Army Corps of Engineers
Galveston District

ADDICKS AND BARKER RESERVOIRS
BUFFALO BAYOU AND TRIBUTARIES
SAN JACINTO RIVER BASIN, TEXAS

WATER CONTROL MANUAL

September 2019
Reservoir Regulation Manual – April 1962
Revised Water Control Manual – November 2012

ADDICKS AND BARKER RESERVOIRS
BUFFALO BAYOU AND TRIBUTARIES
SAN JACINTO RIVER BASIN, TEXAS

WATER CONTROL MANUAL
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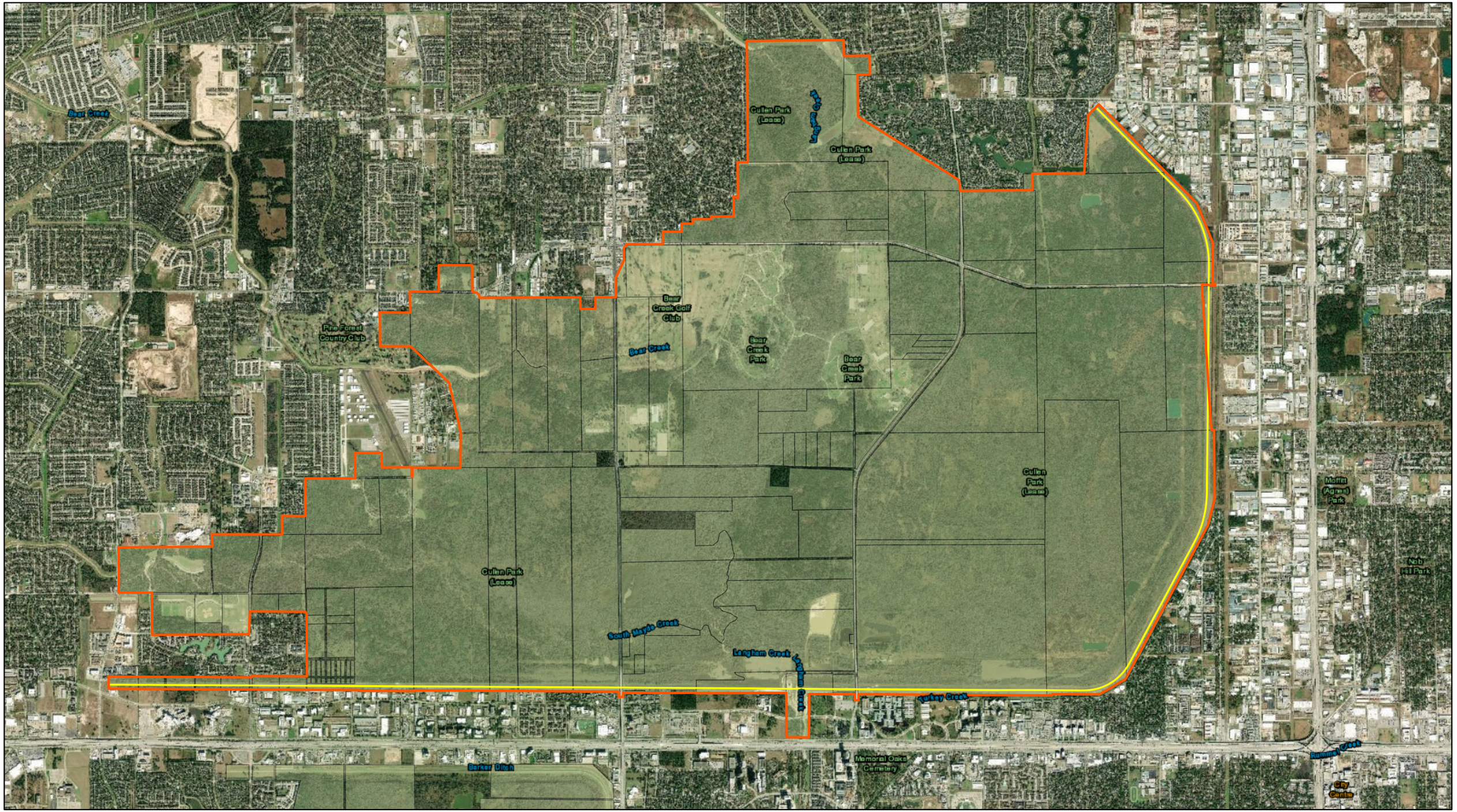
SEPTEMBER 2019
RESERVOIR REGULATION MANUAL – APRIL 1962
REVISED WATER CONTROL MANUAL – NOVEMBER 2012

Department of the Army
Corps of Engineers
Galveston District



Legend

- Addicks Reservoir
- Addicks Centerline of Dam

Addicks Reservoir Aerial View

iii

0 0.5 1 2 3 4 Miles

The data is only a representation of features on the earth completed by a computer program from raw data obtained from different sources and is not necessarily, in whole or in part, based upon any physical recording, study or survey, professional or otherwise, of the covered property. This information is not intended as a substitute for a field survey by a professional or any other use or application that requires legal or engineering accuracy.

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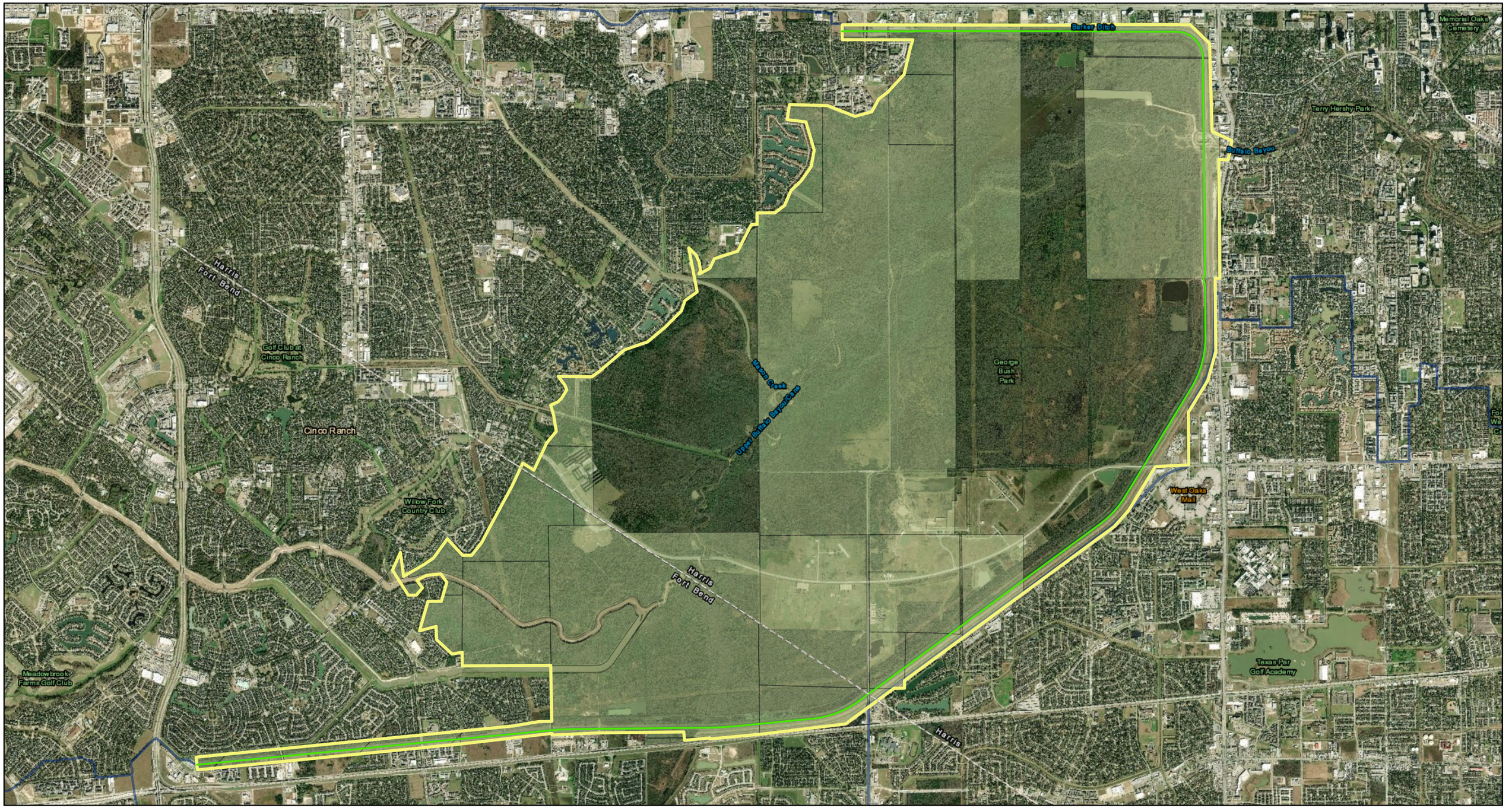
ADDICKS RESERVOIR – OUTLET WORKS (AUGUST 2019)



Legend

- Barker Reservoir
- Barker Centerline of Dam

N
W E
S

Barker Reservoir Aerial View

v

0 0.35 0.7 1.4 2.1 2.8 Miles

The data is only a representation of features on the earth completed by a computer program from raw data obtained from different sources and is not necessarily, in whole or in part, based upon any physical recording, study or survey, professional or otherwise, of the covered property. This information is not intended as a substitute for a field survey by a professional or any other use or application that requires legal or engineering accuracy.

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BARKER RESERVOIR – OUTLET WORKS (AUGUST 2019)

NOTICE TO USERS OF THIS MANUAL

Regulations also specify that this Water Control Manual can be used in a 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. All elevations referred to in this Water Control Manual, unless otherwise noted, are in feet, NAVD 1988 (North American Vertical Datum of 1988). See paragraph 1-07, Page 1-2, for more details on elevation shifts to this Datum.

Regulations also specify that electronic copies and notifications of this Water Control Manual and Subsequent revisions shall be forwarded to HQUSACE (CECW-CE) for file purposes as soon as practicable after completion, preferably within 30 days of date of approval at the Division level. This Water Control Manual shall be published in digital form in the central repository located at the following link:

https://maps.crrel.usace.army.mil/apex/f?p=875:1

The Water Control Manual at the central repository will be considered the official manual and will be kept current at all times. Instructions and information to upload or document the review status of the Water Control Manual, as per Engineering Regulation (ER) 1110-2-240, in the central repository portal can be found under the help tab in the portal.

It is not unexpected that USACE Corporate Information may move the central repository link to a new location. This information will be shared with all offices if a situation occurs by the HQUSACE.

REGULATION ASSISTANCE PROCEDURES

In the event that unusual conditions arise during non-duty hours, communication can be achieved by contacting, in the order listed, one of the following personnel shown below. Chapter VII of this manual contains detailed instructions for emergency regulation. All project personnel associated with regulation of the projects must be thoroughly familiar with this and the procedure outlined in Exhibit C.

EMERGENCY PERSONNEL ROSTER

OFFICE	NAME	OFFICE*	GOVT. CELL
ADDICKS PROJECT OFFICE			
	Addicks Field Office Main Line		Presently Offline
	Addicks Field Office Fax Line		Presently Offline
	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]
WATER CONTROL			
	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]
OPERATIONS DIVISION			
	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]
DAM SAFETY			
	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]
EMERGENCY OPERATIONS			
	[redacted]		[redacted]
	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	

*All office extensions begin with [redacted]

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PERTINENT DATA ADDICKS AND BARKER RESERVOIRS

ITEM	ADDICKS RESERVOIR		BARKER RESERVOIR	
DRAINAGE AREA	136 square miles		130 square miles	
DAMS				
Type	Rolled earth embankment		Rolled earth embankment	
Length	61,166 feet		71,900 feet	
Height (above stream bed)	48.5 feet		36.5 feet	
RESERVOIR	Elevation feet (1)	Storage Capacity acre-feet	Elevation Feet (1)	Storage Capacity acre-feet
Conduit Invert	66.0	29	68.5	0
Limits of Government Land	103.0	127,591	95.0	82,921
100-Year Flood (2)	103.8	138,687	97.0	107,363
Standard Project Flood	107.6	193,956	98.3	125,061
Natural ground at end of dam	108.0	199,643	104.0	209,600
Top of dam	121.0	-	113.1	-
CONDUITS	3 gated steel-lined conduits encased in concrete, 10’ diameter x 247’-8” long each		3 gated steel-lined conduits encased in concrete, 12’ diameter x 131’-11” long each	
STILLING BASIN	59.11’ parabolic chute spillway; 54.98’ long x 54.00’ wide longitudinal stilling basin; 883.63’ of pre-cast concrete block/articulating concrete block outlet channel		50.01’ parabolic chute spillway; 51.00’ long x 57.00’ wide longitudinal stilling basin; 856.23’ of pre-cast concrete block/articulating concrete block outlet channel	

(1) Elevations are based on the NAVD88 datum.

(2) Provisional until compliant with the USACE Civil Works Review Policy.

I - INTRODUCTION

1-01. Authorization for Manual. This manual is submitted as required by Engineer Regulation (ER) 1110-2-240 “Water Control Management,” 30 May 2016 and prepared in accordance with Engineer Manual (EM) 1110-2-3600 “Management of Water Control Systems,” 10 October 2017 and ER 1110-2-8156 "Preparation of Water Control Manuals," 30 September 2018.

1-02. Purpose and Scope. The purpose of this manual is to document the Addicks and Barker Reservoir regulation plans, to present detailed information to higher authority, and to give guidance to personnel concerned with or responsible for the regulation of Addicks and Barker Reservoirs during the life of the projects. This manual includes data and information pertinent to the regulation of Addicks and Barker Reservoirs.

The previous manual version, dated November 2012, consolidated the regulatory conditions published in “Hydrology, Buffalo Bayou and Tributaries, Texas, Addicks and Barker Reservoirs, August 1977” with Reservoir Regulation Schedules published in “Reservoir Regulation Manual for Addicks and Barker Reservoirs, April 1962.” This manual updates reservoir regulation for the new outlet works constructed at both Addicks and Barker Reservoirs, which have a different geometry than the previous outlet works. Additional pertinent data and reports are also incorporated into this manual and are listed in Table 1-01 in the Supplementary Tables at the end of this manual.

1-03. Related Manuals and Reports. Reports and manuals pertinent to Addicks and Barker Reservoirs are listed in Table 1-01, Page T1.01-01, in the Supplementary Tables at the end of this manual.

1-04. Project Owner. Addicks and Barker Reservoirs are owned by the United States Government.

1-05. Operating Agency. The U.S. Army Corps of Engineers (USACE) is the operating agency for Addicks and Barker Reservoirs. The Project Operations Branch, Galveston District office has the responsibility for operation of Addicks and Barker Reservoirs. The Damtender (Natural Resource Management Specialist) for Addicks and Barker Reservoirs has the responsibility for the specific operations of Addicks and Barker Reservoirs. The project is manned and operated from 0730 hours to 1600 hours on weekdays throughout the year, and manned operation can vary up to 24 hours a day depending on the elevation status of the reservoirs and/or any dam safety concerns as well. Reference “Emergency Action Plan, Addicks Reservoir and Barker Reservoir, Annex I to Galveston District Emergency Operation Plan,” Completion Date: 22 May 2014, and any subsequent annual updates. The operators work under the supervision

of the Damtender. Gate operations are manually controlled by the operator from the outlet structures using electrically controlled service gates. The Water Management Section/Hydraulics and Hydrology (H&H) Branch is responsible for regulating the conduit gates. The Damtender provides the Chief, Water Management Section/H&H Branch an updated list of project operations personnel, giving their office and personal telephone numbers.

1-06. Regulating Agencies. USACE is the regulating agency for Addicks and Barker Reservoirs. The Water Management Section/H&H Branch in the Galveston District Office is responsible for establishing pool limits, setting water control criteria and objectives, making hydrologic forecasts, and coordinating overall water management operations. The plans and objectives for water control purposes are executed on a real-time basis by the project operating personnel.

1-07. Vertical Datum. The Vertical Datum for the Buffalo Bayou and Tributaries project is the North American Vertical Datum of 1988 (NAVD88). Because the Houston metropolitan region has experienced extreme subsidence, local adjustments have been made to account for subsidence with periodic adjustments. In 2000-2001, the National Geodetic Survey (NGS) ran levels in the region that resulted in Harris-Galveston County Subsidence District (HGCSD) to update their control network reflecting updated elevations in 2002-2003 using fast static Global Positioning System (GPS) (NAVD88 geoid99, NAD83 1997.00 epoch). This network adjustment was constrained to multiple Continuously Operating Reference Stations (CORS) with extensometers on site (Lake Houston CORS ARP, Northeast 2250 CORS ARP, and Addicks 1795 CORS ARP). Once this network was completed, HGCSD applied a .253-foot shift due to elevation changes to CORS “Northeast 2250 CORS ARP.” Previous versions of this manual referred to this shift as “NAVD88 adjustment 2001.” Project elevations have not been updated since this adjustment, and elevations in this water control manual are based on previous publications. Future updated elevations should be referenced with a year the survey was completed with the datum used and geoid, if applicable.

II - DESCRIPTION OF PROJECT

2-01. Location. The Buffalo Bayou watershed is within the San Jacinto River Basin and lies primarily in Harris and Fort Bend Counties in southeast Texas. Barker Dam is located on Buffalo Bayou, and Addicks Dam is located on South Mayde Creek, a tributary of Buffalo Bayou. Both dams are located on the northwestern boundaries of the city limits of Houston, Texas. The top of dam at the outlet works of Addicks Reservoir are located at approximate latitude 29.791111° and longitude -95.623333°. The top of dam at the outlet of Barker Reservoir is located at approximate latitude 29.769722° and longitude -95.646944°. An overall vicinity map is shown on Plate 2-01.

2-02. Purpose. Addicks and Barker Reservoirs contribute to the overall purposes of authorized Buffalo Bayou flood risk management projects, which include the flood risk management protection provided to the City of Houston from flood damages. As a result of providing flood risk management downstream of Addicks and Barker Reservoirs, a benefit from this Risk Reduction is the prevention of excessive channel velocities and silt deposits accumulating in the Houston Ship Channel Turning Basin. The two reservoirs provide floodwater detention for flood risk management on the Buffalo Bayou watershed, and except during periods of rainfall, do not normally impound significant water.

2-03. Physical Components. Addicks and Barker Reservoirs are similar structures, consisting of long earthen embankments, with each dam having three conduits discharging flood waters into downstream channels. Subsidence has occurred along the dams and at the outlet works since construction to varying degrees. All elevations, unless otherwise noted, are NAVD88. The following paragraphs describe the physical components of the reservoir projects:

a. Addicks Dam. The reservoir is formed by an earthen dam approximately 61,166 feet long constructed with 1 on 3 side slopes on the upstream and 1 on 2.5 side slopes on the downstream with a maximum height above stream bed of 48.5 feet. Both the upstream and downstream slopes are sodded, and a 12-foot wide, flexible road surface extends along the crest of the dam. The top of the dam is at elevation 121.0 feet, and the ends of the dam embankment terminate at a ground elevation of 108.0 feet on the north end and elevation 112.0 feet on the west end. The spillway consists of two emergency spillways at both ends of the dam. Page iii shows a local aerial map for Addicks Reservoir. Plate 2-02 shows typical sections for Addicks Dam.

b. Addicks Outlet Works. The outlet works consist of an intake tower, trash rack structures, three 10.0 foot diameter circular steel lined conduits encased in concrete that extend 247 feet – 8 inches through

the embankment. Each conduit has an invert elevation of 66.0 feet and an exit elevation of 65.0 feet. After exiting the conduits the flows then drop into a parabolic spillway and exits the stilling basin at elevation 51.0 feet. Discharge through the conduits passes through an approximately 59 foot parabolic spillway and into a 55 foot long by 54 foot wide longitudinal stilling basin, then through a 883.63 foot long pre-cast and articulating concrete block lined outlet channel emptying into South Mayde Creek. Plate 2-04 shows a plan and profile view of the Addicks Outlet works.

c. Barker Dam. The reservoir is formed by an earthen dam approximately 71,900 feet long constructed with 1 on 3 side slopes on the upstream and 1 on 2.5 side slopes on the downstream with a maximum height above stream bed of 36.5 feet. Both the upstream and downstream slopes of the dam are sodded, and a 12-foot wide, flexible road surface extends along the crest. The top of the dam is at elevation 113.1 feet, and both ends of the dam embankment terminate at a ground elevation of 104.0 feet. The spillway consists of two emergency spillways at the ends of the dam. Page iv shows a local aerial map for Barker Reservoir. Plate 2-03 shows typical sections for Barker Dam.

d. Barker Outlet Works. The outlet works consist of an intake tower, trash rack structures, three 12.0 foot diameter circular steel lined conduits encased in concrete that extend 131 feet – 11 inches through the embankment. Each conduit has an invert elevation of 68.5 feet and an exit elevation of 67.5 feet. After exiting the conduits the flows then drop into a parabolic spillway and exits the stilling basin at elevation 55.0 feet. The conduits are controlled by means of rectangular, electrically-operated 12-foot by 12-foot service gates. Discharge through the conduits passes through an approximately 50 foot parabolic spillway and into a 51 foot long by 57 foot wide longitudinal stilling basin, then through an 856.23 foot long pre-cast and articulating concrete block lined outlet channel emptying into Buffalo Bayou. Plate 2-05 shows a plan and profile view of the Barker Outlet works.

2-04. Related Control Facilities. Addicks and Barker Reservoirs serve in conjunction with approximately 7.4 miles of Buffalo Bayou channel improvements immediately downstream of the dams to provide flood protection along Buffalo Bayou. Construction of additional downstream channel improvements along Buffalo Bayou were authorized by the Flood Control Act of 1954, but this construction was never performed due to public opposition concerned with aesthetic and environmental effects to Buffalo Bayou and the rapid development of the area.

2-05. Real Estate Acquisition. Fee simple title has been obtained on approximately 12,460 acres for Addicks Reservoir and 12,060 acres for Barker

Reservoir. Property limits are defined by elevation 103.0 for Addicks Reservoir and elevation 95.0 for Barker Reservoir, based on NAVD88 elevations.

2-06. Public Facilities.

a. Addicks Reservoir. Public facilities at Addicks Reservoir are Bear Creek Pioneer Park, Cullen Park, Congressman Bill Archer Dog Park, a community center, sports fields for soccer and baseball, cycling park, golf course, and jogging trails, etc. Public facility areas are shown on Plate 2-06.

b. Barker Reservoir. Public facilities at Barker Reservoir are George Bush Park, Millie Bush Dog Park, as well as other facilities catering to Little League baseball, soccer fields, sports shooting sites, model airplane fields, and hiking trails, etc. Public facility areas are shown on Plate 2-07.

III - HISTORY OF PROJECT

3-01. Authorization of Project. Addicks and Barker Dams were authorized under the Rivers and Harbors Act of June 20, 1938, House Document No. 456, 75th Congress, 2nd Session, which authorized flood control work in the Buffalo Bayou watershed. The project was further modified by the Flood Control Acts of August 11, 1939, September 3, 1954, and October 27, 1965. The Flood Control Act of 1954, House Document No. 250, 83rd Congress, 2nd Session, authorized the straightening, enlarging, and lining, where necessary, on Buffalo, Brays, and White Oak Bayous.

The existing project, as authorized, provides for flood risk management, to include the protection of the City of Houston from flood damages. The authorized benefits of detention reservoirs, channel improvements, and diversionary projects should help in preventing excessive velocities and silt deposition in the Houston Ship Channel's turning basin.

3-02. Planning and Design. The original flood control project for the main stem of Buffalo Bayou was authorized for the purpose of protecting urban development along Buffalo Bayou through the City of Houston. Its authorization was prompted by devastating floods in 1929 and 1935.

Initial planning and design for Addicks and Barker Reservoirs were based on the Definite Project Report for Buffalo Bayou, dated June 1940. The construction of the Barker Dam's original outfall structure and outlet channel was started in February 1942 and completed in February 1945. The construction of the Addicks Dam's original outfall structure and outlet channel was started in May 1946 and completed in December 1948. The original Barker Outfall structure and outlet channel were completed in 1945. The original Addicks Outfall structure and outlet channel were completed in 1948. The original design of each of the outfalls included five box culvert conduits, with one conduit gated and the other four uncontrolled. As the construction of the gates neared completion in 1948, gates were installed on two of the four uncontrolled conduits at each reservoir. Gates were added to the remaining conduits in 1962 and 1963.

Several repairs were made to the outlet works at both Addicks and Barker dams since their completion. These repairs were primarily due to the silty and sandy erodible foundation soils underlying the conduits. A summary of these past repairs consist of: foundation erosion repairs during construction, parabolic chute cavity repair in 1968, additional repairs to the cantilever wall at Addicks Dam in 1973, outlet work repairs at Addicks in 1979, and outlet work repairs at Barker in 1982.

Seepage control measures were incorporated at both projects due to seepage concerns that were discovered in 1977. Potential seepage and piping is associated with erodible foundation soils and increased storage durations caused by gated operations. These measures included the construction of a soil bentonite slurry trench through the embankment (not including the area beneath the outlet conduits) and pervious foundation, placement of a downstream berm to enhance slope stability, and placement of clay blankets to thicken the impervious cover over pervious foundation materials. This work was accomplished between 1977 and 1982.

As a result of provisions contained in the Dam Safety Assurance Program (DSAP), Addicks and Barker Dams were modified to conform to updated design criteria between 1986 and 1989. Remedial work consisted of two primary features. First, the main dam was raised to achieve needed freeboard requirements. Raising the tops of the dam embankments was not practical at the outlet works on both dams since this would have required steeper side slopes to compensate for the fixed dam width corresponding to the length of the outlet works. Therefore, concrete T-walls (parapet walls) were constructed along the tops of the original embankments at the outlet works. Second, erosion protection utilizing roller compacted concrete was added to the lower ends of the dams so they could serve as overflow spillways during storms greater than the Standard Project Flood (SPF), up to and including the Probable Maximum Flood (PMF).

Several issues within and around the conduits have led to recent repairs. These issues include erodible foundation soils, ‘window’ areas of the bentonite cutoff walls adjacent to the conduits, open conduit joints, cracks within the parabolic chutes, and lack of engineered filters. All of these factors have led to the formation of voids beneath the conduits and parabolic chutes on both reservoirs.

In 2009, 176 cubic yards of polyurethane was placed beneath the conduits and top of the parabolic chute at Addicks and 340 cubic yards was placed at Barker. This work was done under an Urgent and Compelling contract during high pools to ensure the conduits were stable for the required releases. In 2010, with the assistance and oversight of the United States Bureau of Reclamation (USBR), another contract was awarded to inject cementitious grout beneath the stilling basin, parabolic chutes, and conduits at both dams. These efforts were performed to insure that the foundations under the outlet structures were tight with no voids. A total of 17.8 cubic yards of Portland cement grout was pumped into voids beneath and along the outlet works conduits and parabolic chute at Addicks Dam. A total of 45.3 cubic yards was pumped beneath and along the conduits and parabolic chute at Barker Dam.

During grouting operations in the upstream portions of the conduits at Barker Dam, relatively large amounts of cement grout surfaced at two upstream locations near the embankment toe. Subsequent investigations revealed this exposed grout had flowed from the conduit injection points through the interface between

the excavation for the outlet works and the backfill and along the interface between the stripped foundation and the dam embankment. Cement grout was placed with sufficient pressure to force migration of grout through soft and loose soil zones within and below the embankment. These loose zones most likely existed prior to grout placement but were probably widened and fractured during this effort. In any event, it is evident that damage occurred and a poor foundation condition exists within and below the embankment.

In 2011, as a result of the Dam Senior Oversight Group (DSOG) categorizing the Addicks and Barker dams as a Dam Safety Action Classification (DSAC) I (urgent and compelling: unsafe), a dam safety modification study (DSMS) was performed and completed in May 2013. Granular filters were designed and constructed as Interim Risk Reduction Measures (IRRMs) while the study was ongoing. Each granular filter is a sand filter constructed along the sides of the conduits and along the top of the conduits. The filter extends upstream from the conduit headwall for about eight feet, and the filter is four feet wide at the sides of the conduits. The filter was placed three feet thick over the tops of the conduits at Addicks Dam and two feet thick over the tops of the conduits at Barker Dam. The recommended alternative of the DSMS was to replace the outlet works structures and abandon the existing outlet works structures in-place at both reservoirs. The design for the new outlet works was completed in June 2015.

Subsequent project-related reports and Design Memoranda are listed in Table 1-01, which is included as a supplementary table in the back of this report.

3-03. Construction. A history of construction activities for Addicks and Barker Reservoirs is presented in Table 3-01.

TABLE 3-01
HISTORY OF CONSTRUCTION ACTIVITIES

Activity		Addicks	Barker
Reservoir Conduits and One Gate	(Start)	May 1946	Feb 1942
	(Complete)	Dec 1948	Feb 1945
Date of Initial Operation	(Start)	Jun 1948	Aug 1945
Two Additional Conduit Gates	(Start)	Feb 1948	Feb 1948
	(Complete)	Apr 1949	Apr 1949
Two Remaining Conduit Gates	(Start)	Jan 1962	Jan 1962
	(Complete)	Feb 1963	Feb 1963
Parabolic Chute Cavity Repair	(Start)	1968	1968
	(Complete)	1968	1968
Cantilever Wall Repair	(Start)	1973	N/A
	(Complete)	1973	N/A
Emergency Seepage Control	(Start)	Sep 1977	Sep 1977
	(Complete)	Aug 1979	Sep 1979
Raise Main Embankment	(Start)	Jul 1986	Jun 1986
	(Complete)	Aug 1987	Aug 1988
Armor Plate Ends of Dam w/RCC	(Start)	May 1987	May 1987
	(Complete)	Sep 1988	Sep 1988
T-wall Contract at Outlet	(Start)	Dec 1988	Sep 1989
	(Complete)	Sep 1989	Jun 1991
Outlet Structure Renovations (Electrical Work and Gate Repairs)	(Start)	1998	1998
	(Complete)	1999	1999
Fill Voids Under Conduits Phase 1	(Start)	May 2009	May 2009
	(Complete)	May 2009	May 2009
Fill Voids Under Conduits Phase 2	(Start)	Mar 2010	Mar 2010
	(Complete)	Apr 2010	Apr 2010
Granular Filter	(Start)	2010	2010
	(Complete)	2010	2010
Stabilize Uplift at End of Parabolic Chute Slab	(Start)	2013	2014
	(Complete)	2013	2014
New Outlet Works, Cutoff Wall, and Existing Outlet Works Abandonment	(Start)	Aug 2015	Aug 2015
	(Complete - Estimated)	April 2020	April 2020

3-04. Related Projects. The original Federally authorized flood control plan for the City of Houston provided for three detention reservoirs (Addicks, Barker, and White Oak). A system of canals was to convey releases from White Oak Reservoir, north of Houston, to the San Jacinto River and from Addicks and Barker Reservoirs, south of Houston, to Galveston Bay. Also, a levee was to be constructed along the Cypress Creek divide to prevent overflow from the Cypress Creek watershed into Addicks Reservoir. The original design concept for the dams provided for five outlet conduits at each dam, with four of the five to be uncontrolled.

Construction of Barker Dam was initiated in February 1942 and completed in February 1945. During preconstruction planning for Addicks Dam, it was determined more economical to increase the capacity of Addicks Reservoir to accommodate the overflow from Cypress Creek and delete the authorized levee.

Construction of Addicks Dam was initiated in May 1946 and completed in December 1948. Also, rectification and enlargement of approximately 7.4 miles of the Buffalo Bayou channel immediately downstream of the dams was completed in 1948. However, during construction of Addicks Dam, it was recognized that the planned discharge canals would be delayed because of rapid development in the Houston area. Therefore, in order to provide limited protection downstream on Buffalo Bayou until problems with the discharge canals could be resolved, gates were installed on two of the four uncontrolled conduits at each reservoir.

A review of reports completed in 1952 concluded that rising land costs and rapid development made construction of White Oak Reservoir and the discharge canals impracticable, and, in lieu of these facilities, recommended channel rectification of Buffalo, Brays, and White Oak Bayous. These improvements were subsequently authorized by the Flood Control Act of 1954. The plan envisioned straightening and enlarging the channels to contain the SPF with concrete lining to the level of the 10-year frequency flood. It was rationalized at the time that since the reservoirs provided a measure of flood protection for Buffalo Bayou, priority would be placed on channel rectification of Brays and White Oak Bayous. Channel improvements for 25.4 miles of Brays Bayou and 10.7 miles of White Oak Bayou were completed in 1971 and 1975, respectively. However, rectification of Buffalo Bayou was delayed by public opposition concerned with aesthetic and environmental effects of the plan on the existing stream.

3-05. Dam Safety History/Issues. While the gating of two previously uncontrolled conduits on both projects in 1963 made it possible to reduce downstream flooding, it also prolonged storage of rainfall runoff behind the dams and resulted in a serious seepage problem through pervious sections of the embankments and foundations. This seepage problem threatened the stability of the embankments and created a potential for failure of the dams in the event of a high reservoir pool. Repairs for various reaches of the embankments included a bentonite slurry

trench seepage barrier extending through the earth fill dams into the relatively imperious clay strata, earthen stability berms placed on the downstream slope of the embankments, and upstream clay blanketing. These emergency modifications were completed between 1977 and 1982 at a cost of approximately $12 million for both reservoirs.

As a result of provisions contained in the DSAP, Addicks and Barker Dams were modified to conform to updated design criteria between 1986 and 1989.

Several factors within and around the conduits have led to recent repairs. These include: erodible foundation soils, 'window' areas of the bentonite cutoff walls adjacent to the conduits, open conduit joints, cracks within the parabolic chutes, and lack of an engineered filters. Grouting was performed in 2009 and 2010 in an effort to fill many of the voids.

In 2011, as a result of the DSOG categorizing the Addicks and Barker dams as a DSAC I (urgent and compelling: unsafe), a DSMS was funded. IRRM Plans were developed for both Addicks and Barker dams in February 2010 and April 2013 while long-term remedial measures were pursued. Risk reduction measures at both projects included coordinating the emergency action plan with local authorities, installing a reservoir regulator alarm system for stage and rainfall reporting, and installing outlet conduit monitoring instrumentation and enhanced lighting. The risk reduction measures also included conducting risk communications with the public, developing an interim reservoir control action plan, updating the emergency action plan, and filling voids under conduits. Other risk reduction measures implemented at Barker Dam only included replacing an outlet structure gate and implementing a normal operational flow restriction. Other risk reduction measures implemented at both projects included constructing a granular filter, lacing inspection plugs, grouting outlet works conduit joints, and stabilizing the uplift at the end of parabolic spillway.

The DSMS was completed in May 2013 and recommended to replace the outlet works structure and abandon the existing outlet works structure in-place. Design was complete in June 2015, and the current ongoing construction contract was awarded in August 2015 for approximately $75M with a projected scheduled completion date of April 2020.

3-06. Principal Regulation Problems. The chief regulation problem associated with Addicks and Barker Reservoirs has been the continually diminishing downstream non-damaging channel capacity due to encroachment. Additionally, continual upstream development has increased inflow into the Reservoirs due to these developments and is likely to continue. Plates 3-01 and 3-02 display water surface profiles and floor elevations along Buffalo Bayou downstream of the reservoirs. In 1972, releases from the reservoirs, when combined with uncontrolled runoff and outflow from Addicks and Barker Reservoirs, were limited to 2,000 cfs due to embankment problems and continued development. This is

the principal regulation issue that constrains the downstream releases. Over the last ten years, surveys and observations along the bayou have determined that the present non-damaging channel capacity is approximately 4,000 cfs. A Section 216 review of completed projects is included in the scope of the ongoing Buffalo Bayou and Tributaries Resiliency Study, and this manual will be updated with results from the study after it is reviewed and approved.

Additional regulation problems include seepage and boils infiltrating the embankments. While the gating of two previously uncontrolled conduits on both projects in 1963 made it possible to reduce downstream flooding, it also prolonged storage of rainfall runoff behind the dams and resulted in a serious seepage problem through pervious sections of the embankments and foundations. This seepage problem threatened the stability of the embankments and created a potential for failure of the dams in the event of a high reservoir pool. Repairs for various reaches of the embankments included a bentonite slurry trench seepage barrier extending through the earth fill dams into the relatively imperious clay strata, earthen stability berms placed on the downstream slope of the embankments, and upstream clay blanketing. These emergency modifications were completed between 1977 and 1979 at a cost of about $12 million.

3-07. Modifications to Regulations. The original design concept for both dams provided for four of the five outlet conduits to be uncontrolled, permitting a combined uncontrolled discharge of about 15,700 cfs into Buffalo Bayou. When two of the four ungated conduits were gated at each dam in 1948, the combined uncontrolled discharge was about 7,900 cfs, which was considered to be the channel capacity at that time. Increasing urban development adjacent to Buffalo Bayou during the 1940's and 1950's created a potential flood threat by the uncontrolled release from the reservoirs. Studies undertaken in 1960 showed the feasibility of gating the remaining uncontrolled conduits, and this work was subsequently completed in 1963. The total of all releases, plus local runoff downstream from the dams, would start at 4,000 cfs and be gradually increased to 6,000 cfs except under emergency conditions. While the gating of the last two uncontrolled conduits on both projects in 1963 made it possible to reduce downstream flooding, it also prolonged storage of rainfall runoff behind the dams.

Continued residential development along Buffalo Bayou downstream from the reservoirs resulted in channel encroachment, and by late 1970, flows in excess of 3,000 cfs in the unimproved channel downstream of the dams would begin to threaten the first floor elevations of some residences. Even without significant downstream inflows, release rates of 2,500 to 2,800 cfs would produce prolonged nuisance type flooding of flower beds, trees, and lawns for a considerable number of residences adjacent to the Bayou and in some of its tributary swales. Discharges in this range do not leave any freeboard for inflows from rainfall.
In early 1971, an inspection of Buffalo Bayou revealed serious bank erosion at several locations. In order to provide temporary relief from this problem, until the

local interests could provide the necessary remedial measures, releases from the reservoirs were temporarily restricted to 500 cfs at Piney Point. During dry periods with little or no chance of rain, releases could be made from 700 to 1,000 cfs. When rainfall was expected, releases had to be reduced or shut off entirely.

The reduction in release rates and the resulting prolonged detention of water in the reservoirs generated a number of complaints from local residents during the latter part of 1971. The complaints generally referred to the floodwaters that were stored in the reservoirs and expressed concern that the reservoirs were becoming breeding grounds for mosquitoes and that the prolonged storage would kill the trees and make the area unfit for parks sites. The Galveston District received complaints of an undesirable odor due to the prolonged detention of floodwaters in the wooded areas at the Addicks Outlet Works when releases were being made.

A study was started in 1971 and completed in 1972 revising the regulation procedures to maintain the best balance of reservoir releases into the inadequate downstream channel without serious damage as opposed to the prolonged storage of water in the reservoirs. The interim procedures described herein were put in place until local interests were able to complete their improvements. These improvements as planned were expected to permit total releases from the reservoirs of 2,000 to 2,500 cfs. Based on the available data at the time and new field surveys, the anticipated operational procedure with the local channel improvements was determined to permit releases of 2,000 cfs. In 1974, local interests completed improvements to the channel in areas which extensive damage to adjacent structures was threatening. Regulation procedures were implemented to allow combined releases of Addicks and Barker Dams up to 2,000 cfs at Piney Point, local inflow included.

In early 1976, the Harris County Flood Control District (HCFCD) excavated Turkey Creek Ditch adjacent to Federal property downstream of Addicks Dam. The ditch, about 15 feet deep, intercepted and exposed a sand stratum that was believed to be continuous through pervious sections of the dam embankments foundation that opened to the surface of the pool area. During subsequent rises in the reservoir pool, seepage was noted in the exposed sand strata in the ditch. This was considered to be a serious seepage problem that threatened the stability of the embankment and created a potential for failure of the dam in the event of a high reservoir pool. Immediate action was taken to fix the problem. Since Barker Reservoir had Barker and Clodine Ditches below its dam, the repairs for Addicks Dam were implemented on Barker Dam also. These repairs for the various reaches of the embankments included a bentonite slurry trench seepage barrier extending through the earth fill dams into the relatively imperious clay strata, earthen stability berms placed on the downstream slope of the embankments, and upstream clay blanketing. Emergency modifications were completed between 1977 and 1979.

In 1976, a restudy of Addicks and Barker Reservoirs was initiated to determine the adequacy of the two dams with respect to safety and functional reliability. On 8 May 1977, the Hydrology Report for Addicks and Barker Reservoirs was submitted and later approved by Southwestern Division. In this report, Exhibit D, titled “Description of Addicks and Barker Reservoirs Regulation Program,” Section D-5, Regulatory Conditions, modified the flood risk management regulations for each reservoir. Since that report, the flood risk management regulations have remained the same up until the construction of the new outlet works. The regulation procedures stipulated that releases from both reservoirs, plus the downstream inflow, will not exceed 2,000 cfs at Piney Point on Buffalo Bayou except under emergency conditions. Over the last ten years, surveys and observations along the bayou have determined that the present non-damaging channel capacity is approximately 4,000 cfs. During the construction of the new outlet works, a temporary deviation was approved by Southwestern Division to allow releases from both reservoirs, plus the downstream inflow, up to a flow rate of 4,000 cfs at Piney Point on Buffalo Bayou. This deviation allowed releases of up to 3,000 cfs during Stage 1 Extended Watch and 4,000 during Stage 2 Extended Watch, as defined by the Emergency Action Plan.

