408	32597	32788	32977	33167	33332	33498	33663	33829
80	5	5	4	4	4	4	32982	33178	33374	33571	33766	33963	34128	34293	34458	34623
81	5	5	5	4	4	4	33747	33949	34151	34355	34556	34759	34923	35088	35252	35417
82	5	5	5	5	4	4	34511	34719	34927	35139	35345	35554	35718	35882	36046	36210
83	5	5	5	5	5	4	35275	35490	35704	35922	36135	36350	36515	36677	36841	37004
84	5	5	5	5	5	5	36039	36260	36481	36706	36924	37146	37309	37472	37635	37798
85	6	5	5	5	5	5	36661	36880	37099	37321	37539	37757	37924	38091	38258	38425
86	6	6	5	5	5	5	37282	37499	37716	37936	38151	38369	38539	38710	38881	39052
87	6	6	6	5	5	5	37904	38199	38334	38551	38764	38980	39155	39330	39505	39680
88	6	6	6	6	5	5	38525	38738	38951	39165	39377	39591	39770	39949	40128	40307
89	6	6	6	6	6	5	39147	39358	39569	39780	39991	40203	40385	40568	40751	40934
90	6	6	6	6	6	6	39768	39977	40186	40395	40604	40814	41000	41157	41375	41561
91	7	6	6	6	6	6	40363	40563	40763	40963	41163	41363	41561	41760	41959	42158
92	7	7	6	6	6	6	40959	41149	41340	41531	41721	41913	42123	42333	42544	42755
93	7	7	7	6	6	6	41554	41736	41917	42099	42280	42462	42684	42907	43129	43352
94	7	7	7	7	6	6	42149	42322	42494	42666	42839	43011	43245	43480	43714	43948
95	7	7	7	7	7	6	42745	42908	43071	43234	43397	43561	43807	44053	44299	44545
96	7	7	7	7	7	7	43340	43494	43648	43802	43956	44110	44368	44626	44884	45142

ALABAMA-COOSA-TALLAPOOSA RIVER BASIN

WATER CONTROL MANUAL
CLAIBORNE LOCK AND DAM AND LAKE

GATE OPENING SCHEDULE

GATE STEP NO.	GATE OPENING IN FEET						SPILLWAY DISCHARGE IN CFS									
	GATE NUMBER						POOL ELEVATION IN FT NGVD29									
	1	2	3	4	5	6	33	33.1	33.2	33.3	33.4	33.5	33.6	33.7	33.8	33.9
97	8	7	7	7	7	7	41794	42051	42309	42566	42824	43081	43219	43357	43496	43634
98	8	8	7	7	7	7	42212	42466	42720	42974	43228	43483	43627	43771	43915	44059
99	8	8	8	7	7	7	42631	42882	43432	43383	43633	43884	44034	44184	44335	44485
100	8	8	8	8	7	7	43050	43297	43544	43791	44038	44285	44441	44597	44754	44910
101	8	8	8	8	8	7	43468	43712	43955	44199	44442	44687	44849	45011	45174	45336
102	8	8	8	8	8	8	43887	44127	44367	44607	44847	45088	45256	45424	45593	45761
103	9	8	8	8	8	8	44279	44504	44728	44953	45177	45403	45572	45741	45911	46080
104	9	9	8	8	8	8	44671	44880	45089	45298	45507	45717	45887	46059	46229	46399
105	9	9	9	8	8	8	45064	45257	45451	45644	45838	46032	46203	46375	46547	46718
106	9	9	9	9	8	8	45456	45634	45812	45990	46168	46346	46519	46691	46864	47037
107	9	9	9	9	9	8	45848	46010	46173	46335	46498	46661	46834	47008	47182	47356
108	9	9	9	9	9	9	46240	46387	46534	46681	46828	46975	47150	47325	47500	47675
109	10	9	9	9	9	9	46562	46704	46846	46988	47130	47272	47450	47628	47806	47984
110	10	10	9	9	9	9	46883	47020	47157	47295	47432	47539	47750	47931	48112	48292
111	10	10	10	9	9	9	47205	47337	47469	47602	47734	47867	48050	48234	48418	48601
112	10	10	10	10	9	9	47526	47653	47781	47908	48036	48164	48350	48536	48723	48910
113	10	10	10	10	10	9	47848	47970	48092	48215	48338	48461	48650	48839	49029	49218
114	10	10	10	10	10	10	48169	48286	48404	48522	48640	48758	48950	49142	49335	49527
115	11	10	10	10	10	10	48133	48552	48672	48792	48912	49032	49230	49429	49629	49827
116	11	11	10	10	10	10	48696	48817	48939	49061	49183	49305	49511	49716	49922	50127
117	11	11	11	10	10	10	48960	49083	49207	49331	49455	49579	49791	50003	50216	50128
118	11	11	11	11	10	10	49223	49349	49475	49601	49727	49853	50071	50290	50509	50728
119	11	11	11	11	11	10	49487	49614	49742	49870	49998	50126	50352	50577	50806	51028
120	11	11	11	11	11	11	49750	49880	50010	50140	50270	50400	50632	50864	51096	51328
121	12	11	11	11	11	11	49975	50112	50249	50386	50524	50661	50895	51129	51363	51597
122	12	12	11	11	11	11	50200	50311	50488	50633	50777	50921	51158	51394	51630	51867
123	12	12	12	11	11	11	50425	50576	50728	50879	51031	51182	51421	51659	51898	52136
124	12	12	12	12	11	11	50650	50808	50967	51125	51284	51443	51683	51924	52165	52405
125	12	12	12	12	12	11	50875	51040	51206	51372	51538	51703	51946	52189	52432	52675
126	12	12	12	12	12	12	51100	51272	51445	51618	51791	51964	52209	52454	52699	52944
127	13	12	12	12	12	12	51285	51468	51652	51836	52020	52200	52450	52650	52943	53189
128	13	13	12	12	12	12	51470	51664	51859	52053	52248	52400	52691	52880	53187	53435
129	13	13	13	12	12	12	51655	51860	52066	52271	52477	52550	52932	53150	53674	53680
130	13	13	13	13	12	12	51840	52056	52272	52489	52705	52830	53172	53370	53674	53925
131	13	13	13	13	13	12	52025	52252	52479	52706	52934	53100	53416	53600	53918	54171
132	13	13	13	13	13	13	52210	52448	52686	52924	53162	53300	53654	53820	54162	54416
133	14	13	13	13	13	13	52357	52609	52861	53113	53365	53550	53868	54030	54372	54624
134	14	14	13	13	13	13	52505	52770	53036	53302	53567	53800	54083	54280	54583	54833
135	14	14	14	13	13	13	52652	52932	53211	53491	53770	54000	54297	54500	54793	55041
136	14	14	14	14	13	13	52799	53093	53386	53679	53973	54250	54511	54730	55003	55249
137	14	14	14	14	14	13	52947	53254	53561	53868	54175	54420	54726	54950	55214	55458
138	14	14	14	14	14	14	53094	53415	53736	54057	54378	54699	54940	55182	55424	55666
139	FULL	14	14	14	14	14	53465	53780	54094	54409	54723	55038	55285	55534	55783	56031
140	FULL	FULL	14	14	14	14	53836	54144	54452	54760	55068	55379	55631	55886	56141	56397
141	FULL	FULL	FULL	14	14	14	54207	54509	54810	55112	55413	55715	55973	56238	56500	56762
142	FULL	FULL	FULL	FULL	14	14	54578	54873	55168	55463	55758	56053	56321	56590	56859	57127
143	FULL	FULL	FULL	FULL	FULL	14	54949	55238	55526	55815	56103	56392	56667	56942	57217	57493
144	FULL	FULL	FULL	FULL	FULL	FULL	55320	55602	55884	56115	56448	56730	57012	57294	57576	57858

ALABAMA-COOSA-TALLAPOOSA RIVER BASIN

WATER CONTROL MANUAL
CLAIBORNE LOCK AND DAM AND LAKE

GATE OPENING SCHEDULE

GATE STEP NO.	GATE OPENING IN FEET						SPILLWAY DISCHARGE IN CFS									
	GATE NUMBER						POOL ELEVATION IN FT NGVD29									
	1	2	3	4	5	6	34	34.1	34.2	34.3	34.4	34.5	34.6	34.7	34.8	34.9
1	0.25	0	0	0	0	0	2116	2417	2718	3019	3320	3621	3993	4366	4739	5112
2	0.25	0.25	0	0	0	0	2532	2864	3166	3468	3770	4072	4446	4820	5194	5568
3	0.25	0.25	0.25	0	0	0	3007	3310	3613	3917	4220	4514	4899	5274	5619	6024
4	0.25	0.25	0.25	0.25	0	0	3453	3757	4061	4366	4670	4975	5351	5728	6104	6481
5	0.25	0.25	0.25	0.25	0.25	0	3899	4204	4510	4815	5121	5427	5804	6182	6559	6937
6	0.25	0.25	0.25	0.25	0.25	0.25	4345	4651	4958	5265	5572	5879	6257	6636	7014	7393
7	0.5	0.25	0.25	0.25	0.25	0.25	4788	5094	5401	5708	6015	6322	6704	7086	7468	7850
8	0.5	0.5	0.25	0.25	0.25	0.25	5230	5536	5944	6151	6458	6766	7151	7536	7922	8307
9	0.5	0.5	0.5	0.25	0.25	0.25	5673	5979	6287	6594	6902	7209	7598	7987	8346	8765
10	0.5	0.5	0.5	0.5	0.25	0.25	6115	6422	6729	7037	7345	7652	8044	8437	8829	9222
11	0.5	0.5	0.5	0.5	0.5	0.25	6558	6864	7172	7480	7788	8096	8491	8887	9283	9679
12	0.5	0.5	0.5	0.5	0.5	0.5	7000	7307	7615	7923	8231	8539	8938	9337	9737	10136
13	0.75	0.5	0.5	0.5	0.5	0.5	7426	7735	8045	8356	8666	8976	9374	9772	10170	10568
14	0.75	0.75	0.5	0.5	0.5	0.5	7852	8163	8476	8788	9100	9413	9809	10206	10604	11001
15	0.75	0.75	0.75	0.5	0.5	0.5	8278	8592	8906	9221	9535	9850	10245	10641	11037	11433
16	0.75	0.75	0.75	0.75	0.5	0.5	8704	9020	9336	9653	9970	10286	10681	11076	11470	11865
17	0.75	0.75	0.75	0.75	0.75	0.5	9130	9448	9767	10086	10404	10723	11116	11510	11904	12298
18	0.75	0.75	0.75	0.75	0.75	0.75	9556	9876	10197	10518	10839	11160	11552	11945	12337	12730
19	1	0.75	0.75	0.75	0.75	0.75	9976	10297	10619	10941	11264	11586	11979	12373	12766	13160
20	1	1	0.75	0.75	0.75	0.75	10396	10718	11041	11365	11688	12011	12406	12801	13195	13590
21	1	1	1	0.75	0.75	0.75	10816	11139	11464	11788	12113	12437	12833	13229	13624	14020
22	1	1	1	1	0.75	0.75	11235	11560	11886	12211	12537	12893	13259	13656	14053	14450
23	1	1	1	1	1	0.75	11655	11981	12308	12635	12962	13288	13686	14084	14482	14880
24	1	1	1	1	1	1	12075	12402	12730	13058	13386	13715	14113	14512	14911	15310
25	1.25	1	1	1	1	1	12465	12793	13122	13451	13780	14110	14510	14910	15310	15710
26	1.25	1.25	1	1	1	1	12855	13185	13515	13845	14175	14505	14906	15307	15709	16110
27	1.25	1.25	1.25	1	1	1	13246	13576	13907	14238	14569	14901	15303	15705	16108	16510
28	1.25	1.25	1.25	1.25	1	1	13636	13967	14299	14631	14963	15296	15699	16103	16506	16910
29	1.25	1.25	1.25	1.25	1.25	1	14026	14359	14692	15025	15358	15692	16096	16500	16905	17310
30	1.25	1.25	1.25	1.25	1.25	1.25	14416	14750	15084	15418	15752	16087	16492	16898	17304	17710
31	1.5	1.25	1.25	1.25	1.25	1.25	14795	15130	15465	15800	16136	16472	16871	17271	17671	18072
32	1.5	1.5	1.25	1.25	1.25	1.25	15174	15510	15847	16183	16519	16856	17250	17644	18039	18433
33	1.5	1.5	1.5	1.25	1.25	1.25	15554	15891	16228	16565	16903	17241	17629	18018	18406	18795
34	1.5	1.5	1.5	1.5	1.25	1.25	15933	16271	16609	16947	17286	17625	18007	18391	18773	19157
35	1.5	1.5	1.5	1.5	1.5	1.25	16312	16651	16991	17330	17670	18010	18386	18764	19141	19518
36	1.5	1.5	1.5	1.5	1.5	1.5	16691	17031	17372	17712	18053	18394	18765	19137	19508	19880
37	1.75	1.5	1.5	1.5	1.5	1.5	17037	17378	17720	18061	18403	18745	19109	19474	19838	20202
38	1.75	1.75	1.5	1.5	1.5	1.5	17383	17725	18068	18411	18754	19097	19453	19811	20167	20525
39	1.75	1.75	1.75	1.5	1.5	1.5	17730	18073	18417	18760	19104	19448	19798	20148	20497	20847
40	1.75	1.75	1.75	1.75	1.5	1.5	18076	18420	18765	19109	19454	19799	20142	20484	20827	21169
41	1.75	1.75	1.75	1.75	1.75	1.5	18422	18767	19113	19459	19805	20151	20186	20821	21156	21492
42	1.75	1.75	1.75	1.75	1.75	1.75	18768	19114	19461	19808	20155	20502	20830	21158	21486	21814
43	2	1.75	1.75	1.75	1.75	1.75	19082	19429	19777	20125	20473	20821	21146	21471	21796	22121
44	2	2	1.75	1.75	1.75	1.75	19396	19744	20093	20442	20790	21139	21461	21783	22105	22427
45	2	2	2	1.75	1.75	1.75	19711	20030	20409	20759	21108	21458	21777	22096	22415	22734
46	2	2	2	2	1.75	1.75	20025	20375	20725	21075	21426	21777	22093	22409	22725	23041
47	2	2	2	2	2	1.75	20339	20690	21041	21392	21743	22095	22408	22721	23034	23347
48	2	2	2	2	2	2	20653	21005	21357	21709	22061	22414	22724	23034	23344	23654