IV - WATERSHED CHARACTERISTICS

4-01. General Characteristics.

a. Buffalo Bayou Watershed. Buffalo Bayou is located in the San Jacinto Watershed Basin. The Buffalo Bayou watershed lies primarily in Harris and Fort Bend Counties in southeast Texas. The basin is bounded on the north by Cypress Creek; on the east by the San Jacinto River; on the south by Clear Creek; and on the west by the Brazos River. Buffalo Bayou travels through heavily wooded residential areas and flows east through downtown Houston, draining a 102 square mile watershed by the time it reaches the Houston Ship Channel. Barker Dam is located on Buffalo Bayou about 1.5 miles upstream of the confluence of South Mayde Creek. Addicks Dam is located on South Mayde Creek about one mile upstream of its confluence with Buffalo Bayou.

b. Barker Reservoir Watershed. The portion of the Buffalo Bayou watershed flowing into Barker Reservoir lies within Harris, Waller, and Fort Bend Counties. The watershed, a roughly trapezoidal area of approximately 130 square miles, is approximately 23 miles long with an average width of 6 miles. The watershed is shown on Plate 4-01.

c. Addicks Reservoir Watershed. The South Mayde Creek watershed flowing into Addicks Reservoir lies within Harris County. The watershed is roughly 15 miles long, 10 miles wide, and has a drainage area of approximately 136 square miles. The watershed includes several major tributaries including Bear Creek, Langham Creek, Horsepen Creek and Turkey Creek. The watershed is shown on Plate 4-01.

d. Cypress Creek Watershed. The 130 square mile watershed of Cypress Creek upstream of U.S. Highway 290 lies north of and adjacent to the Addicks Reservoir watershed. The general land slope of Harris and Waller Counties in this area is in a southerly direction while the Cypress Creek channel flows in an easterly direction to its outlet into the San Jacinto River in eastern Harris County. Consequently, the flood plain for Cypress Creek is relatively shallow with a poorly defined divide to the south and floodwaters from larger floods flow southward into the Addicks Reservoir watershed. The watershed is shown on Plate 4-01.

4-02. Topography. Natural ground elevations in the Addicks and Barker Reservoir watersheds vary from approximately 200 feet at the upstream divides to approximately 68 feet at Addicks Dam and approximately 70 feet at Barker Dam. Natural stream flow gradients in the basin are very uniform at about 5 feet per mile sloping in a southeastern direction.

4-03. Geology and Soils. The geologic formations which outcrop on the Buffalo Bayou watershed are of the Quaternary system. The southeastern part of the basin is occupied by Beaumont clay, and the northeastern part by Lissie sands. Recent alluvium deposits occupy the shallow stream valleys. The formations dip southeasterly in the same direction at the land surface, but on a much steeper slope. The soils are of the Coastal Prairie series and generally drain poorly.

a. Addicks Dam. The existing embankment materials are typically stiff to hard sandy clays with thin layers, seams, and pockets of silty sands, clayey sands, and sandy silts. The existing embankment is founded on a layer of stiff to hard sandy clays and clays varying in thickness from 8 to 30 feet. The sandy clays overlie a medium dense to very dense layer of silty sand, clayey sand, or sandy silt. The thickness of this layer varies considerably from a few feet to 60 feet. In some reaches of the embankment the layer was not encountered. Deeper materials are very stiff to hard clays with some sandy silt or clayey silt layers.

During the period of September 1977 to March 1979, approximately 6.8 miles of the existing embankment were modified by remedial seepage control construction. Under the first contract, a soil-bentonite slurry trench was constructed through the embankment and pervious foundation along approximately 1.57 miles of the embankment to prevent possible piping failure through the dam foundation. With the second contract, the slurry trench was extended along an additional 1.9 mile segment of the embankment; 0.47 mile of slurry trench along the upstream toe of the embankment was constructed; and approximately 0.9 mile of stability berm was constructed along the downstream slope. An additional 1.39 miles of upstream slurry trench and 2.38 miles of downstream stability berms were constructed under the third contract. The total length of remedial work was 6.8 miles or 58.6 percent of the length of the dam. Work under the fourth contract was restricted to improvement of seepage control measures at the outlet works. The work included placement of well screens in weep holes in the outlet works structure to control loss of underlying pervious material; installation of capped inspection holes in the parabolic chute slab to allow monitoring of the loss of pervious foundation material; and installation of relief wells in the pervious materials adjacent to the outlet works. Reaches where slurry trenches and downstream stability berms were constructed, and details of the construction are given in the Emergency Seepage Control Construction Completion Report, Buffalo Bayou and Tributaries, Addicks and Barker Dams, Texas, March 1983 and the Addicks and Barker Dam Safety Modification Report, May 2013.

In 1986, approximately 23,600 linear feet of the main earth embankment of Addicks Dam was raised about 1 to 2 feet to the minimum freeboard elevation of 121 feet NAVD88 and approximately

8,800 linear feet was raised about 3 feet to the computed freeboard elevation of 121 feet NAVD88. This generally was accomplished by the addition of compacted fill on the downstream slope and crown of the embankment. The compacted fill was composed of sandy clays and clayey sand material excavated from borrow areas within the reservoir. The downstream slope of the enlarged embankment was resurfaced with the existing topsoil materials suitable for establishing turf. A portion of the flexible base material on the existing crown was reused in constructing the open surfaced roadway on the new 12-foot wide crown. The enlarged main embankments generally have side slopes of 1 vertical to 3 horizontal on the upstream side and 1 vertical to 2.5 horizontal on the downstream side. Exceptions to the 1 vertical to 3 horizontal upstream slope occurred on Addicks Dam between stations 160+00 and 235+00 and between stations 380+00 and 460+00 where the existing embankment crest was approximately 1.0 foot below the crest of the proposed embankment. In these reaches, the side slope on the upstream side would be 1 vertical to 2.5 horizontal to allow reshaping of the existing crown with minimal disturbance to the upstream and downstream side slopes.

b. Barker Dam. The existing embankment materials are typically stiff to hard sandy clays with thin layers, seams, and pockets of silty sands, clayey sands, and sandy silts. The existing embankment is founded on a layer of stiff to hard sandy clay varying in thickness from 7 to 25 feet. The sandy clays overlie a medium dense to very dense layer of silty sand, sandy silt, or clayey sand. The thickness of this layer varies from a few feet to 35 feet. In some reaches of the embankment the sandy layer was not encountered. Deeper materials are predominantly very stiff to hard clays with some sandy silt or clayey silt layers.

   Approximately 9.1 miles of the existing embankment was modified by remedial seepage control construction in 1978 through 1982. Under the first contract, a soil-bentonite slurry trench was constructed through the embankment and pervious foundation along approximately 1.9 miles of the embankment to prevent possible piping failure through the dam foundation. In adjacent lengths, a downstream berm was constructed under the second contract along approximately 7.2 miles of the embankment to improve stability of the downstream slope under steady seepage conditions. Also under the second contract, clay blankets were constructed in the upstream borrow areas in three segments to thicken the impervious cover over the pervious foundation materials. Under the third contract, relief wells were installed in the stilling basin and joints were sealed in the outlet works conduits. Reaches where slurry trenches and downstream stability berms were constructed, and details of the construction are given in the Emergency Seepage Control Construction Completion Report, Buffalo Bayou and Tributaries, Addicks and Barker

Dams, Texas, March 1983 and the Addicks and Barker Dam Safety Modification Report, May 2013.

In 1986, approximately 14,800 linear feet of the main earth embankment on Barker Dam was raised about 2 to 3 feet to the minimum freeboard elevation of 113.1 feet NAVD88, and approximately 42,750 linear feet was raised about 3 to 5 feet to varying computed freeboard elevations up to 113.1 feet NAVD88. This generally was accomplished by the addition of compacted fill on the downstream slope and crown of the embankment. The compacted fill was composed of sandy clays and clayey sand excavated from borrow areas within the reservoir. The downstream slope of the enlarged embankment was resurfaced with the existing topsoil materials suitable for establishing turf. A portion of the flexible base material on the existing crown was reused in constructing the open surfaced roadway on the new 12-foot crown. The enlarged main embankments generally have side slopes of 1 vertical to 3 horizontal on the upstream side and 1 vertical to 2.5 horizontal on the downstream side.

c. Groundwater Conditions. Water table measurements were made in some of the borings taken prior to remedial seepage control construction. The measurements indicated a water table existed 5 to 15 feet below natural ground along Addicks Dam and 5 to 25 feet below natural ground along Barker Dam.

d. Subsidence. The geologic area has experienced large regional subsidence due to groundwater extraction which continues today albeit at a decreased rate in recent years due to restrictions on groundwater extraction. Although the regional subsidence in the Barker area appears to be evenly distributed over the region, there could be localized differential settlement around the conduit and the soils (CL/CH) are compressible.

4-04. Sediment. Subsequent to project completion and through the 1973-1975 reservoir re-surveys, there has been no evidence of appreciable erosion in the watersheds upstream of the dams or serious sedimentation problems. Since 1975, construction activities associated with urbanization of the upper watersheds have substantially increased the sediment load of the streams flowing into the reservoirs. As a result of the Galveston District's policy established in the late 1970's of prohibiting drainage improvements on the Government-owned reservoir lands, sediment deposits have been restricted to the improved channels on privately- owned land and to the shallow overbanks of the upper elevations of the reservoirs. In 1981, the Galveston District relaxed the drainage policy regarding improved channels with the requirement of positive sediment control upstream of improved channel reaches on Government-owned lands. Reference Exhibit B for a copy of the letter submitted to Harris County communicating this

change in policy. Sediment ranges have been set up upstream of the Government-owned lands and within the reservoir area to monitor Harris County and Fort Bend County sediment basin operation and maintenance programs on channel improvements brought onto government-owned land.

4-05. Climate.

a. General. The Buffalo Bayou watershed lies in a relatively humid and temperate climatic region. Summers are long and hot but are tempered somewhat by sea breezes from the Gulf of Mexico. Winters are generally mild, and snowfall is infrequent. Prevailing winds are from the south or southeast.

b. Temperature. The daily range in temperatures is moderate except in the winter months when polar air masses periodically cause sharp drops. The average annual temperature for this area is about 70.5 degrees Fahrenheit. Temperature extremes range from 109 degrees (2000 and 2011) to 5 degrees (1940 and 1980) were recorded at various official Houston recording sites. Usually, the major airports are the official sites of these recorded temperatures. Table 4-01 presents climatological data relative to temperature at representative United States Weather Service stations near Addicks and Barker Reservoirs.

TABLE 4-01
TEMPERATURE DATA

	Years of Record Thru 2018	Temperature in Degrees Fahrenheit		
		Mean Annual (1)	Maximum Recorded (2)	Minimum Recorded (2)
Houston (Hobby Airport – HOU)	88	70.3	108	5
Houston (Bush Airport – IAH)	49	69.9	109	7
Sugar Land, TX	18	71.3	108	16

(1) Data Tools: 1981 – 2010 Normals, National Oceanic and Atmospheric Administration, https://www.ncdc.noaa.gov/cdo-web/datatools/normals.
(2) Applied Climate Information System, Version 2, National Oceanic and Atmospheric Administration, Regional Climate Centers, http://scacis.rcc-acis.org/.

c. Precipitation. Precipitation in the Addicks and Barker Reservoir area is well distributed throughout the year. Summer precipitation typically results from intense, short, isolated convective cells, while winter and

spring precipitation is generally produced by more widespread frontal events. The area is also affected by torrential rainfall associated with hurricanes and other tropical disturbances. The highest recorded 24-hour precipitation in the Houston area was 42 inches on 25-26 July 1979 (Tropical Storm Claudette) north of Alvin, a national record for that time period. Another intense 24-hour total of 19.58 inches was recorded on 8 June 2001 (Tropical Storm Allison) in Houston Heights. Tropical Storm Allison produced a six-day rainfall in Houston that amounted to 38.6 inches. However, Hurricane Harvey in August 2017 produced a U.S. record rainfall of 60.58 inches near Nederland, Texas over a five-day period (25-29 August 2019). This was the most significant tropical cyclone rainfall even in U.S. history. The highest recorded annual precipitation was 76.6 inches at Katy, Texas in 2017, and the lowest recorded annual precipitation was 21.5 inches in Katy, Texas in 1956. Average monthly and annual rainfall totals for Katy, Texas are presented in Table 4-02.

TABLE 4-02
AVERAGE MONTHLY AND ANNUAL RAINFALL

Month	Average Rainfall (inches) (1)	Addicks (inches) (2)(3)	Barker (inches) (2)(3)
Jan	3.11	4.13	3.28
Feb	2.77	2.90	2.77
March	2.56	2.70	3.20
April	3.64	3.43	3.40
May	4.60	4.24	4.28
June	3.96	4.17	4.21
July	3.10	3.44	3.30
Aug	3.82	3.87	4.08
Sept	4.06	4.40	4.39
Oct	4.08	4.46	4.21
Nov	3.98	3.51	3.49
Dec	3.42	3.43	3.32
Total	42.04	44.68	43.92

(1) Periods of Record (1952-2018) at the National Oceanic and Atmospheric Administration's Global Historical Climatology Network Site, ID USC00414704 in Katy, Texas.
(2) Prior to 2018, average rainfall numbers were derived by weighting various rain gauges in the vicinity.
(3) Starting in 2018, average rainfall numbers were derived by using MetVue to calculate a basin average rainfall using National Weather Service radar data.

d. Evaporation. Since Addicks and Barker Reservoirs are detention-type reservoirs with only flood pools of short duration, evaporation is not a consideration in their daily regulating operations.

e. Wind. The mean annual wind speed for the Houston area is 7.6 miles per hour, with the highest wind speed recorded in the area was 84 miles per hour in March 1926.

4-06. Storms and Floods. Major storm events affect Harris County in every month of the year. Harris County is relatively flat and possesses a humid semi-tropical climate making it susceptible to both supercell rainstorms coming from the west or tropical storm events moving up from the Gulf of Mexico.

The maximum known flood on Buffalo Bayou occurred in December of 1935. During this flood, overflow occurred from White Oak Bayou into Buffalo Bayou, and considerable overflow occurred from Buffalo Bayou into Brays Bayou. A peak flow rate of 40,000 cfs was estimated for Buffalo Bayou at Waugh Drive, located about 25 stream miles downstream of the reservoirs. Buffalo Bayou below the intersection of White Oak Bayou, located about 28 stream miles downstream of the reservoirs, had an estimated flow of 53,000 cfs.

Since establishment of stream gaging stations, the maximum flood which has occurred on Buffalo Bayou was that of August 2017 (Hurricane Harvey) when a peak discharge of 32,600 cfs was recorded at Shepherd Drive. The largest combined discharge releases from both reservoir projects occurred in August 2017 (Hurricane Harvey) when a total outflow of 11,400 cfs was estimated. The maximum impoundment in Addicks and Barker Reservoirs occurred in August 2017 when pool elevations reached 109.1 feet and 101.6 feet, respectively. These pools resulted from a total rainfall of over 34 inches over a 108-hour period from 25-29 August 2017. Chapter VIII of this manual contains information on additional major storm events.

4-07. Runoff Characteristics. The Buffalo Bayou basin upstream of Addicks and Barker Dams produces moderate to high runoff. Based upon years of observations, it was found that 1.0 to 2.5 inches of rainfall generally was needed to satisfy initial losses before significant runoff begins. The total contributing drainage area during moderate flood events for Addicks and Barker Reservoirs is 136 and 130 square miles, respectively. Under major flood events, Addicks Reservoir receives about one-third of its total volume from the 130 square mile drainage area of the Upper Cypress Creek Basin. The time of concentration from the period of most intense rainfall for major floods is about 5 to 13 hours for the basin. The volume of runoff (inflow volume) is summarized in the average monthly and annual project flows in Table 4-03.

TABLE 4-03
AVERAGE INFLOW VOLUMES AT ADDICKS AND BARKER RESERVOIRS RECORDED FOR PROJECT RELEASES (1)

Month	Addicks Monthly Average Inflow Volume (1,000 acre-ft)	Barker Monthly Average Inflow Volume (1,000 acre-ft)
January	9.1	9.5
February	8.9	9.6
March	9.1	9.9
April	12.5	12.0
May	10.8	11.8
June	8.8	8.5
July	7.2	6.8
August	12.2	10.2
September	7.4	8.0
October	9.5	9.2
November	9.1	9.8
December	8.3	8.5
ANNUAL TOTAL	112.8	113.8

(1) Period of Record: 1982 through 2018.

4-08. Water Quality. Addicks and Barker Reservoirs are detention reservoirs with flood pools of short duration; therefore, water quality is not an authorized purpose. However, P.L. 92-500 requires that all federal facilities be managed, operated, and maintained to protect the quality of water and resources through conformance with all applicable federal, state, interstate, and local substantive standards.

4-09. Channel and Floodway Characteristics. The Buffalo Bayou channel downstream of Addicks and Barker Reservoirs remains in a relatively natural state; however, adjacent development has encroached to very near the main channel for several miles downstream of the two projects. Plates 3-01 and 3-02 show water surface profiles for various flows down Buffalo Bayou with first floor slab elevations. Potential flood damage to these properties is the major constraint on releases while bank erosion is also a concern. The primary stream gaging station by which Addicks and Barker Reservoirs are regulated is Buffalo Bayou at Piney Point, approximately 10.7 stream miles downstream of Barker Dam.

Other pertinent stream gaging stations include Buffalo Bayou near Addicks (USGS Station Number 8013500) and Buffalo Bayou at West Belt Drive (USGS Station Number 8073600), approximately 3.0 and 6.5 miles downstream of Barker Dam, respectively. These station locations and other nearby gaging stations are shown in Plate 5-01, and a discharge rating curve for the Buffalo Bayou at Piney Point gage is provided in Plate 4-02.

4-10. Upstream Structures. There are no significant upstream flood control structures on Buffalo Bayou or its tributaries.

4-11. Downstream Structures. There are no significant downstream flood control structures on Buffalo Bayou or its tributaries.

4-12. Economic Data.

a. Population. Population by county in the vicinity of Addicks and Barker Reservoirs are shown in Table 4-04.

TABLE 4-04
POPULATION OF COUNTIES IN THE
VICINITY OF ADDICKS AND BARKER RESERVOIRS

County	1980 (1)	1990 (1)	2000 (1)	2010 (1)	% Change 2000-2010
Fort Bend	130,962	225,421	354,452	585,375	+65.1
Harris	2,409,547	2,818,101	3,400,578	4,092,459	+20.3
Montgomery	127,222	182,201	293,768	455,746	+55.1
Waller	19,798	23,389	32,663	43,205	+32.3

(1) U. S. Bureau of the Census, Census of Housing and Population.

b. Agriculture. The Addicks and Barker Reservoir watersheds are approximately 34% and 41% agricultural land-use and land-cover respectively (Yang and others, 2019). The agricultural areas are used primarily for pasture land and general mixed agricultural purposes.

c. Industry. The Addicks and Barker Reservoir watersheds are approximately 49% and 45% urbanized respectively (Yang and others, 2019), most of which is residential and related commercial and office land use. There is very little heavy industrial development in the Addicks and Barker Reservoir watersheds or in the upper Buffalo Bayou watershed immediately downstream of the two projects.

d. Recreation. A brief description of public facilities available in these areas is presented in Section 2-06. A detailed description of existing

and proposed public facilities is provided in the latest version of the Addicks and Barker Master Plan.

e. Flood Damages. Prior to development of the extensive flood control system in the Buffalo Bayou watershed, frequent flooding caused extensive property damage and occasional loss of life. Since the construction of the Addicks and Barker Reservoir projects, flood damages along Buffalo Bayou and its downstream tributaries upstream of White Oak Bayou have been drastically reduced. The flood damage reduction has been accomplished through the progressive reduction in allowable combined discharge for the two projects to accommodate increasing downstream development. Estimated flood damages prevented by Addicks and Barker Reservoirs are shown in Table 4-05 on the following page.

   Prior to 2012, “Without Project” flows were determined by lagging the reservoir inflows down the bayou. It was assumed that the inflows would take eight hours to reach the outlet, four more hours to make their way downstream to the USGS gauge at West Belt, and then another four hours to the USGS gauge at Piney Point. The reservoir flows were then added to the flows in the Bayou.

   Until Hurricane Harvey stage levels in the bayou were determined by using a 1D RAS model for Buffalo Bayou and calibrating it to the stage/discharge readings from the USGS gauges at Dairy Ashford, West Belt, Piney Point, and Shepherd. Currently, stage levels in the bayou are determined by using a 2D RAS model for the Buffalo Bayou watershed.

   The water surface generated by the hydraulic model is then brought into HEC-FIA. The water surface overlays the terrain file and a structure inventory obtained from the local appraisal district to determine a depth of flooding on each structure. HAZUS depth-damage curves are used to assign an approximate dollar value to each structure impacted by the flood event.

   The flooding associated with the “Without Project” flows are determined by routing the reservoir inflows down the bayou within the hydraulic model. FIA results are then similarly determined. The final value for Flood Damages Prevented is arrived at by subtracting the losses that were incurred with the project from the losses estimated using “Without Project” Flows.

TABLE 4-05
DAMAGES PREVENTED BY ADDICKS AND BARKER RESERVOIRS
(FY 1980 THROUGH FY 2018)

Fiscal Year (1)	Damages Prevented ($000) in Actual Dollars (2)
1980	501
1981	17,733
1982	11,700
1983	16,000
1984	0
1985	18,800
1986	25,500
1987	34,792
1988	0
1989	60,434
1990	27,960
1991	22,420
1992	397,600
1993	306,100
1994	289,700
1995	340,000
1996	260
1997	285
1998	478
1999	445
2000	415
2001	24,000
2002	23,300
2003	385,000
2004	194,060
2005	371,953
2006	387,200
2007	801,000
2008	804,200
2009	964,000
2010	762,000
2011	0
2012	544
2013	372,816
2014	1,639,431
2015	2,559,078
2016	5,654,921
2017	8,385,029
2018	513,821
Average	651,628

(1) USACE, Southwestern Division Reservoir Control Center, Annual Water Control Reports.
(2) Fiscal Year includes period of time from October through September.

V - DATA COLLECTION AND COMMUNICATION NETWORKS

5-01. Hydrometeorological Stations.

a. Facilities. USACE, National Weather Service (NWS), and United States Geological Survey (USGS) cooperate in the collection and dissemination of hydrologic data related to Addicks and Barker Reservoirs. The locations of gaging stations used to regulate Addicks and Barker Reservoirs are shown on Plate 5-01. These stream gaging stations essential to the operation of Addicks and Barker Reservoirs are shown in Table 5-01.

TABLE 5-01
STREAMGAGING STATIONS PERTINENT TO ADDICKS AND BARKER RESERVOIRS

USGS Station Name	USGS Station Number	Latitude and Longitude (1) (Decimal Degrees)	Monitored Parameter	Monitored Parameter Units
Cypress Ck at Sharp Rd nr Hockley, TX	08068700	N 29.921058 W 95.840229	Precipitation Gage height	in ft
Cypress Ck at Katy-Hockley Rd nr Hockley, TX	08068720	N 29.95022 W 95.80828	Discharge Gage height	ft^3/s ft
Cypress Ck at House-Hahl Rd nr Cypress, TX	08068740	N 29.959112 W 95.717725	Discharge Gage height	ft^3/s ft
Buffalo Bayou nr Katy, TX	08072300	N 29.743287 W 95.806895	Precipitation Discharge Gate height	in ft^3/s ft
Buffalo Bayou nr Fulshear, TX	08072350	N 29.723009 W 95.767172	Precipitation Gage height	in ft
Barker Res nr Addicks, TX	08072500	N 29.769951 W 95.647168	Precipitation Reservoir storage Water surface elevation	In ac-ft ft
Buffalo Bayou at State Hwy 6 nr Addicks, TX	08072600	N 29.769381 W 95.643167	Discharge Gage height	ft^3/s ft
S Mayde Ck nr Addicks, TX	08072700	N 29.801062 W 95.692447	Gage height	ft
Bear Ck nr Barker, TX	08072730	N 29.830783 W 95.686891	Discharge Gage height	ft^3/s ft
Langham Ck at W Little York Rd nr Addicks, TX	08072760	N 29.86717 W 95.646612	Precipitation Discharge Gage height	In ft^3/s ft
Langham Ck nr Addicks, TX	08072800	N 29.835782 W 95.625778	Gage height	ft
Addicks Res nr Addicks, TX	08073000	N 29.791339 W 95.623556	Reservoir storage Water surface elevation	ac-ft ft
Buffalo Bayou nr Addicks, TX	08073500	N 29.761896 W 95.605778	Discharge Gage height	ft^3/s ft
Buffalo Bayou at W Belt Dr, Houston, TX	08073600	N 29.762173 W 95.557721	Precipitation Discharge Gage height	In ft^3/s ft
Buffalo Bayou at Piney Point, TX	08073700	N 29.746896 W 95.523554	Discharge Gage height	ft^3/s ft
Buffalo Bayou at Houston, TX	08074000	N 29.760228 W 95.408551	Discharge Gage height	ft^3/s ft

(1) Latitude and Longitude values are in North American Datum of 1983 (NAD 83).

b. Reporting.

1. The reporting procedures for gaging stations are on a cooperative basis with the USGS. All gaging stations are automated gages consisting of pressure sensors, bubble gages or radar sensors supplying data to data collection platforms. Some automated

gaging stations are equipped with automated rain gages that provide precipitation data. These gaging stations automatically report pool elevations, stream gage heights and precipitation using the data collection platform (DCP), which records the data and transmits it hourly or when a threshold value is exceeded. The reporting of data from pool elevation and stream gaging stations has been automated by using DCPs that record data every fifteen minutes and transmit the data every hour or when a threshold value is exceeded. The data are transmitted via Geostationary Operational Environmental Satellite (GOES) to a Direct Receive Ground Station and computer facility, owned and operated by the National Oceanic and Atmospheric Administration (NOAA) at Wallops Island, Virginia. The data are rebroadcast over the Domestic Satellite System (DOMSAT) to the Fort Worth District's Direct Receive Only Terminal (DROT). Galveston District currently receives data through a network socket connection to a data acquisition server located in the Fort Worth District via the USACE network.

2. Rainfall and stream stage data are automatically stored in the CWMS database and used by the Water Management Section/H&H Branch in routine and emergency water management activities. Once in the database, the data are then utilized for checking project status, defining basin conditions, forecasting stream flows, and disseminating information to other USACE elements. Data from these files serve as the primary data source from which all water control functions are carried out. The processing of this data is by the CWMS programs developed by the USACE Hydrologic Engineering Center (HEC) at Davis, California.

3. Weather Radar and Gridded Rainfall. The NWS maintains twelve Doppler radar sites distributed across Texas, with an additional five sites located in adjacent states near the Texas state line. In addition, the NWS cooperates with the Department of Defense to obtain radar information from four military sites in Texas. The NWS provides multisensory precipitation estimates (MPE) to the Fort Worth District Water Resources Branch in a gridded XMRG format. The rainfall and river stage data are automatically processed and stored in data files within the CWMS database and used in routine and emergency water management activities.

c. Maintenance.

1. The NWS rainfall reporting sites are maintained by NWS personnel as a part of the observer network program. USACE provides

funding by interagency transfer to the NWS through the NWS/CORPS Cooperative Reporting Network Program operated on a nationwide basis.

2. Malfunctions of automated DCP rainfall, elevation, and stream-gage stations are reported to the USGS, which operates and maintains the gages. USACE provides funding by interagency transfer to the USGS through the USGS/CORPS Cooperative Stream Gaging Program operated on a nationwide basis.

5-02. Water Quality Stations. Since Addicks and Barker Reservoirs are detention-type reservoirs with only flood pools of short duration, water quality is not a consideration in their respective operations. Therefore, there are no water quality stations associated with the two reservoir projects.

a. Facilities. There are no water quality stations associated with the two projects that are maintained by USACE.

b. Reporting. The reporting procedures for water quality stations are made in cooperation with the USGS and EPA. The information is stored in the National Water Quality Portal at https://www.waterqualitydata.us/.

c. Maintenance. Not applicable.

5-03. Sediment Stations. Sediment ranges have been established where major tributaries enter Addicks and Barker Reservoirs. The ranges, along tributaries, are re-surveyed at variable time intervals depending on the frequency of storm events, sedimentation rates, and available funding. To analyze the accumulated sedimentation within the dams, elevation capacity curves are compared. There has been four years of calculated capacity (1962, 1977, 2008, and 2018). The last two (2008 and 2018) were calculated using a Digital Elevation Model (DEM) derived from LiDAR.

a. Facilities. Not applicable.

b. Reporting. As necessary.

c. Maintenance. Through outgrant agreements, the local entities maintain the inflow channels by removing excessive sediment.

5-04. Recording Hydrologic Data.

a. Project Data.

1. Hourly values of stream stage, pool elevations, and precipitation are automatically transmitted to the USACE Water Management

System (CWMS) server via DCP. Upon receipt of the data, the values are decoded into engineering units and written to HEC-DSS and CWMS databases Data is checked and corrected by regulation personnel, as necessary, for quality control.

2. Processed daily parameters (inflow and total release) are also archived in the project HEC-DSS file. Monthly totals are accumulated from the daily information and stored permanently in the project file. For permanent hard copy records required by ER 1110-2-240, daily and monthly data in the project file are used to publish monthly charts for Addicks and Barker Reservoirs.

3. The rainfall and river stage data from the above sources are automatically diverted to data files within the WCDS and used by the Water Management Section/H&H Branch in routine and emergency water management activities. Once in these files, the data is utilized for checking project status, defining basin conditions, forecasting flows into the reservoirs, and disseminating information to other USACE elements. Data from these files serve as the primary data source from which all Hydrology and Hydraulics functions are carried out. The processing of this data is by internal computer software programs based on a database (DSS) developed by the USACE HEC located at Davis, California.

b. Stream Gage Data. Stage data for Buffalo Bayou and other stations identified in Table 5-01 are received and processed into the project HEC-DSS file as described above. In addition to the Hydrology and Hydraulics computer files, the USGS maintains an archive of this station data.

c. Precipitation Data. The project HEC-DSS file stores precipitation data from the DCP stations after the data is checked and corrected by regulation personnel for quality control. Precipitation data received through the NWS-AWIPS system is also stored in the project HEC-DSS file. The NWS also records the data from their observer network permanently within their standard climatological records.

5-05. Communications Network. Primary communication is by phone and email. The Voice over IP (VoIP) phone system is maintained by the U.S. Army Corps of Engineers – Information Technology (ACE-IT). Backup radio communication is by a VHF-FM fixed station capable of reaching local mobile stations and other portable stations. If needed, the HF-SSB Radio system will be used to maintain contact with the Galveston District in an urgent or emergency situation. Further detail on the communications network is provided in the Emergency Action Plan.

5-06. Communication with the Project Office. While there is no scheduled or set daily communications between the Water Management Section/H&H Branch and the

projects, communications do occur on an as needed basis. Generally, communications between Water Management Section/H&H Branch and the project office are dependent on significant weather events and flooding activities within the watersheds. Other scenarios involving communications could involve dam safety issues, chemical spills, accidents, etc. Maintaining project releases within the criteria of Chapter VII does not require detailed real-time coordination. The primary mode of communication is by telephone, cell phone (to include voice and text messaging), and the HF-SSB Radio System as an alternative back-up system in an urgent or emergency situation.

a. Communication between Regulating Office and Project Office. The Chief, Engineering and Construction Division, who is also designated as the Dam Safety Officer (DSO), through the Chief, Water Management Section/H&H Branch, is responsible for setting project regulating criteria for standard operations as documented in this manual and by separate communications for non-routine operations. Communication is normally by telephone or cell phone in response to any problems at either dam. Other communications between Water Management Section/H&H Branch and the project office will be for furnishing flow forecasts, alerting dam projects of developing floods, obtaining data, and scheduling special water releases. Should communications with the Water Management Section/H&H Branch be disrupted, the Damtender will direct regulation of the pool in accordance with the provisions of Chapter VII and Exhibit C (Standing Instructions to Damtender) of this manual and in accordance with the Emergency Action Plan.

b. Communication between Regulating/Project Office and Others. Notifications should be made in accordance with the notification flowchart (Plate 9-01) and procedures in the Emergency Action Plan, dated 22 May 2014, and any subsequent annual updates.

5-07. Project Reporting Instructions. No hydrologic data are routinely reported by the project. However, in the event of a failure in the automated data system, the project personnel will furnish pool elevation, stream gage, and rainfall data to the Water Management Section/H&H Branch by telephone, cell phone, or district radio, if necessary. The actual reporting requirements will be established by the Chief of the Water Management Section/H&H Branch on a case by case basis to assure adequate data is available for the conditions that exist at the time. Non-routine items, such as malfunctioning gates, facilities problems, etc., that may affect normal project operations related to pool limits and release rates should be reported by telephone, to the Chief Water Management Section/H&H Branch. If these are expected to be long term impacts, the telephone report should be followed up by a memorandum from the Damtender to the Chief, Engineering and Construction Division who is also designated as the DSO.

5-08. Warnings. Flood emergency warnings and other information that needs to be passed to the general public will be coordinated and made in accordance with the Emergency Action Plan. Any announcements or warnings that involve public safety from flood releases and/or dam safety concerns are coordinated by the Galveston District with the Addicks and Barker Emergency Coordination Team (ABECT). In general, the Water Management Section/H&H Branch will provide these alerts to the ABECT and the Galveston District Public Affairs Office. For events which are developing locally, and often quite rapidly, Project Office personnel must provide the alert.

a. Local Warnings. In rapidly changing situations where time frames are inadequate for dissemination of information through the above procedure, the Project Office will provide warnings or alerts to the local agencies responsible for the immediate areas of potential impact. The Offices of Emergency Management would be notified first followed by other critical local agencies, law enforcement, and the civil defense. The Project Office should maintain a current list of these agencies that would be endangered or adversely impacted by pool levels outside normal limits or by sudden or large changes in releases. Notifications to the agencies on this list would be by the most appropriate means in response to the situation that is developing. This could include telephone, cell phone, and radio.

b. Flood Emergency Plan. Studies have been made to determine the possible downstream flood conditions that could exist for the Spillway Design Flood event. Reference the Emergency Action Plan, dated 22 May 2014, and any subsequent annual updates for further detail.

   Five constant flow maps shown in Plates 5-02 through 5-08 have been included to show typical areas of inundation for certain prescribed flows in Buffalo Bayou: 3,000 cfs, 6,000 cfs, 10,000 cfs, 15,000 cfs, and 20,000 cfs. These maps indicate areas that may be inundated when the flow in Buffalo Bayou is known for the approximate area in question. A steady flow simulation was run using the HEC-RAS models, and the output was mapped with the HEC-GeoRAS extension for ArcGIS. It should be noted that these maps are the result of modeling assumptions that are not perfectly reflective of existing conditions. Due to times of travel and storage within the bayou reaches, it is unlikely that a flow in one section of the bayou will be identical to the flow in a different section of the bayou even if in close proximity. For example, when the flow at Piney Point (as shown by the USGS gauge) indicates a flow of 3,000 cfs, the flow at West Beltway 8 could be 2000 cfs or even 4000 cfs. The maps are included in the Emergency Action Plan so that local agencies have a quick reference to give an approximate area of inundation at various flow rates. They can then use these guides to know who to evacuate or what roads may be impassable.

5-09. Routine Information for Public Release. Information on current pool elevations, project releases, and stream stages collected as part of the Cooperative Streamgaging program are made available to the public on the USGS website. Information on forecasted pool elevations and releases are available on the Galveston District website or by request from the Water Management Section/H&H Branch. Additionally, information on the Addicks and Barker Reservoir releases are provided to the NWS-WGRFC to combine this information with rainfall estimates to generate river level forecasts along Buffalo Bayou downstream of the dams. These forecasts are available on the NWS Advanced Hydrologic Prediction Service (AHPS) website. See Paragraph 6-02.b.2 for the website link to NWS-AHPS.

VI - HYDROLOGIC FORECAST

6-01. General.

a. Role of the Corps. The role of USACE is to make hydrologic forecasts for flood risk management. The forecasts are provided to project personnel, and planned changes in the release rates are furnished to the NWS-West Gulf River Forecast Center (NWS-WGRFC) in Fort Worth, Texas. The Public Affairs Office, which is kept informed of the lake conditions, makes news releases.

b. Role of Other Agencies. NWS-WGRFC provides information about river flow and flood forecasts to USACE and to the general public. Timely access to weather and water information is provided through NWS systems, including the

- NWS Home Page – www.weather.gov
- NOAAPORT
- NOAA Weather Wire Service (NWWS)
- Emergency Managers Weather Information Network (EMWIN)
- NOAA Weather Radio (NWR)
- Family of Services (FOS)
- Commercial weather information vendors

The NWS - Weather Forecast Offices (NWS-WFO) issues routine scheduled reports containing the following information:

1. Weather forecasts (daily forecasts, severe weather forecasts, and seven- day extended forecasts).

2. Quantitative Precipitation Forecasts (QPF): Twelve successive 6-hour precipitation forecasts are updated each 12 hours. Three successive 24-hour precipitation forecasts are updated every 12 hours. QPF is also created/issued by the NWS-WGRFC for ingest into the hydrologic models used for river stage forecasting. NWS-WGRFC QPF is available for viewing on the WGRFC webpage at www.weather.gov/wgrfc. NWS-WGRFC QPF is also transmitted to USACE via the Fort Worth District.

3. Five-day river stage forecasts, when conditions warrant, from the NWS-WGRFC.

4. Urgent priority messages, such as severe weather warnings, severe weather watches and statements, and instructions from civil defense centers during emergency situations.

5. Other information reports, on a periodic basis:

    i. Winter weather and road conditions.
    ii. River and flood warnings.
    iii. Damage Reports.
    iv. Thirty-day weather forecasts.

6-02. Flood Condition Forecasts.

a. Requirements. Flood forecasts are required whenever substantial rainfall has fallen upstream or downstream of Addicks and Barker Reservoirs, considered to be greater than 2 inches, or when flood pools exceed the thresholds for Stage 1 Extended Watch, as defined in the Emergency Action Plan.

b. Methods. USACE makes the following forecasts with assistance from the NWS:

1. Predicting Reservoir Pool Elevations. The HEC in Davis, California developed a real time water control software system. The Corps Water Management System (CWMS) is an integrated system of hardware and software used to derive the hydrologic response of the watersheds above and below the reservoirs. CWMS consists of PRECIP, HEC-HMS, HEC-ResSim, and HEC-RAS models. The models use a one-hour time interval.

    Precipitation estimates are available from three main sources: precipitation gages, radar, and satellite. Weather Surveillance Radar-1988 Doppler (WSR-88D), also known as Next Generation Weather Radar (NEXRAD), observe the presence and calculate the speed and direction of severe weather. WSR-88D also provides estimated quantitative precipitation amounts. The NWS increases the accuracy of the WSR-88D quantitative precipitation estimates by a three-stage process. Stage I performs basic quality control of the radar data and converts reflectivity from the individual radar sites to precipitation rates. Stage II refines the quality of the radar data and precipitation estimates. The radar estimates are compared and if different, adjusted to measured rainfall from a variety of rain gauge networks, whose data is ingested at the NWS. Stage III formulates a composite rainfall pattern of bias-corrected estimates made by multiple radar sites. The hourly precipitation data is also obtained from rain gages equipped with DCPs and

maintained by either the USGS or Harris County Flood Control District.

The HEC-HMS model predicts runoff form the watersheds and derives reservoir inflows and local uncontrolled downstream flows from the hourly precipitation data. ResSim uses the projected reservoir inflows to forecast pool elevations and provide proposed releases to meet reservoir and downstream operation goals.

2. Predicting flood levels on Buffalo Bayou. The NWS-WGRFC ingests release information from Addicks and Barker from the USACE Galveston District and combines this information with rainfall estimates and forecasts to generate a forecast of river levels along Buffalo Bayou downstream of the Addicks and Barker Reservoirs. Forecasts are produced at three locations; West Belt, Piney Point, and Shepherd Drive. Forecasts from the WGRFC are sent to the NWS-WFO Houston/Galveston for dissemination to the public.

   Forecasts are available on the NWS Advanced Hydrologic Prediction Service at
   http://water.weather.gov/ahps2/index.php?wfo=hgx

6-03. Conservation Purpose Forecasts. Addicks and Barker are flood risk management reservoirs. They do not impound water except for flood risk management and are normally dry. These reservoirs do not have a water supply conservation mission.

a. Requirements. Not Applicable.

b. Methods. Not Applicable.

6-04. Long Range Forecasts. Addicks and Barker are flood risk management reservoirs. They do not impound water except for flood risk management and are normally dry. Long-range weather forecasts, however, are made by the NWS Climate Prediction Center and available online at http://www.cpc.ncep.noaa.gov/.

a. Requirements. Not Applicable.

b. Methods. Not Applicable.

6-05. Drought Forecast. Addicks and Barker are flood risk management reservoirs. They do not impound water except for flood risk management and are normally dry. These reservoirs do not have a drought contingency plan.

a. Requirements. Not Applicable.

b. Methods. Not Applicable.

6-06. Water Quality Forecasting. Addicks and Barker are flood risk management reservoirs. They do not impound water except for flood risk management and are normally dry. These reservoirs do not have any water quality mission.

a. Requirements. Not Applicable.

b. Methods. Not Applicable.

VII - WATER CONTROL PLAN

7-01. General Objectives. Construction of Addicks and Barker Reservoirs (a portion of the Buffalo Bayou, Texas project) was authorized by the River and Harbor Act, approved 20 June 1938, and modified by the Flood Control Acts of 11 August 1939, and 3 September 1954, for flood control on Buffalo Bayou for the protection of the City of Houston, Texas.

The Flood Control Act of 1944 provided the authority to lease land in Addicks and Barker Reservoirs. Harris County leased 7,468 acres and developed Bear Creek Park for recreational purposes within the Addicks Reservoir area.

Public Law (PL) 89-72, Federal Water Project Recreation Act, provides for Federal cost sharing in recreation development at completed projects. The City of Houston is planning development of the proposed 10,600 acre Cullen Park, within the Addicks Reservoir area, under this Act.

PL 92-500, Federal Water Pollution Control Act, as amended by the Clean Water Act of 1977, requires that all Federal facilities shall be managed, operated, and maintained so as to protect and enhance the quality of water and land resources through conformance with applicable Federal, state, interstate and local substantive standards.

Reference the 2009 Master Plan, Addicks and Barker Reservoirs, Buffalo Bayou and Tributaries, Fort Bend and Harris Counties, Texas for additional land usage inside the reservoirs.