ALABAMA-COOSA-TALLAPOOSA RIVER BASIN

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CLAIBORNE LOCK AND DAM AND LAKE

GATE OPENING SCHEDULE

GATE STEP NO.	GATE OPENING IN FEET						SPILLWAY DISCHARGE IN CFS									
	GATE NUMBER						POOL ELEVATION IN FT NGVD29									
	1	2	3	4	5	6	34	34.1	34.2	34.3	34.4	34.5	34.6	34.7	34.8	34.9
49	2.25	2	2	2	2	2	20958	21303	21648	21993	22338	22684	23004	23324	23644	23964
50	2.25	2.25	2	2	2	2	21264	21602	21940	22278	22616	22955	23284	23614	23944	24273
51	2.25	2.25	2.25	2	2	2	21569	21900	22231	22562	22893	23225	23565	23904	24244	24583
52	2.25	2.25	2.25	2.25	2.25	2	21874	22198	22522	22846	23170	23495	23845	24194	24543	24893
53	2.25	2.25	2.25	2.25	2.25	2	22180	22497	22814	23131	23448	23766	24125	24484	24843	25202
54	2.25	2.25	2.25	2.25	2.25	2.25	22485	22795	23105	23415	23725	24036	24405	24774	25143	25512
55	2.5	2.25	2.25	2.25	2.25	2.25	22786	23093	23401	23708	24015	24324	24694	25064	25434	25804
56	2.5	2.5	2.25	2.25	2.25	2.25	23087	23392	23696	24001	24306	24611	24982	25353	25724	26096
57	2.5	2.5	2.5	2.25	2.25	2.25	23388	23690	23992	24294	24596	24899	25271	25643	26015	26388
58	2.5	2.5	2.5	2.5	2.5	2.25	23689	23988	24288	24587	24886	25186	25559	25933	26306	26679
59	2.5	2.5	2.5	2.5	2.5	2.25	23990	24287	24583	24880	25177	25474	25848	26222	26596	26971
60	2.5	2.5	2.5	2.5	2.5	2.5	24291	24585	24879	25173	25467	25761	26136	26512	26887	27263
61	2.75	2.5	2.5	2.5	2.5	2.5	24587	24880	25174	25467	25760	26054	26426	26798	27170	27543
62	2.75	2.75	2.5	2.5	2.5	2.5	24883	25175	25468	25761	26054	26347	26715	27084	27453	27822
63	2.75	2.75	2.75	2.5	2.5	2.5	25179	25471	25763	26055	26347	26640	27005	27371	27736	28102
64	2.75	2.75	2.75	2.75	2.5	2.5	25474	25766	26057	26349	26640	26932	27294	27657	28018	28381
65	2.75	2.75	2.75	2.75	2.75	2.5	25770	26061	26352	26643	26934	27225	27584	27943	28301	28661
66	2.75	2.75	2.75	2.75	2.75	2.75	26066	26356	26646	26937	27227	27518	27873	28229	28584	28940
67	3	2.75	2.75	2.75	2.75	2.75	26340	26625	26910	27196	27482	27768	28125	28482	28839	29197
68	3	3	2.75	2.75	2.75	2.75	26613	26894	27174	27456	27736	28018	28376	28735	29094	29453
69	3	3	3	2.75	2.75	2.75	26887	27163	27439	27715	27991	28268	28628	28989	29349	29710
70	3	3	3	3	2.75	2.75	27161	27431	27703	27974	28246	28517	28879	29242	29603	29966
71	3	3	3	3	3	2.75	27434	27700	27969	28234	28500	28767	29131	29495	29858	30223
72	3	3	3	3	3	3	27708	27969	28231	28493	28755	29017	29382	29748	30113	30479
73	4	3	3	3	3	3	28624	28893	29163	29433	29704	29974	30335	30698	31059	31422
74	4	4	3	3	3	3	29539	29817	30095	30374	30652	30930	31288	31647	32005	32364
75	4	4	4	3	3	3	30455	30741	31028	31314	31601	31887	32242	32597	32952	33307
76	4	4	4	4	3	3	31371	31665	31960	32254	32549	32844	33195	33546	33898	34249
77	4	4	4	4	4	3	32286	32589	32892	33195	33498	33800	34148	34496	34844	35192
78	4	4	4	4	4	4	33202	33513	33824	34135	34446	34757	35101	35445	35790	36134
79	5	4	4	4	4	4	33995	34304	34613	34921	35230	35539	35876	36213	36551	36888
80	5	5	4	4	4	4	34789	35095	35401	35707	36014	36320	36650	36981	37312	37642
81	5	5	5	4	4	4	35582	35886	36190	36494	36798	37102	37425	37749	38073	38396
82	5	5	5	5	4	4	36375	36676	36978	37280	37581	37883	38200	38516	38833	39150
83	5	5	5	5	5	4	37169	37467	37767	38066	38365	38665	38974	39284	39594	39904
84	5	5	5	5	5	5	37962	38258	38555	38852	39149	39446	39749	40052	40355	40685
85	6	5	5	5	5	5	38593	38893	39195	39496	39797	40098	40405	40712	41019	41325
86	6	6	5	5	5	5	39224	39529	39834	40139	40445	40750	41061	41371	41682	41933
87	6	6	6	5	5	5	39855	40164	40474	40783	41093	41402	41717	42031	42346	42660
88	6	6	6	6	5	5	40486	40799	41113	41427	41740	42054	42372	42691	43009	43327
89	6	6	6	6	6	5	41117	41435	41753	42070	42388	42706	43028	43350	43673	43995
90	6	6	6	6	6	6	41748	42070	42392	42714	43036	43358	43684	44010	44336	44662
91	7	6	6	6	6	6	42357	42664	42971	43278	43585	43892	44231	44571	44911	45250
92	7	7	6	6	6	6	42965	43257	43549	43841	44133	44425	44779	45132	45485	45839
93	7	7	7	6	6	6	43574	43851	44128	44405	44682	44959	45326	45693	46060	46427
94	7	7	7	7	6	6	44183	44445	44707	44969	45231	45493	45873	46254	46635	47015
95	7	7	7	7	7	6	44791	45038	45285	45532	45779	46026	46421	46815	47209	47604
96	7	7	7	7	7	7	45400	45632	45864	46096	46328	46560	46968	47376	47784	48192

ALABAMA-COOSA-TALLAPOOSA RIVER BASIN

WATER CONTROL MANUAL
CLAIBORNE LOCK AND DAM AND LAKE

GATE OPENING SCHEDULE

GATE STEP NO.	GATE OPENING IN FEET						SPILLWAY DISCHARGE IN CFS									
	GATE NUMBER						POOL ELEVATION IN FT NGVD29									
	1	2	3	4	5	6	34	34.1	34.2	34.3	34.4	34.5	34.6	34.7	34.8	34.9
97	8	7	7	7	7	7	45858	46100	46342	46584	46826	47068	47471	47874	48277	48680
98	8	8	7	7	7	7	46346	46568	46820	47072	47324	47577	47974	48372	48770	49167
99	8	8	8	7	7	7	46775	47037	47299	47561	47823	48085	48478	48870	49263	49655
100	8	8	8	8	7	7	47266	47505	47777	48049	48321	48593	48981	49368	49755	50143
101	8	8	8	8	8	7	47691	47973	48255	48537	48819	49102	49484	49866	50248	50630
102	8	8	8	8	8	8	48149	48441	48733	49025	49317	49610	49987	50364	50741	51118
103	9	8	8	8	8	8	48509	48811	49113	49414	49716	50018	50394	50769	51144	51519
104	9	9	8	8	8	8	48869	49191	49492	49803	50115	50427	50800	51173	51547	51920
105	9	9	9	8	8	8	49230	49551	49872	50193	50514	50835	51207	51578	51950	52321
106	9	9	9	9	8	8	49590	49920	50251	50582	50912	51243	51613	51983	52352	52722
107	9	9	9	9	9	8	49950	50290	50631	50971	51311	51652	52020	52387	52755	53123
108	9	9	9	9	9	9	50310	50660	51010	51360	51710	52060	52426	52792	53158	53524
109	10	9	9	9	9	9	50646	50991	51335	51680	52025	52369	52744	53118	53493	53867
110	10	10	9	9	9	9	50982	51321	51661	52000	52339	52678	53061	53444	53927	54210
111	10	10	10	9	9	9	51319	51652	51986	52320	52654	52988	53379	53770	54162	54553
112	10	10	10	10	9	9	51655	51983	52311	52639	52968	53297	53696	54096	54496	54896
113	10	10	10	10	10	9	51991	52313	52637	52959	53283	53606	54014	54422	54831	55239
114	10	10	10	10	10	10	52327	52644	52962	53279	53597	53915	54331	54748	55165	55582
115	11	10	10	10	10	10	52629	52925	53221	53517	53813	54109	54545	55000	55418	55854
116	11	11	10	10	10	10	52931	53205	53480	53754	54029	54303	54759	55350	55671	56127
117	11	11	11	10	10	10	53234	53486	53739	53992	54245	54498	54973	55700	55924	56399
118	11	11	11	11	10	10	53536	53767	53998	54229	54460	54692	55186	55900	56176	56671
119	11	11	11	11	11	10	53838	54047	54257	54467	54676	54886	55400	56200	56429	56944
120	11	11	11	11	11	11	54140	54328	54516	54704	54892	55080	55614	56400	56682	57216
121	12	11	11	11	11	11	54391	54598	54805	55012	55219	55427	55936	56800	56956	57466
122	12	12	11	11	11	11	54641	54868	55094	55320	55547	55773	56259	57000	57230	57716
123	12	12	12	11	11	11	54892	55138	55383	55629	55874	56120	56581	57200	57504	57966
124	12	12	12	12	11	11	55143	55407	55672	55937	56201	56466	56903	57450	57778	58215
125	12	12	12	12	12	11	55393	55677	55961	56245	56529	56813	57226	57750	58052	58465
126	12	12	12	12	12	12	55611	55947	56250	56553	56856	57159	57548	57937	58326	58715
127	13	12	12	12	12	12	55837	56148	56458	56769	57080	57391	57773	58155	58537	58920
128	13	13	12	12	12	12	56029	56348	56667	56985	57304	57623	57998	58373	58749	59124
129	13	13	13	12	12	12	56222	56549	56875	57202	57528	57855	58223	58592	58960	59329
130	13	13	13	13	12	12	56415	56749	57083	57418	57752	58086	58448	58810	59171	59533
131	13	13	13	13	13	12	56607	56950	57292	57634	57976	58318	58673	59028	59383	59738
132	13	13	13	13	13	13	56800	57150	57500	57850	58200	58550	58898	59246	59594	59924
133	14	13	13	13	13	13	56973	57328	57683	58039	58394	58750	59089	59429	59769	60109
134	14	14	13	13	13	13	57145	57506	57867	58227	58588	58949	59281	59612	59944	60275
135	14	14	14	13	13	13	57315	57684	58050	58416	58783	59149	59472	59795	60119	60442
136	14	14	14	14	13	13	57490	57861	58233	58605	58977	59349	59663	59978	60293	60608
137	14	14	14	14	14	13	57663	58039	58417	58793	59171	59548	59855	60161	60468	60775
138	14	14	14	14	14	14	57835	58217	58600	58982	59365	59748	60046	60344	60643	60941
139	FULL	14	14	14	14	14	58635	59053	59471	59889	60308	60726	61024	61323	61621	61920
140	FULL	FULL	14	14	14	14	59435	59889	60343	60796	61250	61705	62003	62301	62600	62898
141	FULL	FULL	FULL	14	14	14	60236	60725	61214	61704	62193	62683	62981	63280	63578	63877
142	FULL	FULL	FULL	FULL	14	14	61036	61560	62085	62611	63136	63661	63959	64258	64556	64855
143	FULL	FULL	FULL	FULL	FULL	14	61836	62396	62957	63518	64076	64640	64938	65237	65535	65834
144	FULL	FULL	FULL	FULL	FULL	FULL	62636	63232	63828	64425	65021	65618	65916	66215	66513	66612