7-02. Constraints. Constraints on the operation of Addicks and Barker Reservoirs are many and varied.

a. Spillway Design Flood Impacts. If pool levels are extremely high, there are concerns associated with flows flanking the ends of both dams or passing over the emergency spillways. Spillway Design Flood Impacts are currently being reanalyzed as part of the Dam Safety Modification Study and the ongoing Buffalo Bayou and Tributaries Resiliency Study, and this manual will be updated with results from the study after it is reviewed and approved.

b. Upstream Reservoir Impacts. Acquisition of real estate was based on the 1940s-era design. Presently, pool levels in excess of Government-owned land will damage residential developments adjacent to Government-owned lands at both reservoirs

c. Reservoir Release Restrictions. The original design included a downstream rectified channel and diversion channel with a capacity of approximately 18,000 cfs. In 1972, releases from the reservoirs, when combined with uncontrolled runoff and outflow from Addicks and Barker Reservoirs, were limited to 2,000 cfs due to embankment problems and continued development. Over the last ten years, surveys and observations along the bayou have determined that the present non-damaging channel capacity is approximately 4,000 cfs. Reservoir gates should only be opened uniformly (symmetrically) to maintain structural integrity of the outfalls.

d. Pool Drawdown Rate. The pool drawdown rate is limited to one foot per day to prevent, if possible, dam embankment damage.

7-03. Overall Plan for Water Control Management. Addicks and Barker Reservoirs will be operated to provide maximum downstream flood protection on South Mayde Creek and Buffalo Bayou. Normal system operation will attempt to maintain equal available storage capacity for each reservoir within the constraints relating to the safety of the structure.

7-04. Standing Instructions to Project Operator (Damtender). A summary of these instructions is also included in Exhibit C.

a. Normal Operation. The Natural Resource Management Specialist will act as Damtender when regulation is required. The duties of the Damtender are as follows:

1. The Damtender will execute all instructions issued by the Water Management Section/H&H Branch relating to reservoir operations.

2. The Damtender is to observe and be cognizant of all available hydrologic and meteorological data that is pertinent to the operation of the projects. This data, when requested by the Water Management Section/H&H Branch, will be reported by telephone, e-mail, or radio.

3. The Damtender will dispatch personnel to the dam sites to keep the gates under surveillance whenever reservoir pool stages warrants in accordance with the Emergency Action Plan.

4. If one inch of rainfall or more falls in 24 hours or less and is recorded at the dam or on the watershed downstream of the dam or if flooding is predicted downstream of the dams, the Damtender will contact the Water Management Section/H&H Branch for instructions. If an unwarranted delay does ensue, the Damtender

will proceed to the reservoirs, close the gates, and then contact Water Management Section/H&H Branch personnel.

5. When releases are being made, the Damtender will monitor downstream conditions. If flow approaches the limiting flow of 2,000 cfs at the Piney Point gage, or if one-half inch of rainfall in 24 hours or less occurs downstream or if flooding is predicted downstream of the dams, the Damtender will notify the Water Management Section/H&H Branch. If an unwarranted delay does ensue, the Damtender will proceed to both reservoirs, close the gates, and then contact Water Management Section/H&H Branch personnel.

6. The conduit outlet and stilling basin must be visually monitored very closely during all releases and during all high tailwater events. If unusual conditions occur (such as riprap displacement, surging, or submerged outlet) notify the Water Management Section/H&H Branch and the Dam Safety Program Manager immediately.

7. The Damtender will notify lessees of land in the reservoirs when advised by the Reservoir Control that flooding of their land is imminent to permit the removal of stock and equipment from pertinent areas.

b. Emergency Operations. Communication between the Damtender and the Water Management Section/H&H Branch will be by telephone (primary), cell phone, or by e-mail, with the District radio net serving as a backup system in accordance with the Emergency Action Plan. Emergency operations are to be used if communications fail, the Damtender's instructions are as follows:

    1. The Damtender will attempt to restore communications as soon as possible.

    2. If 1 inch of rainfall or more occurs in 24 hours or less downstream of the reservoirs and/or flooding is predicted or occurring downstream, the Damtender will close all gates on both reservoirs and keep them under surveillance until communications are restored, or an authorized representative of the District arrives, or the induced surcharge regulation schedule dictates releases.

    3. If flood control releases are in progress, flooding is not forecasted and rainfall downstream of the reservoirs is less than one-half inch in 24 hours, then no change in operation will be made until communications are restored or the induced surcharge regulation schedule dictates releases.

4. If flood control releases are in progress and rainfall downstream of the reservoirs is more than one-half inch in 24 hours or less, or flooding is predicted, the Damtender will close all gates on both reservoirs unless the induced surcharge regulation schedules (see paragraph 7-05.b.) are controlling.

5. If inflow and pool elevation conditions dictate the use of the induced surcharge regulation schedule and instructions from the Water Management Section/H&H Branch are unavailable, releases will be made by the Damtender in accordance with the induced surcharge regulation schedules shown on Plates 7-03 and 7-04. The gates should remain at the maximum opening attained from the induced surcharge regulation schedules until reservoir levels fall to elevation 101 feet NAVD88 in Addicks Reservoir and 94.9 feet NAVD88 in Barker Reservoir. Then, if the outflow from both reservoirs, when combined with the uncontrolled runoff downstream is greater than channel capacity, adjust the gates until the total discharges do not exceed channel capacity and follow the normal operating procedures.

6. The conduit outlet and stilling basin must be visually monitored very closely during all releases and during all high tailwater events. If unusual conditions occur (such as riprap displacement, surging, or submerged outlet) close all conduit gates immediately and continue efforts to re-establish communications with the district office and dam safety personnel.

7-05. Flood Risk Management. In keeping with the primary objective of flood control for Addicks and Barker Reservoirs, the general plan for reservoir regulation will be to operate the reservoirs in a manner that will utilize, to the maximum extent possible, the available storage to prevent the occurrence of damaging stages on Buffalo Bayou within the limits placed by the constraints on project operations.

a. Normal Flood Control Regulation. Water Management Section/H&H Branch has the responsibility for directing the regulation of Addicks and Barker Reservoirs. Normal conditions are defined to exist when the reservoir pools are not in the range of the induced surcharge schedule.

    1. If flooding on Buffalo Bayou is neither expected nor occurring, the reservoirs will operate with two conduit gates at each outlet works set at an opening of 1.0 foot each, allowing for the passage of normal low flows.

2. The gates on both reservoirs will be closed when 1 inch of rainfall occurs over the watershed downstream of the reservoirs in 24 hours or less, or when flooding is predicted downstream.

3. Keep the gates closed and under surveillance as long as necessary to prevent flooding downstream of the dams. Begin releases in accordance with the paragraph below or in accordance with the induced surcharge schedule if pool elevations exceed 101 feet NAVD88 in Addicks Reservoir or 95.7 feet NAVD88 in Barker Reservoir. Continue these operations until the flood control storage has been evacuated or, in the case of induced surcharge releases, until a peak pool elevation is attained. Initial releases shall be made through two conduit gates until additional discharge capacity is needed.

4. If inflow and pool elevation conditions do not dictate use of the induced surcharge regulation schedule for the reservoirs and the downstream runoff has receded to non-damaging stages, then open gates gradually to release amounts which, when combined with uncontrolled runoff, will not exceed 2,000 cfs at Piney Point. In order to maintain equal available storage in both reservoirs, releases based on available downstream channel capacity will be made at rates necessary to maintain a difference in reservoir storages of no more than 20 percent. If, during the release period, rains in excess of 0.5 inch within 24 hours fall over the watershed downstream of the reservoirs or flooding is predicted, the gates will be closed until the above operations can be resumed.

5. When the reservoirs are emptied, close gates to normal position of two conduit gates at each outlet works at an opening of 1.0 foot each, allowing for the passage of normal low flows.

b. Induced Surcharge Flood Control Regulation. At any time the reservoir pool equals or exceeds 101 feet NAVD88 in Addicks Reservoir and 95.7 feet NAVD88 in Barker Reservoir, monitoring of both pool elevations should immediately begin to determine if inflows are causing the pool elevations to continue to rise. If inflow and pool elevation conditions dictate, both reservoir releases will be made in accordance with the induced surcharge regulation schedules shown on Plates 7-03 and 7-04. Using the horizontal curve that corresponds to the appropriate rate-of-rise, locate the pool elevation that the reservoir is currently at, on the vertical axis. The corresponding surcharge release rate is read from the horizontal axis. The bold vertical lines provide recommended gate openings to achieve the requisite surcharge release rates. The gates should remain at the maximum opening attained from the induced surcharge regulation schedules until reservoir levels fall to elevation 101 feet NAVD88 in

Addicks and 94.9 NAVD88 feet in Barker. Then, if the outflow from both reservoirs, when combined with the uncontrolled runoff downstream, is greater than channel capacity, adjust the gates until the total discharges do not exceed channel capacity and follow the normal operating procedures.

The conduit and stilling basin must be visually monitored very closely during all high releases and during high tailwater events. If unusual conditions occur (such as riprap displacement, surging, or submerged outlet) notify the Water Management Section/H&H Branch and Dam Safety immediately.

c. Constraints Regarding Flood Control Operation. Constraints on flood control operation are the same constraints enumerated in paragraph 7-02.

7-06. Recreation. Addicks and Barker Reservoirs are detention reservoirs with a normally dry pool. The normal dry state of the reservoir area has encouraged local interest in recreational development on the Government-owned land.

a. Land Usage. Harris County has leased 3,085 acres in Addicks Reservoir for Bear Creek Pioneer Park. This land use development includes camping areas, hiking trails, picnic areas, playground areas, petting zoo, baseball fields, soccer fields, dog park, Precinct 3 Headquarters, County Extension Agent. A Farm and Ranch Club, a Community Center, and sports fields and courts. Use of the pool above elevation 88.9 feet NAVD88 for flood control starts to restrict the use of these facilities and creates public relation problems. Harris County has leased 7,800 acres in Barker Reservoir for George Bush Park. This development includes hike and bike trails, picnic areas, playground areas, baseball fields, soccer fields, model airplane airport, dog park and a shooting range. Use of the pool above elevation 89.2 feet NAVD88 for flood control starts to restrict the use of these facilities and creates public relation issues.

The City of Houston, Texas, has leased 9,270 acres in Addicks Reservoir for Cullen Park. This development includes a veladrome and community park. This development will produce similar issues when water levels reach certain elevations. The city has no leased acreage in Barker Reservoir.

Fort Bend County has leased 1,961 acres in Barker Reservoir. This development includes a day camp for the scouts. This development will produce similar issues when water levels reach certain elevations.

b. Reservoir Regulation for Special Events. In the late 1980's, a request was made of the Galveston District to provide water for a special event on

Buffalo Bayou. The district commander honored this request as a way to support the community. Every year since then, the district has stored water for certain events by a deviation from the approved Water Control Plan. These events have historically been the Buffalo Bayou Regatta sponsored by the Buffalo Bayou Partnership, Buffalo Bayou Trash Bash, and a charity event involving a Houston Rubber Duck Race.

A request for a deviation from the Regulation Manual for Addicks and Barker Reservoirs was granted in April of 1989. The letter of approval, signed by the Chief of Engineering, Southwestern Division gave approval to store water in both reservoirs every year for these special events with the understanding that the impoundment of only this amount of water would ensure minimum impact on these projects. It was recommended that a revision be made to the Water Control Manual to address these special requests.

Based on the above authorization, water can be stored to an elevation of 78.9 feet NAVD88 in Addicks Reservoir and 79.7 feet NAVD88 in Barker Reservoir to support special events without deviation approval. Even though a deviation will not be necessary from Southwestern Division to store water up to an elevation of 78.9 feet NAVD88 in Addicks or 79.7 feet NAVD88 in Barker for these events, the Water Management Section/H&H Branch will notify Reservoir Control personnel in Southwestern Division of the events prior to initiation. This will serve to keep Southwestern Division personnel aware of district involvement with such events and be able to respond to any issues that might arise from district participation. Reservoir regulation for these events will not be allowed to impact the overall mission of the projects.

7-07. Water Quality. Addicks Reservoir does not have an ongoing water quality program at the present time.

7-08. Fish and Wildlife. None.

7-09. Water Conservation/Water Supply. None.

7-10. Hydroelectric Power. None.

7-11. Navigation. Addicks and Barker Reservoirs are not navigation projects; however, the sedimentation trap from both reservoirs reduces the sediment inflow into the Houston Ship Channel.

7-12. Drought Contingency Plans. Addicks and Barker Reservoirs are kept dry for flood risk management. Therefore, a Drought Contingency Plan is not applicable to these two reservoirs.

7-13. Flood Emergency Action Plans. Reference “Emergency Action Plan, Addicks Reservoir and Barker Reservoir, Annex I to Galveston District Emergency Operation Plan,” Completion Date: 22 May 2014, and any subsequent annual updates. This is a stand-alone document. Copies are located in the Emergency Management Office and the Engineering and Construction Division, who is also designated as the DSO.

The Emergency Action Plan outlines procedures for advanced preparation, extended watch for detection, and emergency response actions by the Galveston District. The procedures prescribed in the Emergency Action Plan become automatically effective when actual or predicted water surface elevations within the reservoirs reach designated limits or when the District Commander declares an emergency condition. The District Commander is responsible for declaring an emergency condition and initiating the internal USACE notification process. The extent to which the District Commander activates emergency elements will be dependent upon conditions at Addicks and Barker Reservoirs and flooding on Buffalo Bayou downstream of the reservoir.

7-14. Other. None

7-15. Deviation from Normal Regulations. The District Engineer is occasionally requested to deviate from the normal regulation of the reservoirs. Prior approval for a deviation is obtained from Southwestern Division except as noted in section 7-06 subparagraph b and subparagraph a below. Deviation requests usually fall under the following categories:

a. Emergencies. Some emergencies that can be expected are: drowning and other accidents, failure of operation facilities, and flushing of pollution where water quality is not a project purpose. Necessary action under emergency conditions is taken immediately unless such action would create equal or worse conditions. Southwestern Division will be informed as soon as practicable. A written confirmation showing the deviation and conditions will be furnished to Reservoir Control personnel in Southwestern Division.

b. Unplanned Minor Deviations. There are unplanned instances that create a temporary need for minor deviations from the normal regulation of the reservoirs, although they are not considered emergencies. Construction activities account for the major portion of the incidents can include utility stream crossing, bridge work, and major construction contracts. Changes in releases are sometimes necessary for maintenance and inspection. Requests for changes of release rates are generally for a few hours to a few days. Each request is analyzed on its own merits. Consideration is given to upstream watershed conditions, potential flood threat, condition of the reservoirs, and possible alternative measures. In the interest of maintaining good public relations, the requests are complied with, providing there are no adverse effects on the overall operation of the

projects for the authorized purposes. Approval for these minor deviations will normally be obtained from Reservoir Control personnel in Southwestern Division by telephone. A written confirmation showing the deviation and conditions will be furnished to Reservoir Control personnel in Southwestern Division.

c. Planned Deviations. Each condition should be analyzed on its own merits. Sufficient data on flood potential, reservoir and watershed conditions, possible alternative measures, benefits to be expected, and probable effects on other authorized and useful purposes will be presented by e-mail to Reservoir Control personnel in Southwestern Division along with recommendations for review and approval.

d. Unplanned Major Deviations. There are unplanned instances that create a temporary need for major deviations from the normal regulation plan and may be considered, but are not emergencies. Flood control releases account for the major portion of these incidents and typical examples include project pre-releases or exceeding downstream channel capacity, incidents that have a short window of opportunity in an effort to minimize damages or optimize benefits. Requests for changes in release rates generally involve time periods ranging from a few hours to a few days. Each request is analyzed on its own merits. In evaluating the proposed deviation, consideration must be given to upstream watershed conditions, potential flood threat, condition of the reservoirs, and alternative measures that can be taken. Approval for these major deviations normally will be obtained from the Southwestern Division by telephone or email. Written confirmation explaining the deviation and its cause will be furnished to the Southwestern Division water control manager.

7-16. Rate of Release Change. Changes in release rates will be accomplished in a manner which minimizes damage to the downstream channel. Every reasonable precaution will be made to prevent, if possible, bank sloughing, undercutting, excessive erosion, and danger to human and animal lives. Generally, limit the change in opening of the service gates to no more than one foot per each half hour for each gate, corresponds to approximately 300-400 cfs per change per dam. All gate operations should be symmetrical as practical with an allowable difference in gate openings not to exceed one foot.

7-17. Operation Curves and Tables. Area-Capacity curves for Addicks and Barker Reservoirs are shown on Plates 7-01 and Plate 7-02, respectively. Induced Surcharge Regulation Schedule curves for Addicks and Barker Reservoirs (assuming no tailwater effect on discharges) are shown on Plates 7-03 and 7-04, respectively. The outlet rating curves for Addicks and Barker Reservoirs are shown on Plates 7-05 and 7-06, respectively.

Elevation-Area/Capacity tables are included in this manual as Table 7-01 for Addicks Reservoir and in Table 7-02 for Barker Reservoir. These tables were based upon survey data gathered in 2002 and are located in this manual in the Supplementary Tables section.

VIII - EFFECT OF WATER CONTROL PLAN

8-01. General. The main purpose of both Addicks and Barker Reservoirs is flood risk management. The reservoirs also provide recreational benefits and limited habitat for wildlife.

8-02. Flood Risk Management.

a. Spillway Design Flood. The original spillway design floods were computed in 1940. This design was performed before construction of the reservoirs. The spillway design storm for the study was the 1899 Hearne, Texas storm modified to include the rates of rainfall recorded at Taylor, Texas on the 9thand 10th of September 1921. The average rainfall over a 100 square mile area for this storm was about 30 inches in 72 hours, with a peak intensity of 4.40 inches per hour. For the original design of Addicks Reservoir, the peak inflow was estimated to be 50,000 cfs, and the total inflow volume was estimated to be 190,000 acre-feet. For Barker Reservoir, the peak inflow was estimated to be 40,300 cfs, and the total inflow volume was estimated to be 214,500 acre-feet.

   There are considerable differences between the 1940 design features discussed above and the actual constructed project. Features included in the 1940 design that never were constructed included a levee to prevent Cypress Creek watershed flows from entering Addicks Reservoir, a Reservoir on White Oak Bayou, and a system of canals to convey releases from White Oak Bayou to the San Jacinto River. During construction, it was determined to be more economically feasible to increase the capacity of Addicks Reservoir to accommodate Cypress Creek overflows, and the levee was never constructed. A review of reports in 1952 concluded that rising land costs and rapid development made construction of White Oak Reservoir and the canals economically unfeasible.

   In 1962, the “Reservoir Regulation Manual for Addicks and Barker Reservoirs” was released with revised spillway design flood information that accounted for the actual constructed project. This 1962 design included all gated conduits and included the Cypress Creek overflow into Addicks Reservoir, Brays Bayou rectification, Buffalo Bayou Rectification, and White Oak Bayou rectification. Previously prepared unit hydrographs were used to compute volumes of runoff as well as peak flows and times of peaks. Routing was performed using the coefficient method. For additional information, reference the 1962 Reservoir Regulation Manual for Addicks and Barker Reservoirs.

In 1977, a restudy of Addicks and Barker Reservoirs was deemed necessary because urbanization was reaching levels in excess of the original 1962 design study. Details of this restudy can be found in “Buffalo Bayou and Tributaries, Addicks and Barker Reservoirs, Hydrology,” dated August 1977. Spillway design flood inflow hydrographs were computed consistent with Standard 1 design criteria as outlined in EC 1110-2-163, “Spillway and Freeboard Requirements for Dams,” dated August 1975. In accordance with these criteria, the adopted spillway design storm was of probable maximum severity.

The 1977 spillway design rainfall was determined in accordance with the method described in Hydrometeorlogical Report No. 51, dated September 1976, entitled “Probable Maximum Precipitation Estimates, United States East of the 105h Meridian.” The average rainfall for the spillway design flood was computed as 44.6 inches in 72 hours, with a peak intensity of 11.3 inches. The watershed of Addicks and Barker Reservoirs, Cypress Creek, and Buffalo Bayou upstream of Piney Point were modeled to reflect ultimate conditions using the generalized storm network computation capability of HEC-1. Basins and subbasins were delineated on topographic maps of the study area. Loss rates and unit hydrograph coefficients were based on gages in the Houston area. All stream flow routing was accomplished using the Modified Puls method. Unit hydrographs of storm runoff were computed for each basin using the Clark synthetic unit hydrograph procedure.

The 1977 flood hydrograph adopted for Addicks Reservoir was produced by the spillway design storm centered over Addicks Reservoir Watershed, and the flood hydrograph adopted for Barker Reservoir was produced by the spillway design storm centered over Barker Reservoir Watershed. These centerings were selected because they produce the largest inflow rates into the reservoirs. For Addicks Reservoir, the peak inflow was calculated as 294,570 cfs, and the total inflow volume was calculated as 462,145 acre-feet (approximately one-third of the inflow volume is overflow from Cypress Creek). For Barker Reservoir, the peak inflow was calculated as 255,779 cfs, and the total inflow volume was calculated as 279,072 acre-feet. For additional information on the calculation of the SDF, reference the 1977 hydrology report. The adopted spillway design flood hydrographs for Addicks and Barker are shown on Plates 8-01 and 8-02.

The spillway design flood is currently being reanalyzed, and this manual will be updated when the updated analysis is completed and approved.

b. Standard Project Flood. The original Standard Project Floods (SPFs) were computed in 1940. As with the original Spillway Design Flood, the original SPF was calculated incorporating features that were never

actually constructed. In the original design of Addicks Reservoir, the peak inflow was estimated to be 41,000 cfs, and the total inflow volume was estimated to be 146,000 acre-feet. For Barker Reservoir, the peak inflow was estimated to be 32,300 cfs, and the total inflow volume was estimated to be 164,000 acre-feet.

In 1962, the “Reservoir Regulation Manual for Addicks and Barker Reservoirs” was released with revised SPF information, including the current design at that time. The 1962 design included all gated conduits and included the Cypress Creek overflow into Addicks Reservoir, Brays Bayou rectification, Buffalo Bayou rectification, and White Oak Bayou rectification.

Previously prepared unit hydrographs were used to compute volumes of runoff as well as peak flows and times of peaks. Routing was performed using the coefficient method. For additional information reference the 1962 Reservoir Regulation Manual.

In 1977, the SPF inflow hydrographs were computed for Addicks and Barker Reservoirs using the same methodology previously described in the spillway design flood section. Rainfall was taken as 50 percent of the spillway design rainfall. For Addicks Reservoir the SPF peak inflow has been computed as 124,094 cfs, and the total inflow volume was computed to be 193,956 acre-feet (approximately one-third of the inflow volume is overflow from Cypress Creek). For Barker Reservoir the peak inflow was computed to be 86,961 cfs, and the total inflow volume was computed to be 125,061 acre-feet. The adopted SPF hydrographs for Addicks and Barker are shown on Plates 8-03 and 8-04.

The SPF is currently being reanalyzed, and this manual will be updated when the updated analysis is completed and approved.

c. Other Floods. Tables 8-01 and Table 8-02 include details for the top ten significant pools for Addicks and Barker Reservoirs.

TABLE 8-01
ADDICKS RESERVOIR – OTHER SIGNIFICANT FLOOD EVENTS

DATE	ELEV (1)	SURFACE AREA IN ACRES	CAPACITY IN ACRE-FEET (2)	% CAPACITY MAX. POOL (3)
30 AUG ‘17	109.10	16,989	217,896	100.0
23 APR ‘16	102.65	12,834	123,067	61.1
9 MAR ‘92	97.46	9,189	65,264	32.7
30 APR ‘ 09	96.90	8,771	60,233	30.2
7 NOV ‘02	96.45	8,395	56,371	28.2
17 NOV ‘98	95.70	7,809	50,301	25.2
23 OCT ‘94	95.63	7,759	49,757	24.9
31 MAY ‘15	95.51	7,673	48,831	24.5
15 MAY '68	95.16	7,425	46,189	23.1
25 NOV '04	94.88	7,242	44,137	22.1

TABLE 8-02
BARKER RESERVOIR – OTHER SIGNIFICANT FLOOD EVENTS

DATE	ELEV (1)	SURFACE AREA ACRES	CAPACITY IN ACRE-FEET (2)	% CAPACITY MAX. POOL (3)
30 AUG ‘17	101.56	15,149	170,941	81.6
25 APR ‘16	95.24	12,090	85,816	40.9
6 MAR ‘92	93.60	11,494	66,489	31.7
7 NOV ‘02	93.24	11,404	62,368	29.8
18 NOV ‘98	92.31	10,987	51,934	24.8
1 JUN ‘15	91.87	10,748	47,150	22.5
9 JUL '07	91.85	10,736	46,935	22.4
28 NOV '04	91.69	10,699	45,225	21.6
20 APR '91	91.34	10,425	41,539	19.8
1 MAY '09	91.21	10,347	40,189	19.2

NOTES:

(1) Elevations of water surface are in feet-NAVD88.
(2) One acre-foot of water is one acre of water, one foot deep.
(3) Percent of capacity of maximum possible pool before water spills around the ends of the dams.

8-03. Recreation. Recreational areas are available to the public in both Addicks and Barker Reservoirs. Reference the 2009 Master Plan for Addicks and Barker Reservoirs provides further detail. The district has approved construction of a variety of recreational and multi-use facilities while protecting and preserving the natural habitat in the reservoirs. The recreation opportunities are numerous, which includes a variety of parks, hike and bike trails, nature studies, and photography.

There are three types of wildlife habitat, open land, woodland, and wetlands that harbor many types of animals including birds, deer, reptiles, and amphibians.

Reservoir pools inundate some of these areas from time to time, but the majority of the recreational facilities are in the upper reaches of the reservoirs and do not flood often. Except for periods of heavy rainfall, the dams do not normally impound water.

8-04. Water Quality. There are no water quality interests associated with Addicks and Barker Reservoirs.

8-05. Fish and Wildlife. There are no fish and wildlife interests associated with Addicks and Barker Reservoirs. The area does provide some limited habitat for game, such as deer, fish, and birds. This is not a purpose of the reservoirs but a positive side effect due to the existence of the reservoirs.

8-06. Water Conservation/Water Supply. There are no water supply interests associated with Addicks and Barker Reservoirs.

8-07. Hydroelectric Power. There are no hydroelectric interests associated with Addicks and Barker Reservoirs.

8-08. Navigation. There are no navigation interests associated with Addicks and Barker Reservoirs.

8-09. Drought Contingency Plans. There are no drought contingency plans associated with Addicks and Barker Reservoirs.

8-10. Flood Emergency Action Plan. Reference “Emergency Action Plan, Addicks Reservoir and Barker Reservoir, Annex I to Galveston District Emergency Operation Plan,” Completion Date: 22 May 2014. This is a stand-alone document. Copies are located in Emergency Management and the Engineering and Construction Division.

The Emergency Action Plan, dated 22 May 2014, outlines procedures for advanced preparation, extended watch for detection, and emergency response actions by the Galveston District. The procedures prescribed in the Emergency Action Plan become automatically effective when actual or predicted water surface elevations within the reservoirs reach designated limits or when the District Commander declares an emergency condition. The Emergency Action Plan for Addicks and Barker Dams is directed at recognizing potential dam safety dangers, outlining actions to be taken, and assuring key individuals are aware of their respective responsibilities and have ready access to a plan of action outlining their roles.

The District Commander is responsible for declaring an emergency condition and initiating the internal USACE notification process. The extent to which the District Commander activates emergency elements will be dependent upon conditions at Addicks and Barker Reservoirs and flooding on Buffalo Bayou downstream of the reservoir.

8-11. Frequencies.

a. Peak Inflow Probability. Pool probabilities up to the 0.1% were derived using Markov chain Monte Carlo simulation based on distributions of peak inflow and critical duration inflow volumes and their statistical relations to peak reservoir elevations. Analyses were performed following RMC-TR-2018-03. Peak inflow and peak inflow volume distributions were determined using USGS Bulletin 17C methods (authored by John F. England, USACE, and others, 2018). The following Table 8-03 tabulates peak inflows derived from USGS Bulletin 17C analyses.

TABLE 8-03
PEAK INFLOW FROM USGS BULLETIN 17C ANALYSIS

Percent Chance Exceedance	Flow (cfs)	Lower 90% Confidence Interval	Upper 90% Confidence Interval
Addicks Reservoir			
0.1	170,600	82,570	560,200
0.2	145,570	76,490	416,700
1	94,650	59,820	201,400
2	75,800	51,350	143,200
4	58,800	42,100	99,020
10	39,070	29,140	56,940
50	11,590	8,670	15,470
90	2,960	1,770	4,200
Barker Reservoir			
0.1	103,300	47,700	290,900
0.2	91,540	46,080	227,700
1	64,880	40,310	124,500
2	53,880	36,540	93,690
4	43,260	31,560	68,770
10	29,970	22,820	42,450
50	9,190	6,800	12,420
90	2,130	1,180	3,110

b. Pool Elevation Duration and Frequency. Pool inflow-frequency curves are shown on Plate 8-05 for Addicks Reservoir and 8-06 for Barker Reservoir. The pool elevation-frequency curves are shown on Plate 8-07 for Addicks Reservoir and 8-08 for Barker Reservoir.

c. Key Control Points. The key control point for the operations of the Addicks and Barker Reservoirs is the gage at Piney Point (USGS station number 8073700). A stage-discharge curve for the Piney Point gage is included

as Plate 4-02. The location of this key control point and other monitoring gages are displayed on Plate 5-01.

8-12. Other Studies.

a. Examples of Regulation. In the first filling plan, procedures will be developed to verify the updated rating curves and update this manual, as necessary.

b. Channel and Floodway Improvement. None.

c. Miscellaneous Studies. The Bipartisan Budget Act of 2018 (PL 115-123) appropriated funds for "…emergency situations at Corps of Engineers projects, and to construct, and rehabilitate and repair damages caused by natural disasters, to Corps of Engineers projects…" Per the Policy Guidance on Implementation of Supplemental Appropriations in the Bipartisan Budget Act of 2018, dated 9 August 2018, paragraph 4 and Enclosure 4, USACE identified the Buffalo Bayou and Tributaries Resiliency Study as a study to be funded by the Supplemental Investigations fund. This study is being conducted under Section 216, Review of Completed Projects.

The Harris County Flood Control District and the Federal Emergency Management Agency (FEMA) are partnering on a flood hazard assessment project. The Harris County Flood Control District applied for and has received a grant from FEMA to provide funding for the first phase, which include Addicks and Barker Reservoirs, Buffalo Bayou, White Oak Bayou, and Cypress Creek.

IX - WATER CONTROL MANAGEMENT

9-01. Responsibilities and Organization.

a. USACE. Addicks and Barker Reservoirs are owned by the U.S. Government and operated by USACE. The Galveston District maintains full responsibility for its day-to-day operation and regulation. Operations and maintenance at the project are the responsibility of the Damtender operating under the functional authority of the Galveston District Project Operations Branch directly responsible to the Chief, Operations Division. Regulation procedures and criteria are the responsibility of the Chief, Water Management Section/H&H Branch operating under the functional authority of the Chief of Engineering and Construction Division, who is also designated as the DSO. The regulation procedures and criteria to be followed by the Damtender are presented in Chapter VII and are condensed in Exhibit C as Standing Instructions To Damtender. An Organization and Communications Chart for Water Management is shown on Plate 9-01.

1. The Chief, Water Management Section/H&H Branch is responsible for preparing and publishing a project Water Control Manual with the water management procedures and criteria for the project in compliance with ER1110-2-240. The manual serves as the standard water control plan for the project and is used at all times except when superseded by an approved deviation as provided for in Chapter VII or the approved Addicks and Barker Emergency Action Plan in response to Dam failure.

2. The Damtender is responsible for maintaining the project releases and pool levels specified in this Water Control Manual.

3. The Southwestern Division Reservoir Control Center is responsible for reviewing and determining the acceptability of the recommended standard water control plan and deviation requests, as needed.

b. Other Federal Agencies.

1. The NWS has the responsibility for providing rainfall forecasts needed in water management functions.

2. The USGS has the responsibility for providing stream flow data needed in water management functions.

c. State, County, and Local Agencies. Harris County Flood Control District, as a part of their emergency operations, provides rainfall data used in water management functions.

d. Private Organizations. These organizations have no responsibility in the operation of the projects.

9-02. Interagency Coordination.

a. Local Press and USACE Bulletins. There are currently no standing contracts with local press or USACE Bulletins associated with Addicks and Barker Reservoirs.

b. National Weather Service. USACE participates in a Cooperative Rainfall Network Program with the NWS for collecting rainfall data as described in paragraph 5-01.

c. U.S. Geological Survey. As detailed in paragraph 5-01, the USGS operates and maintains USACE stream gages as a function of the CE/USGS cooperative stream gaging program to provide the stage data, stream flow and rainfall data needed in the USACE real time water management activities.

d. Power Marketing Agency. There is no hydroelectric component associated with Addicks and Barker Reservoirs.

e. Other Federal, State, or Local Agencies. Since 2007, the district and its local, state, and federal partners have participated in the ABECT. This team includes Galveston District, USGS, NWS-HGX, NWS-WGRFC, Harris County, Fort Bend County, City of Houston, Village Fire Department, Texas Department of Public Safety, and Texas Department of Transportation. The purpose of ABECT is to maintain effective interagency communications and prepare for coordinated responses to severe rain events affecting the Addicks and Barker Reservoirs.

9-03. Interagency Agreements. There are no interagency agreements associated with Addicks and Barker Reservoirs.

9-04. Commissions, River Authorities, Compacts, and Committees. There are no commissions, river authorities, compacts, or committees associated with Addicks and Barker Reservoirs.

9-05. Non-Federal Hydropower. There are no non-federal hydropower interests associated with Addicks and Barker Reservoirs.

9-06. Reports.

a. Daily Reservoir Report. This report is prepared by the Water Management Section/H&H Branch daily to cover a period of 24 hours. The report provides data for use by personnel whose work requires knowledge pertaining to the regulation of reservoirs, field investigations, stream gaging, construction activities affected by releases from reservoirs, answering public inquiries, and preparing public releases.

b. Monthly Reservoir Report. The Water Management Section/H&H Branch prepares the monthly reservoir reports in accordance with ER 1110-2-240. These reports are a tabular record of regulation for all flood control, navigation, or multiple-purpose storage reservoirs that are under supervision of, or of direct interest to, the District Office. Supplemental information on the regulation of the reservoirs, such as explanation of deviations from approved schedules, are added as a note on the report or as an attachment. These reports are promptly prepared each month and maintained in such form as to be readily available for transmittal to the Chief of Engineers, or others, upon request.

c. Flood Damage Report. The Water Management Section/H&H Branch submits data to the Emergency Operation Center (EOC) to be included in daily situation reports during floods in accordance with ER 500-1-1. The report contains various types of information relative to the floods. Information specifically required for reservoirs are as follows: name of reservoir, reservoir stage, predicted maximum stage and anticipated date, rates of inflow and outflow in cfs, percent of flood control storage utilized to date, and any special information particularly pertinent to the flood situation.

d. Post Flood Report. This report is prepared in accordance with ER 500-1-1 as soon as practical after a flood causing major damage. The report describes flood emergency operations by USACE and others. Included in summary form are: available hydrologic information, damage estimates, and other engineering data considered to be essential for flood control and flood plain studies or for the review of possible claims against the United States. The report is prepared by the District Office Planning Section. Information derived from field investigations by personnel of the H&H Branch along with information compiled by the Water Management Section/H&H Branch is also included. The report should be completed within approximately three months of the time of flooding, including a statement on the final cost of flood damages occurring.

e. Annual Report. This report is prepared by the Water Management Section/H&H Branch in accordance with ER 1110-2-240. The report contains a summation of the general conditions of the river basins and the

individual projects in the District for the preceding fiscal year. The report also presents the activities and accomplishments of the Water Management Section/H&H Branch for the past year. The report is forwarded to the Southwestern Reservoir Control Center for inclusion in the Division's Annual Report.

f. Summary of Reports. Table 9-01 is a summary of the reports required in the regulation of reservoirs in the Galveston District.