ALABAMA-COOSA-TALLAPOOSA RIVER BASIN

WATER CONTROL MANUAL
CLAIBORNE LOCK AND DAM AND LAKE

GATE OPENING SCHEDULE

GATE STEP NO.	GATE OPENING IN FEET						SPILLWAY DISCHARGE IN CFS									
	GATE NUMBER						POOL ELEVATION IN FT NGVD29									
	1	2	3	4	5	6	35	35.1	35.2	35.3	35.4	35.5	35.6	35.7	35.8	35.9
1	0.25	0	0	0	0	0	5485	5925	6365	6806	7246	7687	8189	8691	9194	9696
2	0.25	0.25	0	0	0	0	5943	6384	6825	7267	7708	8150	8653	9154	9660	10161
3	0.25	0.25	0.25	0	0	0	6400	6842	7285	7727	8170	8613	9117	9622	10126	10631
4	0.25	0.25	0.25	0.25	0	0	6858	7301	7745	8188	8632	9076	9582	10088	10594	11100
5	0.25	0.25	0.25	0.25	0.25	0	7315	7760	8205	8650	9095	9540	10046	10553	11060	11567
6	0.25	0.25	0.25	0.25	0.25	0.25	7772	8218	8664	9110	9556	10003	10511	11019	11527	12035
7	0.5	0.25	0.25	0.25	0.25	0.25	8233	8678	9122	9567	10012	10458	10967	11476	11985	12494
8	0.5	0.5	0.25	0.25	0.25	0.25	8693	9137	9581	10024	10468	10913	11423	11933	12443	12954
9	0.5	0.5	0.5	0.25	0.25	0.25	9154	9597	10039	10482	10924	11368	11879	12390	12902	13413
10	0.5	0.5	0.5	0.5	0.25	0.25	9615	10056	10497	10939	11380	11822	12334	12847	13360	13872
11	0.5	0.5	0.5	0.5	0.5	0.25	10075	10516	10956	11396	11836	12277	12790	13304	13818	14332
12	0.5	0.5	0.5	0.5	0.5	0.5	10536	10975	11414	11853	12292	12732	13246	13761	14276	14791
13	0.75	0.5	0.5	0.5	0.5	0.5	10967	11410	11852	12294	12737	13180	13692	14205	14718	15230
14	0.75	0.75	0.5	0.5	0.5	0.5	11398	11844	12290	12736	13182	13628	14138	14648	15159	15669
15	0.75	0.75	0.75	0.5	0.5	0.5	11830	12279	12728	13177	13627	14077	14584	15092	15601	16109
16	0.75	0.75	0.75	0.75	0.5	0.5	12261	12713	13166	13618	14071	14525	15030	15536	16042	16548
17	0.75	0.75	0.75	0.75	0.75	0.5	12692	13148	13604	14060	14516	14973	15479	15979	16484	16987
18	0.75	0.75	0.75	0.75	0.75	0.75	13123	13582	14042	14501	14961	15421	15922	16423	16925	17426
19	1	0.75	0.75	0.75	0.75	0.75	13554	14014	14475	14936	15397	15858	16341	16824	17308	17791
20	1	1	0.75	0.75	0.75	0.75	13985	14447	14909	15370	15832	16295	16760	17225	17690	18155
21	1	1	1	0.75	0.75	0.75	14418	14879	15342	15805	16268	16732	17179	17626	18073	18520
22	1	1	1	1	0.75	0.75	14848	15311	15775	16240	16704	17168	17597	18026	18456	18885
23	1	1	1	1	1	0.75	15279	15744	16209	16675	17139	17605	18016	18427	18838	19249
24	1	1	1	1	1	1	15710	16176	16642	17109	17575	18042	18435	18828	19221	19614
25	1.25	1	1	1	1	1	16111	16562	17013	17465	17916	18367	18775	19182	19590	19997
26	1.25	1.25	1	1	1	1	16512	16948	17384	17820	18256	18693	19115	19537	19959	20384
27	1.25	1.25	1.25	1	1	1	16913	17334	17755	18176	18597	19018	19455	19891	20328	20764
28	1.25	1.25	1.25	1.25	1	1	17314	17719	18125	18531	18937	19343	19794	20245	20696	21147
29	1.25	1.25	1.25	1.25	1.25	1	17715	18105	18496	18887	19278	19669	20134	20600	21065	21531
30	1.25	1.25	1.25	1.25	1.25	1.25	18116	18491	18867	19242	19618	19994	20474	20954	21434	21914
31	1.5	1.25	1.25	1.25	1.25	1.25	18472	18800	19200	19550	19950	20250	20850	21250	21800	22275
32	1.5	1.5	1.25	1.25	1.25	1.25	18828	19100	19530	19950	20200	20600	21100	21550	22080	22600
33	1.5	1.5	1.5	1.25	1.25	1.25	19184	19450	19850	20200	20500	20950	21350	21900	22380	22900
34	1.5	1.5	1.5	1.5	1.25	1.25	19540	19900	20200	20550	20900	21180	21800	22180	22700	23250
35	1.5	1.5	1.5	1.5	1.5	1.25	19896	20100	20480	20850	21150	21550	22030	22550	23030	23550
36	1.5	1.5	1.5	1.5	1.5	1.5	20252	20480	20850	21150	21450	21900	22350	22900	23300	23900
37	1.75	1.5	1.5	1.5	1.5	1.5	20567	20800	21100	21500	21800	22150	22700	23150	23700	24260
38	1.75	1.75	1.5	1.5	1.5	1.5	20882	21100	21450	21800	22050	22500	23000	23530	24030	24650
39	1.75	1.75	1.75	1.5	1.5	1.5	21197	21450	21800	22100	22400	22850	23300	23900	24350	24950
40	1.75	1.75	1.75	1.75	1.5	1.5	21512	21800	22100	22450	22750	23150	23700	24100	24750	25270
41	1.75	1.75	1.75	1.75	1.75	1.5	21827	22050	22450	22850	23050	23500	24000	24500	25030	25700
42	1.75	1.75	1.75	1.75	1.75	1.75	22142	22460	22778	23097	23415	23734	24279	24825	25370	25916
43	2	1.75	1.75	1.75	1.75	1.75	22446	22778	23110	23443	23775	24108	24646	25186	25725	26264
44	2	2	1.75	1.75	1.75	1.75	22750	23096	23442	23788	24134	24481	25014	25547	26079	26612
45	2	2	2	1.75	1.75	1.75	23054	23414	23774	24134	24494	24855	25381	25908	26434	26961
46	2	2	2	2	1.75	1.75	23357	23731	24105	24480	24854	25229	25748	26268	26789	27309
47	2	2	2	2	2	1.75	23661	24049	24437	24825	25216	25602	26116	26629	27143	27657
48	2	2	2	2	2	2	23965	24367	24769	25171	25573	25976	26483	26990	27498	28005

ALABAMA-COOSA-TALLAPOOSA RIVER BASIN

WATER CONTROL MANUAL
CLAIBORNE LOCK AND DAM AND LAKE

GATE OPENING SCHEDULE

GATE STEP NO.	GATE OPENING IN FEET						SPILLWAY DISCHARGE IN CFS									
	GATE NUMBER						POOL ELEVATION IN FT NGVD29									
	1	2	3	4	5	6	35	35.1	35.2	35.3	35.4	35.5	35.6	35.7	35.8	35.9
49	2.25	2	2	2	2	2	24284	24687	25091	25494	25897	26301	26802	27303	27805	28306
50	2.25	2.25	2	2	2	2	24604	25008	25412	25816	26220	26625	27120	27616	28111	28607
51	2.25	2.25	2.25	2	2	2	24923	25328	25734	26139	26544	26950	27439	27929	28418	28908
52	2.25	2.25	2.25	2.25	2.25	2	25242	25648	26055	26461	26868	27275	27758	28241	28725	29208
53	2.25	2.25	2.25	2.25	2.25	2	25562	25969	26377	26784	27191	27599	28076	28554	29031	29509
54	2.25	2.25	2.25	2.25	2.25	2.25	25881	26289	26698	27106	27515	27924	28395	28867	29338	29810
55	2.5	2.25	2.25	2.25	2.25	2.25	26174	26583	26992	27401	27811	28220	28690	29161	29631	30102
56	2.5	2.5	2.25	2.25	2.25	2.25	26467	26976	27296	27696	28106	28516	28985	29455	29923	30393
57	2.5	2.5	2.5	2.25	2.25	2.25	26760	27170	27581	27991	28402	28813	29280	29749	30216	30685
58	2.5	2.5	2.5	2.5	2.5	2.25	27053	27464	27875	28286	28697	29109	29575	30042	30509	30976
59	2.5	2.5	2.5	2.5	2.5	2.25	27346	27757	28169	28581	28993	29405	29870	30336	30801	31268
60	2.5	2.5	2.5	2.5	2.5	2.5	27639	28051	28463	28876	29288	29701	30165	30630	31094	31559
61	2.75	2.5	2.5	2.5	2.5	2.5	27915	28327	28739	29152	29564	29977	30437	30899	31360	31822
62	2.75	2.75	2.5	2.5	2.5	2.5	28191	28603	29015	29427	29839	30252	30710	31168	31626	32084
63	2.75	2.75	2.75	2.5	2.5	2.5	28468	28879	29291	29703	30115	30528	30982	31437	31892	32347
64	2.75	2.75	2.75	2.75	2.5	2.5	28744	29155	29567	29979	30391	30803	31254	31706	32158	32610
65	2.75	2.75	2.75	2.75	2.75	2.5	29020	29431	29843	30254	30666	31079	31527	31975	32424	32872
66	2.75	2.75	2.75	2.75	2.75	2.75	29296	29707	30119	30530	30942	31354	31799	32244	32690	33135
67	3	2.75	2.75	2.75	2.75	2.75	29554	29968	30383	30797	31212	31627	32073	32520	32967	33413
68	3	3	2.75	2.75	2.75	2.75	29812	30229	30647	31064	31482	31900	32347	32795	33243	33691
69	3	3	3	2.75	2.75	2.75	30071	30491	30911	31331	31752	32173	32622	33071	33520	33969
70	3	3	3	3	2.75	2.75	30329	30752	31175	31598	32021	32445	32896	33346	33797	34247
71	3	3	3	3	3	2.75	30587	31013	31439	31865	32291	32718	33170	33622	34073	34525
72	3	3	3	3	3	3	30845	31274	31703	32132	32561	32991	33444	33897	34350	34803
73	4	3	3	3	3	3	31784	32206	32628	33050	33471	33894	34349	34803	35257	35712
74	4	4	3	3	3	3	32723	33138	33552	33967	34382	34797	35253	35709	36164	36620
75	4	4	4	3	3	3	33662	34070	34477	34885	35292	35701	36158	36615	37072	37529
76	4	4	4	4	3	3	34601	35001	35402	35802	36202	36604	37062	37520	37979	38437
77	4	4	4	4	4	3	35540	35933	36326	36720	37113	37507	37967	38426	38886	39346
78	4	4	4	4	4	4	36479	36865	37251	37637	38023	38410	38871	39332	39793	40254
79	5	4	4	4	4	4	37226	37608	37991	38373	38755	39138	39605	40072	40538	41005
80	5	5	4	4	4	4	37973	38352	38730	39109	39487	39866	40339	40811	41284	41756
81	5	5	5	4	4	4	38721	39095	39470	39845	40219	40595	41073	41551	42029	42508
82	5	5	5	5	4	4	39468	39838	40209	40580	40951	41323	41806	42291	42774	43259
83	5	5	5	5	5	4	40215	40582	40949	41316	41683	42051	42540	43030	43520	44010
84	5	5	5	5	5	5	40962	41325	41688	42052	42415	42779	43274	43770	44265	44761
85	6	5	5	5	5	5	41633	41996	42359	42723	43086	43450	43934	44420	44905	45391
86	6	6	5	5	5	5	42304	42667	43030	43393	43756	44120	44595	45070	45545	46020
87	6	6	6	5	5	5	42975	43338	43701	44064	44427	44791	45255	45720	46185	46650
88	6	6	6	6	5	5	43646	44008	44371	44735	45098	45461	45915	46370	46824	47279
89	6	6	6	6	6	5	44317	44679	45042	45405	45768	46132	46576	47020	47464	47909
90	6	6	6	6	6	6	44988	45350	45713	46076	46439	46802	47236	47670	48104	48538
91	7	6	6	6	6	6	45590	45958	46327	46696	47065	47433	47852	48271	48690	49109
92	7	7	6	6	6	6	46192	46566	46941	47315	47690	48065	48469	48873	49277	49681
93	7	7	7	6	6	6	46794	47174	47555	47935	48316	48696	49085	49474	49863	50252
94	7	7	7	7	6	6	47396	47782	48168	48555	48941	49327	49701	50075	50449	50823
95	7	7	7	7	7	6	47998	48390	48782	49174	49567	49959	50318	50677	51036	51395
96	7	7	7	7	7	7	48600	48998	49396	49794	50192	50590	50934	51278	51622	51966

ALABAMA-COOSA-TALLAPOOSA RIVER BASIN

WATER CONTROL MANUAL
CLAIBORNE LOCK AND DAM AND LAKE

GATE OPENING SCHEDULE

GATE STEP NO.	GATE OPENING IN FEET						SPILLWAY DISCHARGE IN CFS									
	GATE NUMBER						POOL ELEVATION IN FT NGVD29									
	1	2	3	4	5	6	35	35.1	35.2	35.3	35.4	35.5	35.6	35.7	35.8	35.9
97	8	7	7	7	7	7	49083	49472	49860	50249	50638	51027	51372	51717	52063	52408
98	8	8	7	7	7	7	49565	49945	50325	50705	51084	51464	51810	52157	52503	52849
99	8	8	8	7	7	7	50048	50419	50789	51160	51531	51902	52249	52596	52944	53291
100	8	8	8	8	7	7	50531	50892	51253	51615	51977	52339	52687	53035	53384	53733
101	8	8	8	8	8	7	51013	51366	51718	52071	52423	52776	53125	53475	53825	54174
102	8	8	8	8	8	8	51496	51839	52182	52526	52869	53213	53563	53914	54265	54616
103	9	8	8	8	8	8	51895	52247	52598	52950	53302	53654	53992	54330	54668	55006
104	9	9	8	8	8	8	52294	52654	53014	53375	53735	54095	54420	54745	55071	55396
105	9	9	9	8	8	8	52693	53062	53430	53799	54168	54537	54849	55161	55474	55786
106	9	9	9	9	8	8	53092	53469	53846	54223	54600	54978	55277	55577	55876	56176
107	9	9	9	9	9	8	53491	53877	54262	54648	55033	55419	55706	55992	56279	56566
108	9	9	9	9	9	9	53890	54284	54678	55072	55466	55860	56134	56408	56682	56956
109	10	9	9	9	9	9	54242	54614	54987	55360	55733	56106	56403	56701	56999	57296
110	10	10	9	9	9	9	54593	54945	55296	55648	56000	56351	56673	56994	57315	57637
111	10	10	10	9	9	9	54945	55275	55606	55936	56267	56597	56942	57297	57632	57977
112	10	10	10	10	9	9	55296	55605	55915	56224	56533	56843	57211	57580	57949	58317
113	10	10	10	10	10	9	55640	55936	56224	56512	56800	57088	57481	57873	58265	58658
114	10	10	10	10	10	10	55999	56266	56533	56800	57067	57334	57750	58166	58582	58998
115	11	10	10	10	10	10	56291	56557	56823	56923	57356	57622	58032	58442	58852	59262
116	11	11	10	10	10	10	56583	56848	57113	57045	57644	57909	58313	58717	59121	59525
117	11	11	11	10	10	10	56875	57139	57404	57168	57933	58197	58595	58993	59391	59789
118	11	11	11	11	10	10	57166	57430	57694	57291	58221	58485	58877	59269	59661	60053
119	11	11	11	11	11	10	57458	57721	57984	57413	58510	58772	59158	59544	59930	60316
120	11	11	11	11	11	11	57750	58012	58274	57536	58798	59060	59440	59820	60200	60580
121	12	11	11	11	11	11	57976	58240	58504	57934	59031	59295	59675	60054	60434	60814
122	12	12	11	11	11	11	58201	58467	58733	58332	59265	59531	59910	60289	60668	61047
123	12	12	12	11	11	11	58427	58695	58963	58730	59498	59766	60145	60523	60902	61281
124	12	12	12	12	11	11	58653	58922	59192	59128	59731	60001	60379	60757	61136	61514
125	12	12	12	12	12	11	58878	59150	59422	59526	59965	60237	60614	60992	61370	61748
126	12	12	12	12	12	12	59104	59377	59651	59924	60198	60472	60849	61226	61604	61981
127	13	12	12	12	12	12	59302	59576	59851	60125	60400	60675	61057	61439	61821	62203
128	13	13	12	12	12	12	59499	59775	60051	60326	60602	60878	61265	61651	62039	62425
129	13	13	13	12	12	12	59697	59974	60251	60527	60804	61081	61473	61864	62256	62648
130	13	13	13	13	12	12	59895	60172	60450	60728	61006	61284	61680	62077	62473	62870
131	13	13	13	13	13	12	60092	60371	60650	60929	61208	61487	61888	62289	62691	63092
132	13	13	13	13	13	13	60290	60570	60850	61130	61410	61690	62096	62502	62908	63314
133	14	13	13	13	13	13	60448	61232	61016	61300	61584	61867	62280	62692	63104	63516
134	14	14	13	13	13	13	60607	61894	61182	61469	61757	62045	62463	62882	63300	63719
135	14	14	14	13	13	13	60765	62556	61348	61639	61931	62222	62647	63072	63496	63921
136	14	14	14	14	13	13	60923	63218	61513	61809	62104	62399	62830	63261	63692	64123
137	14	14	14	14	14	13	61082	63880	61679	61978	62278	62577	63014	63451	63888	64326
138	14	14	14	14	14	14	61240	64542	61845	62148	62451	62754	63197	63641	64084	64528
139	FULL	14	14	14	14	14	62219	65028	62838	63148	63458	63768	64202	64636	65069	65503
140	FULL	FULL	14	14	14	14	63197	65513	63831	64148	64465	64783	65206	65630	66054	66478
141	FULL	FULL	FULL	14	14	14	64176	65999	64824	65148	65473	65797	66211	66625	67039	67453
142	FULL	FULL	FULL	FULL	14	14	65154	66485	65816	66148	66480	66811	67215	67620	68023	68428
143	FULL	FULL	FULL	FULL	FULL	14	66133	66970	66809	67148	67487	67826	68220	68614	69008	69403
144	FULL	FULL	FULL	FULL	FULL	FULL	67111	67456	67802	68148	68494	68840	69224	69609	69993	70378