TABLE 9-01
TABULATION OF REPORTS

Name of Report	When Required	Regulation Requiring Report
Daily Reservoir Report	Daily	-
Monthly Reservoir Report	Monthly	ER 1110-2-240
Flood Situation Reports	During Floods	ER 500-1-1
Post Flood Reports	Following a Flood Causing Major Damage	ER 500-1-1
Annual Reports	Annually	ER 1110-2-240

SUPPLEMENTARY TABLES

TABLE 1-01
PERTINENT MANUALS AND REPORTS FOR
ADDICKS AND BARKER RESERVOIRS

Title	Date
Definite Project Report, Basis of Design, Buffalo Bayou, Texas	June 1940
Definite Project Report, Construction Drafting Section, Buffalo Bayou, Texas	June 1940
Definite Project Report, Buffalo Bayou, Texas	June 1940
Construction Contract Drawings, Barker Dam	November 1941
Revised Construction Contract Drawings, Barker Dam	November 1941
Preliminary Report on Operation of Reservoir, Barker Dam	July 1942
Analysis of Design, Addicks Dam	September 1945
Construction Contract Drawings, Addicks Dam	March 1946
Revised Construction Contract Drawings, Addicks Dam	March 1946
Analysis of Design for Installation of Additional Sluice Gates, Addicks and Barker Reservoirs	October 1947
Report on Feasibility of Gating the Uncontrolled Conduits at Barker and Addicks Dams	September 1960
Design Memorandum No. 1, Gating the Uncontrolled Conduits, Addicks and Barker Dams	August 1961
Initial and Emergency Instructions to Damtender, Addicks and Barker Dams	April 1962
Reservoir Regulation Manual for Addicks and Barker Reservoirs	April 1962
Design Memorandum No. 1, Rehabilitation of Addicks and Barker Dams - Buffalo Bayou, Texas	February 1963
Design Memorandum No. 2, Master Plan for Barker Dam and Reservoir and Addicks Dam and Reservoir, Buffalo Bayou, Texas	August 1963

Summary Report on Review of Design Features of Existing Dams Under Jurisdiction of Galveston District	March 1967
(Periodic) Inspection Report No. 1, Buffalo Bayou and Tributaries, Addicks Dam, Texas	June 1969
(Periodic) Inspection Report No. 1, Buffalo Bayou and Tributaries, Barker Dam, Texas	June 1969
(Periodic) Inspection Report No. 2, Buffalo Bayou and Tributaries, Addicks Dam, Texas	June 1974
(Periodic) Inspection Report No. 2, Buffalo Bayou and Tributaries, Barker Dam, Texas	July 1974
Letter Report for Emergency Seepage Control, Buffalo Bayou and Tributaries, Addicks Dam, Texas	May 1977
Construction Contract Drawings, Seepage Control, Addicks Dam, Texas	June 1977
GDR 500-1-5, Emergency Operation Plan, Addicks and Barker Reservoirs, Emergency Employment of Army Resources	June 1977
Hydrology, Buffalo Bayou and Tributaries, Texas, Addicks and Barker Reservoirs	August 1977
Periodic Inspection Report No. 3, Buffalo Bayou and Tributaries, Addicks Dam, Texas	October 1977
Periodic Inspection Report No. 3, Buffalo Bayou and Tributaries, Barker Dam, Texas	October 1977
Reconnaissance Report, Buffalo Bayou and Tributaries, Texas, Major Rehabilitation of Addicks and Barker Dams	October 1977
Design Memorandum No. 2, Updated Master Plan, Addicks and Barker Dams	November 1977
Letter Report for Spillways, Addicks and Barker Dams	January 1978
Construction Contract Drawings, Seepage Control, Addicks Dam	February 1978
Letter Report for Spillway Alternatives, Addicks and Barker Dams	March 1978
Construction Contract Drawings, Seepage Control, Addicks Dam	May 1978
Surface Traces of Geologic Faults in Areas of Addicks Dam	June 1978

Geologic Study of Faulting, Addicks Dam	June 1978
Construction Contract Drawings, Seepage Control, Barker Dam	August 1978
Construction Contract Drawings, Seepage Control, Addicks Dam	August 1978
Construction Contract Drawings, Seepage Control, Barker Dam	October 1978
Construction Contract Drawings, Gate Painting and Structural Repairs, Addicks and Barker Dams	August 1979
Emergency Operations Drawings for Foundation Observers, Addicks and Barker Dams	September 1979
Evaluation of Slurry Trench Collapse, Barker Dam	August 1980
Environmental Assessment, Dam Safety, Addicks and Barker Dam	November 1981
Geotechnical Investigation, Seepage Control, Slurry Trench Stability, Barker Dam	April 1982
(Periodic) Inspection Report No. 4, Buffalo Bayou and Tributaries, Addicks and Barker Dams	September 1982
Emergency Seepage Control Construction Completion Report, Buffalo Bayou and Tributaries, Addicks and Barker Dams, Texas	March 1983
Environmental Assessment, Two-Phased Improvements to Elridge Road, Addicks Dam	July 1983
Geotechnical Investigations, Clodine Ditch Improvements Study No. 2, Barker Dam	March 1984
Dam Safety Assurance General Design Memorandum, Buffalo Bayou and Tributaries, Texas, Addicks and Barker Dams	June 1984
Geotechnical Investigations, Clodine Ditch Improvements Study No. 2, Barker Dam	July 1984
Dam Safety Assurance; Supplement No. 1 to General Design Memorandum, Buffalo Bayou and Tributaries, Texas, Addicks and Barker Dams	December 1985
Environmental Assessment, Dam Safety Assurance, Addicks and Barker Dams	December 9185
Geotechnical Investigation, Clodine Ditch Addendum, Barker Dam	March 1986

Construction Contract Drawings, Dam Safety Assurance, Barker Dam	April 1986
Construction Contract Drawings, Raise Main Dam, Addicks Dam	May 1986
Design Memorandum No. 3 - Master Plan Update, Addicks and Barker Reservoirs, Buffalo Bayou Watershed, Houston, Texas	June 1986
Construction Contract Drawings, Armor Plate Ends, Addicks and Barker Dams	April 1987
(Periodic) Inspection Report No. 5, Buffalo Bayou and Tributaries, Addicks Dam	May 1987
(Periodic) Inspection Report No. 5, Buffalo Bayou and Tributaries, Barker Dam	May 1987
Construction Contract Drawings, Periodic Inspection Repairs, Addicks and Barker Dams	December 1987
Construction Contract Drawings, T-Wall at Outlet, Addicks Dam	March 1988
Construction Contract Drawings, T-Wall at Outlet, Barker Dam	January 1989
Construction Contract Drawings, Aesthetic Improvements, Addicks and Barker Dams	April 1989
Construction Contract Drawings, Repairs to RCC, Addicks and Barker Dams	May 1990
(Periodic) Inspection Report No. 6, Buffalo Bayou and Tributaries, Addicks Dam	September 1992
(Periodic) Inspection Report No. 6, Buffalo Bayou and Tributaries, Barker Dam	September 1992
Reconnaissance Report, Section 216 Study, Addicks and Barker Reservoirs, Buffalo Bayou and Tributaries, Houston, Texas	October 1995
Construction Contract Drawings, Embankment Restoration, Addicks and Barker Dams	September 1996
Construction Contract Drawings, Repairs to Barker Ditch and Outfall, Barker Dam	January 1997
Construction Contract Drawings, Embankment Restoration, Addicks and Barker Dams	February 1997

(Periodic) Inspection Report No. 7, Buffalo Bayou and Tributaries, Addicks Dam	October 1997
(Periodic) Inspection Report No. 7, Buffalo Bayou and Tributaries, Barker Dam	October 1997
Emergency Operations Plan, Addicks and Barker Dams	August 2000
Annual Inspection Report, Addicks and Barker Dams	May 2001
Construction Contract Drawings, Repairs to RCC	August 2002
(Periodic) Inspection Report No. 8, Buffalo Bayou and Tributaries, Addicks Dam	May 2003
(Periodic) Inspection Report No. 8, Buffalo Bayou and Tributaries, Barker Dam	May 2003
2003 Instrumentation Summary, Addicks and Barker Dams	January 2004
Construction Contract Drawings, Emergency Embankment Restoration, Addicks Dam	July 2004
2004 Instrumentation Summary, Addicks and Barker Dams	January 2005
2005, Instrumentation Summary, Addicks and Barker Dams	May 2006
2006, Instrumentation Summary, Addicks and Barker Dams	March 2007
(Periodic) Inspection Report No. 9, Buffalo Bayou and Tributaries, Addicks Dam	June 2007
(Periodic) Inspection Report No. 9, Buffalo Bayou and Tributaries, Barker Dam	June 2007
Construction Contract Drawings, Clodine Ditch Rehabilitation, Barker Dam	May 2008
Specifications, Clodine Ditch Rehabilitation, Barker Dam	May 2008
Outlet Structure Inspection and Report (Draft), Addicks and Barker Dams	August 2008
Aquatrack Geophysical Investigation (Draft), Addicks and Barker Dams	November 2008
2008 Instrumentation Summary	February 2009

Construction Contract Drawings, Conduit Void Repair, Addicks and Barker Dams	May 2009
Specifications, Conduit Void Repairs, Addicks and Barker Dams	May 2009
Galveston District Emergency Operations Plan, Annex I, Addicks & Barker Emergency Action Plan	August 2006
2009 Master Plan Addicks and Barker Reservoirs, Buffalo Bayou And Tributaries, Fort Bend and Harris Counties, Texas	August 2009
Addicks and Barker Pool Probability Analysis, US Army Corps Of Engineers, Galveston District	October 2011
Addicks and Barker Reservoirs, Buffalo Bayou and Tributaries, San Jacinto River Basin, Texas, Water Control Manual	November 2012
Interim Risk Reduction Measures Plan, Addicks Dam, Texas	February 2010
Interim Risk Reduction Measures Plan, Barker Dam, Texas	February 2010
Updated Interim Risk Reduction Measures Plan, Addicks Dam, Texas	April 2013
Updated Interim Risk Reduction Measures Plan, Barker Dam, Texas	April 2013
Addicks and Barker Dam Safety Modification Report	May 2013
Emergency Action Plan, Addicks Reservoir and Barker Reservoir, Buffalo Bayou and Tributaries	June 2018
New Outlet Structures and Cutoff Walls, Addicks Dam, Volume 1	June 2015
New Outlet Structures and Cutoff Walls, Barker Dam, Volume 2	June 2015
Specifications, W9126G-15-C-9937	June 2015
Design Documentation Report	July 2015
Engineering Considerations and Instructions to Field Personnel	February 2016

Table 7-01

Elevation-Area/Capacity Table - Addicks Reservoir

Elevation (ft) NAVD 1988	Area (acres) Capacity (Ac-ft) 0	Area (acres) Capacity (Ac-ft) 0.01	Area (acres) Capacity (Ac-ft) 0.02	Area (acres) Capacity (Ac-ft) 0.03	Area (acres) Capacity (Ac-ft) 0.04	Area (acres) Capacity (Ac-ft) 0.05	Area (acres) Capacity (Ac-ft) 0.06	Area (acres) Capacity (Ac-ft) 0.07	Area (acres) Capacity (Ac-ft) 0.08	Area (acres) Capacity (Ac-ft) 0.09
66	6	6	6	6	6	6	6	6	6	6
	25	26	26	26	26	26	26	26	26	26
66.1	6	6	6	6	6	6	6	6	6	6
	26	26	26	26	26	26	26	27	27	27
66.2	6	6	6	6	6	6	6	6	6	6
	27	27	27	27	27	27	27	27	27	27
66.3	6	6	6	6	6	6	6	6	6	6
	27	27	27	27	28	28	28	28	28	28
66.4	6	6	6	6	6	6	6	6	6	6
	28	28	28	28	28	28	28	28	28	28
66.5	6	6	6	6	6	6	6	6	6	6
	29	29	29	29	29	29	29	29	29	29
66.6	7	7	7	7	7	7	7	7	7	7
	29	29	29	29	29	30	30	30	30	30
66.7	7	7	7	7	7	7	7	7	7	7
	30	30	30	30	30	30	30	30	30	30
66.8	7	7	7	7	7	7	7	7	7	7
	31	31	31	31	31	31	31	31	31	31
66.9	7	7	7	7	7	7	7	7	7	7
	31	31	31	31	31	32	32	32	32	32
67	7	7	7	7	7	7	7	7	7	7
	32	32	32	32	32	32	32	32	32	33
67.1	7	7	7	7	7	7	7	7	7	7
	33	33	33	33	33	33	33	33	33	33
67.2	7	7	7	7	7	7	7	7	7	7
	33	33	33	34	34	34	34	34	34	34
67.3	7	7	7	7	7	7	7	7	7	7
	34	34	34	34	34	34	34	34	35	35
67.4	7	7	7	7	7	7	7	7	7	7
	35	35	35	35	35	35	35	35	35	35
67.5	7	7	7	7	7	7	7	7	7	7
	35	36	36	36	36	36	36	36	36	36
67.6	7	7	7	7	7	7	7	7	7	7
	36	36	36	36	36	37	37	37	37	37
67.7	7	7	7	7	7	7	7	7	7	7
	37	37	37	37	37	37	37	37	37	38
67.8	7	7	7	7	7	7	7	7	7	7
	38	38	38	38	38	38	38	38	38	38
67.9	7	7	7	7	7	7	7	7	7	7
	38	38	38	39	39	39	39	39	39	39

Table 7-01

Elevation-Area/Capacity Table - Addicks Reservoir

Elevation (ft) NAVD 1988	Area (acres) Capacity (Ac-ft) 0	Area (acres) Capacity (Ac-ft) 0.01	Area (acres) Capacity (Ac-ft) 0.02	Area (acres) Capacity (Ac-ft) 0.03	Area (acres) Capacity (Ac-ft) 0.04	Area (acres) Capacity (Ac-ft) 0.05	Area (acres) Capacity (Ac-ft) 0.06	Area (acres) Capacity (Ac-ft) 0.07	Area (acres) Capacity (Ac-ft) 0.08	Area (acres) Capacity (Ac-ft) 0.09
68	7	7	7	7	7	7	7	7	7	7
	39	39	39	39	39	39	40	40	40	40
68.1	7	7	7	7	7	7	7	7	7	7
	40	40	40	40	40	40	40	40	40	40
68.2	7	7	7	7	7	7	7	7	7	7
	41	41	41	41	41	41	41	41	41	41
68.3	7	7	7	7	8	8	8	8	8	8
	41	41	41	42	42	42	42	42	42	42
68.4	8	8	8	8	8	8	8	8	8	8
	42	42	42	42	42	42	42	43	43	43
68.5	8	8	8	8	8	8	8	8	8	8
	43	43	43	43	43	43	43	43	43	43
68.6	8	8	8	8	8	8	8	8	8	8
	44	44	44	44	44	44	44	44	44	44
68.7	8	8	8	8	8	8	8	8	8	8
	44	44	44	45	45	45	45	45	45	45
68.8	8	8	8	8	8	8	8	8	8	8
	45	45	45	45	45	45	46	46	46	46
68.9	8	8	8	8	8	8	8	8	8	8
	46	46	46	46	46	46	46	46	46	47
69	8	8	8	8	8	8	8	8	8	8
	47	47	47	47	47	47	47	47	47	47
69.1	8	8	8	8	8	8	8	8	8	8
	47	47	48	48	48	48	48	48	48	48
69.2	8	8	8	8	8	8	8	8	8	8
	48	48	48	48	49	49	49	49	49	49
69.3	8	8	8	8	8	8	8	8	8	8
	49	49	49	49	49	49	49	50	50	50
69.4	8	8	8	8	8	8	8	8	8	8
	50	50	50	50	50	50	50	50	50	50
69.5	8	8	8	8	8	8	8	8	8	8
	51	51	51	51	51	51	51	51	51	51
69.6	8	8	8	8	8	8	8	8	8	8
	51	51	52	52	52	52	52	52	52	52
69.7	8	8	8	8	8	8	8	8	8	8
	52	52	52	52	52	53	53	53	53	53
69.8	8	8	8	8	8	8	8	8	8	8
	53	53	53	53	53	53	53	54	54	54
69.9	8	8	8	8	8	8	8	8	8	8
	54	54	54	54	54	54	54	54	54	55

Table 7-01

Elevation-Area/Capacity Table - Addicks Reservoir

Elevation (ft) NAVD 1988	Area (acres) Capacity (Ac-ft) 0	Area (acres) Capacity (Ac-ft) 0.01	Area (acres) Capacity (Ac-ft) 0.02	Area (acres) Capacity (Ac-ft) 0.03	Area (acres) Capacity (Ac-ft) 0.04	Area (acres) Capacity (Ac-ft) 0.05	Area (acres) Capacity (Ac-ft) 0.06	Area (acres) Capacity (Ac-ft) 0.07	Area (acres) Capacity (Ac-ft) 0.08	Area (acres) Capacity (Ac-ft) 0.09
70	8	8	8	8	8	8	8	8	8	8
	55	55	55	55	55	55	55	55	55	55
70.1	8	8	8	8	8	8	8	8	8	8
	55	55	56	56	56	56	56	56	56	56
70.2	8	8	8	8	8	8	8	8	8	8
	56	56	56	56	57	57	57	57	57	57
70.3	8	8	8	8	8	8	8	8	8	8
	57	57	57	57	57	57	58	58	58	58
70.4	8	8	8	8	8	8	8	8	8	8
	58	58	58	58	58	58	58	58	59	59
70.5	8	8	8	8	8	8	8	8	8	8
	59	59	59	59	59	59	59	59	59	59
70.6	8	8	8	8	8	8	8	8	8	8
	60	60	60	60	60	60	60	60	60	60
70.7	8	8	8	8	8	8	8	8	8	8
	60	60	61	61	61	61	61	61	61	61
70.8	8	8	8	8	8	8	8	8	8	8
	61	61	61	61	62	62	62	62	62	62
70.9	8	9	9	9	9	9	9	9	9	9
	62	62	62	62	62	62	63	63	63	63
71	9	9	9	9	9	9	9	9	9	9
	63	63	63	63	63	63	63	64	64	64
71.1	9	9	9	9	9	9	9	9	9	9
	64	64	64	64	64	64	64	64	64	65
71.2	9	9	9	9	9	9	9	9	9	9
	65	65	65	65	65	65	65	65	65	65
71.3	9	9	9	9	9	9	9	9	9	9
	66	66	66	66	66	66	66	66	66	66
71.4	9	9	9	9	9	9	9	9	9	9
	66	66	67	67	67	67	67	67	67	67
71.5	9	9	9	9	9	9	9	9	9	9
	67	67	67	68	68	68	68	68	68	68
71.6	9	9	9	9	9	9	9	9	9	9
	68	68	68	68	68	69	69	69	69	69
71.7	9	9	9	9	9	9	9	9	9	9
	69	69	69	69	69	69	70	70	70	70
71.8	9	9	9	9	9	9	9	9	9	9
	70	70	70	70	70	70	70	70	71	71
71.9	9	9	9	9	9	9	9	9	9	9
	71	71	71	71	71	71	71	71	71	72

Table 7-01

Elevation-Area/Capacity Table - Addicks Reservoir

Elevation (ft) NAVD 1988	Area (acres) Capacity (Ac-ft) 0	Area (acres) Capacity (Ac-ft) 0.01	Area (acres) Capacity (Ac-ft) 0.02	Area (acres) Capacity (Ac-ft) 0.03	Area (acres) Capacity (Ac-ft) 0.04	Area (acres) Capacity (Ac-ft) 0.05	Area (acres) Capacity (Ac-ft) 0.06	Area (acres) Capacity (Ac-ft) 0.07	Area (acres) Capacity (Ac-ft) 0.08	Area (acres) Capacity (Ac-ft) 0.09
72	9	9	9	9	9	9	9	9	9	9
	72	72	72	72	72	72	72	72	72	72
72.1	9	9	9	9	9	9	9	9	9	9
	73	73	73	73	73	73	73	73	73	73
72.2	9	9	9	9	9	9	9	9	9	9
	73	74	74	74	74	74	74	74	74	74
72.3	9	9	9	9	9	9	9	9	9	9
	74	74	75	75	75	75	75	75	75	75
72.4	9	9	9	9	9	9	9	9	9	9
	75	75	75	76	76	76	76	76	76	76
72.5	9	9	9	9	9	9	9	9	9	9
	76	76	76	76	77	77	77	77	77	77
72.6	9	9	9	9	9	9	9	9	9	9
	77	77	77	77	77	78	78	78	78	78
72.7	9	9	9	9	9	9	9	9	9	9
	78	78	78	78	78	78	79	79	79	79
72.8	9	9	9	9	9	9	9	9	9	9
	79	79	79	79	79	79	79	80	80	80
72.9	9	9	9	9	9	9	9	9	9	9
	80	80	80	80	80	80	80	80	81	81
73	9	9	9	9	9	9	9	9	9	9
	81	81	81	81	81	81	81	81	82	82
73.1	9	9	9	9	9	9	9	9	9	9
	82	82	82	82	82	82	82	82	82	83
73.2	9	9	9	9	9	9	9	9	9	9
	83	83	83	83	83	83	83	83	83	84
73.3	9	9	9	9	9	9	9	9	9	9
	84	84	84	84	84	84	84	84	84	84
73.4	9	9	9	9	9	9	9	9	9	10
	85	85	85	85	85	85	85	85	85	85
73.5	10	10	10	10	10	10	10	10	10	10
	86	86	86	86	86	86	86	86	86	86
73.6	10	10	10	10	10	10	10	10	10	10
	86	87	87	87	87	87	87	87	87	87
73.7	10	10	10	10	10	10	10	10	10	10
	87	88	88	88	88	88	88	88	88	88
73.8	10	10	10	10	10	10	10	10	10	10
	88	88	89	89	89	89	89	89	89	89
73.9	10	10	10	10	10	10	10	10	10	10
	89	89	90	90	90	90	90	90	90	90

Table 7-01

Elevation-Area/Capacity Table - Addicks Reservoir

Elevation (ft) NAVD 1988	Area (acres) Capacity (Ac-ft) 0	Area (acres) Capacity (Ac-ft) 0.01	Area (acres) Capacity (Ac-ft) 0.02	Area (acres) Capacity (Ac-ft) 0.03	Area (acres) Capacity (Ac-ft) 0.04	Area (acres) Capacity (Ac-ft) 0.05	Area (acres) Capacity (Ac-ft) 0.06	Area (acres) Capacity (Ac-ft) 0.07	Area (acres) Capacity (Ac-ft) 0.08	Area (acres) Capacity (Ac-ft) 0.09
74	10	10	10	10	10	10	10	10	10	10
	90	90	90	91	91	91	91	91	91	91
74.1	11	11	11	11	11	11	11	11	11	11
	91	91	92	92	92	92	92	92	92	92
74.2	11	12	12	12	12	12	12	12	12	12
	92	93	93	93	93	93	93	93	93	93
74.3	12	13	13	13	13	13	13	13	13	13
	94	94	94	94	94	94	94	95	95	95
74.4	13	14	14	14	14	14	14	14	14	14
	95	95	95	95	95	96	96	96	96	96
74.5	14	15	15	15	15	15	15	15	15	15
	96	96	97	97	97	97	97	97	97	98
74.6	16	16	16	16	16	16	16	16	16	17
	98	98	98	98	98	99	99	99	99	99
74.7	17	17	17	17	17	17	17	17	18	18
	99	100	100	100	100	100	100	101	101	101
74.8	18	18	18	18	18	18	18	19	19	19
	101	101	101	102	102	102	102	102	103	103
74.9	19	19	19	19	19	20	20	20	20	20
	103	103	103	104	104	104	104	104	105	105
75	20	20	20	20	20	20	20	20	20	20
	105	105	105	105	106	106	106	106	107	107
75.1	20	21	21	21	21	21	21	21	21	21
	107	107	107	108	108	108	108	108	109	109
75.2	21	21	21	21	21	21	21	21	21	21
	109	109	109	110	110	110	110	110	111	111
75.3	21	21	21	21	21	21	21	21	21	21
	111	111	112	112	112	112	112	113	113	113
75.4	21	21	21	21	22	22	22	22	22	22
	113	113	114	114	114	114	114	115	115	115
75.5	22	22	22	22	22	22	22	22	22	22
	115	116	116	116	116	116	117	117	117	117
75.6	22	22	22	22	22	22	22	22	22	22
	118	118	118	118	118	119	119	119	119	120
75.7	22	22	22	22	22	22	23	23	23	23
	120	120	120	120	121	121	121	121	122	122
75.8	23	23	23	23	23	23	23	23	23	23
	122	122	122	123	123	123	123	124	124	124
75.9	23	23	23	23	23	23	23	23	23	23
	124	125	125	125	125	125	126	126	126	126

Table 7-01

Elevation-Area/Capacity Table - Addicks Reservoir

Elevation (ft) NAVD 1988	Area (acres) Capacity (Ac-ft) 0	Area (acres) Capacity (Ac-ft) 0.01	Area (acres) Capacity (Ac-ft) 0.02	Area (acres) Capacity (Ac-ft) 0.03	Area (acres) Capacity (Ac-ft) 0.04	Area (acres) Capacity (Ac-ft) 0.05	Area (acres) Capacity (Ac-ft) 0.06	Area (acres) Capacity (Ac-ft) 0.07	Area (acres) Capacity (Ac-ft) 0.08	Area (acres) Capacity (Ac-ft) 0.09
76	23	23	23	23	23	23	23	23	23	23
	127	127	127	127	128	128	128	128	128	129
76.1	24	24	24	24	24	24	24	24	24	24
	129	129	129	130	130	130	130	131	131	131
76.2	24	24	24	24	24	24	24	24	24	24
	131	132	132	132	132	132	133	133	133	133
76.3	24	24	24	24	24	24	24	24	24	24
	134	134	134	134	135	135	135	135	136	136
76.4	24	24	24	24	24	24	24	24	24	24
	136	136	137	137	137	137	138	138	138	138
76.5	24	24	24	24	25	25	25	25	25	25
	139	139	139	139	140	140	140	140	140	141
76.6	25	25	25	25	25	25	25	25	25	25
	141	141	141	142	142	142	142	143	143	143
76.7	25	25	25	25	25	25	25	25	25	25
	143	144	144	144	144	145	145	145	145	146
76.8	25	25	25	25	25	25	25	25	25	25
	146	146	146	147	147	147	147	148	148	148
76.9	25	25	25	25	25	25	26	26	26	26
	148	149	149	149	150	150	150	150	151	151
77	26	26	26	27	27	27	28	28	29	29
	151	151	152	152	152	152	153	153	153	153
77.1	29	30	30	30	31	31	32	32	32	33
	154	154	154	155	155	155	156	156	156	157
77.2	33	34	34	35	35	35	36	36	37	37
	157	157	158	158	158	159	159	159	160	160
77.3	38	38	38	39	39	40	40	41	41	42
	160	161	161	162	162	162	163	163	164	164
77.4	42	42	43	43	44	44	45	45	46	46
	164	165	165	166	166	167	167	167	168	168
77.5	47	47	48	48	49	49	50	50	51	51
	169	169	170	170	171	171	172	172	173	173
77.6	52	52	53	53	54	54	55	55	56	56
	174	174	175	175	176	176	177	178	178	179
77.7	57	57	58	59	59	60	60	61	61	62
	179	180	180	181	182	182	183	183	184	185
77.8	62	63	64	64	65	65	66	66	67	68
	185	186	186	187	188	188	189	190	190	191
77.9	68	69	69	70	70	71	72	72	73	73
	192	192	193	194	194	195	196	197	197	198

Table 7-01

Elevation-Area/Capacity Table - Addicks Reservoir

Elevation (ft) NAVD 1988	Area (acres) Capacity (Ac-ft) 0	Area (acres) Capacity (Ac-ft) 0.01	Area (acres) Capacity (Ac-ft) 0.02	Area (acres) Capacity (Ac-ft) 0.03	Area (acres) Capacity (Ac-ft) 0.04	Area (acres) Capacity (Ac-ft) 0.05	Area (acres) Capacity (Ac-ft) 0.06	Area (acres) Capacity (Ac-ft) 0.07	Area (acres) Capacity (Ac-ft) 0.08	Area (acres) Capacity (Ac-ft) 0.09
78	74	75	76	77	79	80	81	82	83	84
	199	200	200	201	202	203	203	204	205	206
78.1	86	87	88	89	90	92	93	94	95	97
	207	208	209	209	210	211	212	213	214	215
78.2	98	99	100	102	103	104	106	107	108	110
	216	217	218	219	220	221	222	223	224	225
78.3	111	112	114	115	117	118	119	121	122	124
	226	227	229	230	231	232	233	234	236	237
78.4	125	126	128	129	131	132	134	135	137	138
	238	239	241	242	243	245	246	247	249	250
78.5	140	141	143	144	146	148	149	151	152	154
	251	253	254	256	257	259	260	262	263	265
78.6	155	157	159	160	162	164	165	167	169	170
	266	268	269	271	273	274	276	277	279	281
78.7	172	174	175	177	179	180	182	184	186	187
	283	284	286	288	290	291	293	295	297	299
78.8	189	191	193	194	196	198	200	202	204	205
	301	302	304	306	308	310	312	314	316	318
78.9	207	209	211	213	215	217	219	220	222	224
	320	322	325	327	329	331	333	335	338	340
79	226	227	228	228	229	230	230	231	232	233
	342	344	347	349	351	353	356	358	360	363
79.1	233	234	235	235	236	237	238	238	239	240
	365	367	370	372	374	377	379	382	384	386
79.2	240	241	242	243	243	244	245	245	246	247
	389	391	394	396	398	401	403	406	408	411
79.3	248	248	249	250	251	251	252	253	254	254
	413	416	418	421	423	426	428	431	433	436
79.4	255	256	256	257	258	259	259	260	261	262
	438	441	443	446	448	451	454	456	459	461
79.5	262	263	264	265	265	266	267	268	269	269
	464	467	469	472	475	477	480	483	485	488
79.6	270	271	272	272	273	274	275	275	276	277
	491	493	496	499	502	504	507	510	513	515
79.7	278	279	279	280	281	282	282	283	284	285
	518	521	524	526	529	532	535	538	541	543
79.8	286	286	287	288	289	289	290	291	292	293
	546	549	552	555	558	561	564	566	569	572
79.9	293	294	295	296	297	297	298	299	300	301
	575	578	581	584	587	590	593	596	599	602

Table 7-01

Elevation-Area/Capacity Table - Addicks Reservoir

Elevation (ft) NAVD 1988	Area (acres) Capacity (Ac-ft) 0	Area (acres) Capacity (Ac-ft) 0.01	Area (acres) Capacity (Ac-ft) 0.02	Area (acres) Capacity (Ac-ft) 0.03	Area (acres) Capacity (Ac-ft) 0.04	Area (acres) Capacity (Ac-ft) 0.05	Area (acres) Capacity (Ac-ft) 0.06	Area (acres) Capacity (Ac-ft) 0.07	Area (acres) Capacity (Ac-ft) 0.08	Area (acres) Capacity (Ac-ft) 0.09
80	301	302	303	303	304	305	305	306	307	307
	605	608	611	614	617	620	623	626	629	632
80.1	308	309	309	310	311	311	312	313	313	314
	635	639	642	645	648	651	654	657	660	663
80.2	315	316	316	317	318	318	319	320	320	321
	667	670	673	676	679	682	686	689	692	695
80.3	322	322	323	324	324	325	326	326	327	328
	698	702	705	708	711	715	718	721	724	728
80.4	329	329	330	331	331	332	333	333	334	335
	731	734	738	741	744	747	751	754	757	761
80.5	335	336	337	338	338	339	340	340	341	342
	764	767	771	774	778	781	784	788	791	795
80.6	342	343	344	345	345	346	347	347	348	349
	798	801	805	808	812	815	819	822	826	829
80.7	350	350	351	352	352	353	354	355	355	356
	833	836	840	843	847	850	854	857	861	864
80.8	357	357	358	359	360	360	361	362	363	363
	868	871	875	879	882	886	889	893	897	900
80.9	364	365	365	366	367	368	368	369	370	371
	904	908	911	915	919	922	926	930	933	937
81	371	372	373	374	375	376	377	377	378	379
	941	944	948	952	956	959	963	967	971	974
81.1	380	381	382	383	384	384	385	386	387	388
	978	982	986	990	994	997	1001	1005	1009	1013
81.2	389	390	391	392	393	393	394	395	396	397
	1017	1021	1025	1028	1032	1036	1040	1044	1048	1052
81.3	398	399	400	401	402	402	403	404	405	406
	1056	1060	1064	1068	1072	1076	1080	1084	1088	1092
81.4	407	408	409	410	411	412	412	413	414	415
	1096	1100	1104	1109	1113	1117	1121	1125	1129	1133
81.5	416	417	418	419	420	421	422	423	424	425
	1137	1142	1146	1150	1154	1158	1163	1167	1171	1175
81.6	425	426	427	428	429	430	431	432	433	434
	1180	1184	1188	1192	1197	1201	1205	1210	1214	1218
81.7	435	436	437	438	439	440	441	441	442	443
	1223	1227	1231	1236	1240	1244	1249	1253	1258	1262
81.8	444	445	446	447	448	449	450	451	452	453
	1267	1271	1275	1280	1284	1289	1293	1298	1302	1307
81.9	454	455	456	457	458	459	460	461	462	463
	1311	1316	1321	1325	1330	1334	1339	1343	1348	1353

Table 7-01

Elevation-Area/Capacity Table - Addicks Reservoir

Elevation (ft) NAVD 1988	Area (acres) Capacity (Ac-ft) 0	Area (acres) Capacity (Ac-ft) 0.01	Area (acres) Capacity (Ac-ft) 0.02	Area (acres) Capacity (Ac-ft) 0.03	Area (acres) Capacity (Ac-ft) 0.04	Area (acres) Capacity (Ac-ft) 0.05	Area (acres) Capacity (Ac-ft) 0.06	Area (acres) Capacity (Ac-ft) 0.07	Area (acres) Capacity (Ac-ft) 0.08	Area (acres) Capacity (Ac-ft) 0.09
82	464	465	466	468	469	471	472	473	475	476
	1357	1362	1367	1371	1376	1381	1385	1390	1395	1400
82.1	478	479	480	482	483	485	486	487	489	490
	1404	1409	1414	1419	1424	1428	1433	1438	1443	1448
82.2	492	493	495	496	497	499	500	502	503	505
	1453	1458	1463	1468	1473	1478	1483	1488	1493	1498
82.3	506	508	509	510	512	513	515	516	518	519
	1503	1508	1513	1518	1523	1528	1533	1539	1544	1549
82.4	521	522	524	525	527	528	530	531	533	534
	1554	1559	1565	1570	1575	1580	1586	1591	1596	1602
82.5	536	537	539	540	542	543	545	546	548	549
	1607	1612	1618	1623	1628	1634	1639	1645	1650	1656
82.6	551	552	554	555	557	558	560	561	563	564
	1661	1667	1672	1678	1683	1689	1695	1700	1706	1711
82.7	566	567	569	570	572	573	575	577	578	580
	1717	1723	1728	1734	1740	1745	1751	1757	1763	1769
82.8	581	583	584	586	587	589	591	592	594	595
	1774	1780	1786	1792	1798	1804	1810	1815	1821	1827
82.9	597	598	600	602	603	605	606	608	609	611
	1833	1839	1845	1851	1857	1863	1869	1875	1881	1888
83	613	615	617	619	621	623	626	628	630	632
	1894	1900	1906	1912	1918	1925	1931	1937	1943	1950
83.1	634	636	639	641	643	645	647	650	652	654
	1956	1962	1969	1975	1982	1988	1995	2001	2007	2014
83.2	656	658	661	663	665	667	670	672	674	676
	2021	2027	2034	2040	2047	2054	2060	2067	2074	2081
83.3	679	681	683	685	688	690	692	695	697	699
	2087	2094	2101	2108	2115	2122	2128	2135	2142	2149
83.4	701	704	706	708	711	713	715	718	720	722
	2156	2163	2170	2177	2185	2192	2199	2206	2213	2220
83.5	725	727	729	732	734	736	739	741	743	746
	2228	2235	2242	2249	2257	2264	2271	2279	2286	2294
83.6	748	750	753	755	758	760	762	765	767	769
	2301	2309	2316	2324	2331	2339	2347	2354	2362	2370
83.7	772	774	777	779	782	784	786	789	791	794
	2377	2385	2393	2400	2408	2416	2424	2432	2440	2448
83.8	796	799	801	803	806	808	811	813	816	818
	2456	2464	2472	2480	2488	2496	2504	2512	2520	2528
83.9	821	823	826	828	831	833	836	838	841	843
	2536	2545	2553	2561	2569	2578	2586	2595	2603	2611

Table 7-01

Elevation-Area/Capacity Table - Addicks Reservoir

Elevation (ft) NAVD 1988	Area (acres) Capacity (Ac-ft) 0	Area (acres) Capacity (Ac-ft) 0.01	Area (acres) Capacity (Ac-ft) 0.02	Area (acres) Capacity (Ac-ft) 0.03	Area (acres) Capacity (Ac-ft) 0.04	Area (acres) Capacity (Ac-ft) 0.05	Area (acres) Capacity (Ac-ft) 0.06	Area (acres) Capacity (Ac-ft) 0.07	Area (acres) Capacity (Ac-ft) 0.08	Area (acres) Capacity (Ac-ft) 0.09
84	846	849	852	855	859	862	865	868	871	875
	2620	2628	2637	2645	2654	2662	2671	2680	2688	2697
84.1	878	881	884	888	891	894	898	901	904	907
	2706	2715	2724	2732	2741	2750	2759	2768	2777	2786
84.2	911	914	917	921	924	927	931	934	937	941
	2795	2805	2814	2823	2832	2841	2851	2860	2869	2879
84.3	944	948	951	954	958	961	965	968	971	975
	2888	2898	2907	2917	2926	2936	2945	2955	2965	2974
84.4	978	982	985	989	992	995	999	1002	1006	1009
	2984	2994	3004	3014	3024	3034	3044	3054	3064	3074
84.5	1013	1016	1020	1023	1027	1030	1034	1037	1041	1045
	3084	3094	3104	3114	3125	3135	3145	3156	3166	3176
84.6	1048	1052	1055	1059	1062	1066	1069	1073	1077	1080
	3187	3197	3208	3218	3229	3240	3250	3261	3272	3283
84.7	1084	1087	1091	1095	1098	1102	1106	1109	1113	1117
	3293	3304	3315	3326	3337	3348	3359	3370	3381	3392
84.8	1120	1124	1128	1131	1135	1139	1142	1146	1150	1154
	3404	3415	3426	3437	3449	3460	3472	3483	3494	3506
84.9	1157	1161	1165	1169	1172	1176	1180	1184	1187	1191
	3518	3529	3541	3552	3564	3576	3588	3599	3611	3623
85	1195	1199	1203	1207	1211	1215	1219	1223	1227	1231
	3635	3647	3659	3671	3683	3695	3708	3720	3732	3744
85.1	1235	1239	1243	1247	1251	1255	1259	1263	1267	1271
	3757	3769	3781	3794	3806	3819	3831	3844	3857	3869
85.2	1275	1279	1283	1288	1292	1296	1300	1304	1308	1312
	3882	3895	3908	3921	3933	3946	3959	3972	3985	3999
85.3	1316	1321	1325	1329	1333	1337	1341	1346	1350	1354
	4012	4025	4038	4051	4065	4078	4091	4105	4118	4132
85.4	1358	1362	1367	1371	1375	1379	1384	1388	1392	1396
	4145	4159	4173	4186	4200	4214	4228	4242	4255	4269
85.5	1401	1405	1409	1413	1418	1422	1426	1431	1435	1439
	4283	4297	4311	4326	4340	4354	4368	4382	4397	4411
85.6	1444	1448	1452	1457	1461	1465	1470	1474	1479	1483
	4426	4440	4454	4469	4484	4498	4513	4528	4542	4557
85.7	1487	1492	1496	1501	1505	1509	1514	1518	1523	1527
	4572	4587	4602	4617	4632	4647	4662	4677	4692	4708
85.8	1532	1536	1541	1545	1550	1554	1559	1563	1568	1572
	4723	4738	4754	4769	4785	4800	4816	4831	4847	4863
85.9	1577	1581	1586	1590	1595	1600	1604	1609	1613	1618
	4878	4894	4910	4926	4942	4958	4974	4990	5006	5022

Elevation-Area/Capacity Table - Addicks Reservoir

Elevation (ft) NAVD 1988	Area (acres) Capacity (Ac-ft) 0	Area (acres) Capacity (Ac-ft) 0.01	Area (acres) Capacity (Ac-ft) 0.02	Area (acres) Capacity (Ac-ft) 0.03	Area (acres) Capacity (Ac-ft) 0.04	Area (acres) Capacity (Ac-ft) 0.05	Area (acres) Capacity (Ac-ft) 0.06	Area (acres) Capacity (Ac-ft) 0.07	Area (acres) Capacity (Ac-ft) 0.08	Area (acres) Capacity (Ac-ft) 0.09
86	1622	1627	1632	1636	1641	1646	1651	1655	1660	1665
	5038	5055	5071	5087	5104	5120	5137	5153	5170	5186
86.1	1669	1674	1679	1684	1688	1693	1698	1703	1707	1712
	5203	5220	5236	5253	5270	5287	5304	5321	5338	5355
86.2	1717	1722	1727	1731	1736	1741	1746	1751	1756	1760
	5372	5390	5407	5424	5441	5459	5476	5494	5511	5529
86.3	1765	1770	1775	1780	1785	1790	1795	1799	1804	1809
	5546	5564	5582	5600	5617	5635	5653	5671	5689	5707
86.4	1814	1819	1824	1829	1834	1839	1844	1849	1854	1859
	5725	5744	5762	5780	5798	5817	5835	5854	5872	5891
86.5	1864	1869	1874	1879	1884	1889	1894	1899	1904	1909
	5909	5928	5947	5965	5984	6003	6022	6041	6060	6079
86.6	1914	1919	1924	1929	1934	1939	1945	1950	1955	1960
	6098	6117	6137	6156	6175	6195	6214	6233	6253	6272
86.7	1965	1970	1975	1980	1986	1991	1996	2001	2006	2011
	6292	6312	6332	6351	6371	6391	6411	6431	6451	6471
86.8	2017	2022	2027	2032	2037	2043	2048	2053	2058	2064
	6491	6511	6532	6552	6572	6593	6613	6634	6654	6675
86.9	2069	2074	2079	2085	2090	2095	2101	2106	2111	2116
	6695	6716	6737	6758	6779	6800	6821	6842	6863	6884
87	2122	2127	2133	2138	2144	2149	2155	2161	2166	2172
	6905	6926	6948	6969	6990	7012	7033	7055	7077	7098
87.1	2177	2183	2188	2194	2200	2205	2211	2216	2222	2228
	7120	7142	7164	7186	7207	7229	7252	7274	7296	7318
87.2	2233	2239	2245	2250	2256	2262	2267	2273	2279	2285
	7340	7363	7385	7408	7430	7453	7475	7498	7521	7544
87.3	2290	2296	2302	2307	2313	2319	2325	2331	2336	2342
	7567	7590	7613	7636	7659	7682	7705	7728	7752	7775
87.4	2348	2354	2359	2365	2371	2377	2383	2389	2394	2400
	7799	7822	7846	7869	7893	7917	7940	7964	7988	8012
87.5	2406	2412	2418	2424	2430	2436	2442	2447	2453	2459
	8036	8060	8084	8109	8133	8157	8182	8206	8231	8255
87.6	2465	2471	2477	2483	2489	2495	2501	2507	2513	2519
	8280	8304	8329	8354	8379	8404	8429	8454	8479	8504
87.7	2525	2531	2537	2543	2549	2555	2561	2567	2573	2579
	8529	8555	8580	8605	8631	8656	8682	8708	8733	8759
87.8	2585	2591	2598	2604	2610	2616	2622	2628	2634	2640
	8785	8811	8837	8863	8889	8915	8941	8967	8994	9020
87.9	2647	2653	2659	2665	2671	2677	2684	2690	2696	2702
	9046	9073	9099	9126	9153	9180	9206	9233	9260	9287

Table 7-01

Elevation-Area/Capacity Table - Addicks Reservoir

Elevation (ft) NAVD 1988	Area (acres) Capacity (Ac-ft) 0	Area (acres) Capacity (Ac-ft) 0.01	Area (acres) Capacity (Ac-ft) 0.02	Area (acres) Capacity (Ac-ft) 0.03	Area (acres) Capacity (Ac-ft) 0.04	Area (acres) Capacity (Ac-ft) 0.05	Area (acres) Capacity (Ac-ft) 0.06	Area (acres) Capacity (Ac-ft) 0.07	Area (acres) Capacity (Ac-ft) 0.08	Area (acres) Capacity (Ac-ft) 0.09
88	2708	2714	2720	2727	2733	2739	2745	2751	2757	2763
	9314	9341	9368	9396	9423	9450	9478	9505	9533	9560
88.1	2769	2775	2781	2787	2793	2800	2806	2812	2818	2824
	9588	9616	9644	9671	9699	9727	9755	9783	9811	9840
88.2	2830	2836	2843	2849	2855	2861	2867	2874	2880	2886
	9868	9896	9925	9953	9982	10010	10039	10068	10096	10125
88.3	2892	2898	2905	2911	2917	2923	2930	2936	2942	2948
	10154	10183	10212	10241	10270	10299	10329	10358	10387	10417
88.4	2955	2961	2967	2974	2980	2986	2993	2999	3005	3012
	10446	10476	10506	10535	10565	10595	10625	10655	10685	10715
88.5	3018	3024	3031	3037	3043	3050	3056	3063	3069	3075
	10745	10775	10806	10836	10866	10897	10927	10958	10989	11019
88.6	3082	3088	3095	3101	3108	3114	3121	3127	3134	3140
	11050	11081	11112	11143	11174	11205	11236	11267	11299	11330
88.7	3147	3153	3160	3166	3173	3179	3186	3192	3199	3205
	11361	11393	11425	11456	11488	11520	11551	11583	11615	11647
88.8	3212	3218	3225	3231	3238	3245	3251	3258	3264	3271
	11679	11712	11744	11776	11808	11841	11873	11906	11938	11971
88.9	3278	3284	3291	3298	3304	3311	3318	3324	3331	3338
	12004	12037	12070	12102	12135	12169	12202	12235	12268	12302
89	3344	3351	3358	3365	3372	3379	3386	3393	3400	3407
	12335	12368	12402	12436	12469	12503	12537	12571	12605	12639
89.1	3414	3421	3428	3435	3442	3449	3456	3463	3470	3477
	12673	12707	12741	12776	12810	12844	12879	12913	12948	12983
89.2	3484	3491	3498	3505	3512	3519	3526	3533	3540	3547
	13018	13053	13088	13123	13158	13193	13228	13263	13299	13334
89.3	3555	3562	3569	3576	3583	3590	3597	3605	3612	3619
	13370	13405	13441	13477	13512	13548	13584	13620	13656	13692
89.4	3626	3633	3641	3648	3655	3662	3669	3677	3684	3691
	13729	13765	13801	13838	13874	13911	13947	13984	14021	14058
89.5	3698	3706	3713	3720	3727	3735	3742	3749	3757	3764
	14095	14132	14169	14206	14243	14281	14318	14356	14393	14431
89.6	3771	3779	3786	3793	3801	3808	3815	3823	3830	3838
	14468	14506	14544	14582	14620	14658	14696	14734	14772	14811
89.7	3845	3852	3860	3867	3875	3882	3889	3897	3904	3912
	14849	14888	14926	14965	15004	15042	15081	15120	15159	15198
89.8	3919	3927	3934	3942	3949	3957	3964	3972	3979	3987
	15237	15277	15316	15355	15395	15434	15474	15514	15553	15593
89.9	3994	4002	4010	4017	4025	4032	4040	4047	4055	4063
	15633	15673	15713	15753	15793	15834	15874	15914	15955	15996

Table 7-01

Elevation-Area/Capacity Table - Addicks Reservoir

Elevation (ft) NAVD 1988	Area (acres) Capacity (Ac-ft) 0	Area (acres) Capacity (Ac-ft) 0.01	Area (acres) Capacity (Ac-ft) 0.02	Area (acres) Capacity (Ac-ft) 0.03	Area (acres) Capacity (Ac-ft) 0.04	Area (acres) Capacity (Ac-ft) 0.05	Area (acres) Capacity (Ac-ft) 0.06	Area (acres) Capacity (Ac-ft) 0.07	Area (acres) Capacity (Ac-ft) 0.08	Area (acres) Capacity (Ac-ft) 0.09
90	4070	4077	4084	4091	4098	4105	4113	4120	4127	4134
	16036	16077	16118	16159	16200	16241	16282	16323	16364	16405
90.1	4141	4148	4155	4162	4169	4176	4184	4191	4198	4205
	16447	16488	16530	16571	16613	16655	16697	16738	16780	16822
90.2	4212	4219	4226	4234	4241	4248	4255	4262	4270	4277
	16864	16907	16949	16991	17034	17076	17118	17161	17204	17246
90.3	4284	4291	4298	4306	4313	4320	4327	4335	4342	4349
	17289	17332	17375	17418	17461	17504	17548	17591	17634	17678
90.4	4357	4364	4371	4378	4386	4393	4400	4408	4415	4422
	17721	17765	17809	17852	17896	17940	17984	18028	18072	18116
90.5	4430	4437	4444	4452	4459	4466	4474	4481	4489	4496
	18161	18205	18249	18294	18338	18383	18428	18472	18517	18562
90.6	4503	4511	4518	4526	4533	4540	4548	4555	4563	4570
	18607	18652	18697	18743	18788	18833	18879	18924	18970	19016
90.7	4578	4585	4593	4600	4608	4615	4623	4630	4638	4645
	19061	19107	19153	19199	19245	19291	19337	19384	19430	19476
90.8	4653	4660	4668	4675	4683	4690	4698	4705	4713	4721
	19523	19569	19616	19663	19709	19756	19803	19850	19897	19945
90.9	4728	4736	4743	4751	4758	4766	4774	4781	4789	4797
	19992	20039	20087	20134	20182	20229	20277	20325	20372	20420
91	4804	4812	4820	4827	4835	4843	4850	4858	4866	4873
	20468	20516	20565	20613	20661	20710	20758	20807	20855	20904
91.1	4881	4889	4897	4904	4912	4920	4928	4935	4943	4951
	20953	21002	21050	21099	21149	21198	21247	21296	21346	21395
91.2	4959	4967	4974	4982	4990	4998	5006	5013	5021	5029
	21445	21494	21544	21594	21644	21694	21744	21794	21844	21894
91.3	5037	5045	5053	5060	5068	5076	5084	5092	5100	5108
	21944	21995	22045	22096	22147	22197	22248	22299	22350	22401
91.4	5116	5124	5131	5139	5147	5155	5163	5171	5179	5187
	22452	22503	22555	22606	22657	22709	22760	22812	22864	22916
91.5	5195	5203	5211	5219	5227	5235	5243	5251	5259	5267
	22968	23020	23072	23124	23176	23228	23281	23333	23386	23438
91.6	5275	5283	5291	5299	5307	5315	5323	5331	5339	5348
	23491	23544	23597	23650	23703	23756	23809	23862	23916	23969
91.7	5356	5364	5372	5380	5388	5396	5404	5412	5421	5429
	24023	24076	24130	24184	24237	24291	24345	24399	24454	24508
91.8	5437	5445	5453	5461	5470	5478	5486	5494	5502	5510
	24562	24617	24671	24726	24780	24835	24890	24945	25000	25055
91.9	5519	5527	5535	5543	5552	5560	5568	5576	5585	5593
	25110	25165	25221	25276	25331	25387	25443	25498	25554	25610

Elevation-Area/Capacity Table - Addicks Reservoir

Elevation (ft) NAVD 1988	Area (acres) Capacity (Ac-ft) 0	Area (acres) Capacity (Ac-ft) 0.01	Area (acres) Capacity (Ac-ft) 0.02	Area (acres) Capacity (Ac-ft) 0.03	Area (acres) Capacity (Ac-ft) 0.04	Area (acres) Capacity (Ac-ft) 0.05	Area (acres) Capacity (Ac-ft) 0.06	Area (acres) Capacity (Ac-ft) 0.07	Area (acres) Capacity (Ac-ft) 0.08	Area (acres) Capacity (Ac-ft) 0.09
92	5601	5607	5612	5618	5623	5628	5634	5639	5645	5650
	25666	25722	25778	25834	25890	25947	26003	26059	26116	26172
92.1	5656	5661	5667	5672	5678	5683	5689	5694	5700	5705
	26229	26285	26342	26399	26456	26512	26569	26626	26683	26740
92.2	5711	5716	5722	5727	5733	5738	5744	5749	5755	5761
	26797	26854	26911	26969	27026	27083	27141	27198	27256	27313
92.3	5766	5772	5777	5783	5788	5794	5799	5805	5810	5816
	27371	27429	27486	27544	27602	27660	27718	27776	27834	27892
92.4	5822	5827	5833	5838	5844	5849	5855	5861	5866	5872
	27950	28009	28067	28125	28184	28242	28301	28359	28418	28477
92.5	5877	5883	5889	5894	5900	5905	5911	5917	5922	5928
	28535	28594	28653	28712	28771	28830	28889	28948	29007	29067
92.6	5933	5939	5945	5950	5956	5961	5967	5973	5978	5984
	29126	29185	29245	29304	29364	29423	29483	29543	29602	29662
92.7	5990	5995	6001	6007	6012	6018	6024	6029	6035	6041
	29722	29782	29842	29902	29962	30022	30082	30143	30203	30263
92.8	6046	6052	6058	6063	6069	6075	6080	6086	6092	6097
	30324	30384	30445	30505	30566	30627	30688	30748	30809	30870
92.9	6103	6109	6114	6120	6126	6132	6137	6143	6149	6154
	30931	30992	31053	31115	31176	31237	31298	31360	31421	31483
93	6160	6166	6171	6177	6183	6188	6194	6199	6205	6211
	31544	31606	31668	31729	31791	31853	31915	31977	32039	32101
93.1	6216	6222	6228	6233	6239	6245	6250	6256	6261	6267
	32163	32225	32288	32350	32412	32475	32537	32600	32662	32725
93.2	6273	6278	6284	6290	6295	6301	6307	6312	6318	6324
	32788	32850	32913	32976	33039	33102	33165	33228	33291	33355
93.3	6329	6335	6341	6346	6352	6358	6364	6369	6375	6381
	33418	33481	33545	33608	33671	33735	33799	33862	33926	33990
93.4	6386	6392	6398	6403	6409	6415	6421	6426	6432	6438
	34054	34118	34181	34245	34310	34374	34438	34502	34566	34631
93.5	6444	6449	6455	6461	6466	6472	6478	6484	6489	6495
	34695	34760	34824	34889	34953	35018	35083	35148	35212	35277
93.6	6501	6507	6512	6518	6524	6530	6536	6541	6547	6553
	35342	35407	35472	35538	35603	35668	35733	35799	35864	35930
93.7	6559	6564	6570	6576	6582	6588	6593	6599	6605	6611
	35995	36061	36127	36192	36258	36324	36390	36456	36522	36588
93.8	6617	6622	6628	6634	6640	6646	6651	6657	6663	6669
	36654	36720	36787	36853	36919	36986	37052	37119	37185	37252
93.9	6675	6681	6686	6692	6698	6704	6710	6716	6722	6727
	37319	37385	37452	37519	37586	37653	37720	37787	37854	37922

Elevation-Area/Capacity Table - Addicks Reservoir

Elevation (ft) NAVD 1988	Area (acres) Capacity (Ac-ft) 0	Area (acres) Capacity (Ac-ft) 0.01	Area (acres) Capacity (Ac-ft) 0.02	Area (acres) Capacity (Ac-ft) 0.03	Area (acres) Capacity (Ac-ft) 0.04	Area (acres) Capacity (Ac-ft) 0.05	Area (acres) Capacity (Ac-ft) 0.06	Area (acres) Capacity (Ac-ft) 0.07	Area (acres) Capacity (Ac-ft) 0.08	Area (acres) Capacity (Ac-ft) 0.09
94	6733	6739	6745	6750	6756	6762	6767	6773	6779	6784
	37989	38056	38124	38191	38259	38326	38394	38462	38530	38597
94.1	6790	6796	6801	6807	6813	6819	6824	6830	6836	6841
	38665	38733	38801	38869	38937	39005	39074	39142	39210	39279
94.2	6847	6853	6859	6864	6870	6876	6882	6887	6893	6899
	39347	39416	39484	39553	39621	39690	39759	39828	39897	39966
94.3	6904	6910	6916	6922	6927	6933	6939	6945	6951	6956
	40035	40104	40173	40242	40311	40381	40450	40519	40589	40658
94.4	6962	6968	6974	6979	6985	6991	6997	7002	7008	7014
	40728	40798	40867	40937	41007	41077	41147	41217	41287	41357
94.5	7020	7026	7031	7037	7043	7049	7055	7060	7066	7072
	41427	41497	41568	41638	41708	41779	41849	41920	41991	42061
94.6	7078	7084	7090	7095	7101	7107	7113	7119	7125	7130
	42132	42203	42274	42345	42416	42487	42558	42629	42700	42771
94.7	7136	7142	7148	7154	7160	7165	7171	7177	7183	7189
	42843	42914	42985	43057	43129	43200	43272	43344	43415	43487
94.8	7195	7201	7206	7212	7218	7224	7230	7236	7242	7248
	43559	43631	43703	43775	43847	43920	43992	44064	44137	44209
94.9	7253	7259	7265	7271	7277	7283	7289	7295	7301	7307
	44282	44354	44427	44499	44572	44645	44718	44791	44864	44937
95	7312	7319	7326	7333	7340	7347	7354	7361	7368	7375
	45010	45083	45156	45230	45303	45376	45450	45523	45597	45671
95.1	7382	7389	7396	7403	7410	7417	7425	7432	7439	7446
	45745	45818	45892	45966	46040	46115	46189	46263	46337	46412
95.2	7453	7460	7467	7474	7481	7488	7495	7502	7509	7516
	46486	46561	46636	46710	46785	46860	46935	47010	47085	47160
95.3	7523	7530	7537	7544	7552	7559	7566	7573	7580	7587
	47235	47310	47386	47461	47537	47612	47688	47764	47839	47915
95.4	7594	7601	7608	7616	7623	7630	7637	7644	7651	7658
	47991	48067	48143	48219	48295	48372	48448	48524	48601	48677
95.5	7665	7673	7680	7687	7694	7701	7708	7716	7723	7730
	48754	48831	48907	48984	49061	49138	49215	49292	49370	49447
95.6	7737	7744	7751	7759	7766	7773	7780	7787	7795	7802
	49524	49602	49679	49757	49834	49912	49990	50067	50145	50223
95.7	7809	7816	7823	7831	7838	7845	7852	7859	7867	7874
	50301	50380	50458	50536	50614	50693	50771	50850	50928	51007
95.8	7881	7888	7896	7903	7910	7917	7925	7932	7939	7947
	51086	51165	51244	51323	51402	51481	51560	51639	51719	51798
95.9	7954	7961	7968	7976	7983	7990	7998	8005	8012	8019
	51878	51957	52037	52117	52196	52276	52356	52436	52516	52596

Table 7-01

Elevation-Area/Capacity Table - Addicks Reservoir

Elevation (ft) NAVD 1988	Area (acres) Capacity (Ac-ft) 0	Area (acres) Capacity (Ac-ft) 0.01	Area (acres) Capacity (Ac-ft) 0.02	Area (acres) Capacity (Ac-ft) 0.03	Area (acres) Capacity (Ac-ft) 0.04	Area (acres) Capacity (Ac-ft) 0.05	Area (acres) Capacity (Ac-ft) 0.06	Area (acres) Capacity (Ac-ft) 0.07	Area (acres) Capacity (Ac-ft) 0.08	Area (acres) Capacity (Ac-ft) 0.09
96	8027	8035	8043	8051	8059	8067	8075	8083	8092	8100
	52677	52757	52837	52918	52998	53079	53160	53241	53321	53402
96.1	8108	8116	8124	8132	8140	8148	8157	8165	8173	8181
	53483	53565	53646	53727	53808	53890	53971	54053	54135	54216
96.2	8189	8197	8206	8214	8222	8230	8238	8246	8255	8263
	54298	54380	54462	54544	54627	54709	54791	54874	54956	55039
96.3	8271	8279	8287	8296	8304	8312	8320	8329	8337	8345
	55121	55204	55287	55370	55453	55536	55619	55702	55786	55869
96.4	8353	8362	8370	8378	8386	8395	8403	8411	8419	8428
	55953	56036	56120	56203	56287	56371	56455	56539	56623	56708
96.5	8436	8444	8453	8461	8469	8477	8486	8494	8502	8511
	56792	56876	56961	57045	57130	57215	57300	57385	57470	57555
96.6	8519	8527	8536	8544	8552	8561	8569	8577	8586	8594
	57640	57725	57810	57896	57981	58067	58152	58238	58324	58410
96.7	8603	8611	8619	8628	8636	8644	8653	8661	8670	8678
	58496	58582	58668	58754	58841	58927	59013	59100	59187	59273
96.8	8686	8695	8703	8712	8720	8729	8737	8745	8754	8762
	59360	59447	59534	59621	59708	59796	59883	59970	60058	60145
96.9	8771	8779	8788	8796	8805	8813	8821	8830	8838	8847
	60233	60321	60409	60497	60585	60673	60761	60849	60937	61026
97	8855	8863	8870	8877	8884	8891	8899	8906	8913	8920
	61114	61203	61292	61380	61469	61558	61647	61736	61825	61914
97.1	8927	8935	8942	8949	8956	8964	8971	8978	8985	8992
	62004	62093	62182	62272	62361	62451	62540	62630	62720	62810
97.2	9000	9007	9014	9021	9029	9036	9043	9050	9058	9065
	62900	62990	63080	63170	63260	63351	63441	63532	63622	63713
97.3	9072	9080	9087	9094	9101	9109	9116	9123	9130	9138
	63803	63894	63985	64076	64167	64258	64349	64440	64532	64623
97.4	9145	9152	9160	9167	9174	9182	9189	9196	9204	9211
	64714	64806	64897	64989	65081	65173	65264	65356	65448	65540
97.5	9218	9226	9233	9240	9248	9255	9262	9270	9277	9284
	65633	65725	65817	65909	66002	66094	66187	66280	66372	66465
97.6	9292	9299	9306	9314	9321	9328	9336	9343	9351	9358
	66558	66651	66744	66837	66930	67024	67117	67210	67304	67397
97.7	9365	9373	9380	9388	9395	9402	9410	9417	9425	9432
	67491	67585	67678	67772	67866	67960	68054	68148	68242	68337
97.8	9439	9447	9454	9462	9469	9477	9484	9491	9499	9506
	68431	68526	68620	68715	68809	68904	68999	69094	69189	69284
97.9	9514	9521	9529	9536	9544	9551	9558	9566	9573	9581
	69379	69474	69569	69664	69760	69855	69951	70047	70142	70238

Elevation-Area/Capacity Table - Addicks Reservoir

Elevation (ft) NAVD 1988	Area (acres) Capacity (Ac-ft) 0	Area (acres) Capacity (Ac-ft) 0.01	Area (acres) Capacity (Ac-ft) 0.02	Area (acres) Capacity (Ac-ft) 0.03	Area (acres) Capacity (Ac-ft) 0.04	Area (acres) Capacity (Ac-ft) 0.05	Area (acres) Capacity (Ac-ft) 0.06	Area (acres) Capacity (Ac-ft) 0.07	Area (acres) Capacity (Ac-ft) 0.08	Area (acres) Capacity (Ac-ft) 0.09
98	9588	9596	9604	9612	9620	9628	9636	9643	9651	9659
	70334	70430	70526	70622	70718	70814	70911	71007	71103	71200
98.1	9667	9675	9683	9691	9699	9707	9715	9723	9731	9738
	71297	71393	71490	71587	71684	71781	71878	71975	72073	72170
98.2	9746	9754	9762	9770	9778	9786	9794	9802	9810	9818
	72267	72365	72462	72560	72658	72756	72854	72951	73050	73148
98.3	9826	9834	9842	9850	9858	9866	9874	9882	9890	9898
	73246	73344	73443	73541	73640	73738	73837	73936	74035	74133
98.4	9906	9914	9922	9930	9938	9946	9954	9962	9970	9978
	74232	74332	74431	74530	74629	74729	74828	74928	75028	75127
98.5	9986	9994	10002	10010	10018	10026	10034	10042	10050	10058
	75227	75327	75427	75527	75627	75727	75828	75928	76029	76129
98.6	10067	10075	10083	10091	10099	10107	10115	10123	10131	10139
	76230	76330	76431	76532	76633	76734	76835	76936	77038	77139
98.7	10147	10155	10164	10172	10180	10188	10196	10204	10212	10220
	77240	77342	77444	77545	77647	77749	77851	77953	78055	78157
98.8	10229	10237	10245	10253	10261	10269	10277	10286	10294	10302
	78259	78362	78464	78566	78669	78772	78874	78977	79080	79183
98.9	10310	10318	10326	10334	10343	10351	10359	10367	10375	10384
	79286	79389	79492	79596	79699	79803	79906	80010	80114	80217
99	10392	10400	10408	10415	10423	10431	10439	10447	10455	10463
	80321	80425	80529	80633	80737	80842	80946	81051	81155	81260
99.1	10471	10479	10486	10494	10502	10510	10518	10526	10534	10542
	81364	81469	81574	81679	81784	81889	81994	82099	82204	82310
99.2	10550	10558	10566	10574	10582	10589	10597	10605	10613	10621
	82415	82521	82626	82732	82838	82944	83050	83156	83262	83368
99.3	10629	10637	10645	10653	10661	10669	10677	10685	10693	10701
	83474	83581	83687	83794	83900	84007	84113	84220	84327	84434
99.4	10709	10717	10725	10733	10741	10749	10757	10765	10773	10781
	84541	84648	84756	84863	84970	85078	85185	85293	85400	85508
99.5	10789	10797	10805	10813	10821	10829	10837	10845	10853	10861
	85616	85724	85832	85940	86048	86157	86265	86373	86482	86590
99.6	10869	10877	10885	10894	10902	10910	10918	10926	10934	10942
	86699	86808	86917	87025	87134	87243	87353	87462	87571	87681
99.7	10950	10958	10966	10974	10982	10990	10999	11007	11015	11023
	87790	87900	88009	88119	88229	88338	88448	88558	88669	88779
99.8	11031	11039	11047	11055	11063	11072	11080	11088	11096	11104
	88889	88999	89110	89220	89331	89442	89552	89663	89774	89885
99.9	11112	11120	11128	11137	11145	11153	11161	11169	11177	11186
	89996	90107	90219	90330	90441	90553	90664	90776	90888	91000

Table 7-01

Elevation-Area/Capacity Table - Addicks Reservoir

Elevation (ft) NAVD 1988	Area (acres) Capacity (Ac-ft) 0	Area (acres) Capacity (Ac-ft) 0.01	Area (acres) Capacity (Ac-ft) 0.02	Area (acres) Capacity (Ac-ft) 0.03	Area (acres) Capacity (Ac-ft) 0.04	Area (acres) Capacity (Ac-ft) 0.05	Area (acres) Capacity (Ac-ft) 0.06	Area (acres) Capacity (Ac-ft) 0.07	Area (acres) Capacity (Ac-ft) 0.08	Area (acres) Capacity (Ac-ft) 0.09
100	11194	11200	11207	11214	11221	11228	11234	11241	11248	11255
	91111	91223	91335	91448	91560	91672	91784	91897	92009	92122
100.1	11261	11268	11275	11282	11288	11295	11302	11309	11316	11322
	92234	92347	92460	92572	92685	92798	92911	93024	93137	93250
100.2	11329	11336	11343	11350	11356	11363	11370	11377	11384	11390
	93364	93477	93590	93704	93817	93931	94045	94158	94272	94386
100.3	11397	11404	11411	11418	11425	11431	11438	11445	11452	11459
	94500	94614	94728	94842	94957	95071	95185	95300	95414	95529
100.4	11466	11472	11479	11486	11493	11500	11507	11513	11520	11527
	95643	95758	95873	95987	96102	96217	96332	96447	96563	96678
100.5	11534	11541	11548	11555	11561	11568	11575	11582	11589	11596
	96793	96909	97024	97140	97255	97371	97486	97602	97718	97834
100.6	11603	11609	11616	11623	11630	11637	11644	11651	11658	11665
	97950	98066	98182	98298	98415	98531	98647	98764	98880	98997
100.7	11671	11678	11685	11692	11699	11706	11713	11720	11727	11734
	99114	99230	99347	99464	99581	99698	99815	99932	100050	100167
100.8	11741	11747	11754	11761	11768	11775	11782	11789	11796	11803
	100284	100402	100519	100637	100754	100872	100990	101108	101226	101344
100.9	11810	11817	11824	11831	11838	11845	11851	11858	11865	11872
	101462	101580	101698	101816	101935	102053	102172	102290	102409	102528
101	11879	11885	11892	11898	11904	11910	11916	11922	11928	11934
	102646	102765	102884	103003	103122	103241	103360	103479	103599	103718
101.1	11941	11947	11953	11959	11965	11971	11977	11983	11990	11996
	103837	103957	104076	104196	104315	104435	104555	104675	104794	104914
101.2	12002	12008	12014	12020	12027	12033	12039	12045	12051	12057
	105034	105154	105275	105395	105515	105635	105756	105876	105997	106117
101.3	12063	12070	12076	12082	12088	12094	12101	12107	12113	12119
	106238	106358	106479	106600	106721	106842	106963	107084	107205	107326
101.4	12125	12131	12138	12144	12150	12156	12162	12169	12175	12181
	107447	107568	107690	107811	107933	108054	108176	108297	108419	108541
101.5	12187	12193	12199	12206	12212	12218	12224	12231	12237	12243
	108663	108785	108907	109029	109151	109273	109395	109517	109640	109762
101.6	12249	12255	12262	12268	12274	12280	12286	12293	12299	12305
	109885	110007	110130	110252	110375	110498	110621	110743	110866	110989
101.7	12311	12318	12324	12330	12336	12342	12349	12355	12361	12367
	111113	111236	111359	111482	111605	111729	111852	111976	112099	112223
101.8	12374	12380	12386	12392	12399	12405	12411	12417	12424	12430
	112347	112471	112594	112718	112842	112966	113090	113214	113339	113463
101.9	12436	12442	12449	12455	12461	12468	12474	12480	12486	12493
	113587	113712	113836	113961	114085	114210	114335	114459	114584	114709

Table 7-01

Elevation-Area/Capacity Table - Addicks Reservoir

Elevation (ft) NAVD 1988	Area (acres) Capacity (Ac-ft) 0	Area (acres) Capacity (Ac-ft) 0.01	Area (acres) Capacity (Ac-ft) 0.02	Area (acres) Capacity (Ac-ft) 0.03	Area (acres) Capacity (Ac-ft) 0.04	Area (acres) Capacity (Ac-ft) 0.05	Area (acres) Capacity (Ac-ft) 0.06	Area (acres) Capacity (Ac-ft) 0.07	Area (acres) Capacity (Ac-ft) 0.08	Area (acres) Capacity (Ac-ft) 0.09
102	12499	12504	12509	12514	12519	12524	12530	12535	12540	12545
	114834	114959	115084	115209	115334	115460	115585	115710	115836	115961
102.1	12550	12555	12560	12565	12571	12576	12581	12586	12591	12596
	116086	116212	116338	116463	116589	116715	116840	116966	117092	117218
102.2	12601	12607	12612	12617	12622	12627	12632	12637	12643	12648
	117344	117470	117596	117722	117849	117975	118101	118227	118354	118480
102.3	12653	12658	12663	12668	12674	12679	12684	12689	12694	12699
	118607	118733	118860	118987	119113	119240	119367	119494	119621	119748
102.4	12704	12710	12715	12720	12725	12730	12735	12741	12746	12751
	119875	120002	120129	120256	120383	120511	120638	120765	120893	121020
102.5	12756	12761	12766	12772	12777	12782	12787	12792	12798	12803
	121148	121275	121403	121531	121658	121786	121914	122042	122170	122298
102.6	12808	12813	12818	12823	12829	12834	12839	12844	12849	12855
	122426	122554	122682	122810	122939	123067	123195	123324	123452	123581
102.7	12860	12865	12870	12875	12881	12886	12891	12896	12901	12907
	123709	123838	123967	124095	124224	124353	124482	124611	124740	124869
102.8	12912	12917	12922	12927	12933	12938	12943	12948	12953	12959
	124998	125127	125256	125385	125515	125644	125773	125903	126032	126162
102.9	12964	12969	12974	12979	12985	12990	12995	13000	13006	13011
	126292	126421	126551	126681	126811	126940	127070	127200	127330	127460
103	13016	13021	13025	13030	13034	13039	13044	13048	13053	13057
	127591	127721	127851	127981	128112	128242	128372	128503	128633	128764
103.1	13062	13067	13071	13076	13080	13085	13090	13094	13099	13104
	128895	129025	129156	129287	129417	129548	129679	129810	129941	130072
103.2	13108	13113	13117	13122	13127	13131	13136	13141	13145	13150
	130203	130334	130465	130596	130728	130859	130990	131122	131253	131385
103.3	13154	13159	13164	13168	13173	13178	13182	13187	13191	13196
	131516	131648	131779	131911	132043	132174	132306	132438	132570	132702
103.4	13201	13205	13210	13215	13219	13224	13228	13233	13238	13242
	132834	132966	133098	133230	133362	133495	133627	133759	133891	134024
103.5	13247	13252	13256	13261	13266	13270	13275	13280	13284	13289
	134156	134289	134421	134554	134687	134819	134952	135085	135218	135350
103.6	13293	13298	13303	13307	13312	13317	13321	13326	13331	13335
	135483	135616	135749	135882	136015	136149	136282	136415	136548	136682
103.7	13340	13345	13349	13354	13359	13363	13368	13373	13377	13382
	136815	136948	137082	137215	137349	137483	137616	137750	137884	138017
103.8	13387	13391	13396	13401	13405	13410	13415	13419	13424	13429
	138151	138285	138419	138553	138687	138821	138955	139090	139224	139358
103.9	13433	13438	13443	13447	13452	13457	13461	13466	13471	13475
	139492	139627	139761	139895	140030	140165	140299	140434	140568	140703

Table 7-01

Elevation-Area/Capacity Table - Addicks Reservoir

Elevation (ft) NAVD 1988	Area (acres) Capacity (Ac-ft) 0	Area (acres) Capacity (Ac-ft) 0.01	Area (acres) Capacity (Ac-ft) 0.02	Area (acres) Capacity (Ac-ft) 0.03	Area (acres) Capacity (Ac-ft) 0.04	Area (acres) Capacity (Ac-ft) 0.05	Area (acres) Capacity (Ac-ft) 0.06	Area (acres) Capacity (Ac-ft) 0.07	Area (acres) Capacity (Ac-ft) 0.08	Area (acres) Capacity (Ac-ft) 0.09
104	13480	13486	13491	13496	13502	13507	13513	13518	13524	13529
	140838	140973	141108	141243	141378	141513	141648	141783	141918	142053
104.1	13535	13540	13546	13551	13557	13562	13568	13573	13579	13584
	142189	142324	142460	142595	142731	142866	143002	143137	143273	143409
104.2	13590	13595	13601	13606	13612	13617	13623	13628	13634	13639
	143545	143681	143817	143953	144089	144225	144361	144498	144634	144770
104.3	13645	13650	13656	13661	13667	13672	13678	13683	13689	13694
	144907	145043	145180	145316	145453	145590	145726	145863	146000	146137
104.4	13700	13705	13711	13716	13722	13727	13733	13738	13744	13750
	146274	146411	146548	146685	146822	146960	147097	147234	147372	147509
104.5	13755	13761	13766	13772	13777	13783	13788	13794	13799	13805
	147647	147784	147922	148060	148197	148335	148473	148611	148749	148887
104.6	13810	13816	13822	13827	13833	13838	13844	13849	13855	13860
	149025	149163	149301	149439	149578	149716	149855	149993	150131	150270
104.7	13866	13871	13877	13883	13888	13894	13899	13905	13910	13916
	150409	150547	150686	150825	150964	151103	151242	151381	151520	151659
104.8	13921	13927	13933	13938	13944	13949	13955	13960	13966	13972
	151798	151937	152077	152216	152355	152495	152634	152774	152914	153053
104.9	13977	13983	13988	13994	13999	14005	14011	14016	14022	14027
	153193	153333	153473	153613	153753	153893	154033	154173	154313	154453
105	14033	14039	14044	14050	14055	14061	14067	14072	14078	14084
	154593	154734	154874	155015	155155	155296	155436	155577	155718	155859
105.1	14089	14095	14101	14106	14112	14118	14123	14129	14135	14140
	156000	156141	156282	156423	156564	156705	156846	156987	157129	157270
105.2	14146	14152	14157	14163	14169	14174	14180	14186	14191	14197
	157411	157553	157694	157836	157978	158119	158261	158403	158545	158687
105.3	14203	14208	14214	14220	14225	14231	14237	14242	14248	14254
	158829	158971	159113	159255	159397	159540	159682	159824	159967	160109
105.4	14259	14265	14271	14276	14282	14288	14293	14299	14305	14311
	160252	160395	160537	160680	160823	160966	161108	161251	161394	161538
105.5	14316	14322	14328	14333	14339	14345	14350	14356	14362	14368
	161681	161824	161967	162110	162254	162397	162541	162684	162828	162971
105.6	14373	14379	14385	14390	14396	14402	14408	14413	14419	14425
	163115	163259	163403	163547	163691	163835	163979	164123	164267	164411
105.7	14430	14436	14442	14448	14453	14459	14465	14470	14476	14482
	164555	164700	164844	164988	165133	165278	165422	165567	165712	165856
105.8	14488	14493	14499	14505	14511	14516	14522	14528	14533	14539
	166001	166146	166291	166436	166581	166726	166872	167017	167162	167307
105.9	14545	14551	14556	14562	14568	14574	14579	14585	14591	14597
	167453	167598	167744	167889	168035	168181	168327	168472	168618	168764

Table 7-01

Elevation-Area/Capacity Table - Addicks Reservoir

Elevation (ft) NAVD 1988	Area (acres) Capacity (Ac-ft) 0	Area (acres) Capacity (Ac-ft) 0.01	Area (acres) Capacity (Ac-ft) 0.02	Area (acres) Capacity (Ac-ft) 0.03	Area (acres) Capacity (Ac-ft) 0.04	Area (acres) Capacity (Ac-ft) 0.05	Area (acres) Capacity (Ac-ft) 0.06	Area (acres) Capacity (Ac-ft) 0.07	Area (acres) Capacity (Ac-ft) 0.08	Area (acres) Capacity (Ac-ft) 0.09
106	14602	14610	14617	14624	14631	14639	14646	14653	14660	14668
	168910	169056	169202	169349	169495	169641	169788	169934	170081	170227
106.1	14675	14682	14689	14697	14704	14711	14718	14726	14733	14740
	170374	170521	170668	170815	170962	171109	171256	171403	171550	171698
106.2	14748	14755	14762	14769	14777	14784	14791	14799	14806	14813
	171845	171993	172140	172288	172436	172583	172731	172879	173027	173175
106.3	14820	14828	14835	14842	14850	14857	14864	14872	14879	14886
	173324	173472	173620	173769	173917	174066	174214	174363	174512	174660
106.4	14893	14901	14908	14915	14923	14930	14937	14945	14952	14959
	174809	174958	175107	175256	175406	175555	175704	175854	176003	176153
106.5	14967	14974	14981	14989	14996	15003	15011	15018	15025	15033
	176302	176452	176602	176752	176902	177052	177202	177352	177502	177652
106.6	15040	15047	15055	15062	15069	15077	15084	15091	15099	15106
	177803	177953	178104	178254	178405	178556	178706	178857	179008	179159
106.7	15114	15121	15128	15136	15143	15150	15158	15165	15173	15180
	179310	179461	179613	179764	179915	180067	180218	180370	180522	180674
106.8	15187	15195	15202	15209	15217	15224	15232	15239	15246	15254
	180825	180977	181129	181281	181433	181586	181738	181890	182043	182195
106.9	15261	15269	15276	15283	15291	15298	15306	15313	15320	15328
	182348	182500	182653	182806	182959	183112	183265	183418	183571	183724
107	15335	15344	15352	15361	15369	15378	15386	15395	15404	15412
	183878	184031	184184	184338	184492	184645	184799	184953	185107	185261
107.1	15421	15429	15438	15446	15455	15463	15472	15480	15489	15498
	185415	185570	185724	185878	186033	186187	186342	186497	186652	186807
107.2	15506	15515	15523	15532	15540	15549	15558	15566	15575	15583
	186962	187117	187272	187427	187583	187738	187894	188049	188205	188361
107.3	15592	15601	15609	15618	15626	15635	15643	15652	15661	15669
	188517	188673	188829	188985	189141	189297	189454	189610	189767	189923
107.4	15678	15687	15695	15704	15712	15721	15730	15738	15747	15756
	190080	190237	190394	190551	190708	190865	191022	191180	191337	191495
107.5	15764	15773	15781	15790	15799	15807	15816	15825	15833	15842
	191652	191810	191968	192126	192283	192442	192600	192758	192916	193075
107.6	15851	15859	15868	15877	15885	15894	15903	15911	15920	15929
	193233	193392	193550	193709	193868	194027	194186	194345	194504	194663
107.7	15937	15946	15955	15963	15972	15981	15990	15998	16007	16016
	194822	194982	195141	195301	195461	195620	195780	195940	196100	196260
107.8	16024	16033	16042	16050	16059	16068	16077	16085	16094	16103
	196420	196581	196741	196902	197062	197223	197383	197544	197705	197866
107.9	16112	16120	16129	16138	16146	16155	16164	16173	16181	16190
	198027	198188	198350	198511	198672	198834	198995	199157	199319	199481

Table 7-01

Elevation-Area/Capacity Table - Addicks Reservoir

Elevation (ft) NAVD 1988	Area (acres) Capacity (Ac-ft) 0	Area (acres) Capacity (Ac-ft) 0.01	Area (acres) Capacity (Ac-ft) 0.02	Area (acres) Capacity (Ac-ft) 0.03	Area (acres) Capacity (Ac-ft) 0.04	Area (acres) Capacity (Ac-ft) 0.05	Area (acres) Capacity (Ac-ft) 0.06	Area (acres) Capacity (Ac-ft) 0.07	Area (acres) Capacity (Ac-ft) 0.08	Area (acres) Capacity (Ac-ft) 0.09
108	16199	16206	16213	16220	16227	16235	16242	16249	16256	16263
	199643	199805	199967	200129	200291	200454	200616	200778	200941	201104
108.1	16270	16277	16285	16292	16299	16306	16313	16320	16327	16335
	201266	201429	201592	201755	201918	202081	202244	202407	202570	202733
108.2	16342	16349	16356	16363	16370	16377	16385	16392	16399	16406
	202897	203060	203224	203387	203551	203715	203879	204042	204206	204370
108.3	16413	16420	16428	16435	16442	16449	16456	16464	16471	16478
	204535	204699	204863	205027	205192	205356	205521	205685	205850	206015
108.4	16485	16492	16499	16507	16514	16521	16528	16535	16543	16550
	206179	206344	206509	206674	206839	207005	207170	207335	207501	207666
108.5	16557	16564	16571	16579	16586	16593	16600	16607	16615	16622
	207832	207997	208163	208329	208494	208660	208826	208992	209158	209325
108.6	16629	16636	16644	16651	16658	16665	16672	16680	16687	16694
	209491	209657	209824	209990	210157	210323	210490	210657	210824	210990
108.7	16701	16709	16716	16723	16730	16738	16745	16752	16759	16766
	211157	211324	211492	211659	211826	211993	212161	212328	212496	212663
108.8	16774	16781	16788	16795	16803	16810	16817	16825	16832	16839
	212831	212999	213167	213335	213503	213671	213839	214007	214175	214344
108.9	16846	16854	16861	16868	16875	16883	16890	16897	16904	16912
	214512	214681	214849	215018	215187	215355	215524	215693	215862	216031
109	16919	16926	16933	16940	16947	16954	16961	16968	16975	16982
	216200	216370	216539	216708	216878	217047	217217	217386	217556	217726
109.1	16989	16996	17003	17010	17017	17024	17031	17038	17045	17052
	217896	218066	218236	218406	218576	218746	218916	219087	219257	219428
109.2	17059	17066	17073	17080	17087	17094	17101	17108	17115	17123
	219598	219769	219940	220110	220281	220452	220623	220794	220965	221136
109.3	17130	17137	17144	17151	17158	17165	17172	17179	17186	17193
	221308	221479	221650	221822	221993	222165	222337	222508	222680	222852
109.4	17200	17207	17214	17221	17228	17235	17242	17249	17257	17264
	223024	223196	223368	223540	223713	223885	224057	224230	224402	224575
109.5	17271	17278	17285	17292	17299	17306	17313	17320	17327	17334
	224748	224920	225093	225266	225439	225612	225785	225958	226132	226305
109.6	17341	17348	17356	17363	17370	17377	17384	17391	17398	17405
	226478	226652	226825	226999	227173	227346	227520	227694	227868	228042
109.7	17412	17419	17427	17434	17441	17448	17455	17462	17469	17476
	228216	228390	228564	228739	228913	229087	229262	229437	229611	229786
109.8	17483	17490	17498	17505	17512	17519	17526	17533	17540	17547
	229961	230136	230311	230486	230661	230836	231011	231186	231362	231537
109.9	17555	17562	17569	17576	17583	17590	17597	17604	17612	17619
	231713	231888	232064	232240	232415	232591	232767	232943	233119	233295

Elevation-Area/Capacity Table - Addicks Reservoir

Elevation (ft) NAVD 1988	Area (acres) Capacity (Ac-ft) 0	Area (acres) Capacity (Ac-ft) 0.01	Area (acres) Capacity (Ac-ft) 0.02	Area (acres) Capacity (Ac-ft) 0.03	Area (acres) Capacity (Ac-ft) 0.04	Area (acres) Capacity (Ac-ft) 0.05	Area (acres) Capacity (Ac-ft) 0.06	Area (acres) Capacity (Ac-ft) 0.07	Area (acres) Capacity (Ac-ft) 0.08	Area (acres) Capacity (Ac-ft) 0.09
110	17626	17632	17639	17646	17652	17659	17665	17672	17679	17685
	233472	233648	233824	234001	234177	234354	234530	234707	234884	235061
110.1	17692	17699	17705	17712	17718	17725	17732	17738	17745	17751
	235238	235415	235592	235769	235946	236123	236300	236478	236655	236833
110.2	17758	17765	17771	17778	17785	17791	17798	17804	17811	17818
	237010	237188	237365	237543	237721	237899	238077	238255	238433	238611
110.3	17824	17831	17838	17844	17851	17858	17864	17871	17877	17884
	238789	238967	239146	239324	239503	239681	239860	240039	240217	240396
110.4	17891	17897	17904	17911	17917	17924	17931	17937	17944	17951
	240575	240754	240933	241112	241291	241470	241650	241829	242008	242188
110.5	17957	17964	17971	17977	17984	17991	17997	18004	18011	18017
	242367	242547	242727	242906	243086	243266	243446	243626	243806	243986
110.6	18024	18031	18037	18044	18051	18057	18064	18071	18077	18084
	244166	244347	244527	244707	244888	245068	245249	245430	245610	245791
110.7	18091	18097	18104	18111	18117	18124	18131	18137	18144	18151
	245972	246153	246334	246515	246696	246877	247059	247240	247421	247603
110.8	18158	18164	18171	18178	18184	18191	18198	18204	18211	18218
	247785	247966	248148	248330	248511	248693	248875	249057	249239	249421
110.9	18225	18231	18238	18245	18251	18258	18265	18271	18278	18285
	249604	249786	249968	250151	250333	250516	250698	250881	251064	251247
111	18292	18297	18303	18309	18314	18320	18325	18331	18337	18342
	251429	251612	251795	251978	252162	252345	252528	252711	252895	253078
111.1	18348	18353	18359	18365	18370	18376	18382	18387	18393	18399
	253261	253445	253628	253812	253996	254179	254363	254547	254731	254915
111.2	18404	18410	18415	18421	18427	18432	18438	18444	18449	18455
	255099	255283	255467	255651	255836	256020	256204	256389	256573	256758
111.3	18461	18466	18472	18477	18483	18489	18494	18500	18506	18511
	256942	257127	257312	257496	257681	257866	258051	258236	258421	258606
111.4	18517	18523	18528	18534	18540	18545	18551	18557	18562	18568
	258791	258976	259162	259347	259532	259718	259903	260089	260274	260460
111.5	18574	18579	18585	18591	18596	18602	18608	18613	18619	18625
	260646	260831	261017	261203	261389	261575	261761	261947	262133	262320
111.6	18630	18636	18642	18647	18653	18659	18664	18670	18676	18681
	262506	262692	262879	263065	263251	263438	263625	263811	263998	264185
111.7	18687	18693	18698	18704	18710	18715	18721	18727	18732	18738
	264372	264559	264746	264933	265120	265307	265494	265681	265868	266056
111.8	18744	18749	18755	18761	18767	18772	18778	18784	18789	18795
	266243	266431	266618	266806	266993	267181	267369	267557	267745	267932
111.9	18801	18806	18812	18818	18823	18829	18835	18841	18846	18852
	268120	268308	268497	268685	268873	269061	269250	269438	269626	269815