ALABAMA-COOSA-TALLAPOOSA RIVER BASIN

WATER CONTROL MANUAL
CLAIBORNE LOCK AND DAM AND LAKE

GATE OPENING SCHEDULE

GATE STEP NO.	GATE OPENING IN FEET						SPILLWAY DISCHARGE IN CFS									
	GATE NUMBER						POOL ELEVATION IN FT NGVD29									
	1	2	3	4	5	6	36	36.1	36.2	36.3	36.4	36.5	36.6	36.7	36.8	36.9
1	0.25	0	0	0	0	0	10199	10758	11318	11877	12437	12997	13610	14223	14837	15450
2	0.25	0.25	0	0	0	0	10668	11228	11789	12349	12910	13471	14085	14700	15314	15929
3	0.25	0.25	0.25	0	0	0	11136	11698	12260	12822	13384	13946	14561	15177	15792	16408
4	0.25	0.25	0.25	0.25	0	0	11606	12168	12731	13294	13857	14420	15036	15653	16269	16886
5	0.25	0.25	0.25	0.25	0.25	0	12074	12638	13202	13766	14330	14895	15512	16130	16747	17365
6	0.25	0.25	0.25	0.25	0.25	0.25	12543	13106	13673	14238	14803	15369	15987	16606	17225	17884
7	0.5	0.25	0.25	0.25	0.25	0.25	13004	13560	14117	14674	15230	15788	16407	17028	17648	18302
8	0.5	0.5	0.25	0.25	0.25	0.25	13464	14012	14561	15109	15657	16207	16828	17449	18071	18720
9	0.5	0.5	0.5	0.25	0.25	0.25	13925	14465	15005	15545	16085	16626	17248	17871	18495	19138
10	0.5	0.5	0.5	0.5	0.25	0.25	14385	14917	15448	15980	16512	17044	17668	18239	18918	19555
11	0.5	0.5	0.5	0.5	0.5	0.25	14846	15369	15892	16416	16939	17463	18089	18714	19341	19973
12	0.5	0.5	0.5	0.5	0.5	0.5	15306	15821	16336	16851	17366	17882	18509	19136	19764	20391
13	0.75	0.5	0.5	0.5	0.5	0.5	15743	16258	16772	17287	17802	18317	18943	19569	20195	20821
14	0.75	0.75	0.5	0.5	0.5	0.5	16180	16694	17209	17723	18237	18753	19377	20001	20626	21251
15	0.75	0.75	0.75	0.5	0.5	0.5	16617	17131	17645	18159	18673	19188	19811	20434	21058	21681
16	0.75	0.75	0.75	0.75	0.5	0.5	17054	17568	18081	18595	19109	19623	20245	20867	21489	22110
17	0.75	0.75	0.75	0.75	0.75	0.5	17491	18004	18518	19031	19544	20059	20679	21299	21920	22540
18	0.75	0.75	0.75	0.75	0.75	0.75	17928	18441	18954	19467	19980	20494	21113	21732	22351	22970
19	1	0.75	0.75	0.75	0.75	0.75	18275	18793	19311	19829	20347	20866	21487	22108	22729	23350
20	1	1	0.75	0.75	0.75	0.75	18621	19144	19667	20190	20713	21237	21860	22484	23107	23730
21	1	1	1	0.75	0.75	0.75	18968	19496	20024	20552	21080	21609	22234	22860	23485	24110
22	1	1	1	1	0.75	0.75	19315	19849	20381	20914	21447	21981	22608	23235	23862	24490
23	1	1	1	1	1	0.75	19661	20199	20737	21275	21813	22352	22981	23611	24240	24870
24	1	1	1	1	1	1	20008	20551	21094	21637	22180	22724	23355	23987	24618	25250
25	1.25	1	1	1	1	1	20406	20942	21479	22015	22552	23089	23721	24354	24986	25619
26	1.25	1.25	1	1	1	1	20804	21334	21864	22394	22924	23454	24087	24721	25354	25988
27	1.25	1.25	1.25	1	1	1	21202	21725	22249	22772	23296	23820	24454	25088	25723	26357
28	1.25	1.25	1.25	1.25	1	1	21599	22116	22633	23150	23667	24185	24820	25455	26091	26726
29	1.25	1.25	1.25	1.25	1.25	1	21997	22508	23018	23529	24039	24550	25186	25822	26459	27095
30	1.25	1.25	1.25	1.25	1.25	1.25	22395	22899	23403	23907	24411	24915	25552	26189	26827	27464
31	1.5	1.25	1.25	1.25	1.25	1.25	22742	23248	23753	24258	24763	25268	25905	26543	27181	27818
32	1.5	1.5	1.25	1.25	1.25	1.25	23090	23596	24102	24609	25115	25621	26259	26896	27534	28171
33	1.5	1.5	1.5	1.25	1.25	1.25	23437	23945	24452	24960	25467	25975	26612	27250	27888	28525
34	1.5	1.5	1.5	1.5	1.25	1.25	23784	24293	24802	25310	25819	26328	26965	27603	28241	28879
35	1.5	1.5	1.5	1.5	1.5	1.25	24132	24642	25151	25661	26171	26681	27319	27957	28595	29232
36	1.5	1.5	1.5	1.5	1.5	1.5	24479	24990	25501	26012	26523	27034	27672	28310	28948	29586
37	1.75	1.5	1.5	1.5	1.5	1.5	24810	25321	25833	26345	26857	27369	28007	28645	29283	29921
38	1.75	1.75	1.5	1.5	1.5	1.5	25140	25653	26166	26678	27191	27704	28342	28980	29617	30255
39	1.75	1.75	1.75	1.5	1.5	1.5	25471	25984	26498	27012	27526	28040	28677	29315	29952	30590
40	1.75	1.75	1.75	1.75	1.5	1.5	25801	26315	26830	27345	27860	28375	29012	29649	30287	30924
41	1.75	1.75	1.75	1.75	1.75	1.5	26132	26647	27163	27678	28194	28710	29347	29974	30621	31259
42	1.75	1.75	1.75	1.75	1.75	1.75	26462	26978	27495	28011	28528	29045	29682	30319	30956	31593
43	2	1.75	1.75	1.75	1.75	1.75	26804	27314	27825	28335	28846	29356	29975	30594	31213	31832
44	2	2	1.75	1.75	1.75	1.75	27146	27650	28154	28658	29163	29668	30268	30869	31470	32071
45	2	2	2	1.75	1.75	1.75	27488	27986	28484	28982	29481	29979	30562	31145	31728	32311
46	2	2	2	2	1.75	1.75	27829	28321	28814	29306	29798	30290	30855	31420	31985	32550
47	2	2	2	2	2	1.75	28171	28657	29143	29629	30116	30602	31148	31695	32242	32789
48	2	2	2	2	2	2	28513	28993	29473	29953	30433	30913	31441	31970	32499	33028

ALABAMA-COOSA-TALLAPOOSA RIVER BASIN

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CLAIBORNE LOCK AND DAM AND LAKE

GATE OPENING SCHEDULE

GATE STEP NO.	GATE OPENING IN FEET						SPILLWAY DISCHARGE IN CFS									
	GATE NUMBER						POOL ELEVATION IN FT NGVD29									
	1	2	3	4	5	6	36	36.1	36.2	36.3	36.4	36.5	36.6	36.7	36.8	36.9
49	2.25	2	2	2	2	2	28808	29287	29767	30247	30726	31206	31737	32268	32800	33332
50	2.25	2.25	2	2	2	2	29103	29582	30061	30540	31020	31499	32032	32567	33101	33635
51	2.25	2.25	2.25	2	2	2	29398	29876	30355	30834	31313	31792	32328	32865	33402	33939
52	2.25	2.25	2.25	2.25	2.25	2	29692	30170	30649	31128	31616	32085	32624	33163	33703	34243
53	2.25	2.25	2.25	2.25	2.25	2	29987	30465	30943	31421	31900	32378	32919	33462	34004	34546
54	2.25	2.25	2.25	2.25	2.25	2.25	30282	30759	31237	31715	32193	32671	33215	33760	34305	34850
55	2.5	2.25	2.25	2.25	2.25	2.25	30572	31049	31525	32002	32479	32955	33498	34042	34585	35129
56	2.5	2.5	2.25	2.25	2.25	2.25	30863	31337	31813	32288	32764	33240	33781	34323	34865	35407
57	2.5	2.5	2.5	2.25	2.25	2.25	31153	31627	32101	32575	33050	33524	34064	34605	35145	35686
58	2.5	2.5	2.5	2.5	2.5	2.25	31443	31916	32389	32862	33335	33808	34347	34886	35425	35964
59	2.5	2.5	2.5	2.5	2.5	2.25	31734	32205	32677	33148	33621	34093	34630	35168	35705	36243
60	2.5	2.5	2.5	2.5	2.5	2.5	32024	32494	32965	33435	33906	34377	34913	35449	35985	36521
61	2.75	2.5	2.5	2.5	2.5	2.5	32284	32761	33238	33716	34193	34671	35203	35736	36268	36800
62	2.75	2.75	2.5	2.5	2.5	2.5	32543	33027	33512	33996	34481	34966	35494	36022	36550	37078
63	2.75	2.75	2.75	2.5	2.5	2.5	32803	33294	33785	34277	34768	35260	35784	36309	36833	37357
64	2.75	2.75	2.75	2.75	2.5	2.5	33062	33560	34058	34557	35055	35554	36074	36595	37115	37636
65	2.75	2.75	2.75	2.75	2.75	2.5	33322	33827	34332	34838	35343	35849	36365	36882	37398	37914
66	2.75	2.75	2.75	2.75	2.75	2.75	33581	34093	34605	35118	35630	36143	36655	37168	37680	38193
67	3	2.75	2.75	2.75	2.75	2.75	33860	34368	34879	35385	35893	36402	36940	37418	37926	38434
68	3	3	2.75	2.75	2.75	2.75	34140	34644	35148	35652	36156	36661	37164	37668	38171	38675
69	3	3	3	2.75	2.75	2.75	34419	34919	35419	35920	36420	36921	37419	37918	38417	38916
70	3	3	3	3	2.75	2.75	34698	35194	35690	36187	36683	37180	37674	38168	38662	39156
71	3	3	3	3	3	2.75	34978	35470	35962	36454	36946	37469	37928	38418	38908	39397
72	3	3	3	3	3	3	35257	35745	36233	36721	37209	37698	38183	38668	39153	39638
73	4	3	3	3	3	3	36167	36656	37144	37633	38122	38611	39098	39585	40072	40559
74	4	4	3	3	3	3	37077	37566	38055	38545	39034	39524	40013	40502	40991	41480
75	4	4	4	3	3	3	37987	38477	38967	39457	39947	40438	40929	41420	41911	42402
76	4	4	4	4	3	3	38896	39387	39878	40368	40859	41351	41844	42337	42830	43323
77	4	4	4	4	4	3	39806	40298	40789	41280	41772	42264	42759	43254	43749	44244
78	4	4	4	4	4	4	40716	41208	41700	42192	42684	43177	43674	44171	44668	45165
79	5	4	4	4	4	4	41473	41959	42445	42931	43417	43903	44404	44905	45405	45906
80	5	5	4	4	4	4	42230	42709	43189	43669	44149	44630	45134	45638	46142	46647
81	5	5	5	4	4	4	42987	43460	43934	44408	44882	45356	45864	46372	46880	47388
82	5	5	5	5	4	4	43743	44211	44679	45146	45614	46085	46593	47105	47617	48128
83	5	5	5	5	5	4	44500	44961	45423	45885	46347	46809	47323	47839	48354	48869
84	5	5	5	5	5	5	45257	45712	46168	46623	47079	47535	48053	48572	49091	49610
85	6	5	5	5	5	5	45876	46329	46782	47235	47688	48141	48663	49185	49707	50229
86	6	6	5	5	5	5	46496	46945	47396	47846	48297	48747	49272	49797	50323	50848
87	6	6	6	5	5	5	47115	47562	48010	48458	48906	49354	49882	50410	50939	51468
88	6	6	6	6	5	5	47734	48179	48624	49069	49514	49960	50491	51023	51555	52087
89	6	6	6	6	6	5	48354	48795	49238	49681	50123	50566	51101	51635	52171	52706
90	6	6	6	6	6	6	48973	49412	49852	50292	50732	51172	51710	52248	52787	53325
91	7	6	6	6	6	6	49529	49955	50382	50808	51235	51662	52196	52730	53266	53800
92	7	7	6	6	6	6	50085	50498	50911	51325	51738	52151	52682	53213	53744	54275
93	7	7	7	6	6	6	50642	51041	51441	51841	52241	52641	53168	53695	54223	54750
94	7	7	7	7	6	6	51198	51584	51971	52357	52744	53131	53654	54177	54701	55224
95	7	7	7	7	7	6	51754	52127	52500	52874	53247	53620	54140	54660	55180	55699
96	7	7	7	7	7	7	52310	52670	53030	53390	53750	54110	54626	55142	55658	56174