Table 7-01

Elevation-Area/Capacity Table - Addicks Reservoir

Elevation (ft) NAVD 1988	Area (acres) Capacity (Ac-ft) 0	Area (acres) Capacity (Ac-ft) 0.01	Area (acres) Capacity (Ac-ft) 0.02	Area (acres) Capacity (Ac-ft) 0.03	Area (acres) Capacity (Ac-ft) 0.04	Area (acres) Capacity (Ac-ft) 0.05	Area (acres) Capacity (Ac-ft) 0.06	Area (acres) Capacity (Ac-ft) 0.07	Area (acres) Capacity (Ac-ft) 0.08	Area (acres) Capacity (Ac-ft) 0.09
112	18858	18864	18871	18877	18884	18890	18897	18903	18910	18916
	270003	270192	270381	270569	270758	270947	271136	271325	271514	271703
112.1	18923	18929	18936	18942	18949	18956	18962	18969	18975	18982
	271892	272082	272271	272460	272650	272839	273029	273219	273408	273598
112.2	18988	18995	19001	19008	19014	19021	19027	19034	19040	19047
	273788	273978	274168	274358	274548	274738	274928	275119	275309	275500
112.3	19054	19060	19067	19073	19080	19086	19093	19099	19106	19113
	275690	275881	276071	276262	276453	276644	276834	277025	277216	277408
112.4	19119	19126	19132	19139	19145	19152	19158	19165	19172	19178
	277599	277790	277981	278173	278364	278555	278747	278939	279130	279322
112.5	19185	19191	19198	19204	19211	19218	19224	19231	19237	19244
	279514	279706	279898	280090	280282	280474	280666	280858	281051	281243
112.6	19250	19257	19264	19270	19277	19283	19290	19297	19303	19310
	281436	281628	281821	282013	282206	282399	282592	282785	282978	283171
112.7	19316	19323	19329	19336	19343	19349	19356	19362	19369	19376
	283364	283557	283750	283944	284137	284331	284524	284718	284911	285105
112.8	19382	19389	19395	19402	19409	19415	19422	19429	19435	19442
	285299	285493	285687	285881	286075	286269	286463	286657	286852	287046
112.9	19448	19455	19462	19468	19475	19481	19488	19495	19501	19508
	287240	287435	287630	287824	288019	288214	288408	288603	288798	288993
113	19515	19522	19530	19537	19545	19552	19560	19567	19575	19583
	289189	289384	289579	289774	289970	290165	290361	290556	290752	290948
113.1	19590	19598	19605	19613	19620	19628	19636	19643	19651	19658
	291144	291340	291536	291732	291928	292124	292321	292517	292713	292910
113.2	19666	19673	19681	19689	19696	19704	19711	19719	19727	19734
	293107	293303	293500	293697	293894	294091	294288	294485	294682	294880
113.3	19742	19749	19757	19765	19772	19780	19787	19795	19803	19810
	295077	295274	295472	295670	295867	296065	296263	296461	296659	296857
113.4	19818	19825	19833	19841	19848	19856	19864	19871	19879	19886
	297055	297253	297451	297650	297848	298047	298245	298444	298643	298842
113.5	19894	19902	19909	19917	19925	19932	19940	19948	19955	19963
	299041	299240	299439	299638	299837	300036	300236	300435	300635	300834
113.6	19970	19978	19986	19993	20001	20009	20016	20024	20032	20039
	301034	301234	301433	301633	301833	302033	302233	302434	302634	302834
113.7	20047	20055	20062	20070	20078	20085	20093	20101	20108	20116
	303035	303235	303436	303636	303837	304038	304239	304440	304641	304842
113.8	20124	20131	20139	20147	20154	20162	20170	20177	20185	20193
	305043	305244	305446	305647	305849	306050	306252	306454	306656	306857
113.9	20200	20208	20216	20223	20231	20239	20246	20254	20262	20270
	307059	307261	307464	307666	307868	308070	308273	308475	308678	308881

Table 7-01

Elevation-Area/Capacity Table - Addicks Reservoir

Elevation (ft) NAVD 1988	Area (acres) Capacity (Ac-ft) 0	Area (acres) Capacity (Ac-ft) 0.01	Area (acres) Capacity (Ac-ft) 0.02	Area (acres) Capacity (Ac-ft) 0.03	Area (acres) Capacity (Ac-ft) 0.04	Area (acres) Capacity (Ac-ft) 0.05	Area (acres) Capacity (Ac-ft) 0.06	Area (acres) Capacity (Ac-ft) 0.07	Area (acres) Capacity (Ac-ft) 0.08	Area (acres) Capacity (Ac-ft) 0.09
114	20277	20284	20290	20296	20302	20309	20315	20321	20328	20334
	309083	309286	309489	309692	309895	310098	310301	310504	310707	310911
114.1	20340	20346	20353	20359	20365	20372	20378	20384	20390	20397
	311114	311318	311521	311725	311928	312132	312336	312539	312743	312947
114.2	20403	20409	20416	20422	20428	20435	20441	20447	20453	20460
	313151	313355	313559	313764	313968	314172	314377	314581	314786	314990
114.3	20466	20472	20479	20485	20491	20498	20504	20510	20517	20523
	315195	315399	315604	315809	316014	316219	316424	316629	316834	317039
114.4	20529	20536	20542	20548	20555	20561	20567	20573	20580	20586
	317244	317450	317655	317861	318066	318272	318477	318683	318889	319095
114.5	20592	20599	20605	20611	20618	20624	20630	20637	20643	20649
	319301	319507	319713	319919	320125	320331	320537	320744	320950	321156
114.6	20656	20662	20668	20675	20681	20687	20694	20700	20707	20713
	321363	321570	321776	321983	322190	322397	322603	322810	323017	323225
114.7	20719	20726	20732	20738	20745	20751	20757	20764	20770	20776
	323432	323639	323846	324054	324261	324468	324676	324884	325091	325299
114.8	20783	20789	20795	20802	20808	20815	20821	20827	20834	20840
	325507	325715	325923	326131	326339	326547	326755	326963	327171	327380
114.9	20846	20853	20859	20865	20872	20878	20885	20891	20897	20904
	327588	327797	328005	328214	328423	328631	328840	329049	329258	329467
115	20910	20917	20924	20931	20938	20944	20951	20958	20965	20972
	329676	329885	330094	330304	330513	330722	330932	331141	331351	331561
115.1	20979	20986	20992	20999	21006	21013	21020	21027	21034	21041
	331771	331980	332190	332400	332610	332820	333030	333241	333451	333661
115.2	21047	21054	21061	21068	21075	21082	21089	21096	21103	21109
	333872	334082	334293	334504	334714	334925	335136	335347	335558	335769
115.3	21116	21123	21130	21137	21144	21151	21158	21165	21171	21178
	335980	336191	336402	336614	336825	337037	337248	337460	337672	337883
115.4	21185	21192	21199	21206	21213	21220	21227	21234	21241	21247
	338095	338307	338519	338731	338943	339155	339367	339580	339792	340005
115.5	21254	21261	21268	21275	21282	21289	21296	21303	21310	21317
	340217	340430	340642	340855	341068	341281	341494	341707	341920	342133
115.6	21324	21330	21337	21344	21351	21358	21365	21372	21379	21386
	342346	342559	342773	342986	343199	343413	343627	343840	344054	344268
115.7	21393	21400	21407	21414	21421	21428	21434	21441	21448	21455
	344482	344696	344910	345124	345338	345552	345767	345981	346195	346410
115.8	21462	21469	21476	21483	21490	21497	21504	21511	21518	21525
	346625	346839	347054	347269	347484	347699	347914	348129	348344	348559
115.9	21532	21539	21546	21553	21560	21567	21574	21581	21587	21594
	348774	348990	349205	349421	349636	349852	350067	350283	350499	350715

Table 7-02

Elevation-Area/Capacity Table - Barker Reservoir

Elevation (ft) NAVD 1988	Area (acres) Capacity (Ac-ft) 0	Area (acres) Capacity (Ac-ft) 0.01	Area (acres) Capacity (Ac-ft) 0.02	Area (acres) Capacity (Ac-ft) 0.03	Area (acres) Capacity (Ac-ft) 0.04	Area (acres) Capacity (Ac-ft) 0.05	Area (acres) Capacity (Ac-ft) 0.06	Area (acres) Capacity (Ac-ft) 0.07	Area (acres) Capacity (Ac-ft) 0.08	Area (acres) Capacity (Ac-ft) 0.09
72	4	4	4	4	4	4	4	4	4	4
	0	0	0	0	0	0	0	0	0	0
72.1	4	4	4	4	4	4	4	4	4	4
	0	0	0	1	1	1	1	1	1	1
72.2	4	4	4	4	4	4	4	4	4	4
	1	1	1	1	1	1	1	1	1	1
72.3	4	4	5	5	5	5	5	5	5	5
	1	1	1	1	1	1	1	2	2	2
72.4	5	5	5	5	5	5	5	5	5	5
	2	2	2	2	2	2	2	2	2	2
72.5	5	5	5	5	5	5	5	5	5	5
	2	2	2	2	2	2	2	3	3	3
72.6	5	5	5	5	5	5	5	5	5	6
	3	3	3	3	3	3	3	3	3	3
72.7	6	6	6	6	6	6	6	6	6	6
	3	3	3	3	3	4	4	4	4	4
72.8	6	6	6	6	6	6	6	6	6	6
	4	4	4	4	4	4	4	4	4	4
72.9	6	6	6	6	6	6	6	6	6	6
	4	4	5	5	5	5	5	5	5	5
73	6	7	7	7	7	7	7	7	7	7
	5	5	5	5	5	5	5	5	6	6
73.1	7	7	7	7	7	7	8	8	8	8
	6	6	6	6	6	6	6	6	6	6
73.2	8	8	8	8	8	8	8	8	8	9
	6	7	7	7	7	7	7	7	7	7
73.3	9	9	9	9	9	9	9	9	9	9
	7	7	7	8	8	8	8	8	8	8
73.4	9	9	10	10	10	10	10	10	10	10
	8	8	8	8	9	9	9	9	9	9
73.5	10	10	10	10	11	11	11	11	11	11
	9	9	9	9	10	10	10	10	10	10
73.6	11	11	11	11	11	12	12	12	12	12
	10	10	10	11	11	11	11	11	11	11
73.7	12	12	12	12	12	12	13	13	13	13
	11	11	12	12	12	12	12	12	12	12
73.8	13	13	13	13	13	13	13	14	14	14
	13	13	13	13	13	13	13	14	14	14
73.9	14	14	14	14	14	14	14	15	15	15
	14	14	14	14	15	15	15	15	15	15

Table 7-02

Elevation-Area/Capacity Table - Barker Reservoir

Elevation (ft) NAVD 1988	Area (acres) Capacity (Ac-ft) 0	Area (acres) Capacity (Ac-ft) 0.01	Area (acres) Capacity (Ac-ft) 0.02	Area (acres) Capacity (Ac-ft) 0.03	Area (acres) Capacity (Ac-ft) 0.04	Area (acres) Capacity (Ac-ft) 0.05	Area (acres) Capacity (Ac-ft) 0.06	Area (acres) Capacity (Ac-ft) 0.07	Area (acres) Capacity (Ac-ft) 0.08	Area (acres) Capacity (Ac-ft) 0.09
74	15	15	15	15	15	15	16	16	16	16
	15	16	16	16	16	16	16	16	17	17
74.1	16	16	16	16	16	17	17	17	17	17
	17	17	17	17	18	18	18	18	18	18
74.2	17	17	17	17	18	18	18	18	18	18
	19	19	19	19	19	19	20	20	20	20
74.3	18	18	19	19	19	19	19	19	19	19
	20	21	21	21	21	21	21	22	22	22
74.4	20	20	20	20	20	20	20	20	21	21
	22	22	23	23	23	23	23	24	24	24
74.5	21	21	21	21	21	21	22	22	22	22
	24	24	25	25	25	25	26	26	26	26
74.6	22	22	22	22	23	23	23	23	23	23
	26	27	27	27	27	28	28	28	28	28
74.7	23	24	24	24	24	24	24	24	25	25
	29	29	29	29	30	30	30	30	31	31
74.8	25	25	25	25	25	26	26	26	26	26
	31	31	32	32	32	32	33	33	33	33
74.9	26	26	27	27	27	27	27	27	27	28
	34	34	34	34	35	35	35	36	36	36
75	28	28	28	28	28	28	28	28	29	29
	36	37	37	37	37	38	38	38	39	39
75.1	29	29	29	29	29	29	29	29	30	30
	39	39	40	40	40	41	41	41	41	42
75.2	30	30	30	30	30	30	30	30	31	31
	42	42	43	43	43	44	44	44	45	45
75.3	31	31	31	31	31	31	31	32	32	32
	45	45	46	46	46	47	47	47	48	48
75.4	32	32	32	32	32	32	33	33	33	33
	48	49	49	49	50	50	50	51	51	51
75.5	33	33	33	33	33	34	34	34	34	34
	51	52	52	52	53	53	53	54	54	55
75.6	34	34	34	34	35	35	35	35	35	35
	55	55	56	56	56	57	57	57	58	58
75.7	35	35	35	36	36	36	36	36	36	36
	58	59	59	59	60	60	60	61	61	62
75.8	36	37	37	37	37	37	37	37	37	37
	62	62	63	63	63	64	64	64	65	65
75.9	38	38	38	38	38	38	38	38	39	39
	66	66	66	67	67	67	68	68	69	69

Table 7-02

Elevation-Area/Capacity Table - Barker Reservoir

Elevation (ft) NAVD 1988	Area (acres) Capacity (Ac-ft) 0	Area (acres) Capacity (Ac-ft) 0.01	Area (acres) Capacity (Ac-ft) 0.02	Area (acres) Capacity (Ac-ft) 0.03	Area (acres) Capacity (Ac-ft) 0.04	Area (acres) Capacity (Ac-ft) 0.05	Area (acres) Capacity (Ac-ft) 0.06	Area (acres) Capacity (Ac-ft) 0.07	Area (acres) Capacity (Ac-ft) 0.08	Area (acres) Capacity (Ac-ft) 0.09
76	39	39	39	39	40	40	40	40	41	41
	69	70	70	71	71	71	72	72	73	73
76.1	41	41	41	42	42	42	42	43	43	43
	73	74	74	75	75	75	76	76	77	77
76.2	43	44	44	44	44	44	45	45	45	45
	78	78	78	79	79	80	80	81	81	82
76.3	46	46	46	46	47	47	47	47	48	48
	82	83	83	83	84	84	85	85	86	86
76.4	48	48	49	49	49	49	50	50	50	50
	87	87	88	88	89	89	90	90	91	91
76.5	51	51	51	51	52	52	52	52	53	53
	92	92	93	93	94	94	95	95	96	96
76.6	53	53	54	54	54	54	55	55	55	56
	97	97	98	98	99	100	100	101	101	102
76.7	56	56	56	57	57	57	57	58	58	58
	102	103	103	104	105	105	106	106	107	107
76.8	58	59	59	59	60	60	60	60	61	61
	108	109	109	110	110	111	112	112	113	113
76.9	61	62	62	62	62	63	63	63	63	64
	114	115	115	116	116	117	118	118	119	120
77	64	65	65	66	67	68	68	69	70	71
	120	121	122	122	123	124	124	125	126	126
77.1	71	72	73	74	74	75	76	77	78	78
	127	128	129	129	130	131	131	132	133	134
77.2	79	80	81	82	82	83	84	85	86	87
	135	135	136	137	138	139	139	140	141	142
77.3	87	88	89	90	91	92	92	93	94	95
	143	144	145	146	146	147	148	149	150	151
77.4	96	97	98	99	99	100	101	102	103	104
	152	153	154	155	156	157	158	159	160	161
77.5	105	106	107	108	109	110	110	111	112	113
	162	163	164	165	166	167	169	170	171	172
77.6	114	115	116	117	118	119	120	121	122	123
	173	174	175	177	178	179	180	181	183	184
77.7	124	125	126	127	128	129	130	131	132	133
	185	186	187	189	190	191	193	194	195	197
77.8	134	135	136	137	138	139	141	142	143	144
	198	199	201	202	203	205	206	208	209	210
77.9	145	146	147	148	149	150	151	152	154	155
	212	213	215	216	218	219	221	222	224	225

Table 7-02

Elevation-Area/Capacity Table - Barker Reservoir

Elevation (ft) NAVD 1988	Area (acres) Capacity (Ac-ft) 0	Area (acres) Capacity (Ac-ft) 0.01	Area (acres) Capacity (Ac-ft) 0.02	Area (acres) Capacity (Ac-ft) 0.03	Area (acres) Capacity (Ac-ft) 0.04	Area (acres) Capacity (Ac-ft) 0.05	Area (acres) Capacity (Ac-ft) 0.06	Area (acres) Capacity (Ac-ft) 0.07	Area (acres) Capacity (Ac-ft) 0.08	Area (acres) Capacity (Ac-ft) 0.09
78	156	156	157	157	158	159	159	160	160	161
	227	228	230	232	233	235	236	238	240	241
78.1	161	162	162	163	163	164	165	165	166	166
	243	244	246	248	249	251	252	254	256	257
78.2	167	167	168	169	169	170	170	171	171	172
	259	261	262	264	266	268	269	271	273	274
78.3	173	173	174	174	175	175	176	177	177	178
	276	278	280	281	283	285	287	288	290	292
78.4	178	179	179	180	181	181	182	182	183	184
	294	295	297	299	301	303	304	306	308	310
78.5	184	185	185	186	187	187	188	188	189	190
	312	314	315	317	319	321	323	325	327	329
78.6	190	191	191	192	193	193	194	194	195	196
	330	332	334	336	338	340	342	344	346	348
78.7	196	197	197	198	199	199	200	200	201	202
	350	352	354	356	358	360	362	364	366	368
78.8	202	203	204	204	205	205	206	207	207	208
	370	372	374	376	378	380	382	384	386	388
78.9	209	209	210	210	211	212	212	213	214	214
	390	392	394	397	399	401	403	405	407	409
79	215	216	217	218	219	221	222	223	224	225
	411	414	416	418	420	422	425	427	429	431
79.1	226	227	229	230	231	232	233	234	236	237
	433	436	438	440	443	445	447	450	452	454
79.2	238	239	240	241	243	244	245	246	247	249
	457	459	461	464	466	469	471	474	476	479
79.3	250	251	252	254	255	256	257	258	260	261
	481	484	486	489	491	494	496	499	501	504
79.4	262	263	265	266	267	268	270	271	272	273
	507	509	512	515	517	520	523	525	528	531
79.5	275	276	277	278	280	281	282	284	285	286
	533	536	539	542	545	547	550	553	556	559
79.6	287	289	290	291	293	294	295	297	298	299
	562	564	567	570	573	576	579	582	585	588
79.7	301	302	303	305	306	307	309	310	311	313
	591	594	597	600	603	606	609	612	615	619
79.8	314	315	317	318	319	321	322	324	325	326
	622	625	628	631	634	638	641	644	647	651
79.9	328	329	331	332	333	335	336	338	339	340
	654	657	660	664	667	670	674	677	680	684

Table 7-02

Elevation-Area/Capacity Table - Barker Reservoir

Elevation (ft) NAVD 1988	Area (acres) Capacity (Ac-ft) 0	Area (acres) Capacity (Ac-ft) 0.01	Area (acres) Capacity (Ac-ft) 0.02	Area (acres) Capacity (Ac-ft) 0.03	Area (acres) Capacity (Ac-ft) 0.04	Area (acres) Capacity (Ac-ft) 0.05	Area (acres) Capacity (Ac-ft) 0.06	Area (acres) Capacity (Ac-ft) 0.07	Area (acres) Capacity (Ac-ft) 0.08	Area (acres) Capacity (Ac-ft) 0.09
80	342	343	344	345	346	347	348	350	351	352
	687	691	694	698	701	704	708	711	715	718
80.1	353	354	355	356	357	359	360	361	362	363
	722	726	729	733	736	740	743	747	751	754
80.2	364	365	366	368	369	370	371	372	373	375
	758	762	765	769	773	776	780	784	787	791
80.3	376	377	378	379	380	382	383	384	385	386
	795	799	802	806	810	814	818	821	825	829
80.4	387	389	390	391	392	393	394	396	397	398
	833	837	841	845	849	853	856	860	864	868
80.5	399	400	402	403	404	405	406	408	409	410
	872	876	880	884	888	892	897	901	905	909
80.6	411	413	414	415	416	417	419	420	421	422
	913	917	921	925	929	934	938	942	946	950
80.7	424	425	426	427	428	430	431	432	433	435
	955	959	963	967	972	976	980	985	989	993
80.8	436	437	438	440	441	442	443	445	446	447
	998	1,002	1,006	1,011	1,015	1,020	1,024	1,028	1,033	1,037
80.9	448	450	451	452	454	455	456	457	459	460
	1,042	1,046	1,051	1,055	1,060	1,064	1,069	1,073	1,078	1,083
81	461	464	467	469	472	475	478	480	483	486
	1,087	1,092	1,097	1,101	1,106	1,111	1,115	1,120	1,125	1,130
81.1	489	492	494	497	500	503	506	509	511	514
	1,135	1,140	1,145	1,150	1,155	1,160	1,165	1,170	1,175	1,180
81.2	517	520	523	526	529	532	535	538	540	543
	1,185	1,190	1,195	1,201	1,206	1,211	1,217	1,222	1,227	1,233
81.3	546	549	552	555	558	561	564	567	570	573
	1,238	1,244	1,249	1,255	1,260	1,266	1,272	1,277	1,283	1,289
81.4	576	579	582	586	589	592	595	598	601	604
	1,294	1,300	1,306	1,312	1,318	1,324	1,329	1,335	1,341	1,347
81.5	607	610	613	617	620	623	626	629	632	636
	1,354	1,360	1,366	1,372	1,378	1,384	1,391	1,397	1,403	1,409
81.6	639	642	645	648	652	655	658	661	665	668
	1,416	1,422	1,429	1,435	1,442	1,448	1,455	1,461	1,468	1,475
81.7	671	674	678	681	684	688	691	694	698	701
	1,481	1,488	1,495	1,502	1,508	1,515	1,522	1,529	1,536	1,543
81.8	704	708	711	714	718	721	725	728	731	735
	1,550	1,557	1,564	1,571	1,579	1,586	1,593	1,600	1,608	1,615
81.9	738	742	745	749	752	756	759	763	766	770
	1,622	1,630	1,637	1,645	1,652	1,660	1,667	1,675	1,682	1,690

Table 7-02

Elevation-Area/Capacity Table - Barker Reservoir

Elevation (ft) NAVD 1988	Area (acres) Capacity (Ac-ft) 0	Area (acres) Capacity (Ac-ft) 0.01	Area (acres) Capacity (Ac-ft) 0.02	Area (acres) Capacity (Ac-ft) 0.03	Area (acres) Capacity (Ac-ft) 0.04	Area (acres) Capacity (Ac-ft) 0.05	Area (acres) Capacity (Ac-ft) 0.06	Area (acres) Capacity (Ac-ft) 0.07	Area (acres) Capacity (Ac-ft) 0.08	Area (acres) Capacity (Ac-ft) 0.09
82	773	777	780	784	787	791	794	798	802	805
	1,698	1,706	1,713	1,721	1,729	1,737	1,745	1,753	1,761	1,769
82.1	809	812	816	820	823	827	831	834	838	842
	1,777	1,785	1,793	1,801	1,810	1,818	1,826	1,834	1,843	1,851
82.2	845	849	853	856	860	864	868	871	875	879
	1,860	1,868	1,877	1,885	1,894	1,902	1,911	1,920	1,928	1,937
82.3	883	886	890	894	898	902	905	909	913	917
	1,946	1,955	1,964	1,973	1,982	1,991	2,000	2,009	2,018	2,027
82.4	921	925	928	932	936	940	944	948	952	956
	2,036	2,045	2,055	2,064	2,073	2,083	2,092	2,102	2,111	2,121
82.5	960	964	967	971	975	979	983	987	991	995
	2,130	2,140	2,149	2,159	2,169	2,179	2,188	2,198	2,208	2,218
82.6	999	1,003	1,007	1,011	1,015	1,019	1,023	1,028	1,032	1,036
	2,228	2,238	2,248	2,258	2,268	2,279	2,289	2,299	2,309	2,320
82.7	1,040	1,044	1,048	1,052	1,056	1,060	1,064	1,069	1,073	1,077
	2,330	2,340	2,351	2,361	2,372	2,383	2,393	2,404	2,414	2,425
82.8	1,081	1,085	1,089	1,094	1,098	1,102	1,106	1,110	1,115	1,119
	2,436	2,447	2,458	2,469	2,480	2,491	2,502	2,513	2,524	2,535
82.9	1,123	1,127	1,132	1,136	1,140	1,145	1,149	1,153	1,157	1,162
	2,546	2,557	2,569	2,580	2,592	2,603	2,614	2,626	2,637	2,649
83	1,166	1,171	1,176	1,181	1,186	1,191	1,196	1,201	1,206	1,211
	2,661	2,672	2,684	2,696	2,708	2,720	2,732	2,744	2,756	2,768
83.1	1,216	1,221	1,226	1,231	1,236	1,242	1,247	1,252	1,257	1,262
	2,780	2,792	2,804	2,817	2,829	2,841	2,854	2,866	2,879	2,891
83.2	1,267	1,272	1,278	1,283	1,288	1,293	1,298	1,304	1,309	1,314
	2,904	2,917	2,929	2,942	2,955	2,968	2,981	2,994	3,007	3,020
83.3	1,319	1,325	1,330	1,335	1,340	1,346	1,351	1,356	1,362	1,367
	3,033	3,046	3,060	3,073	3,086	3,100	3,113	3,127	3,141	3,154
83.4	1,372	1,378	1,383	1,389	1,394	1,399	1,405	1,410	1,416	1,421
	3,168	3,182	3,195	3,209	3,223	3,237	3,251	3,265	3,279	3,294
83.5	1,427	1,432	1,438	1,443	1,449	1,454	1,460	1,465	1,471	1,476
	3,308	3,322	3,336	3,351	3,365	3,380	3,394	3,409	3,424	3,438
83.6	1,482	1,487	1,493	1,499	1,504	1,510	1,516	1,521	1,527	1,533
	3,453	3,468	3,483	3,498	3,513	3,528	3,543	3,558	3,574	3,589
83.7	1,538	1,544	1,550	1,555	1,561	1,567	1,572	1,578	1,584	1,590
	3,604	3,620	3,635	3,651	3,666	3,682	3,698	3,713	3,729	3,745
83.8	1,596	1,601	1,607	1,613	1,619	1,625	1,630	1,636	1,642	1,648
	3,761	3,777	3,793	3,809	3,825	3,841	3,858	3,874	3,890	3,907
83.9	1,654	1,660	1,666	1,672	1,678	1,684	1,689	1,695	1,701	1,707
	3,923	3,940	3,957	3,973	3,990	4,007	4,024	4,041	4,058	4,075

Table 7-02

Elevation-Area/Capacity Table - Barker Reservoir

Elevation (ft) NAVD 1988	Area (acres) Capacity (Ac-ft) 0	Area (acres) Capacity (Ac-ft) 0.01	Area (acres) Capacity (Ac-ft) 0.02	Area (acres) Capacity (Ac-ft) 0.03	Area (acres) Capacity (Ac-ft) 0.04	Area (acres) Capacity (Ac-ft) 0.05	Area (acres) Capacity (Ac-ft) 0.06	Area (acres) Capacity (Ac-ft) 0.07	Area (acres) Capacity (Ac-ft) 0.08	Area (acres) Capacity (Ac-ft) 0.09
84	1,713	1,719	1,724	1,729	1,734	1,740	1,745	1,750	1,756	1,761
	4,092	4,109	4,126	4,143	4,161	4,178	4,195	4,213	4,230	4,248
84.1	1,766	1,772	1,777	1,782	1,788	1,793	1,798	1,804	1,809	1,815
	4,266	4,283	4,301	4,319	4,337	4,355	4,373	4,391	4,409	4,427
84.2	1,820	1,825	1,831	1,836	1,842	1,847	1,853	1,858	1,864	1,869
	4,445	4,463	4,482	4,500	4,518	4,537	4,555	4,574	4,592	4,611
84.3	1,874	1,880	1,885	1,891	1,897	1,902	1,908	1,913	1,919	1,924
	4,630	4,648	4,667	4,686	4,705	4,724	4,743	4,762	4,781	4,801
84.4	1,930	1,935	1,941	1,947	1,952	1,958	1,963	1,969	1,975	1,980
	4,820	4,839	4,859	4,878	4,898	4,917	4,937	4,956	4,976	4,996
84.5	1,986	1,992	1,997	2,003	2,009	2,014	2,020	2,026	2,031	2,037
	5,016	5,036	5,056	5,076	5,096	5,116	5,136	5,156	5,176	5,197
84.6	2,043	2,049	2,054	2,060	2,066	2,072	2,077	2,083	2,089	2,095
	5,217	5,238	5,258	5,279	5,299	5,320	5,341	5,362	5,382	5,403
84.7	2,101	2,106	2,112	2,118	2,124	2,130	2,136	2,141	2,147	2,153
	5,424	5,445	5,466	5,488	5,509	5,530	5,551	5,573	5,594	5,616
84.8	2,159	2,165	2,171	2,177	2,183	2,189	2,195	2,200	2,206	2,212
	5,637	5,659	5,681	5,702	5,724	5,746	5,768	5,790	5,812	5,834
84.9	2,218	2,224	2,230	2,236	2,242	2,248	2,254	2,260	2,266	2,272
	5,856	5,878	5,901	5,923	5,945	5,968	5,990	6,013	6,036	6,058
85	2,279	2,285	2,291	2,298	2,304	2,311	2,317	2,323	2,330	2,336
	6,081	6,104	6,127	6,150	6,173	6,196	6,219	6,242	6,265	6,289
85.1	2,343	2,349	2,356	2,362	2,369	2,375	2,382	2,388	2,395	2,401
	6,312	6,335	6,359	6,383	6,406	6,430	6,454	6,478	6,502	6,525
85.2	2,408	2,414	2,421	2,428	2,434	2,441	2,447	2,454	2,461	2,467
	6,550	6,574	6,598	6,622	6,646	6,671	6,695	6,720	6,744	6,769
85.3	2,474	2,480	2,487	2,494	2,500	2,507	2,514	2,521	2,527	2,534
	6,794	6,818	6,843	6,868	6,893	6,918	6,943	6,968	6,994	7,019
85.4	2,541	2,547	2,554	2,561	2,568	2,575	2,581	2,588	2,595	2,602
	7,044	7,070	7,095	7,121	7,146	7,172	7,198	7,224	7,250	7,276
85.5	2,609	2,615	2,622	2,629	2,636	2,643	2,650	2,656	2,663	2,670
	7,302	7,328	7,354	7,380	7,407	7,433	7,460	7,486	7,513	7,539
85.6	2,677	2,684	2,691	2,698	2,705	2,712	2,719	2,726	2,733	2,740
	7,566	7,593	7,620	7,647	7,674	7,701	7,728	7,755	7,782	7,810
85.7	2,747	2,754	2,761	2,768	2,775	2,782	2,789	2,796	2,803	2,810
	7,837	7,865	7,892	7,920	7,948	7,975	8,003	8,031	8,059	8,087
85.8	2,817	2,824	2,831	2,839	2,846	2,853	2,860	2,867	2,874	2,881
	8,115	8,144	8,172	8,200	8,229	8,257	8,286	8,314	8,343	8,372
85.9	2,889	2,896	2,903	2,910	2,917	2,925	2,932	2,939	2,946	2,954
	8,401	8,430	8,459	8,488	8,517	8,546	8,575	8,605	8,634	8,664

Table 7-02

Elevation-Area/Capacity Table - Barker Reservoir

Elevation (ft) NAVD 1988	Area (acres) Capacity (Ac-ft) 0	Area (acres) Capacity (Ac-ft) 0.01	Area (acres) Capacity (Ac-ft) 0.02	Area (acres) Capacity (Ac-ft) 0.03	Area (acres) Capacity (Ac-ft) 0.04	Area (acres) Capacity (Ac-ft) 0.05	Area (acres) Capacity (Ac-ft) 0.06	Area (acres) Capacity (Ac-ft) 0.07	Area (acres) Capacity (Ac-ft) 0.08	Area (acres) Capacity (Ac-ft) 0.09
86	2,961	2,968	2,975	2,982	2,988	2,995	3,002	3,009	3,016	3,023
	8,693	8,723	8,753	8,782	8,812	8,842	8,872	8,902	8,932	8,962
86.1	3,030	3,037	3,044	3,051	3,058	3,065	3,072	3,079	3,086	3,093
	8,993	9,023	9,053	9,084	9,114	9,145	9,176	9,207	9,237	9,268
86.2	3,100	3,107	3,114	3,121	3,128	3,136	3,143	3,150	3,157	3,164
	9,299	9,330	9,361	9,393	9,424	9,455	9,487	9,518	9,550	9,581
86.3	3,171	3,178	3,185	3,193	3,200	3,207	3,214	3,221	3,228	3,236
	9,613	9,645	9,676	9,708	9,740	9,772	9,804	9,837	9,869	9,901
86.4	3,243	3,250	3,257	3,264	3,272	3,279	3,286	3,293	3,301	3,308
	9,933	9,966	9,998	10,031	10,064	10,097	10,129	10,162	10,195	10,228
86.5	3,315	3,323	3,330	3,337	3,345	3,352	3,359	3,367	3,374	3,381
	10,261	10,295	10,328	10,361	10,395	10,428	10,462	10,495	10,529	10,563
86.6	3,389	3,396	3,403	3,411	3,418	3,426	3,433	3,440	3,448	3,455
	10,597	10,631	10,665	10,699	10,733	10,767	10,801	10,836	10,870	10,905
86.7	3,463	3,470	3,478	3,485	3,493	3,500	3,508	3,515	3,523	3,530
	10,939	10,974	11,009	11,043	11,078	11,113	11,148	11,183	11,219	11,254
86.8	3,538	3,545	3,553	3,560	3,568	3,575	3,583	3,591	3,598	3,606
	11,289	11,325	11,360	11,396	11,431	11,467	11,503	11,539	11,575	11,611
86.9	3,613	3,621	3,629	3,636	3,644	3,651	3,659	3,667	3,674	3,682
	11,647	11,683	11,719	11,755	11,792	11,828	11,865	11,901	11,938	11,975
87	3,690	3,699	3,708	3,717	3,727	3,736	3,745	3,754	3,764	3,773
	12,012	12,049	12,086	12,123	12,160	12,197	12,235	12,272	12,310	12,348
87.1	3,782	3,792	3,801	3,810	3,820	3,829	3,838	3,848	3,857	3,867
	12,385	12,423	12,461	12,499	12,537	12,576	12,614	12,652	12,691	12,730
87.2	3,876	3,885	3,895	3,904	3,914	3,923	3,933	3,942	3,952	3,961
	12,768	12,807	12,846	12,885	12,924	12,963	13,003	13,042	13,081	13,121
87.3	3,971	3,980	3,990	3,999	4,009	4,019	4,028	4,038	4,047	4,057
	13,161	13,200	13,240	13,280	13,320	13,360	13,401	13,441	13,481	13,522
87.4	4,067	4,076	4,086	4,096	4,105	4,115	4,125	4,135	4,144	4,154
	13,563	13,603	13,644	13,685	13,726	13,767	13,808	13,850	13,891	13,932
87.5	4,164	4,174	4,183	4,193	4,203	4,213	4,223	4,232	4,242	4,252
	13,974	14,016	14,058	14,099	14,141	14,183	14,226	14,268	14,310	14,353
87.6	4,262	4,272	4,282	4,292	4,302	4,312	4,321	4,331	4,341	4,351
	14,395	14,438	14,481	14,524	14,567	14,610	14,653	14,696	14,739	14,783
87.7	4,361	4,371	4,381	4,391	4,401	4,411	4,422	4,432	4,442	4,452
	14,826	14,870	14,914	14,958	15,002	15,046	15,090	15,134	15,179	15,223
87.8	4,462	4,472	4,482	4,492	4,502	4,513	4,523	4,533	4,543	4,553
	15,268	15,312	15,357	15,402	15,447	15,492	15,537	15,582	15,628	15,673
87.9	4,564	4,574	4,584	4,594	4,605	4,615	4,625	4,635	4,646	4,656
	15,719	15,765	15,810	15,856	15,902	15,948	15,995	16,041	16,087	16,134

Table 7-02

Elevation-Area/Capacity Table - Barker Reservoir

Elevation (ft) NAVD 1988	Area (acres) Capacity (Ac-ft) 0	Area (acres) Capacity (Ac-ft) 0.01	Area (acres) Capacity (Ac-ft) 0.02	Area (acres) Capacity (Ac-ft) 0.03	Area (acres) Capacity (Ac-ft) 0.04	Area (acres) Capacity (Ac-ft) 0.05	Area (acres) Capacity (Ac-ft) 0.06	Area (acres) Capacity (Ac-ft) 0.07	Area (acres) Capacity (Ac-ft) 0.08	Area (acres) Capacity (Ac-ft) 0.09
88	4,666	4,678	4,690	4,702	4,714	4,726	4,738	4,750	4,762	4,774
	16,180	16,227	16,274	16,321	16,368	16,415	16,463	16,510	16,558	16,605
88.1	4,786	4,798	4,811	4,823	4,835	4,847	4,859	4,871	4,883	4,896
	16,653	16,701	16,749	16,797	16,845	16,894	16,942	16,991	17,040	17,089
88.2	4,908	4,920	4,932	4,945	4,957	4,969	4,981	4,994	5,006	5,018
	17,138	17,187	17,236	17,286	17,335	17,385	17,434	17,484	17,534	17,584
88.3	5,031	5,043	5,056	5,068	5,080	5,093	5,105	5,118	5,130	5,143
	17,635	17,685	17,736	17,786	17,837	17,888	17,939	17,990	18,041	18,092
88.4	5,155	5,168	5,180	5,193	5,206	5,218	5,231	5,243	5,256	5,269
	18,144	18,196	18,247	18,299	18,351	18,403	18,456	18,508	18,560	18,613
88.5	5,281	5,294	5,307	5,320	5,332	5,345	5,358	5,371	5,383	5,396
	18,666	18,719	18,772	18,825	18,878	18,931	18,985	19,039	19,092	19,146
88.6	5,409	5,422	5,435	5,448	5,461	5,473	5,486	5,499	5,512	5,525
	19,200	19,254	19,309	19,363	19,418	19,472	19,527	19,582	19,637	19,692
88.7	5,538	5,551	5,564	5,577	5,590	5,603	5,616	5,629	5,643	5,656
	19,748	19,803	19,859	19,914	19,970	20,026	20,082	20,138	20,195	20,251
88.8	5,669	5,682	5,695	5,708	5,721	5,735	5,748	5,761	5,774	5,788
	20,308	20,365	20,422	20,479	20,536	20,593	20,650	20,708	20,766	20,823
88.9	5,801	5,814	5,828	5,841	5,854	5,868	5,881	5,894	5,908	5,921
	20,881	20,940	20,998	21,056	21,115	21,173	21,232	21,291	21,350	21,409
89	5,935	5,958	5,982	6,006	6,030	6,053	6,077	6,101	6,125	6,149
	21,468	21,528	21,587	21,647	21,707	21,768	21,829	21,889	21,951	22,012
89.1	6,174	6,198	6,222	6,246	6,270	6,295	6,319	6,344	6,368	6,393
	22,074	22,135	22,198	22,260	22,322	22,385	22,448	22,512	22,575	22,639
89.2	6,417	6,442	6,466	6,491	6,516	6,541	6,566	6,590	6,615	6,640
	22,703	22,767	22,832	22,897	22,962	23,027	23,093	23,158	23,224	23,291
89.3	6,665	6,691	6,716	6,741	6,766	6,791	6,817	6,842	6,867	6,893
	23,357	23,424	23,491	23,558	23,626	23,694	23,762	23,830	23,898	23,967
89.4	6,918	6,944	6,970	6,995	7,021	7,047	7,073	7,098	7,124	7,150
	24,036	24,106	24,175	24,245	24,315	24,385	24,456	24,527	24,598	24,669
89.5	7,176	7,202	7,228	7,254	7,281	7,307	7,333	7,359	7,386	7,412
	24,741	24,813	24,885	24,957	25,030	25,103	25,176	25,250	25,323	25,397
89.6	7,439	7,465	7,492	7,518	7,545	7,572	7,598	7,625	7,652	7,679
	25,472	25,546	25,621	25,696	25,771	25,847	25,923	25,999	26,075	26,152
89.7	7,706	7,733	7,760	7,787	7,814	7,841	7,868	7,896	7,923	7,950
	26,229	26,306	26,384	26,461	26,539	26,618	26,696	26,775	26,854	26,933
89.8	7,978	8,005	8,033	8,060	8,088	8,115	8,143	8,171	8,199	8,226
	27,013	27,093	27,173	27,254	27,334	27,415	27,497	27,578	27,660	27,742
89.9	8,254	8,282	8,310	8,338	8,366	8,394	8,423	8,451	8,479	8,507
	27,825	27,907	27,990	28,073	28,157	28,241	28,325	28,409	28,494	28,579