ALABAMA-COOSA-TALLAPOOSA RIVER BASIN

WATER CONTROL MANUAL
CLAIBORNE LOCK AND DAM AND LAKE

GATE OPENING SCHEDULE

GATE STEP NO.	GATE OPENING IN FEET						SPILLWAY DISCHARGE IN CFS									
	GATE NUMBER						POOL ELEVATION IN FT NGVD29									
	1	2	3	4	5	6	36	36.1	36.2	36.3	36.4	36.5	36.6	36.7	36.8	36.9
97	8	7	7	7	7	7	52753	53118	53484	53850	54215	54581	55086	55592	56097	56603
98	8	8	7	7	7	7	53196	53567	53938	54309	54680	55051	55546	56041	56537	57032
99	8	8	8	7	7	7	53639	54015	54392	54769	55145	55522	56007	56491	56976	57461
100	8	8	8	8	7	7	54081	54463	54845	55228	55610	55993	56467	56941	57415	57889
101	8	8	8	8	8	7	54524	54912	55299	55688	56075	56463	56927	57390	57855	58318
102	8	8	8	8	8	8	54967	55360	55753	56147	56540	56934	57387	57840	58294	58747
103	9	8	8	8	8	8	55344	55753	56161	56571	56979	57388	57822	58256	58691	59125
104	9	9	8	8	8	8	55721	56145	56569	56994	57419	57943	58257	58672	59097	59502
105	9	9	9	8	8	8	56099	56538	56978	57418	57857	58297	58693	59088	59484	59880
106	9	9	9	9	8	8	56476	56931	57386	57841	58296	58751	59128	59504	59881	60257
107	9	9	9	9	9	8	56853	57323	57794	58265	58735	59206	59563	59920	60277	60635
108	9	9	9	9	9	9	57230	57716	58202	58688	59174	59660	59998	60336	60674	61012
109	10	9	9	9	9	9	57594	58074	58553	59033	59512	59992	60331	60671	61010	61350
110	10	10	9	9	9	9	57958	58431	58904	59377	59850	60323	60664	61006	61347	61688
111	10	10	10	9	9	9	58322	58789	59255	59722	60188	60655	60998	61341	61683	62026
112	10	10	10	10	9	9	58686	59146	59606	60066	60526	60987	61331	61675	62019	62364
113	10	10	10	10	10	9	59050	59504	59957	60411	60864	61318	61664	62010	62356	62702
114	10	10	10	10	10	10	59414	59861	60308	60755	61202	61650	61997	62345	62692	63040
115	11	10	10	10	10	10	59672	60122	60572	61022	61472	61923	62279	62635	62990	63346
116	11	11	10	10	10	10	59929	60383	60836	61289	61743	62197	62560	62924	63287	63651
117	11	11	11	10	10	10	60187	60644	61100	61557	62013	62470	62842	63214	63585	63957
118	11	11	11	11	10	10	60445	60904	61364	61824	62283	62743	63123	63503	63883	64263
119	11	11	11	11	11	10	60702	61165	61628	62091	62554	63017	63405	63793	64180	64568
120	11	11	11	11	11	11	60960	61426	61892	62358	62824	63290	63686	64082	64478	64874
121	12	11	11	11	11	11	61193	61662	62130	62598	63067	63535	63932	64329	64726	65123
122	12	12	11	11	11	11	61426	61897	62368	62838	63309	63780	64178	64576	64974	65372
123	12	12	12	11	11	11	61660	62133	62606	63079	63552	64025	64424	64823	65222	65621
124	12	12	12	12	11	11	61893	62368	62843	63319	63794	64270	64670	65070	65470	65870
125	12	12	12	12	12	11	62126	62604	63081	63559	64037	64515	64916	65317	65718	66119
126	12	12	12	12	12	12	62359	62839	63319	63799	64279	64760	65162	65564	65966	66368
127	13	12	12	12	12	12	62586	63060	63535	64009	64483	64958	65358	65758	66157	66557
128	13	13	12	12	12	12	62813	63281	63750	64219	64687	65157	65554	65951	66349	66746
129	13	13	13	12	12	12	63040	63503	63966	64429	64892	65355	65750	66145	66540	66935
130	13	13	13	13	12	12	63266	63724	64181	64638	65096	65553	65946	66339	66731	67124
131	13	13	13	13	13	12	63493	63945	64397	64848	65300	65752	66142	66532	66923	67313
132	13	13	13	13	13	13	63720	64166	64612	65058	65504	65950	66338	66726	67114	67502
133	14	13	13	13	13	13	63929	64365	64802	65239	65676	66113	66501	66889	67277	67665
134	14	14	13	13	13	13	64137	64565	64992	65420	65847	66275	66663	67051	67439	67827
135	14	14	14	13	13	13	64346	64764	65183	65601	66019	66438	66826	67214	67602	67990
136	14	14	14	14	13	13	64555	64963	65373	65781	66191	66600	66988	67376	67765	68153
137	14	14	14	14	14	13	64763	65163	65563	65962	66362	66763	67151	67539	67927	68315
138	14	14	14	14	14	14	64972	65362	65753	66143	66534	66925	67313	67701	68090	68478
139	FULL	14	14	14	14	14	65937	66330	66724	67116	67510	67904	68296	68687	69080	69472
140	FULL	FULL	14	14	14	14	66902	67298	67694	68090	68486	68882	69278	69674	70070	70466
141	FULL	FULL	FULL	14	14	14	67868	68266	68665	69063	69462	69861	70261	70660	71060	71460
142	FULL	FULL	FULL	FULL	14	14	68833	69233	69635	70036	70438	70840	71243	71646	72050	72453
143	FULL	FULL	FULL	FULL	FULL	14	69798	70201	70606	71010	71414	71818	72226	72633	73040	73447
144	FULL	FULL	FULL	FULL	FULL	FULL	70763	71169	71576	71983	72390	72797	73208	73619	74030	74441

ALABAMA-COOSA-TALLAPOOSA RIVER BASIN

WATER CONTROL MANUAL
CLAIBORNE LOCK AND DAM AND LAKE

GATE OPENING SCHEDULE

CLAIBORNE TARGET DISCHARGE

FLOW IN 100 CFS

Scheduled Millers Ferry Generation (MWH)	POOL ELEVATION															
	34.4 or less	34.5	34.6	34.7	34.8	34.9	35	35.1	35.2	35.3	35.4	35.5	35.6	35.7	35.8	35.9 or greater
225	30	33	36	39	41	44	47	49	52	55	57	60	63	65	68	75
300	38	41	44	47	50	52	55	58	60	63	66	68	71	74	76	79
375	48	51	54	57	60	62	65	68	70	73	76	79	81	85	85	85
450	59	62	65	68	71	73	76	79	81	84	85	85	85	85	85	90
525	71	74	77	80	85	85	85	90	95	95	100	100	100	100	100	100
600	75	80	85	85	85	85	90	90	100	100	100	100	100	100	100	105
675	80	85	85	90	90	95	95	95	100	100	100	105	105	107	110	110
750	95	95	100	100	100	100	100	100	102	105	108	110	113	116	118	121
825	100	100	100	100	100	105	108	111	114	117	120	123	126	129	132	135
900	103	106	108	111	114	116	119	122	124	127	130	133	136	139	142	145
975	113	116	118	121	124	126	129	132	134	137	140	143	146	149	152	155
1050	123	126	128	131	134	136	139	142	144	147	150	153	156	159	162	165
1125	133	136	138	141	144	146	149	152	154	157	160	163	166	169	172	175
1200	146	148	151	154	156	159	162	164	167	170	176	176	179	182	185	188
1275	161	163	166	169	171	174	177	179	182	185	188	191	194	197	200	203
1350	173	176	179	181	184	187	189	192	195	198	201	204	207	210	213	216
1425	183	186	189	191	194	197	199	202	205	208	211	214	217	220	223	226
1500	196	199	201	204	207	209	212	215	218	221	224	227	230	233	236	239
1575	206	209	211	214	217	219	222	225	228	231	234	237	240	243	246	249
1650	219	221	224	227	229	232	235	238	241	244	247	250	253	256	259	262
1725	234	236	239	242	244	247	250	253	256	259	262	265	268	271	274	277
1800	244	246	249	252	254	257	260	263	266	269	272	275	278	281	284	287

THE DAMTENDER, USING CLAIBORNE'S CREST ELEVATION AND MILLERS FERRY'S NEXT DAY GENERATION, WILL LOCATE THE TARGET FLOW FROM THIS CHART AND WILL MAKE THE GAGE CHANGES EVERY HOUR UNTIL THE NEW DISCHARGE IS REACHED.

GATE SETTINGS FOR TARGET DISCHARGE. To release the target discharge, set gates according to the gate schedule in the following manner:

RISING UPPER POOL. Set the gates so the discharge is just less than the target discharge
FALLING UPPER POOL. Set the gates so the discharge is just greater than the target discharge.

MAXIMUM GATE SETTINGS CHANGES.

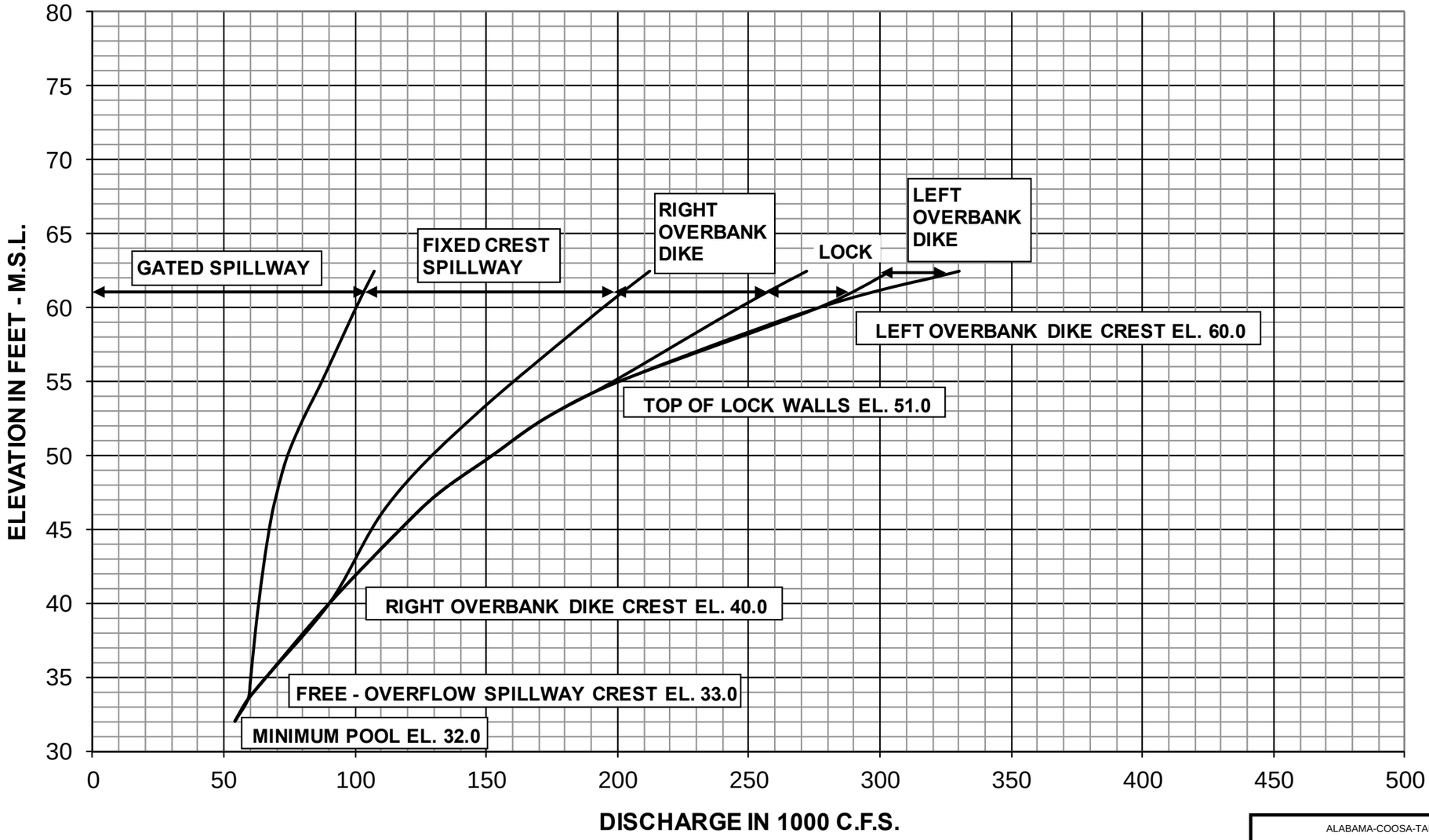
RISING UPPER POOL To increase the discharge open 1 gate step per hour.
To decrease the discharge , close up to 5 gate steps per hour.

FALLING UPPER POOL. To increase the discharge open up to 6 gates steps per hour.
To decrease the discharge close 1 gate step per hour.