Table 7-02

Elevation-Area/Capacity Table - Barker Reservoir

Elevation (ft) NAVD 1988	Area (acres) Capacity (Ac-ft) 0	Area (acres) Capacity (Ac-ft) 0.01	Area (acres) Capacity (Ac-ft) 0.02	Area (acres) Capacity (Ac-ft) 0.03	Area (acres) Capacity (Ac-ft) 0.04	Area (acres) Capacity (Ac-ft) 0.05	Area (acres) Capacity (Ac-ft) 0.06	Area (acres) Capacity (Ac-ft) 0.07	Area (acres) Capacity (Ac-ft) 0.08	Area (acres) Capacity (Ac-ft) 0.09
90	8,536	8,552	8,568	8,584	8,600	8,616	8,632	8,649	8,665	8,681
	28,664	28,749	28,835	28,921	29,007	29,093	29,179	29,265	29,352	29,439
90.1	8,697	8,714	8,730	8,746	8,762	8,779	8,795	8,811	8,828	8,844
	29,526	29,613	29,700	29,787	29,875	29,963	30,050	30,138	30,227	30,315
90.2	8,861	8,877	8,893	8,910	8,926	8,943	8,959	8,976	8,992	9,009
	30,404	30,492	30,581	30,670	30,759	30,849	30,938	31,028	31,118	31,208
90.3	9,025	9,042	9,058	9,075	9,092	9,108	9,125	9,141	9,158	9,175
	31,298	31,388	31,479	31,569	31,660	31,751	31,842	31,934	32,025	32,117
90.4	9,191	9,208	9,225	9,242	9,258	9,275	9,292	9,309	9,326	9,342
	32,209	32,301	32,393	32,485	32,578	32,670	32,763	32,856	32,949	33,043
90.5	9,359	9,376	9,393	9,410	9,427	9,444	9,461	9,478	9,495	9,511
	33,136	33,230	33,324	33,418	33,512	33,606	33,701	33,795	33,890	33,985
90.6	9,528	9,546	9,563	9,580	9,597	9,614	9,631	9,648	9,665	9,682
	34,081	34,176	34,271	34,367	34,463	34,559	34,655	34,752	34,848	34,945
90.7	9,699	9,716	9,734	9,751	9,768	9,785	9,802	9,820	9,837	9,854
	35,042	35,139	35,236	35,334	35,431	35,529	35,627	35,725	35,823	35,922
90.8	9,872	9,889	9,906	9,924	9,941	9,958	9,976	9,993	10,011	10,028
	36,020	36,119	36,218	36,317	36,417	36,516	36,616	36,716	36,816	36,916
90.9	10,045	10,063	10,080	10,098	10,115	10,133	10,150	10,168	10,186	10,203
	37,016	37,117	37,218	37,318	37,420	37,521	37,622	37,724	37,826	37,927
91	10,221	10,227	10,233	10,239	10,245	10,251	10,257	10,263	10,269	10,275
	38,030	38,132	38,234	38,336	38,439	38,541	38,644	38,747	38,849	38,952
91.1	10,281	10,287	10,293	10,299	10,305	10,311	10,317	10,323	10,329	10,335
	39,055	39,157	39,260	39,363	39,466	39,569	39,673	39,776	39,879	39,982
91.2	10,341	10,347	10,353	10,359	10,365	10,371	10,377	10,383	10,389	10,395
	40,086	40,189	40,293	40,396	40,500	40,604	40,707	40,811	40,915	41,019
91.3	10,401	10,407	10,413	10,419	10,425	10,431	10,437	10,444	10,450	10,456
	41,123	41,227	41,331	41,435	41,539	41,644	41,748	41,852	41,957	42,061
91.4	10,462	10,468	10,474	10,480	10,486	10,492	10,498	10,504	10,510	10,516
	42,166	42,271	42,375	42,480	42,585	42,690	42,795	42,900	43,005	43,110
91.5	10,522	10,528	10,535	10,541	10,547	10,553	10,559	10,565	10,571	10,577
	43,215	43,320	43,426	43,531	43,637	43,742	43,848	43,953	44,059	44,165
91.6	10,583	10,589	10,595	10,602	10,608	10,614	10,620	10,626	10,632	10,638
	44,270	44,376	44,482	44,588	44,694	44,800	44,907	45,013	45,119	45,225
91.7	10,644	10,650	10,657	10,663	10,669	10,675	10,681	10,687	10,693	10,699
	45,332	45,438	45,545	45,651	45,758	45,865	45,972	46,078	46,185	46,292
91.8	10,705	10,712	10,718	10,724	10,730	10,736	10,742	10,748	10,755	10,761
	46,399	46,506	46,614	46,721	46,828	46,935	47,043	47,150	47,258	47,365
91.9	10,767	10,773	10,779	10,785	10,791	10,798	10,804	10,810	10,816	10,822
	47,473	47,581	47,688	47,796	47,904	48,012	48,120	48,228	48,336	48,444

Table 7-02

Elevation-Area/Capacity Table - Barker Reservoir

Elevation (ft) NAVD 1988	Area (acres) Capacity (Ac-ft) 0	Area (acres) Capacity (Ac-ft) 0.01	Area (acres) Capacity (Ac-ft) 0.02	Area (acres) Capacity (Ac-ft) 0.03	Area (acres) Capacity (Ac-ft) 0.04	Area (acres) Capacity (Ac-ft) 0.05	Area (acres) Capacity (Ac-ft) 0.06	Area (acres) Capacity (Ac-ft) 0.07	Area (acres) Capacity (Ac-ft) 0.08	Area (acres) Capacity (Ac-ft) 0.09
92	10,828	10,834	10,839	10,844	10,849	10,854	10,859	10,864	10,869	10,874
	48,553	48,661	48,769	48,878	48,986	49,095	49,203	49,312	49,421	49,529
92.1	10,879	10,885	10,890	10,895	10,900	10,905	10,910	10,915	10,920	10,925
	49,638	49,747	49,856	49,965	50,074	50,183	50,292	50,401	50,510	50,619
92.2	10,931	10,936	10,941	10,946	10,951	10,956	10,961	10,966	10,972	10,977
	50,729	50,838	50,947	51,057	51,166	51,276	51,385	51,495	51,605	51,714
92.3	10,982	10,987	10,992	10,997	11,002	11,008	11,013	11,018	11,023	11,028
	51,824	51,934	52,044	52,154	52,264	52,374	52,484	52,594	52,704	52,815
92.4	11,033	11,038	11,044	11,049	11,054	11,059	11,064	11,069	11,074	11,080
	52,925	53,035	53,146	53,256	53,367	53,477	53,588	53,699	53,809	53,920
92.5	11,085	11,090	11,095	11,100	11,105	11,111	11,116	11,121	11,126	11,131
	54,031	54,142	54,253	54,364	54,475	54,586	54,697	54,808	54,919	55,031
92.6	11,136	11,142	11,147	11,152	11,157	11,162	11,167	11,173	11,178	11,183
	55,142	55,253	55,365	55,476	55,588	55,699	55,811	55,923	56,034	56,146
92.7	11,188	11,193	11,198	11,204	11,209	11,214	11,219	11,224	11,230	11,235
	56,258	56,370	56,482	56,594	56,706	56,818	56,930	57,043	57,155	57,267
92.8	11,240	11,245	11,250	11,256	11,261	11,266	11,271	11,276	11,282	11,287
	57,380	57,492	57,604	57,717	57,830	57,942	58,055	58,168	58,280	58,393
92.9	11,292	11,297	11,302	11,308	11,313	11,318	11,323	11,328	11,334	11,339
	58,506	58,619	58,732	58,845	58,958	59,071	59,185	59,298	59,411	59,525
93	11,344	11,347	11,349	11,352	11,354	11,356	11,359	11,361	11,364	11,366
	59,638	59,751	59,865	59,978	60,092	60,205	60,319	60,433	60,546	60,660
93.1	11,369	11,371	11,374	11,376	11,379	11,381	11,384	11,386	11,389	11,391
	60,774	60,887	61,001	61,115	61,229	61,342	61,456	61,570	61,684	61,798
93.2	11,394	11,396	11,399	11,401	11,404	11,406	11,409	11,411	11,414	11,416
	61,912	62,026	62,140	62,254	62,368	62,482	62,596	62,710	62,824	62,938
93.3	11,419	11,421	11,424	11,426	11,429	11,431	11,434	11,436	11,439	11,441
	63,052	63,167	63,281	63,395	63,509	63,624	63,738	63,852	63,967	64,081
93.4	11,444	11,446	11,449	11,451	11,454	11,456	11,459	11,461	11,464	11,466
	64,195	64,310	64,424	64,539	64,653	64,768	64,883	64,997	65,112	65,226
93.5	11,469	11,471	11,474	11,476	11,479	11,481	11,484	11,486	11,489	11,491
	65,341	65,456	65,571	65,685	65,800	65,915	66,030	66,144	66,259	66,374
93.6	11,494	11,496	11,499	11,501	11,504	11,506	11,509	11,511	11,514	11,516
	66,489	66,604	66,719	66,834	66,949	67,064	67,179	67,294	67,409	67,525
93.7	11,519	11,521	11,524	11,526	11,529	11,531	11,534	11,536	11,539	11,541
	67,640	67,755	67,870	67,985	68,101	68,216	68,331	68,447	68,562	68,677
93.8	11,544	11,546	11,549	11,551	11,554	11,556	11,559	11,561	11,564	11,566
	68,793	68,908	69,024	69,139	69,255	69,370	69,486	69,602	69,717	69,833
93.9	11,569	11,571	11,574	11,576	11,579	11,581	11,584	11,586	11,589	11,591
	69,949	70,064	70,180	70,296	70,411	70,527	70,643	70,759	70,875	70,991

Table 7-02

Elevation-Area/Capacity Table - Barker Reservoir

Elevation (ft) NAVD 1988	Area (acres) Capacity (Ac-ft) 0	Area (acres) Capacity (Ac-ft) 0.01	Area (acres) Capacity (Ac-ft) 0.02	Area (acres) Capacity (Ac-ft) 0.03	Area (acres) Capacity (Ac-ft) 0.04	Area (acres) Capacity (Ac-ft) 0.05	Area (acres) Capacity (Ac-ft) 0.06	Area (acres) Capacity (Ac-ft) 0.07	Area (acres) Capacity (Ac-ft) 0.08	Area (acres) Capacity (Ac-ft) 0.09
94	11,594	11,598	11,603	11,607	11,611	11,616	11,620	11,624	11,629	11,633
	71,107	71,223	71,339	71,455	71,571	71,687	71,803	71,919	72,036	72,152
94.1	11,638	11,642	11,646	11,651	11,655	11,660	11,664	11,668	11,673	11,677
	72,268	72,385	72,501	72,618	72,734	72,851	72,967	73,084	73,201	73,317
94.2	11,682	11,686	11,690	11,695	11,699	11,704	11,708	11,712	11,717	11,721
	73,434	73,551	73,668	73,785	73,902	74,019	74,136	74,253	74,370	74,487
94.3	11,726	11,730	11,734	11,739	11,743	11,748	11,752	11,756	11,761	11,765
	74,605	74,722	74,839	74,956	75,074	75,191	75,309	75,426	75,544	75,662
94.4	11,770	11,774	11,778	11,783	11,787	11,792	11,796	11,800	11,805	11,809
	75,779	75,897	76,015	76,133	76,250	76,368	76,486	76,604	76,722	76,840
94.5	11,814	11,818	11,823	11,827	11,831	11,836	11,840	11,845	11,849	11,854
	76,958	77,077	77,195	77,313	77,431	77,550	77,668	77,786	77,905	78,023
94.6	11,858	11,862	11,867	11,871	11,876	11,880	11,885	11,889	11,893	11,898
	78,142	78,261	78,379	78,498	78,617	78,735	78,854	78,973	79,092	79,211
94.7	11,902	11,907	11,911	11,916	11,920	11,924	11,929	11,933	11,938	11,942
	79,330	79,449	79,568	79,687	79,806	79,926	80,045	80,164	80,284	80,403
94.8	11,947	11,951	11,956	11,960	11,964	11,969	11,973	11,978	11,982	11,987
	80,522	80,642	80,762	80,881	81,001	81,120	81,240	81,360	81,480	81,599
94.9	11,991	11,996	12,000	12,005	12,009	12,013	12,018	12,022	12,027	12,031
	81,719	81,839	81,959	82,079	82,199	82,319	82,440	82,560	82,680	82,800
95	12,036	12,038	12,040	12,042	12,045	12,047	12,049	12,052	12,054	12,056
	82,921	83,041	83,161	83,282	83,402	83,523	83,643	83,764	83,884	84,005
95.1	12,058	12,061	12,063	12,065	12,067	12,070	12,072	12,074	12,076	12,079
	84,125	84,246	84,367	84,487	84,608	84,729	84,849	84,970	85,091	85,212
95.2	12,081	12,083	12,085	12,088	12,090	12,092	12,094	12,097	12,099	12,101
	85,332	85,453	85,574	85,695	85,816	85,937	86,058	86,179	86,300	86,421
95.3	12,103	12,106	12,108	12,110	12,113	12,115	12,117	12,119	12,122	12,124
	86,542	86,663	86,784	86,905	87,026	87,147	87,268	87,389	87,511	87,632
95.4	12,126	12,128	12,131	12,133	12,135	12,137	12,140	12,142	12,144	12,147
	87,753	87,874	87,996	88,117	88,238	88,360	88,481	88,602	88,724	88,845
95.5	12,149	12,151	12,153	12,156	12,158	12,160	12,162	12,165	12,167	12,169
	88,967	89,088	89,210	89,331	89,453	89,575	89,696	89,818	89,939	90,061
95.6	12,171	12,174	12,176	12,178	12,181	12,183	12,185	12,187	12,190	12,192
	90,183	90,305	90,426	90,548	90,670	90,792	90,914	91,035	91,157	91,279
95.7	12,194	12,196	12,199	12,201	12,203	12,206	12,208	12,210	12,212	12,215
	91,401	91,523	91,645	91,767	91,889	92,011	92,133	92,255	92,377	92,500
95.8	12,217	12,219	12,221	12,224	12,226	12,228	12,231	12,233	12,235	12,237
	92,622	92,744	92,866	92,988	93,111	93,233	93,355	93,477	93,600	93,722
95.9	12,240	12,242	12,244	12,246	12,249	12,251	12,253	12,256	12,258	12,260
	93,844	93,967	94,089	94,212	94,334	94,457	94,579	94,702	94,824	94,947

Table 7-02

Elevation-Area/Capacity Table - Barker Reservoir

Elevation (ft) NAVD 1988	Area (acres) Capacity (Ac-ft) 0	Area (acres) Capacity (Ac-ft) 0.01	Area (acres) Capacity (Ac-ft) 0.02	Area (acres) Capacity (Ac-ft) 0.03	Area (acres) Capacity (Ac-ft) 0.04	Area (acres) Capacity (Ac-ft) 0.05	Area (acres) Capacity (Ac-ft) 0.06	Area (acres) Capacity (Ac-ft) 0.07	Area (acres) Capacity (Ac-ft) 0.08	Area (acres) Capacity (Ac-ft) 0.09
96	12,262	12,266	12,269	12,272	12,275	12,278	12,281	12,284	12,287	12,291
	95,070	95,192	95,315	95,438	95,560	95,683	95,806	95,929	96,052	96,174
96.1	12,294	12,297	12,300	12,303	12,306	12,309	12,312	12,316	12,319	12,322
	96,297	96,420	96,543	96,666	96,789	96,912	97,036	97,159	97,282	97,405
96.2	12,325	12,328	12,331	12,334	12,338	12,341	12,344	12,347	12,350	12,353
	97,528	97,652	97,775	97,898	98,022	98,145	98,268	98,392	98,515	98,639
96.3	12,356	12,359	12,363	12,366	12,369	12,372	12,375	12,378	12,381	12,385
	98,762	98,886	99,010	99,133	99,257	99,381	99,504	99,628	99,752	99,876
96.4	12,388	12,391	12,394	12,397	12,400	12,403	12,407	12,410	12,413	12,416
	100,000	100,123	100,247	100,371	100,495	100,619	100,743	100,868	100,992	101,116
96.5	12,419	12,422	12,425	12,429	12,432	12,435	12,438	12,441	12,444	12,447
	101,240	101,364	101,488	101,613	101,737	101,861	101,986	102,110	102,234	102,359
96.6	12,451	12,454	12,457	12,460	12,463	12,466	12,470	12,473	12,476	12,479
	102,483	102,608	102,733	102,857	102,982	103,106	103,231	103,356	103,480	103,605
96.7	12,482	12,485	12,488	12,492	12,495	12,498	12,501	12,504	12,507	12,511
	103,730	103,855	103,980	104,105	104,230	104,355	104,480	104,605	104,730	104,855
96.8	12,514	12,517	12,520	12,523	12,526	12,530	12,533	12,536	12,539	12,542
	104,980	105,105	105,230	105,355	105,481	105,606	105,731	105,857	105,982	106,107
96.9	12,545	12,548	12,552	12,555	12,558	12,561	12,564	12,567	12,571	12,574
	106,233	106,358	106,484	106,609	106,735	106,860	106,986	107,112	107,237	107,363
97	12,577	12,583	12,589	12,595	12,601	12,608	12,614	12,620	12,626	12,632
	107,489	107,615	107,741	107,867	107,992	108,119	108,245	108,371	108,497	108,623
97.1	12,638	12,645	12,651	12,657	12,663	12,669	12,675	12,681	12,688	12,694
	108,750	108,876	109,003	109,129	109,256	109,382	109,509	109,636	109,763	109,890
97.2	12,700	12,706	12,712	12,718	12,725	12,731	12,737	12,743	12,749	12,755
	110,017	110,144	110,271	110,398	110,525	110,652	110,780	110,907	111,035	111,162
97.3	12,762	12,768	12,774	12,780	12,786	12,793	12,799	12,805	12,811	12,817
	111,290	111,417	111,545	111,673	111,801	111,929	112,056	112,185	112,313	112,441
97.4	12,823	12,830	12,836	12,842	12,848	12,854	12,861	12,867	12,873	12,879
	112,569	112,697	112,826	112,954	113,082	113,211	113,339	113,468	113,597	113,726
97.5	12,885	12,892	12,898	12,904	12,910	12,917	12,923	12,929	12,935	12,941
	113,854	113,983	114,112	114,241	114,370	114,499	114,629	114,758	114,887	115,017
97.6	12,948	12,954	12,960	12,966	12,973	12,979	12,985	12,991	12,997	13,004
	115,146	115,276	115,405	115,535	115,664	115,794	115,924	116,054	116,184	116,314
97.7	13,010	13,016	13,022	13,029	13,035	13,041	13,047	13,054	13,060	13,066
	116,444	116,574	116,704	116,834	116,965	117,095	117,226	117,356	117,487	117,617
97.8	13,072	13,079	13,085	13,091	13,097	13,104	13,110	13,116	13,122	13,129
	117,748	117,879	118,010	118,140	118,271	118,402	118,533	118,665	118,796	118,927
97.9	13,135	13,141	13,148	13,154	13,160	13,166	13,173	13,179	13,185	13,191
	119,058	119,190	119,321	119,453	119,584	119,716	119,848	119,979	120,111	120,243

Table 7-02

Elevation-Area/Capacity Table - Barker Reservoir

Elevation (ft) NAVD 1988	Area (acres) Capacity (Ac-ft) 0	Area (acres) Capacity (Ac-ft) 0.01	Area (acres) Capacity (Ac-ft) 0.02	Area (acres) Capacity (Ac-ft) 0.03	Area (acres) Capacity (Ac-ft) 0.04	Area (acres) Capacity (Ac-ft) 0.05	Area (acres) Capacity (Ac-ft) 0.06	Area (acres) Capacity (Ac-ft) 0.07	Area (acres) Capacity (Ac-ft) 0.08	Area (acres) Capacity (Ac-ft) 0.09
98	13,198	13,204	13,210	13,216	13,222	13,228	13,234	13,240	13,246	13,253
	120,375	120,507	120,639	120,771	120,903	121,036	121,168	121,300	121,433	121,565
98.1	13,259	13,265	13,271	13,277	13,283	13,289	13,295	13,301	13,307	13,314
	121,698	121,830	121,963	122,096	122,229	122,362	122,494	122,627	122,760	122,894
98.2	13,320	13,326	13,332	13,338	13,344	13,350	13,356	13,362	13,369	13,375
	123,027	123,160	123,293	123,427	123,560	123,694	123,827	123,961	124,094	124,228
98.3	13,381	13,387	13,393	13,399	13,405	13,411	13,418	13,424	13,430	13,436
	124,362	124,496	124,630	124,763	124,898	125,032	125,166	125,300	125,434	125,569
98.4	13,442	13,448	13,454	13,461	13,467	13,473	13,479	13,485	13,491	13,497
	125,703	125,837	125,972	126,106	126,241	126,376	126,511	126,645	126,780	126,915
98.5	13,504	13,510	13,516	13,522	13,528	13,534	13,541	13,547	13,553	13,559
	127,050	127,185	127,320	127,456	127,591	127,726	127,862	127,997	128,132	128,268
98.6	13,565	13,571	13,577	13,584	13,590	13,596	13,602	13,608	13,615	13,621
	128,404	128,539	128,675	128,811	128,947	129,083	129,219	129,355	129,491	129,627
98.7	13,627	13,633	13,639	13,645	13,652	13,658	13,664	13,670	13,676	13,683
	129,763	129,900	130,036	130,172	130,309	130,445	130,582	130,719	130,855	130,992
98.8	13,689	13,695	13,701	13,707	13,714	13,720	13,726	13,732	13,738	13,745
	131,129	131,266	131,403	131,540	131,677	131,814	131,951	132,089	132,226	132,364
98.9	13,751	13,757	13,763	13,769	13,776	13,782	13,788	13,794	13,800	13,807
	132,501	132,639	132,776	132,914	133,052	133,189	133,327	133,465	133,603	133,741
99	13,813	13,818	13,823	13,828	13,833	13,839	13,844	13,849	13,854	13,859
	133,879	134,017	134,156	134,294	134,432	134,570	134,709	134,847	134,986	135,124
99.1	13,864	13,870	13,875	13,880	13,885	13,890	13,895	13,901	13,906	13,911
	135,263	135,402	135,540	135,679	135,818	135,957	136,096	136,235	136,374	136,513
99.2	13,916	13,921	13,926	13,932	13,937	13,942	13,947	13,952	13,957	13,963
	136,652	136,791	136,931	137,070	137,209	137,349	137,488	137,627	137,767	137,907
99.3	13,968	13,973	13,978	13,983	13,989	13,994	13,999	14,004	14,009	14,014
	138,046	138,186	138,326	138,466	138,605	138,745	138,885	139,025	139,165	139,305
99.4	14,020	14,025	14,030	14,035	14,040	14,046	14,051	14,056	14,061	14,066
	139,446	139,586	139,726	139,866	140,007	140,147	140,288	140,428	140,569	140,710
99.5	14,072	14,077	14,082	14,087	14,092	14,098	14,103	14,108	14,113	14,118
	140,850	140,991	141,132	141,273	141,413	141,554	141,695	141,836	141,978	142,119
99.6	14,124	14,129	14,134	14,139	14,144	14,150	14,155	14,160	14,165	14,170
	142,260	142,401	142,543	142,684	142,825	142,967	143,108	143,250	143,392	143,533
99.7	14,176	14,181	14,186	14,191	14,197	14,202	14,207	14,212	14,217	14,223
	143,675	143,817	143,959	144,100	144,242	144,384	144,526	144,668	144,811	144,953
99.8	14,228	14,233	14,238	14,244	14,249	14,254	14,259	14,264	14,270	14,275
	145,095	145,237	145,380	145,522	145,665	145,807	145,950	146,092	146,235	146,378
99.9	14,280	14,285	14,291	14,296	14,301	14,306	14,312	14,317	14,322	14,327
	146,520	146,663	146,806	146,949	147,092	147,235	147,378	147,521	147,665	147,808

Table 7-02

Elevation-Area/Capacity Table - Barker Reservoir

Elevation (ft) NAVD 1988	Area (acres) Capacity (Ac-ft) 0	Area (acres) Capacity (Ac-ft) 0.01	Area (acres) Capacity (Ac-ft) 0.02	Area (acres) Capacity (Ac-ft) 0.03	Area (acres) Capacity (Ac-ft) 0.04	Area (acres) Capacity (Ac-ft) 0.05	Area (acres) Capacity (Ac-ft) 0.06	Area (acres) Capacity (Ac-ft) 0.07	Area (acres) Capacity (Ac-ft) 0.08	Area (acres) Capacity (Ac-ft) 0.09
100	14,333	14,338	14,343	14,348	14,353	14,358	14,363	14,369	14,374	14,379
	147,951	148,094	148,238	148,381	148,525	148,668	148,812	148,956	149,099	149,243
100.1	14,384	14,389	14,394	14,399	14,404	14,410	14,415	14,420	14,425	14,430
	149,387	149,531	149,675	149,819	149,963	150,107	150,251	150,395	150,539	150,684
100.2	14,435	14,441	14,446	14,451	14,456	14,461	14,466	14,471	14,477	14,482
	150,828	150,972	151,117	151,261	151,406	151,550	151,695	151,840	151,984	152,129
100.3	14,487	14,492	14,497	14,502	14,508	14,513	14,518	14,523	14,528	14,533
	152,274	152,419	152,564	152,709	152,854	152,999	153,144	153,289	153,435	153,580
100.4	14,539	14,544	14,549	14,554	14,559	14,564	14,570	14,575	14,580	14,585
	153,725	153,871	154,016	154,162	154,307	154,453	154,599	154,744	154,890	155,036
100.5	14,590	14,595	14,601	14,606	14,611	14,616	14,621	14,627	14,632	14,637
	155,182	155,328	155,474	155,620	155,766	155,912	156,058	156,204	156,351	156,497
100.6	14,642	14,647	14,652	14,658	14,663	14,668	14,673	14,678	14,684	14,689
	156,643	156,790	156,936	157,083	157,229	157,376	157,523	157,670	157,816	157,963
100.7	14,694	14,699	14,704	14,710	14,715	14,720	14,725	14,730	14,736	14,741
	158,110	158,257	158,404	158,551	158,698	158,846	158,993	159,140	159,287	159,435
100.8	14,746	14,751	14,756	14,762	14,767	14,772	14,777	14,783	14,788	14,793
	159,582	159,730	159,877	160,025	160,172	160,320	160,468	160,616	160,764	160,911
100.9	14,798	14,803	14,809	14,814	14,819	14,824	14,829	14,835	14,840	14,845
	161,059	161,207	161,355	161,504	161,652	161,800	161,948	162,097	162,245	162,393
101	14,850	14,856	14,861	14,866	14,872	14,877	14,882	14,888	14,893	14,898
	162,542	162,690	162,839	162,988	163,136	163,285	163,434	163,583	163,732	163,880
101.1	14,903	14,909	14,914	14,919	14,925	14,930	14,935	14,941	14,946	14,951
	164,029	164,179	164,328	164,477	164,626	164,775	164,925	165,074	165,223	165,373
101.2	14,957	14,962	14,967	14,973	14,978	14,983	14,989	14,994	14,999	15,005
	165,523	165,672	165,822	165,971	166,121	166,271	166,421	166,571	166,721	166,871
101.3	15,010	15,015	15,021	15,026	15,031	15,037	15,042	15,047	15,053	15,058
	167,021	167,171	167,321	167,471	167,622	167,772	167,922	168,073	168,223	168,374
101.4	15,063	15,069	15,074	15,079	15,085	15,090	15,095	15,101	15,106	15,112
	168,524	168,675	168,826	168,977	169,127	169,278	169,429	169,580	169,731	169,882
101.5	15,117	15,122	15,128	15,133	15,138	15,144	15,149	15,154	15,160	15,165
	170,034	170,185	170,336	170,487	170,639	170,790	170,941	171,093	171,245	171,396
101.6	15,170	15,176	15,181	15,187	15,192	15,197	15,203	15,208	15,213	15,219
	171,548	171,700	171,851	172,003	172,155	172,307	172,459	172,611	172,763	172,915
101.7	15,224	15,230	15,235	15,240	15,246	15,251	15,256	15,262	15,267	15,273
	173,068	173,220	173,372	173,525	173,677	173,829	173,982	174,135	174,287	174,440
101.8	15,278	15,283	15,289	15,294	15,299	15,305	15,310	15,316	15,321	15,326
	174,593	174,746	174,898	175,051	175,204	175,357	175,510	175,663	175,817	175,970
101.9	15,332	15,337	15,343	15,348	15,353	15,359	15,364	15,370	15,375	15,380
	176,123	176,277	176,430	176,583	176,737	176,890	177,044	177,198	177,351	177,505

Table 7-02

Elevation-Area/Capacity Table - Barker Reservoir

Elevation (ft) NAVD 1988	Area (acres) Capacity (Ac-ft) 0	Area (acres) Capacity (Ac-ft) 0.01	Area (acres) Capacity (Ac-ft) 0.02	Area (acres) Capacity (Ac-ft) 0.03	Area (acres) Capacity (Ac-ft) 0.04	Area (acres) Capacity (Ac-ft) 0.05	Area (acres) Capacity (Ac-ft) 0.06	Area (acres) Capacity (Ac-ft) 0.07	Area (acres) Capacity (Ac-ft) 0.08	Area (acres) Capacity (Ac-ft) 0.09
102	15,386	15,392	15,397	15,403	15,409	15,415	15,421	15,426	15,432	15,438
	177,659	177,813	177,967	178,121	178,275	178,429	178,583	178,737	178,892	179,046
102.1	15,444	15,450	15,455	15,461	15,467	15,473	15,479	15,484	15,490	15,496
	179,201	179,355	179,510	179,664	179,819	179,973	180,128	180,283	180,438	180,593
102.2	15,502	15,508	15,513	15,519	15,525	15,531	15,537	15,542	15,548	15,554
	180,748	180,903	181,058	181,213	181,368	181,524	181,679	181,834	181,990	182,145
102.3	15,560	15,566	15,572	15,577	15,583	15,589	15,595	15,601	15,606	15,612
	182,301	182,457	182,612	182,768	182,924	183,080	183,236	183,392	183,548	183,704
102.4	15,618	15,624	15,630	15,636	15,641	15,647	15,653	15,659	15,665	15,671
	183,860	184,016	184,172	184,329	184,485	184,641	184,798	184,954	185,111	185,268
102.5	15,676	15,682	15,688	15,694	15,700	15,706	15,712	15,717	15,723	15,729
	185,425	185,581	185,738	185,895	186,052	186,209	186,366	186,523	186,681	186,838
102.6	15,735	15,741	15,747	15,753	15,758	15,764	15,770	15,776	15,782	15,788
	186,995	187,152	187,310	187,467	187,625	187,783	187,940	188,098	188,256	188,414
102.7	15,794	15,799	15,805	15,811	15,817	15,823	15,829	15,835	15,840	15,846
	188,572	188,729	188,888	189,046	189,204	189,362	189,520	189,679	189,837	189,995
102.8	15,852	15,858	15,864	15,870	15,876	15,882	15,887	15,893	15,899	15,905
	190,154	190,312	190,471	190,630	190,788	190,947	191,106	191,265	191,424	191,583
102.9	15,911	15,917	15,923	15,929	15,935	15,940	15,946	15,952	15,958	15,964
	191,742	191,901	192,060	192,220	192,379	192,538	192,698	192,857	193,017	193,176
103	15,970	15,976	15,981	15,987	15,993	15,998	16,004	16,010	16,015	16,021
	193,336	193,496	193,656	193,815	193,975	194,135	194,295	194,455	194,615	194,776
103.1	16,027	16,032	16,038	16,044	16,050	16,055	16,061	16,067	16,072	16,078
	194,936	195,096	195,257	195,417	195,577	195,738	195,898	196,059	196,220	196,381
103.2	16,084	16,089	16,095	16,101	16,106	16,112	16,118	16,124	16,129	16,135
	196,541	196,702	196,863	197,024	197,185	197,346	197,507	197,669	197,830	197,991
103.3	16,141	16,146	16,152	16,158	16,164	16,169	16,175	16,181	16,186	16,192
	198,153	198,314	198,476	198,637	198,799	198,960	199,122	199,284	199,446	199,608
103.4	16,198	16,204	16,209	16,215	16,221	16,226	16,232	16,238	16,244	16,249
	199,770	199,932	200,094	200,256	200,418	200,580	200,742	200,905	201,067	201,230
103.5	16,255	16,261	16,267	16,272	16,278	16,284	16,289	16,295	16,301	16,307
	201,392	201,555	201,717	201,880	202,043	202,206	202,369	202,531	202,694	202,857
103.6	16,312	16,318	16,324	16,330	16,335	16,341	16,347	16,353	16,358	16,364
	203,021	203,184	203,347	203,510	203,674	203,837	204,000	204,164	204,327	204,491
103.7	16,370	16,376	16,381	16,387	16,393	16,399	16,404	16,410	16,416	16,422
	204,655	204,818	204,982	205,146	205,310	205,474	205,638	205,802	205,966	206,130
103.8	16,427	16,433	16,439	16,445	16,450	16,456	16,462	16,468	16,474	16,479
	206,295	206,459	206,623	206,788	206,952	207,117	207,281	207,446	207,611	207,775
103.9	16,485	16,491	16,497	16,502	16,508	16,514	16,520	16,525	16,531	16,537
	207,940	208,105	208,270	208,435	208,600	208,765	208,930	209,096	209,261	209,426

Table 7-02

Elevation-Area/Capacity Table - Barker Reservoir

Elevation (ft) NAVD 1988	Area (acres) Capacity (Ac-ft) 0	Area (acres) Capacity (Ac-ft) 0.01	Area (acres) Capacity (Ac-ft) 0.02	Area (acres) Capacity (Ac-ft) 0.03	Area (acres) Capacity (Ac-ft) 0.04	Area (acres) Capacity (Ac-ft) 0.05	Area (acres) Capacity (Ac-ft) 0.06	Area (acres) Capacity (Ac-ft) 0.07	Area (acres) Capacity (Ac-ft) 0.08	Area (acres) Capacity (Ac-ft) 0.09
104	16,543	16,549	16,556	16,562	16,569	16,575	16,582	16,588	16,594	16,601
	209,592	209,757	209,923	210,088	210,254	210,419	210,585	210,751	210,917	211,083
104.1	16,607	16,614	16,620	16,627	16,633	16,640	16,646	16,653	16,659	16,666
	211,249	211,415	211,581	211,748	211,914	212,080	212,247	212,413	212,580	212,746
104.2	16,672	16,679	16,685	16,692	16,698	16,705	16,711	16,718	16,724	16,730
	212,913	213,080	213,247	213,413	213,580	213,747	213,915	214,082	214,249	214,416
104.3	16,737	16,743	16,750	16,756	16,763	16,769	16,776	16,782	16,789	16,795
	214,583	214,751	214,918	215,086	215,253	215,421	215,589	215,757	215,925	216,092
104.4	16,802	16,808	16,815	16,821	16,828	16,834	16,841	16,848	16,854	16,861
	216,260	216,428	216,597	216,765	216,933	217,101	217,270	217,438	217,607	217,775
104.5	16,867	16,874	16,880	16,887	16,893	16,900	16,906	16,913	16,919	16,926
	217,944	218,113	218,281	218,450	218,619	218,788	218,957	219,126	219,295	219,465
104.6	16,932	16,939	16,945	16,952	16,958	16,965	16,971	16,978	16,985	16,991
	219,634	219,803	219,973	220,142	220,312	220,481	220,651	220,821	220,991	221,160
104.7	16,998	17,004	17,011	17,017	17,024	17,030	17,037	17,043	17,050	17,057
	221,330	221,500	221,670	221,841	222,011	222,181	222,351	222,522	222,692	222,863
104.8	17,063	17,070	17,076	17,083	17,089	17,096	17,102	17,109	17,116	17,122
	223,033	223,204	223,375	223,546	223,716	223,887	224,058	224,229	224,401	224,572
104.9	17,129	17,135	17,142	17,148	17,155	17,162	17,168	17,175	17,181	17,188
	224,743	224,914	225,086	225,257	225,429	225,600	225,772	225,944	226,115	226,287
105	17,194	17,202	17,209	17,216	17,223	17,231	17,238	17,245	17,253	17,260
	226,459	226,631	226,803	226,975	227,147	227,320	227,492	227,665	227,837	228,010
105.1	17,267	17,274	17,282	17,289	17,296	17,303	17,311	17,318	17,325	17,332
	228,182	228,355	228,528	228,701	228,873	229,046	229,220	229,393	229,566	229,739
105.2	17,340	17,347	17,354	17,362	17,369	17,376	17,383	17,391	17,398	17,405
	229,913	230,086	230,259	230,433	230,607	230,780	230,954	231,128	231,302	231,476
105.3	17,413	17,420	17,427	17,435	17,442	17,449	17,456	17,464	17,471	17,478
	231,650	231,824	231,999	232,173	232,347	232,522	232,696	232,871	233,046	233,220
105.4	17,486	17,493	17,500	17,508	17,515	17,522	17,530	17,537	17,544	17,552
	233,395	233,570	233,745	233,920	234,095	234,270	234,446	234,621	234,796	234,972
105.5	17,559	17,566	17,574	17,581	17,588	17,596	17,603	17,610	17,618	17,625
	235,147	235,323	235,499	235,674	235,850	236,026	236,202	236,378	236,554	236,731
105.6	17,632	17,640	17,647	17,654	17,662	17,669	17,676	17,684	17,691	17,698
	236,907	237,083	237,260	237,436	237,613	237,789	237,966	238,143	238,320	238,497
105.7	17,706	17,713	17,720	17,728	17,735	17,743	17,750	17,757	17,765	17,772
	238,674	238,851	239,028	239,205	239,383	239,560	239,737	239,915	240,093	240,270
105.8	17,779	17,787	17,794	17,801	17,809	17,816	17,824	17,831	17,838	17,846
	240,448	240,626	240,804	240,982	241,160	241,338	241,516	241,694	241,873	242,051
105.9	17,853	17,861	17,868	17,875	17,883	17,890	17,898	17,905	17,912	17,920
	242,230	242,408	242,587	242,766	242,944	243,123	243,302	243,481	243,660	243,839

Table 7-02

Elevation-Area/Capacity Table - Barker Reservoir

Elevation (ft) NAVD 1988	Area (acres) Capacity (Ac-ft) 0	Area (acres) Capacity (Ac-ft) 0.01	Area (acres) Capacity (Ac-ft) 0.02	Area (acres) Capacity (Ac-ft) 0.03	Area (acres) Capacity (Ac-ft) 0.04	Area (acres) Capacity (Ac-ft) 0.05	Area (acres) Capacity (Ac-ft) 0.06	Area (acres) Capacity (Ac-ft) 0.07	Area (acres) Capacity (Ac-ft) 0.08	Area (acres) Capacity (Ac-ft) 0.09
106	17,927	17,934	17,941	17,948	17,955	17,962	17,968	17,975	17,982	17,989
	244,019	244,198	244,377	244,557	244,736	244,916	245,096	245,275	245,455	245,635
106.1	17,996	18,003	18,010	18,017	18,024	18,031	18,037	18,044	18,051	18,058
	245,815	245,995	246,175	246,355	246,535	246,715	246,896	247,076	247,257	247,437
106.2	18,065	18,072	18,079	18,086	18,093	18,100	18,107	18,113	18,120	18,127
	247,618	247,799	247,979	248,160	248,341	248,522	248,703	248,884	249,065	249,247
106.3	18,134	18,141	18,148	18,155	18,162	18,169	18,176	18,183	18,190	18,197
	249,428	249,609	249,791	249,972	250,154	250,335	250,517	250,699	250,881	251,063
106.4	18,204	18,210	18,217	18,224	18,231	18,238	18,245	18,252	18,259	18,266
	251,245	251,427	251,609	251,791	251,973	252,156	252,338	252,521	252,703	252,886
106.5	18,273	18,280	18,287	18,294	18,301	18,308	18,315	18,322	18,329	18,336
	253,069	253,251	253,434	253,617	253,800	253,983	254,166	254,349	254,533	254,716
106.6	18,343	18,350	18,356	18,363	18,370	18,377	18,384	18,391	18,398	18,405
	254,899	255,083	255,266	255,450	255,634	255,817	256,001	256,185	256,369	256,553
106.7	18,412	18,419	18,426	18,433	18,440	18,447	18,454	18,461	18,468	18,475
	256,737	256,921	257,105	257,290	257,474	257,659	257,843	258,028	258,212	258,397
106.8	18,482	18,489	18,496	18,503	18,510	18,517	18,524	18,531	18,538	18,545
	258,582	258,767	258,952	259,137	259,322	259,507	259,692	259,877	260,063	260,248
106.9	18,552	18,559	18,566	18,573	18,580	18,587	18,594	18,601	18,608	18,615
	260,433	260,619	260,805	260,990	261,176	261,362	261,548	261,734	261,920	262,106
107	18,622	18,629	18,636	18,643	18,650	18,657	18,664	18,671	18,678	18,685
	262,292	262,478	262,665	262,851	263,038	263,224	263,411	263,597	263,784	263,971
107.1	18,692	18,699	18,706	18,713	18,720	18,728	18,735	18,742	18,749	18,756
	264,158	264,345	264,532	264,719	264,906	265,093	265,281	265,468	265,656	265,843
107.2	18,763	18,770	18,777	18,784	18,791	18,798	18,805	18,812	18,819	18,826
	266,031	266,218	266,406	266,594	266,782	266,970	267,158	267,346	267,534	267,722
107.3	18,833	18,840	18,847	18,854	18,861	18,869	18,876	18,883	18,890	18,897
	267,910	268,099	268,287	268,476	268,664	268,853	269,042	269,230	269,419	269,608
107.4	18,904	18,911	18,918	18,925	18,932	18,939	18,946	18,953	18,960	18,968
	269,797	269,986	270,176	270,365	270,554	270,743	270,933	271,122	271,312	271,502
107.5	18,975	18,982	18,989	18,996	19,003	19,010	19,017	19,024	19,031	19,038
	271,691	271,881	272,071	272,261	272,451	272,641	272,831	273,021	273,211	273,402
107.6	19,045	19,053	19,060	19,067	19,074	19,081	19,088	19,095	19,102	19,109
	273,592	273,783	273,973	274,164	274,355	274,545	274,736	274,927	275,118	275,309
107.7	19,116	19,124	19,131	19,138	19,145	19,152	19,159	19,166	19,173	19,181
	275,500	275,692	275,883	276,074	276,266	276,457	276,649	276,840	277,032	277,224
107.8	19,188	19,195	19,202	19,209	19,216	19,223	19,230	19,238	19,245	19,252
	277,416	277,607	277,799	277,991	278,184	278,376	278,568	278,760	278,953	279,145
107.9	19,259	19,266	19,273	19,280	19,287	19,295	19,302	19,309	19,316	19,323
	279,338	279,530	279,723	279,916	280,109	280,302	280,495	280,688	280,881	281,074