ALABAMA-COOSA-TALLAPOOSA RIVER BASIN

WATER CONTROL MANUAL
CLAIBORNE LOCK AND DAM AND LAKE

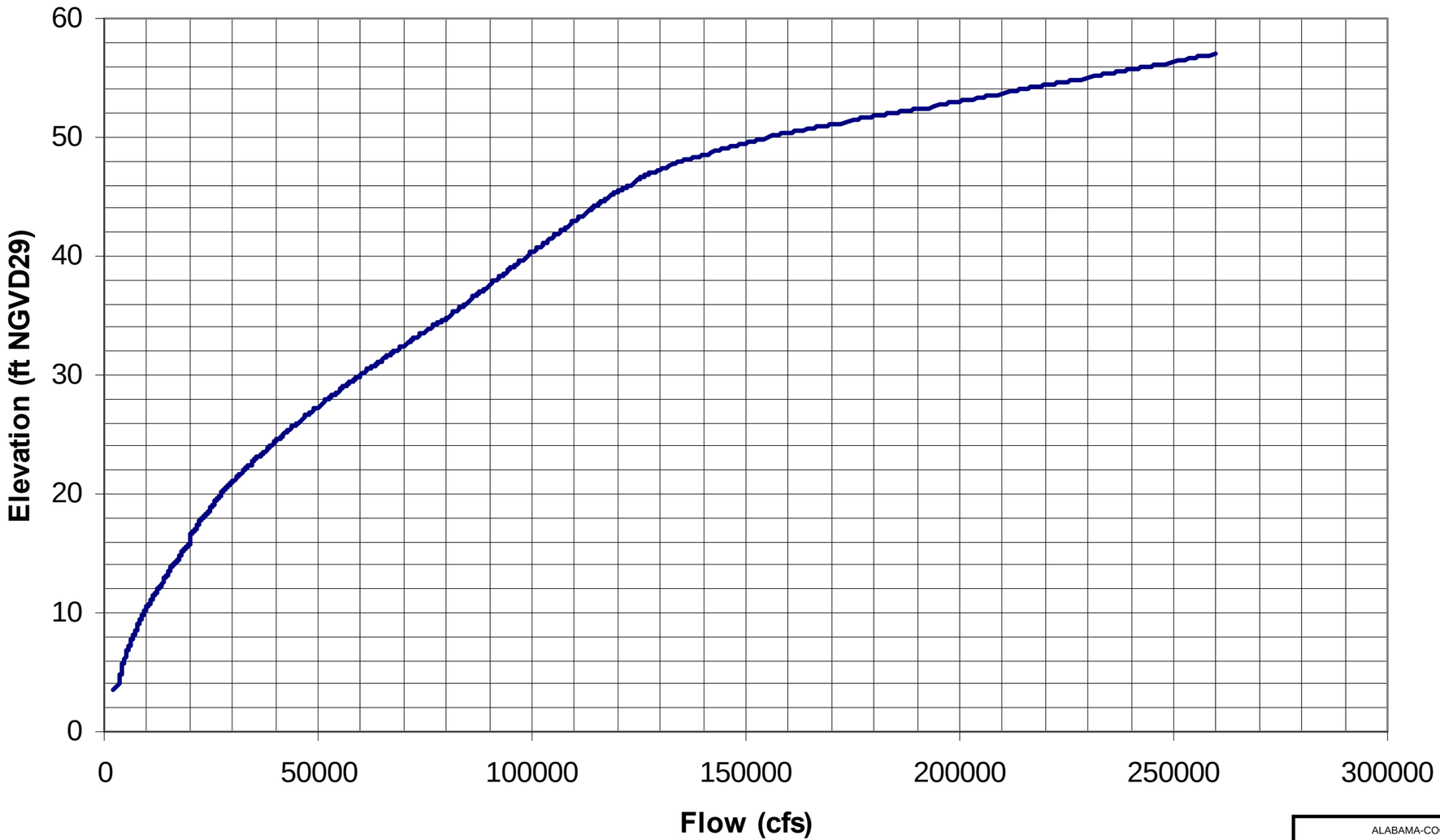
TARGET DISCHARGES



ALABAMA-COOSA-TALLAPOOSA RIVER BASIN

WATER CONTROL MANUAL
CLAIBORNE LOCK AND DAM AND LAKE

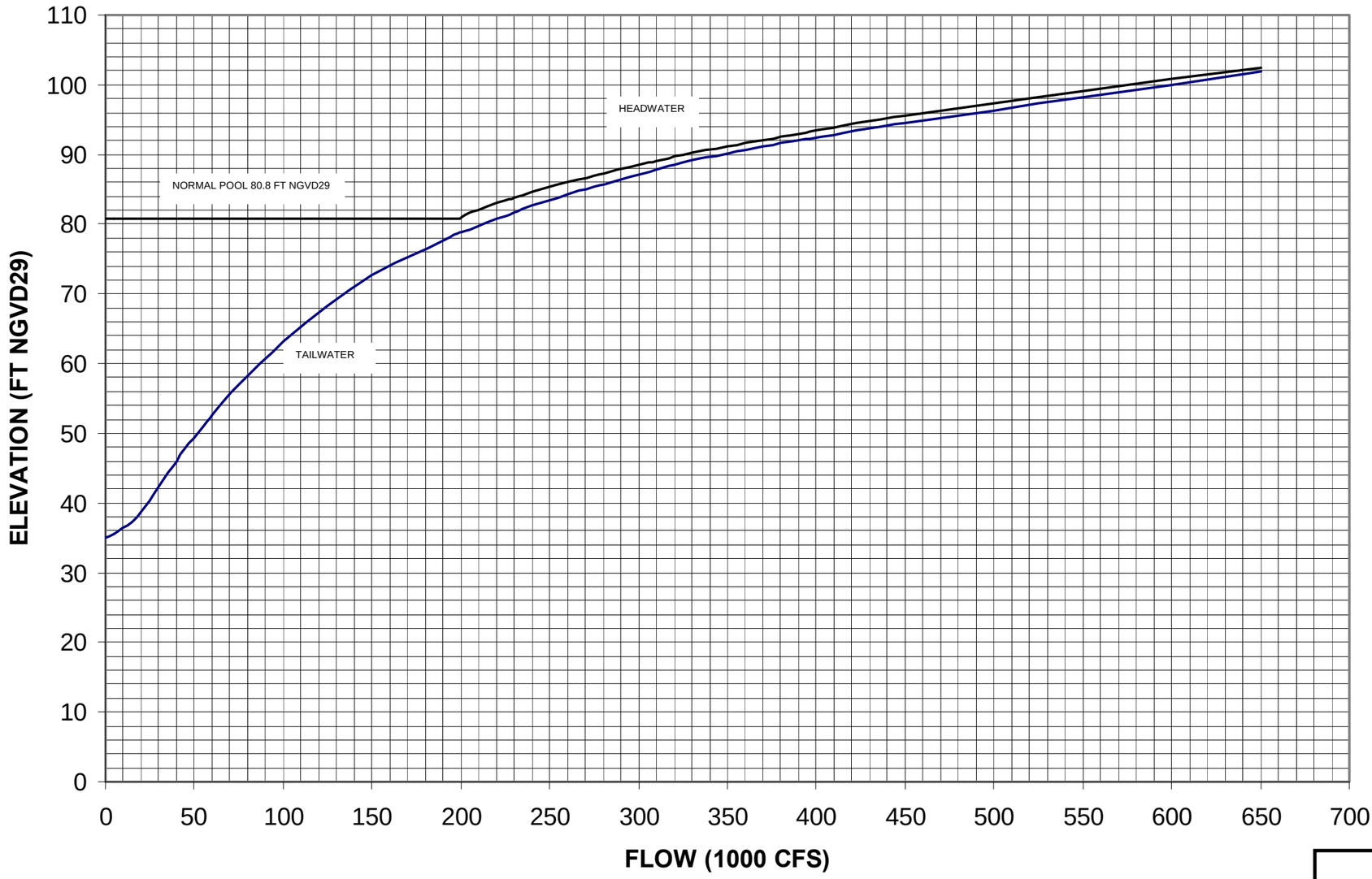
DISCHARGE CAPABILITY CURVES - SPILLWAY, LOCK, AND OVERBANK DIKES



ALABAMA-COOSA-TALLAPOOSA RIVER BASIN

WATER CONTROL MANUAL
CLAIBORNE LOCK AND DAM AND LAKE

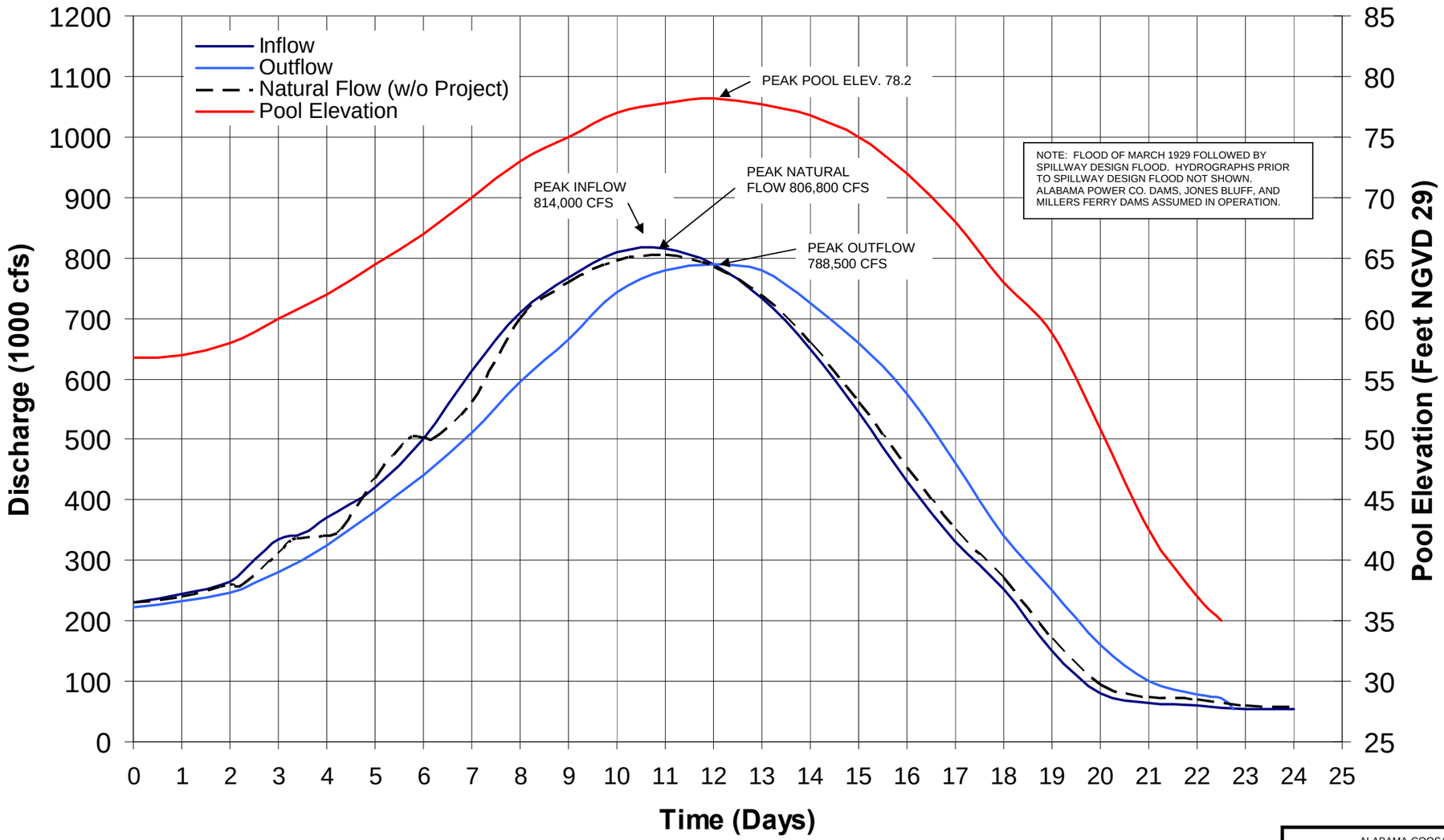
CLAIBORNE TAILWATER



ALABAMA-COOSA-TALLAPOOSA RIVER BASIN

WATER CONTROL MANUAL
CLAIBORNE LOCK AND DAM AND LAKE

MILLERS FERRY HEADWATER TAILWATER RATING CURVES

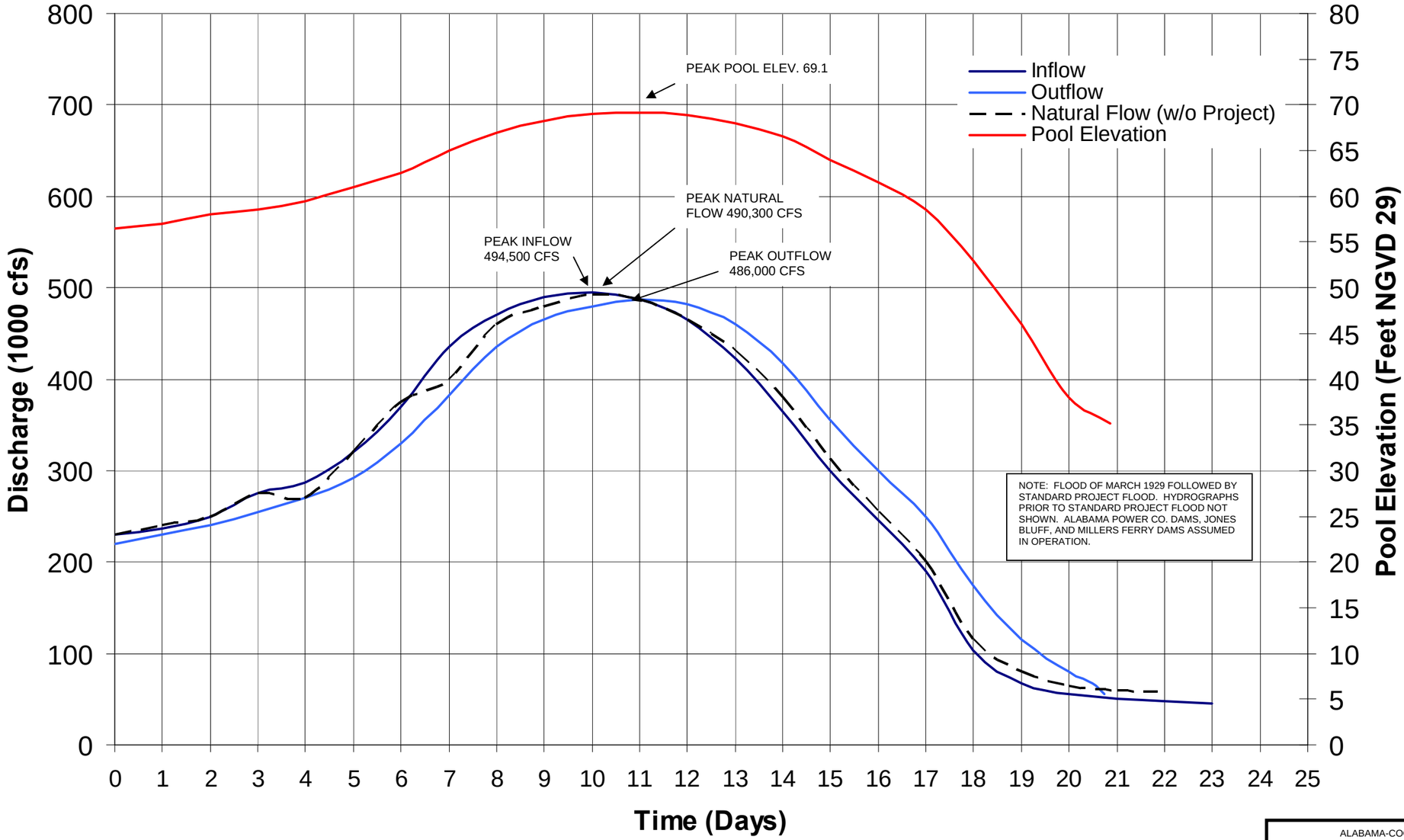


ALABAMA-COOSA-TALLAPOOSA RIVER BASIN

WATER CONTROL MANUAL
CLAIBORNE LOCK AND DAM AND LAKE

INFLOW-OUTFLOW-POOL EL. HYDROGRAPHS SPILLWAY DESIGN FLOOD

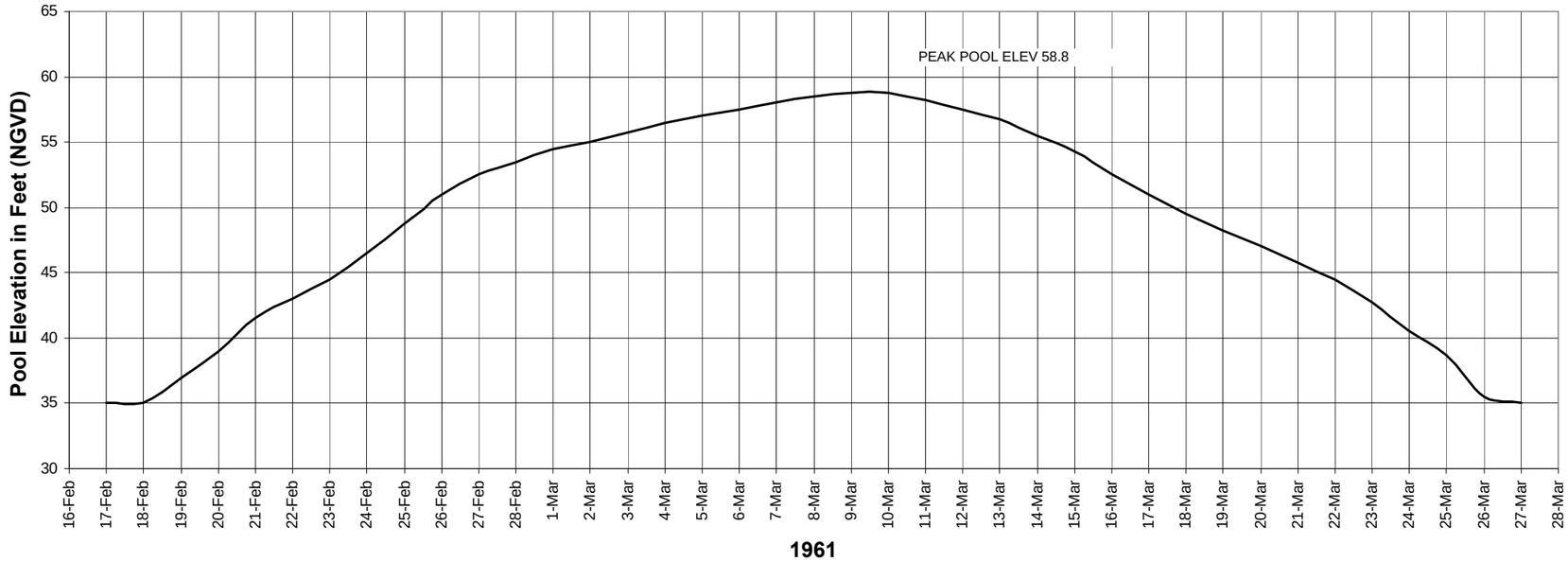
APPENDIX F PLATE 8-1

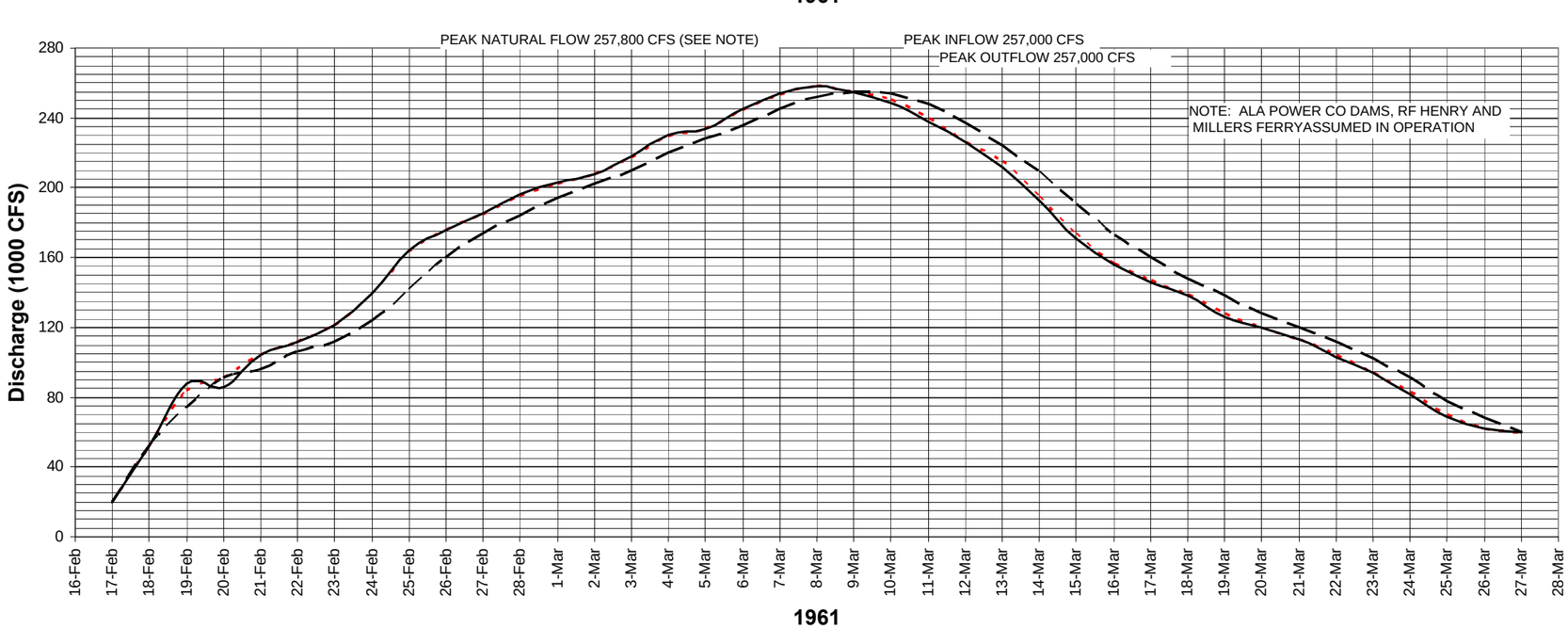


ALABAMA-COOSA-TALLAPOOSA RIVER BASIN

WATER CONTROL MANUAL
CLAIBORNE LOCK AND DAM AND LAKE

INFLOW-OUTFLOW-POOL EL. HYDROGRAPHS STANDARD PROJECT FLOOD

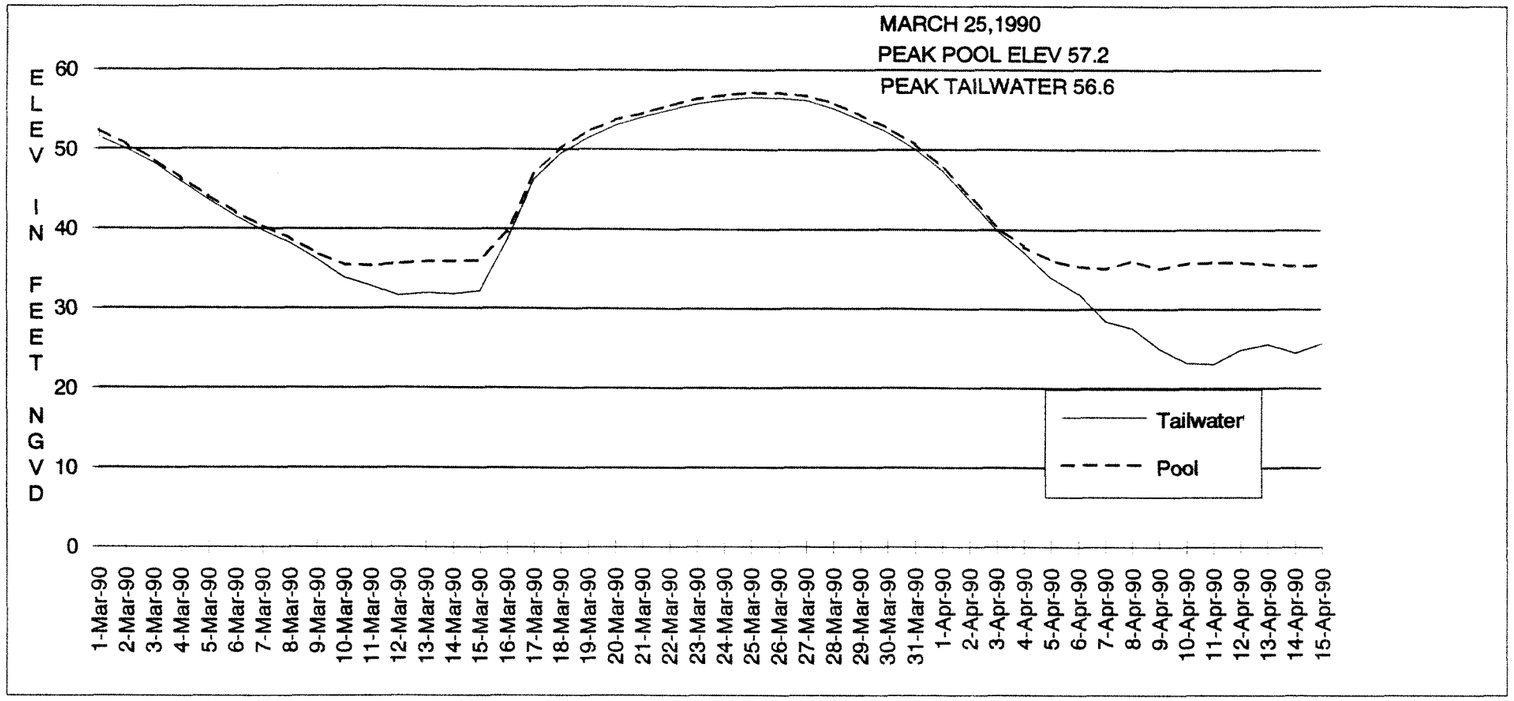


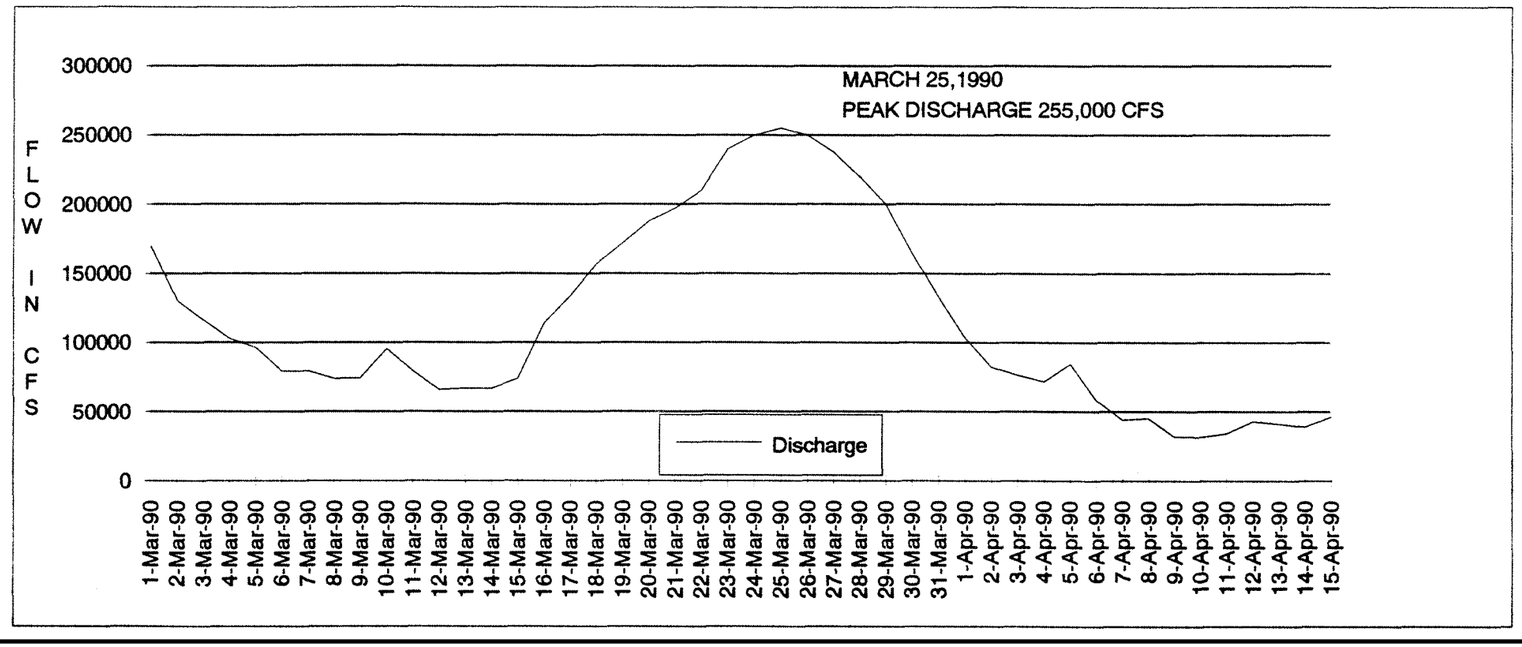


ALABAMA-COOSA-TALLAPOOSA RIVER BASIN

WATER CONTROL MANUAL
CLAIBORNE LOCK AND DAM AND LAKE

1961 FLOOD HYDROGRAPHS

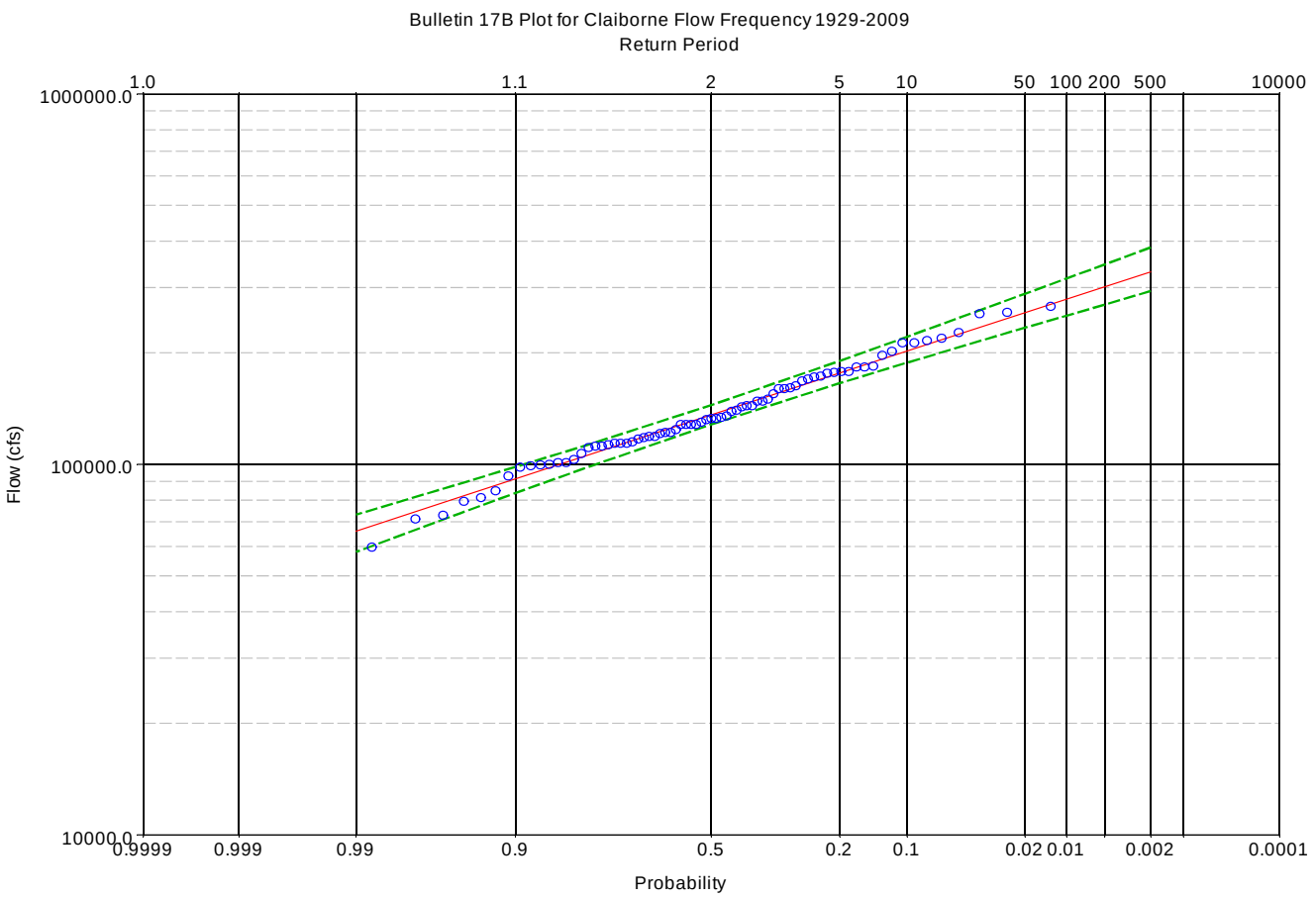




ALABAMA-COOSA-TALLAPOOSA RIVER BASIN

WATER CONTROL MANUAL
CLAIBORNE LOCK AND DAM AND LAKE

1990 FLOOD HYDROGRAPHS



Note: Data from USGS Gage No. 02429500 (1929 – 1981), and
USGS Gage 02428400 1976 – 2009)
Curve computed by HEC-SSP

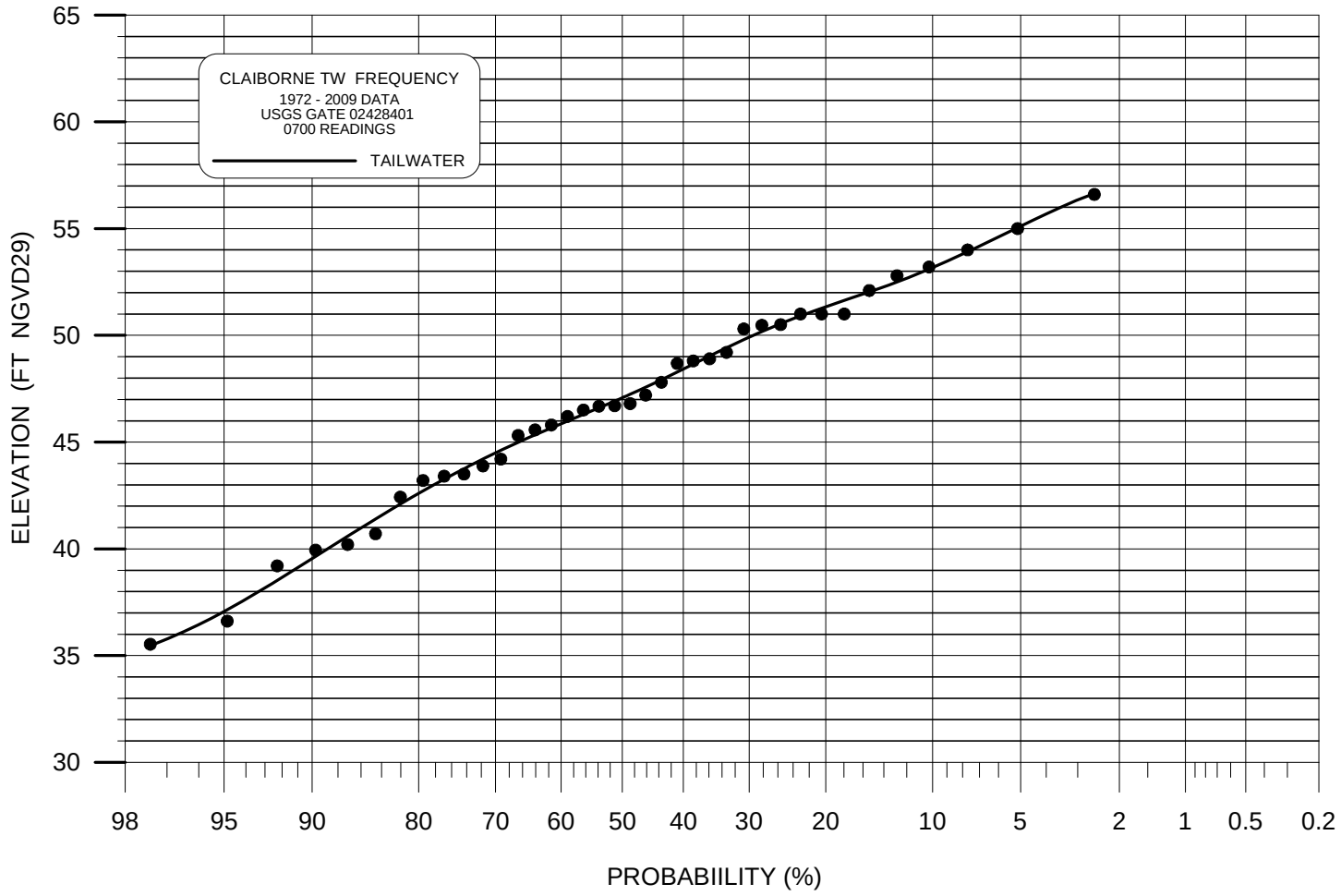
ALABAMA-COOSA-TALLAPOOSA RIVER BASIN

WATER CONTROL MANUAL
CLAIBORNE LOCK AND DAM AND LAKE

CLAIBORNE ANNUAL FLOW FREQUENCY

USGS GAGE 02428400 AND 02429500

APPENDIX F PLATE 8-5



Note: Data from USGS Gage No. 02428401 (1972 – 2009)
Curve fit by eye (7^{th} order polynomial)

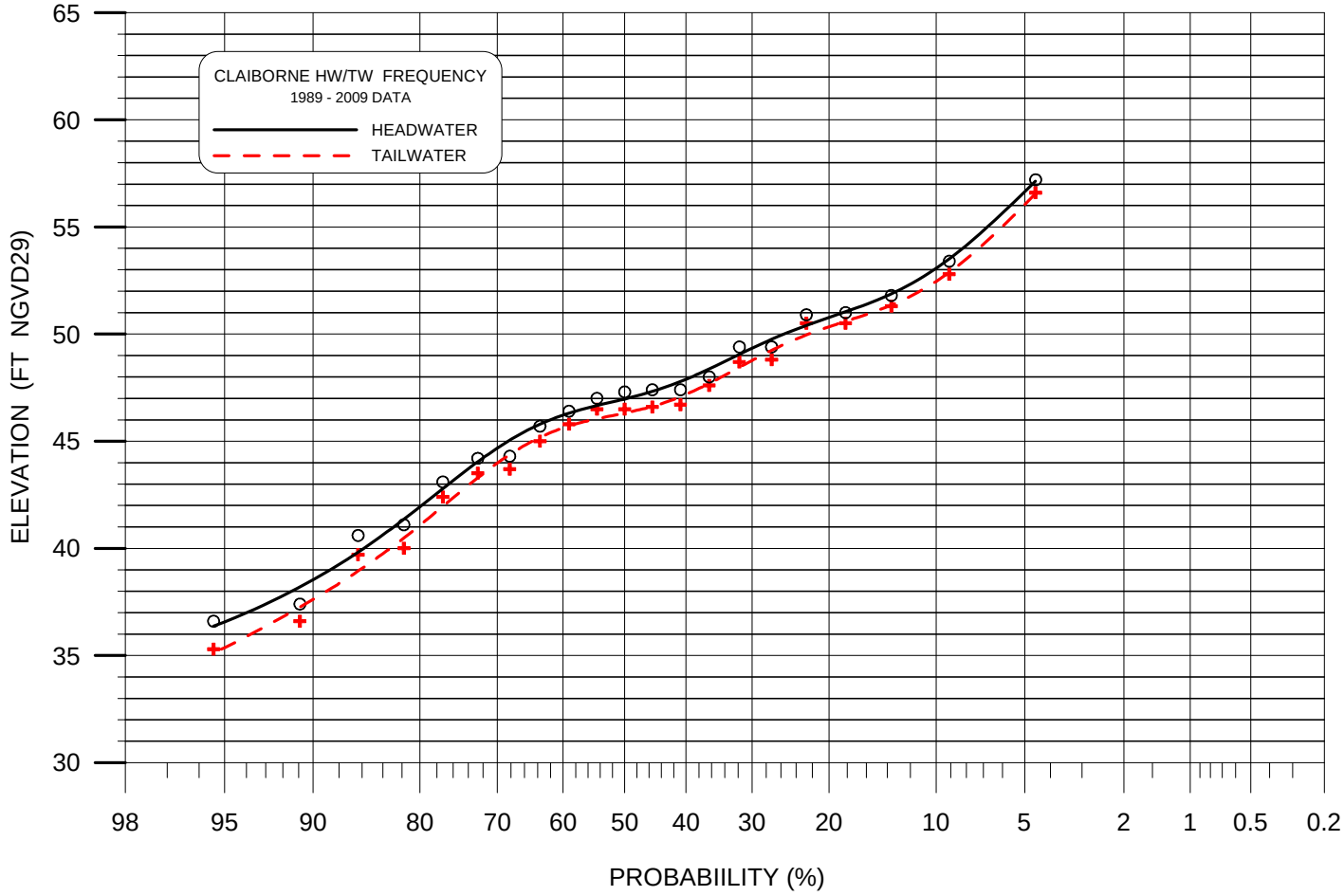
ALABAMA-COOSA-TALLAPOOSA RIVER BASIN

WATER CONTROL MANUAL
CLAIBORNE LOCK AND DAM AND LAKE

CLAIBORNE STAGE FREQUENCY

USGS GAGE 02428401

APPENDIX F PLATE 8-6



Note: Data from COE records of 0600 readings from 1989 – 2009. Period of record limited by lack of simultaneous readings.
Curve fit by eye (7th degree polynomial)

ALABAMA-COOSA-TALLAPOOSA RIVER BASIN

WATER CONTROL MANUAL
CLAIBORNE LOCK AND DAM AND LAKE

HEADWATER/TAILWATER STAGE FREQUENCY

APPENDIX F PLATE 8-7