Table 7-02

Elevation-Area/Capacity Table - Barker Reservoir

Elevation (ft) NAVD 1988	Area (acres) Capacity (Ac-ft) 0	Area (acres) Capacity (Ac-ft) 0.01	Area (acres) Capacity (Ac-ft) 0.02	Area (acres) Capacity (Ac-ft) 0.03	Area (acres) Capacity (Ac-ft) 0.04	Area (acres) Capacity (Ac-ft) 0.05	Area (acres) Capacity (Ac-ft) 0.06	Area (acres) Capacity (Ac-ft) 0.07	Area (acres) Capacity (Ac-ft) 0.08	Area (acres) Capacity (Ac-ft) 0.09
108	19,330	19,333	19,336	19,339	19,342	19,345	19,348	19,351	19,354	19,357
	281,267	281,461	281,654	281,847	282,041	282,234	282,428	282,621	282,815	283,008
108.1	19,360	19,363	19,365	19,368	19,371	19,374	19,377	19,380	19,383	19,386
	283,202	283,395	283,589	283,783	283,976	284,170	284,364	284,558	284,752	284,945
108.2	19,389	19,392	19,395	19,398	19,401	19,403	19,406	19,409	19,412	19,415
	285,139	285,333	285,527	285,721	285,915	286,109	286,303	286,497	286,691	286,885
108.3	19,418	19,421	19,424	19,427	19,430	19,433	19,436	19,439	19,442	19,445
	287,080	287,274	287,468	287,662	287,857	288,051	288,245	288,440	288,634	288,828
108.4	19,447	19,450	19,453	19,456	19,459	19,462	19,465	19,468	19,471	19,474
	289,023	289,217	289,412	289,606	289,801	289,996	290,190	290,385	290,580	290,774
108.5	19,477	19,480	19,483	19,486	19,489	19,491	19,494	19,497	19,500	19,503
	290,969	291,164	291,359	291,553	291,748	291,943	292,138	292,333	292,528	292,723
108.6	19,506	19,509	19,512	19,515	19,518	19,521	19,524	19,527	19,530	19,533
	292,918	293,113	293,308	293,504	293,699	293,894	294,089	294,284	294,480	294,675
108.7	19,536	19,538	19,541	19,544	19,547	19,550	19,553	19,556	19,559	19,562
	294,870	295,066	295,261	295,456	295,652	295,847	296,043	296,239	296,434	296,630
108.8	19,565	19,568	19,571	19,574	19,577	19,580	19,583	19,586	19,588	19,591
	296,825	297,021	297,217	297,412	297,608	297,804	298,000	298,196	298,391	298,587
108.9	19,594	19,597	19,600	19,603	19,606	19,609	19,612	19,615	19,618	19,621
	298,783	298,979	299,175	299,371	299,567	299,763	299,959	300,156	300,352	300,548
109	19,624	19,629	19,634	19,640	19,645	19,651	19,656	19,661	19,667	19,672
	300,744	300,940	301,137	301,333	301,530	301,726	301,923	302,119	302,316	302,512
109.1	19,677	19,683	19,688	19,693	19,699	19,704	19,709	19,715	19,720	19,726
	302,709	302,906	303,103	303,300	303,497	303,694	303,891	304,088	304,285	304,482
109.2	19,731	19,736	19,742	19,747	19,752	19,758	19,763	19,768	19,774	19,779
	304,680	304,877	305,074	305,272	305,469	305,667	305,864	306,062	306,260	306,458
109.3	19,785	19,790	19,795	19,801	19,806	19,811	19,817	19,822	19,827	19,833
	306,655	306,853	307,051	307,249	307,447	307,645	307,843	308,042	308,240	308,438
109.4	19,838	19,844	19,849	19,854	19,860	19,865	19,870	19,876	19,881	19,887
	308,637	308,835	309,033	309,232	309,431	309,629	309,828	310,027	310,225	310,424
109.5	19,892	19,897	19,903	19,908	19,914	19,919	19,924	19,930	19,935	19,940
	310,623	310,822	311,021	311,220	311,419	311,618	311,818	312,017	312,216	312,416
109.6	19,946	19,951	19,957	19,962	19,967	19,973	19,978	19,984	19,989	19,994
	312,615	312,814	313,014	313,214	313,413	313,613	313,813	314,012	314,212	314,412
109.7	20,000	20,005	20,011	20,016	20,021	20,027	20,032	20,038	20,043	20,048
	314,612	314,812	315,012	315,212	315,413	315,613	315,813	316,014	316,214	316,414
109.8	20,054	20,059	20,065	20,070	20,075	20,081	20,086	20,092	20,097	20,103
	316,615	316,815	317,016	317,217	317,418	317,618	317,819	318,020	318,221	318,422
109.9	20,108	20,113	20,119	20,124	20,130	20,135	20,140	20,146	20,151	20,157
	318,623	318,824	319,025	319,226	319,428	319,629	319,830	320,032	320,233	320,435

Table 7-02

Elevation-Area/Capacity Table - Barker Reservoir

Elevation (ft) NAVD 1988	Area (acres) Capacity (Ac-ft) 0	Area (acres) Capacity (Ac-ft) 0.01	Area (acres) Capacity (Ac-ft) 0.02	Area (acres) Capacity (Ac-ft) 0.03	Area (acres) Capacity (Ac-ft) 0.04	Area (acres) Capacity (Ac-ft) 0.05	Area (acres) Capacity (Ac-ft) 0.06	Area (acres) Capacity (Ac-ft) 0.07	Area (acres) Capacity (Ac-ft) 0.08	Area (acres) Capacity (Ac-ft) 0.09
110	20,162	20,165	20,168	20,171	20,174	20,177	20,180	20,183	20,186	20,189
	320,637	320,838	321,040	321,242	321,443	321,645	321,847	322,049	322,250	322,452
110.1	20,192	20,195	20,198	20,201	20,204	20,207	20,210	20,213	20,216	20,219
	322,654	322,856	323,058	323,260	323,462	323,664	323,866	324,068	324,271	324,473
110.2	20,222	20,225	20,228	20,231	20,234	20,237	20,240	20,243	20,246	20,249
	324,675	324,877	325,079	325,282	325,484	325,686	325,889	326,091	326,294	326,496
110.3	20,252	20,255	20,258	20,261	20,264	20,267	20,270	20,273	20,276	20,279
	326,699	326,901	327,104	327,306	327,509	327,712	327,914	328,117	328,320	328,522
110.4	20,282	20,285	20,288	20,291	20,294	20,297	20,300	20,303	20,306	20,309
	328,725	328,928	329,131	329,334	329,537	329,740	329,943	330,146	330,349	330,552
110.5	20,312	20,315	20,318	20,321	20,324	20,327	20,330	20,333	20,336	20,339
	330,755	330,958	331,161	331,364	331,568	331,771	331,974	332,178	332,381	332,584
110.6	20,342	20,345	20,348	20,351	20,354	20,357	20,360	20,363	20,366	20,369
	332,788	332,991	333,195	333,398	333,602	333,805	334,009	334,212	334,416	334,620
110.7	20,372	20,375	20,378	20,381	20,384	20,387	20,390	20,393	20,396	20,399
	334,823	335,027	335,231	335,435	335,638	335,842	336,046	336,250	336,454	336,658
110.8	20,402	20,405	20,408	20,411	20,414	20,417	20,420	20,423	20,426	20,429
	336,862	337,066	337,270	337,474	337,678	337,882	338,087	338,291	338,495	338,699
110.9	20,432	20,435	20,438	20,441	20,444	20,447	20,450	20,453	20,456	20,459
	338,904	339,108	339,312	339,517	339,721	339,926	340,130	340,335	340,539	340,744

EXHIBIT A
SUPPLEMENTARY PERTINENT DATA

EXHIBIT A
SUPPLEMENTARY PERTINENT DATA

GENERAL INFORMATION

ITEM	DESCRIPTION OR QUANTITY AND UNITS
Location	Addicks - South Mayde Creek, approximately 1.4 miles upstream from Buffalo Bayou Barker - Buffalo Bayou, approximately 1.2 miles upstream from South Mayde Creek
Type of Project	Detention - Type Reservoir
Objectives of regulation	Primary purpose is flood control
Project owner	U.S. Army Corps of Engineers
Operating agency	U.S. Army Corps of Engineers
Regulating agency	U.S. Army Corps of Engineers
Hydropower	None
Water supply contracts	None
Other formal agreements	None
Water rights	Riparian
Project cost (both dams)	$4,000,000
Closure Date	Addicks – 08 Jun 1948 Barker – 25 Aug 1945

RESERVOIRS

ITEM	DESCRIPTION OR QUANTITY AND UNITS		
Feature	Elevation (ft, NAVD88)	Surface Area (acres)	Storage Capacity (ac-ft)
ADDICKS RESERVOIR			
Conduit Invert	66.0	7	35
Limits of Government Land	103.0	13,016	127,591
100-Year Flood	103.8	13,405	138,687
Standard Project Flood	107.6	15,886	193,956
Natural Ground at End of Dam	108.0	16,199	199,643
Top of Dam	121.0		-
BARKER RESERVOIR			
Conduit Invert	68.5	0	0
Limits of Government Land	95.0	12,036	82,921
100-Year Flood (1)	97.0	12,574	107,363
Standard Project Flood	98.3	13,412	125,061
Natural Ground at End of Dam	104.0	16,543	209,600
Top of Dam	113.1		-

Length of embankment	Addicks - 61,166 feet
	Barker - 71,900 feet
Initial real estate taking	Addicks - 12,460 acres
	Barker - 12,060 acres
Range of clearing	Not applicable

(1) Provisional until compliant with the USACE Civil Works Review Policy

HYDROLOGY

ITEM	DESCRIPTION OR QUANTITY AND UNITS
Drainage area (total)	Addicks – 136 square miles Barker – 130 square miles
1" runoff equals	Addicks – 7,253 acre-feet Barker – 6,933 acre-feet
Standard Project Flood	Addicks – 193,956 acre-feet Barker – 125,061 acre-feet
Spillway Design Flood	Addicks – 462,145 acre-feet Barker – 279,072 acre-feet
Maximum flood of record	Addicks – 217,896 acre-feet (August 2017) Barker – 170,941 acre-feet (August 2017
Minimum daily flow	Addicks – 35 cfs Barker – 23 cfs
Average flows	(see Table 4-03)
Hydrometeorologic data	A real-time flood forecasting model was developed by the Hydrologic Engineering Center (HEC). This system is used to predict the inflow into the reservoirs. The forecasting system consists of PRECIP and HEC-HMS models. Both models use a one-hour time interval. Precipitation estimates are available from three main sources: precipitation gages, radar, and satellite.

EMBANKMENTS

ITEM	DESCRIPTION OR QUANTITY AND UNITS
Purpose	To complete impoundment structure to high ground and provide for access road
Type	Overflow and Non-Overflow
Type of Fill	Rolled earth fill, soil-cement protection on overflow sections
Length	Addicks – 61,166 feet Barker – 71,900 feet
Top Elevation	Addicks – 121.0 (non-overflow) Barker – 113.1 (non-overflow)

SPILLWAY

ITEM	DESCRIPTION OR QUANTITY AND UNITS
Location	Two emergency spillways at both ends of the dam for both Addicks and Barker Dams
Type	Uncontrolled weirs
Crest Elevation	Addicks (north end) – 112.5 Addicks (south end) – 115.5 Barker (north end) – 105.5 Barker (south end) – 106.7
Net Overflow Length	Addicks (north end) – 8,400 feet Addicks (south end) – 10,500 feet Barker (north end) – 3,000 feet Barker (south end) – 12,500 feet
Maximum Discharge	PMF analysis underway

SPILLWAY CONTINUED

ITEM	DESCRIPTION OR QUANTITY AND UNITS
Type of Energy Dissipater	Cement apron along emergency spillway
Reoccurrence Interval of Pool Attaining Crest Elevation	Addicks – exceeds 500-year event Barker – exceeds 500-year event
Spillway Activation	None to date (1947-2019)

OUTLET FACILITIES

ITEM	DESCRIPTION OR QUANTITY AND UNITS
Location	Addicks – Main Channel of South Mayde Creek Barker – Main Channel of Buffalo Bayou
Type	Addicks – gated steel-lined conduits Barker – gated steel-lined conduits
Number and Size of Conduits	Addicks – 3 10-foot diameter conduits encased in concrete Barker – 3 12-foot diameter conduits encased in concrete
Length of Conduits	Addicks – 247.67 feet Barker – 131.92 feet
Upstream Invert Elevation	Addicks – 66.0 feet Barker – 68.5 feet
Energy Dissipator	Addicks – 59 foot parabolic chute spillway and 55 foot long, 54 foot wide longitudinal stilling basin with baffle blocks and end sill Barker – 50 foot parabolic chute spillway and 51 foot long, 57 foot wide longitudinal stilling basin with baffle blocks and end sill

HYDROELECTRIC POWER FACILITIES

None

LOCK

None

CONTROL STATION

ITEM	DESCRIPTION OR QUANTITY AND UNITS
Location	Buffalo Bayou at Piney Point streamgage approximately 10.2 miles downstream from Barker Dam
Target Flow Rates	2,000 cfs
Monitoring Provisions	The station is equipped with a water stage recorder and a data collection platform for transmission of hourly data via GOES satellite at 4-hour intervals.

EXHIBIT B
POLICY LETTER TO HARRIS COUNTY

Galveston District Drainage Policy

SWGED-H

30 December 1981

Honorable Jon Lindsay
County Judge, Harris County
1001 Preston Avenue
Houston, Texas 77002

Dear Judge Lindsay:

This is to advise you of a change in policy relative to drainage improvements or other facilities which affect drainage on Government-owned lands of Addicks and Barker Reservoirs.

Because of serious seepage problems with the reservoir embankments and the incompleteness of our hydrological reevaluation we established a policy relative to drainage improvements in early 1979 which in effect precluded the construction of any further channel improvements within the reservoirs or enlargement of ditches which parallel the downstream side of the embankments.

Although our repair of the embankments and hydrological reevaluation have been completed, there are still some significant problems with the reservoirs. These problems are primarily their inability to safely pass the spillway design flood and the continued compromised gate operation because of the inadequate capacity of Buffalo Bayou downstream of the reservoirs. The inability to safely pass the spillway design flood was discussed in my letter to you of 16 November 1981. Notwithstanding these problems, our previous policy relating to drainage improvement on reservoir lands can be relaxed without significant effect on the operation of the reservoirs.

In view of this, our revised policy relative to drainage improvements or other facilities which effect drainage on Government-owned lands of Addicks and Barker Reservoirs follows:

a. Drainage improvements for Langham, Horsepen and South Mayde Creeks will be considered for ultimate condition flows as presented in Harris County's Comprehensive Study of Drainage for Buffalo Bayou Watershed above Addicks and Barker Dams, dated June 1980.

b. Drainage improvements for Turkey, Bear and Mason Creeks and the reach of Buffalo Bayou above the Barker Reservoir will be considered to the extent where these streams can carry the rainfall runoff up to and including the 100-year frequency storm for watershed conditions existing as of 1 January 1979. (The 1 January 1979 was selected to be consistent with Harris County's Comprehensive Study of Drainage for Buffalo Bayou Watershed above Addicks and Barker Dams, dated June 1980.) Drainage improvements of other minor channels or laterals will be considered on the basis of the same criteria.

c. The current policy of precluding drainage improvements into the Barker and Clodine ditches and laterals thereto which would increase runoff rates into Buffalo Bayou will continue in effect.

Drainage improvements to the streams identified above or construction of any facilities which affect drainage will be subject to the following conditions:

a. Applications for such easements must be made by the appropriate governmental entity (Harris County Flood Control District) as opposed to municipal utility districts or individual developers. This will assure that we always have a viable agency to deal with concerning future compliance with terms and conditions of any easements or licenses that may be issued. Although any easement granted will be specifically defined and limited, we want to stress that future maintenance of facilities approved will be strictly limited to the original dimensions and alignment. Future modifications, if any, may not require a new easement but such modifications will have to be approved in writing by the Galveston District. Any proposed action must be consistent with the approved Master Plan for Addicks and Barker Reservoirs. The approved Master Plan will always consider the broad scope of the total proposed project and its effect on the resources of the general public, both above and below the reservoirs. Therefore, all outgrants must be considered to be in the best interest of the overall general public, as opposed to serving only the financial interests of private developers.

b. Design criteria for drainage improvements will be consistent with Harris County's Comprehensive Study of Drainage for Buffalo Bayou Watershed above Addicks and Barker Dams of June 1980. It wil be the applicant's responsibility to provide supportive technical data for proposed improvements to insure compatibility with the District policy. Applications without the appropriate supporting technical data will not be considered.

c. Drainage improvements of stream or laterals will be limited to a maximum of 1.5 miles within the reservoir lands. Drainage improvements on streams or laterals which significantly disturb the aesthetic or natural environment of the streams will not be permitted. However, in such cases adequately designed and construction diversions will be considered as viable alternatives.

d. The applicant will provide and maintain settling basins or alternative control methods on inflowing streams to reduce velocity and essentially preclude permanent deposition of sediment in the federally-owned reservoir lands.

e. A diligent maintenance program consistent with Corps of Engineers' standards will be required for each approved feature.

f. The applicant will be required to furnish an Environmental Assessment (EA) to assist the Galveston District in determining the effects of the proposed action on significant resources. The EA will include a brief discussion of the need for the proposed action, its environmental impacts, alternatives to the proposed action, and mitigating measures, if any, for the proposed action. The document will be supported by necessary appendices or technical data and will be concise for meaningful review before any action will be approved.

g. Easements will be compatible with Corps of Engineers' operation and maintenance activities and with other uses and functions of the reservoirs and will not unduly interfere with any other licensed, leased or permitted activity. Preservation of the recreation, wildlife, vegetation, water and cultural resources of Addicks and Barker Reservoirs will be a primary consideration in approval of the easements.

h. The applicant should have easements in his possession and written approval of detail plans and specifications from the Galveston District for each approved feature prior to advertising for construction.

i. Completed roadways within the reservoir will be marked with prominent signs stating that the roadway is subject to inundation.

j. The necessity for Department of the Army permits will be determined on each application.

k. The applicant will be required to indemnify the Government from any and all claims for damages to persons or property that may result from construction and subsequent maintenance of the improvements.

If you or your representative want to discuss this policy further, we will arrange a meeting at your convenience.

Sincerely,

JAMES H. SIGLER
Colonel, Corps of Engineers
District Engineer

Copies furnished:

Commissioner Tom Bass, Prec. No. 1

Commissioner James Fonteno, Prec. No. 2

Commissioner Bob Eckels, Prec. No. 3

Commissioner E. A. Lyons, Jr., Prec. No. 4

Mr. Richard Doss
County Engineer, Harris County
7th Floor, Harris County Admin Bldg
1001 Preston Avenue
Houston, TX 77002

Mr. James Green
Director, Harris County Flood
Control District
8615 N. Main
Houston, TX 77022

EXHIBIT C
STANDING INSTRUCTIONS TO DAMTENDER

EXHIBIT C
STANDING INSTRUCTION TO DAMTENDER

ADDICKS AND BARKER RESERVOIRS, BUFFALO BAYOU, TEXAS

1. Responsibility the Operations Division, through the Chief of Project Operations Branch, is responsible for the maintenance and operation of the Addicks and Barker Reservoirs. The Engineering and Construction Division, who is also designated as the Dam Safety Officer (DSO), through the Water Management Section/H&H Branch Sub-Section is responsible for the preparation and issuance of the reservoir regulation instructions. The Natural Resource Management Specialist or alternate member of the field office organization will serve as Damtender for both reservoirs. The responsibility of the Damtender is to insure that discharges from the reservoirs are as instructed by the District Hydrologist or in accordance with the plan of regulation set forth in Chapter VII of the Reservoir Regulation Manual. The principle duties of the Damtender are given in section 7-04 of the Water Control Manual and in the supplemental manual "Initial and Emergency Instructions to Damtender." The following instructions for the regulation of the reservoirs will be observed by the Damtender.

2. INSTRUCTIONS The Natural Resource Management Specialist will act as the Damtender for reservoir operations. Detailed instructions to the Damtender for Addicks and Barker Reservoirs are presented below.

a. OPERATION During flood periods, the reservoir will be operated in accordance with the normal regulation for flood control as described in Chapter VII of the Addicks and Barker Reservoir Regulation Manual or Paragraph 3, 4 or 5 of this exhibit. Instructions for the storage and discharge of flood waters will be issued by the Water Management Section/H&H Branch. In the event that communication with the Galveston District Office is disrupted, the reservoir will be regulated in accordance with the schedule of emergency regulation for flood control (see Chapter VII of the Addicks and Barker Reservoir Regulation Manual or Paragraph 3, 4 or 5 of this exhibit). In addition, the Damtender will make every effort to re-establish communications with the Galveston District Office.

b. REPORTS TO DISTRICT OFFICE The Damtender is to observe and be cognizant of all available hydrologic/meteorological data and project activities that are pertinent to the operation of the projects. These data, when requested by the Water Management Section/H&H Branch, will be reported by e-mail, telephone or radio.

3. NORMAL OPERATION

a. Normal conditions – Set two conduit gates at each outlet works at an opening of 1.0 foot each, allowing for the passage of normal low flows.

b. If 1 inch of rainfall, in 24 hours or less occurs, over the watershed downstream of the reservoirs or when flooding is predicted downstream, the Water Management Section/H&H Branch will be contacted. If an unwarranted delay will ensue, the Damtender will proceed to the reservoir, close the gates, and then contact the Water Management Section/H&H Branch.

c. When releases are being made and one-half inch of rainfall, in 24 hours or less, occurs over the watershed downstream of the reservoirs or when flooding is predicted downstream, the Water Management Section/H&H Branch will be contacted. If an unwarranted delay will ensue, the Damtender will proceed to the reservoirs, close the gates, and then contact the Water Management Section/H&H Branch.

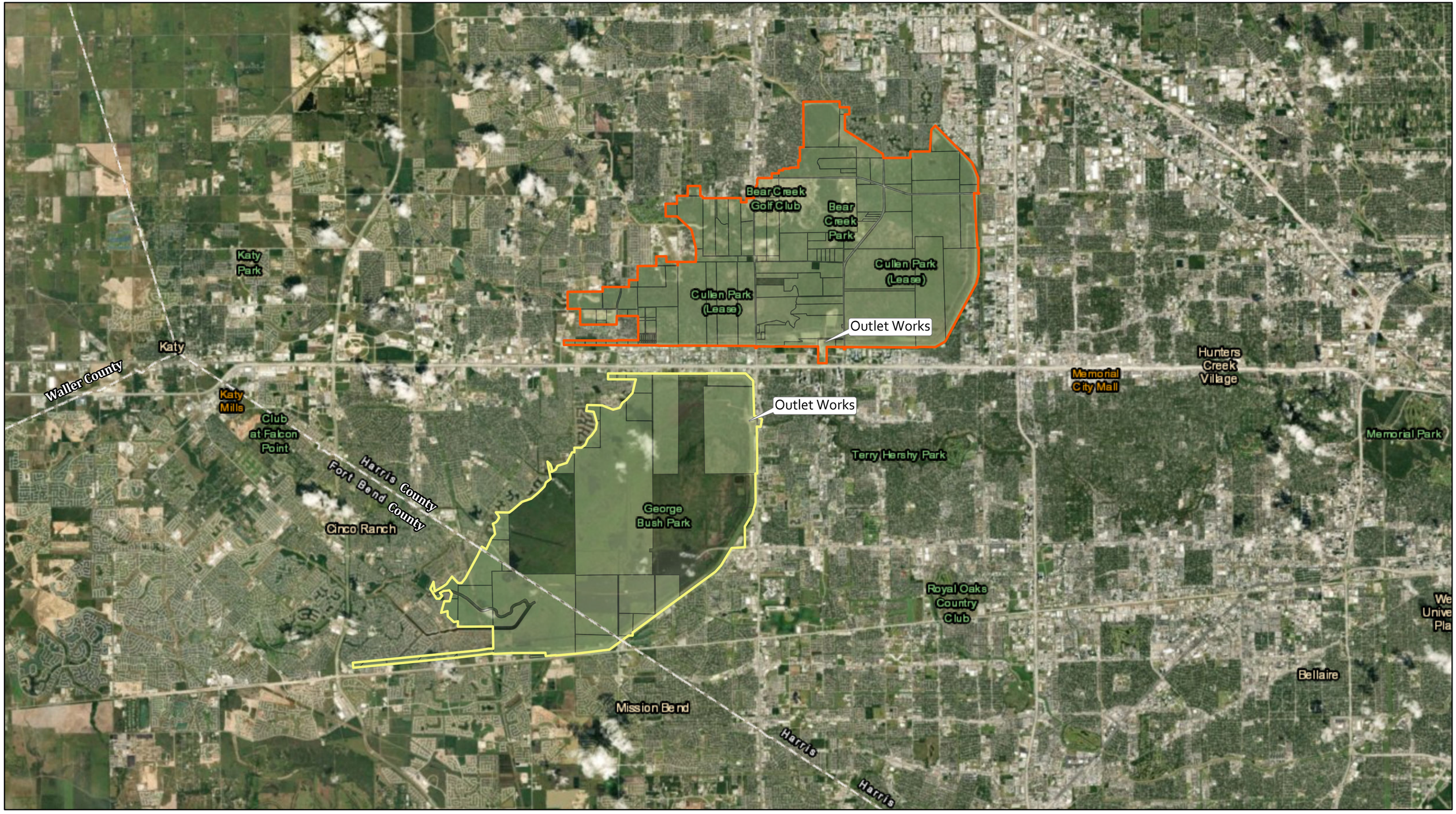
4. INDUCED SURCHARGE REGULATION

a. Induced Surcharge conditions at Addicks and Barker Reservoirs are defined to exist at any time the reservoir pool equals or exceeds 101 feet NAVD88 at Addicks (about 45 percent of storage) and 95.7 feet NAVD88 at Barker (about 40 percent of storage) on the reservoir gages. If inflow and pool elevation conditions dictate the use of the induced surcharge regulation schedule, the Water Management Section/H&H Branch will be contacted and instructions will be provided. Advance information will be given the public by the District Engineer or in his absence by the Officer-in-Charge through the media of the U.S. National Weather Service, other agencies, telephone, radio, television, and newspapers.

b. Emergency Conditions (Loss of Communications). If the Water Management Section/H&H Branch cannot be contacted and communications are lost, emergency conditions exist. Releases will be made independently by the Damtender in accordance with the induced surcharge regulation schedules shown on Plates 7-03 and 7-04. Using the horizontal curve that corresponds to the appropriate rate-of-rise, locate the pool elevation that the reservoir is currently at, on the vertical axis. The corresponding surcharge release rate is read from the horizontal axis. The bold vertical lines provide recommended gate openings to achieve the requisite surcharge release rates. If inflow and pool elevation conditions dictate the use of the induced surcharge regulation schedule in either reservoir, releases will be made regardless of channel capacity downstream. Every effort should be made to provide advance information to the public by the Damtender or in his absence by the alternate through the media of the U.S. National Weather Service, Civil Defense, radio, television and newspapers. The

gates should remain at the maximum opening attained from the induced surcharge operation schedules until reservoir levels fall to elevation 101 feet NAVD88 in Addicks and 94.9 feet NAVD88 in Barker. Then, if the out-flow from both reservoirs when combined with the uncontrolled runoff downstream is greater than channel capacity, adjust the gates until the total discharges do not exceed channel capacity and follow the normal operating procedures in section 7-05, paragraph a, sub-section 4 of the Addicks and Barker Water Control Manual.

PLATES



Legend

- Addicks Reservoir
- Barker Reservoir

Vicinity Map
Addicks and Barker Reservoirs

Plate 2-01

0 0.75 1.5 3 4.5 6 Miles

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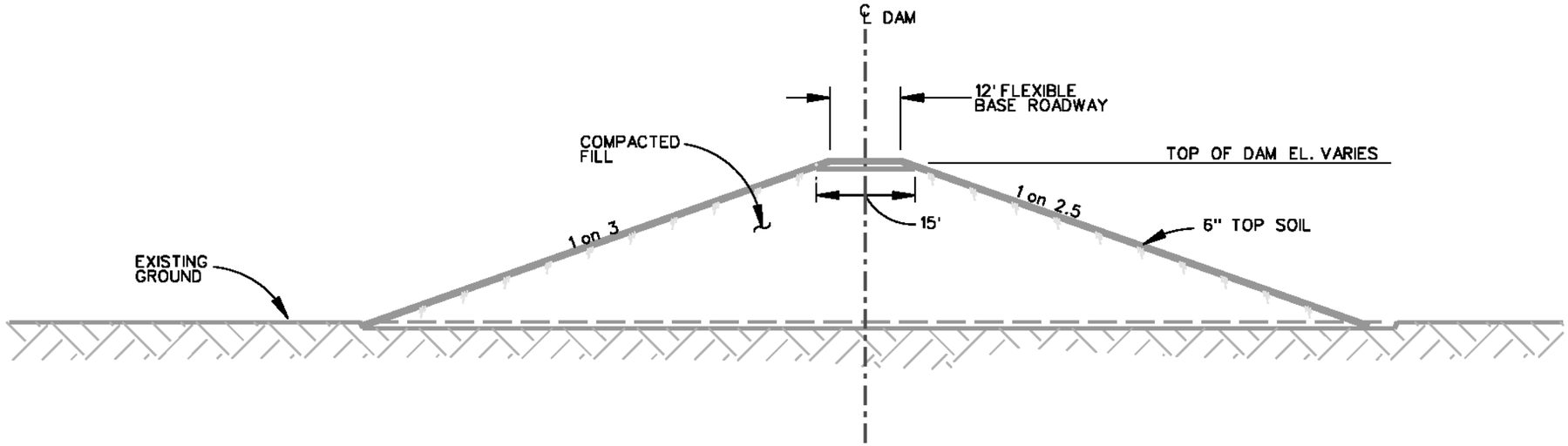
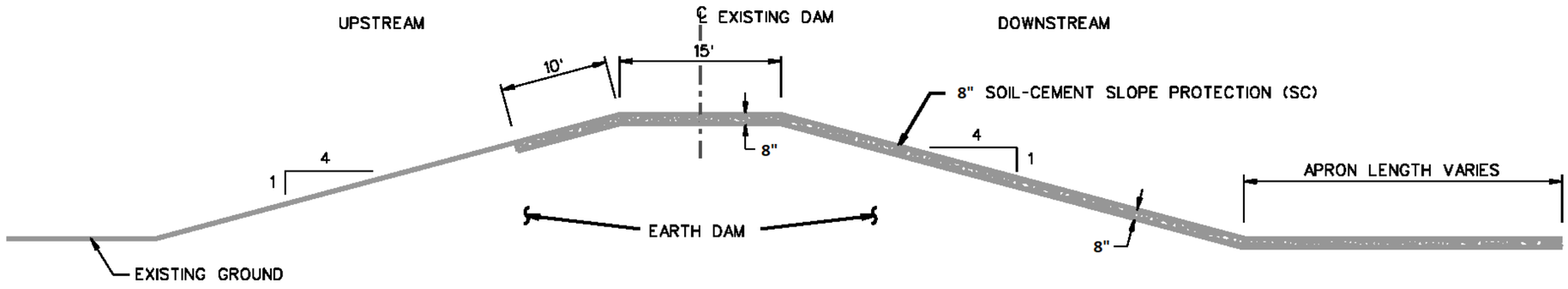
Galveston District



TYPICAL SECTION - DAM

N.T.S.



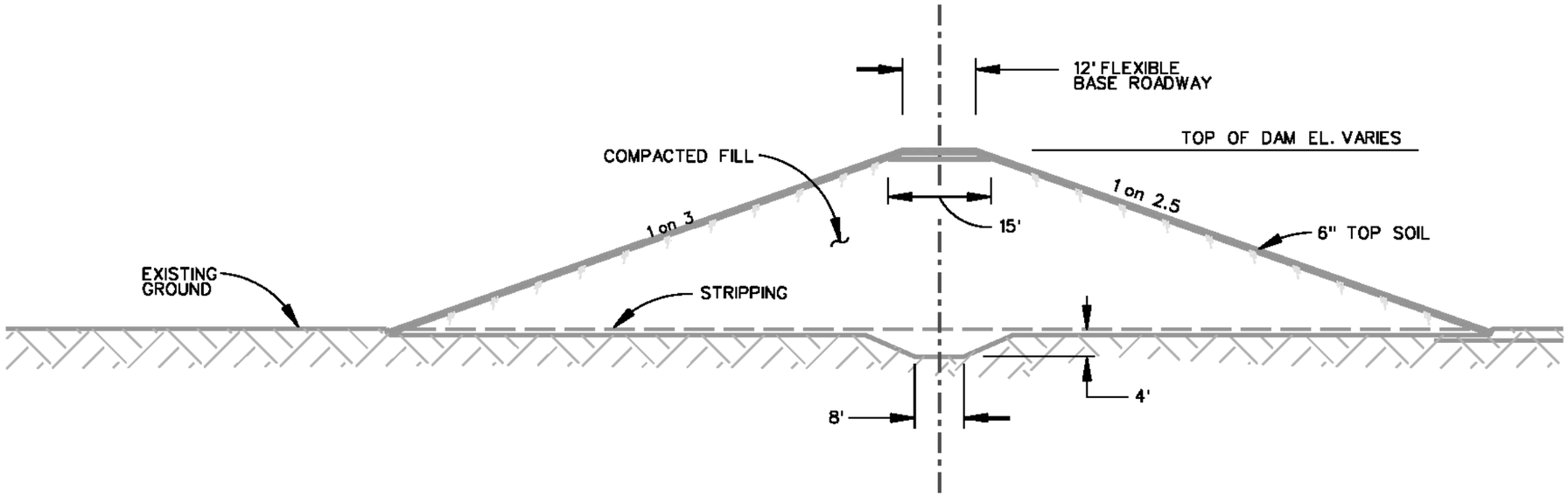
TYPICAL SECTION - SPILLWAY

N.T.S.

Dam and Spillway Typical Sections
Addicks Reservoir

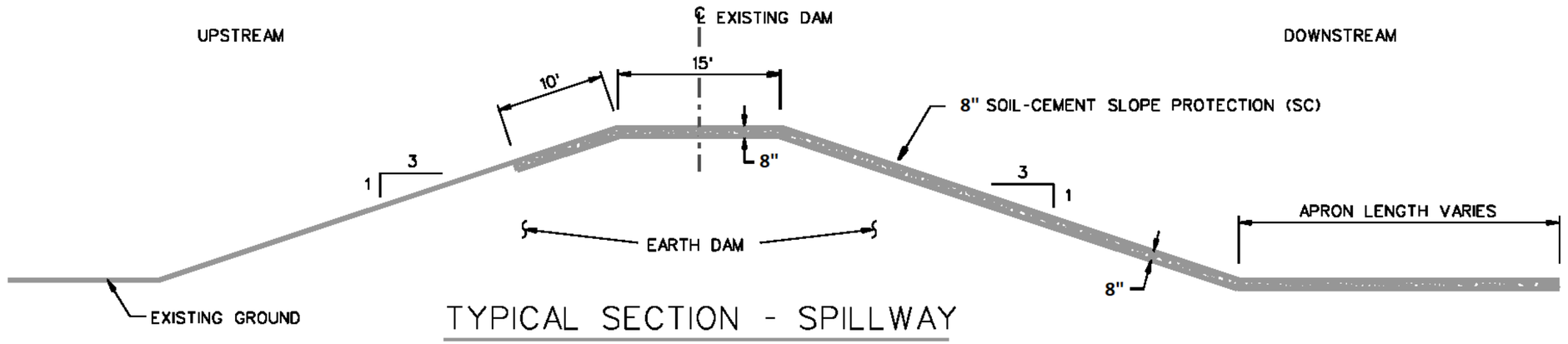
Plate 2-02

US Army Corps of Engineers ®
Galveston District



TYPICAL SECTION - DAM

N.T.S.



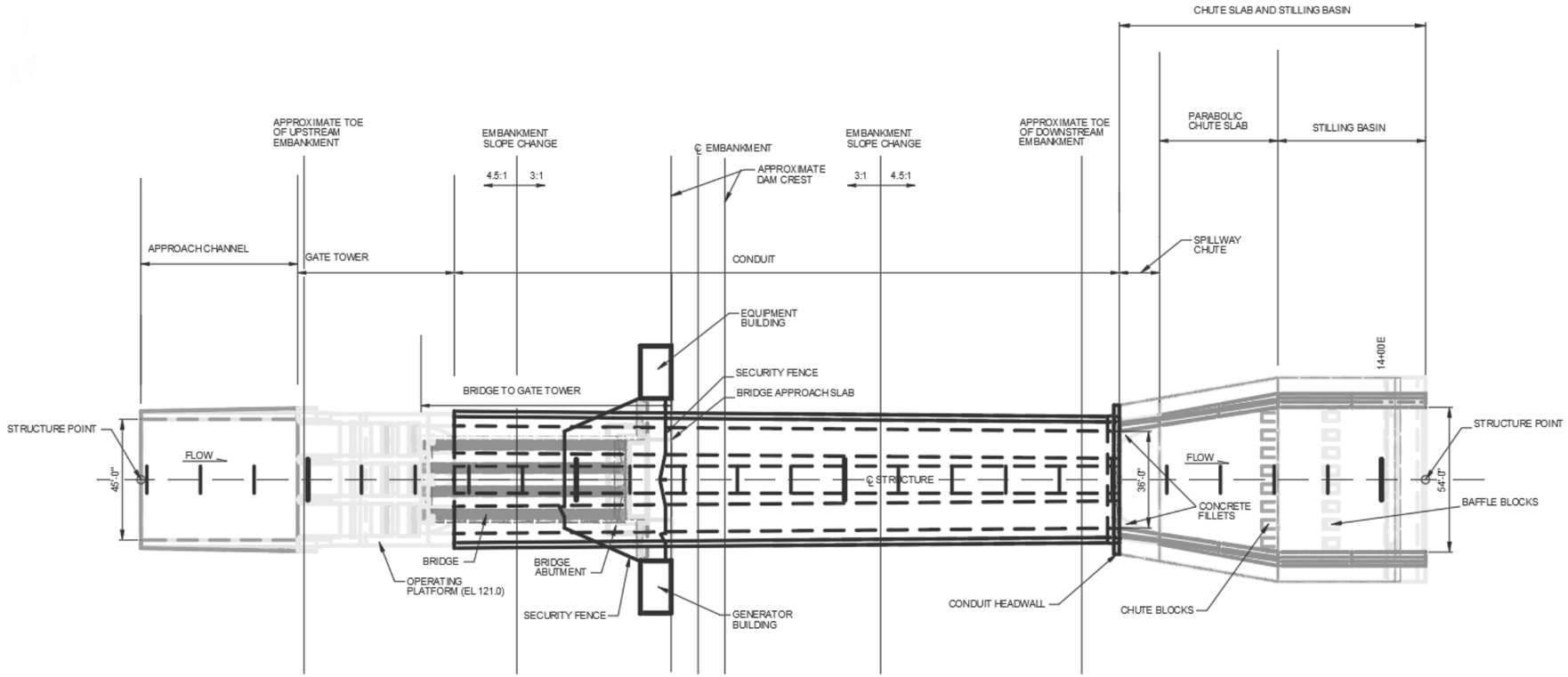
TYPICAL SECTION - SPILLWAY

N.T.S.

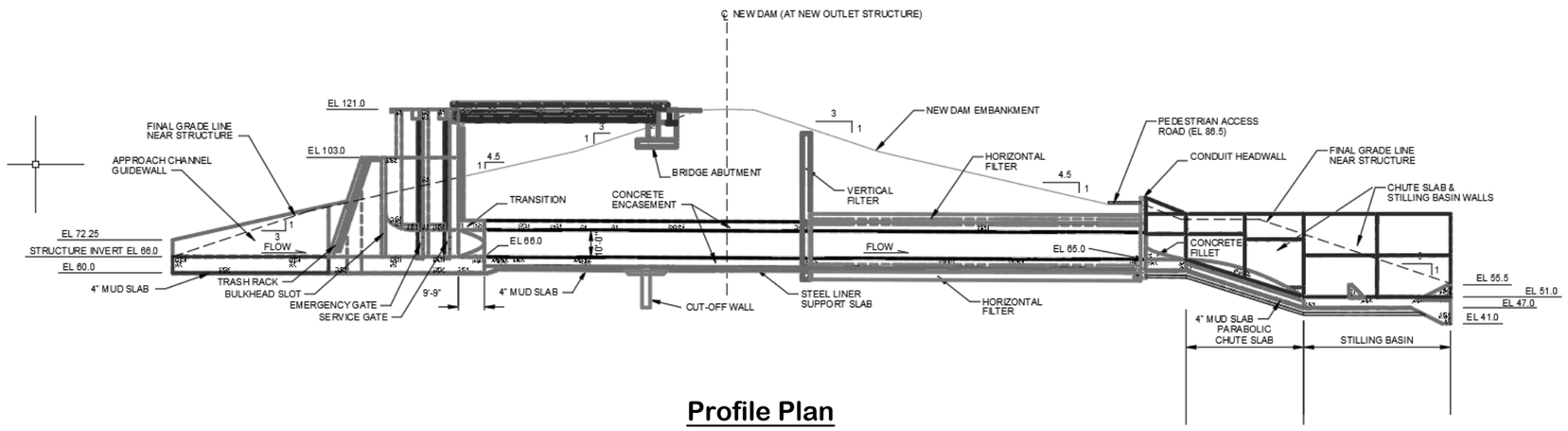
Dam and Spillway Typical Sections
Barker Reservoir

Plate 2-03

US Army Corps of Engineers ®
Galveston District



Structural Feature Plan

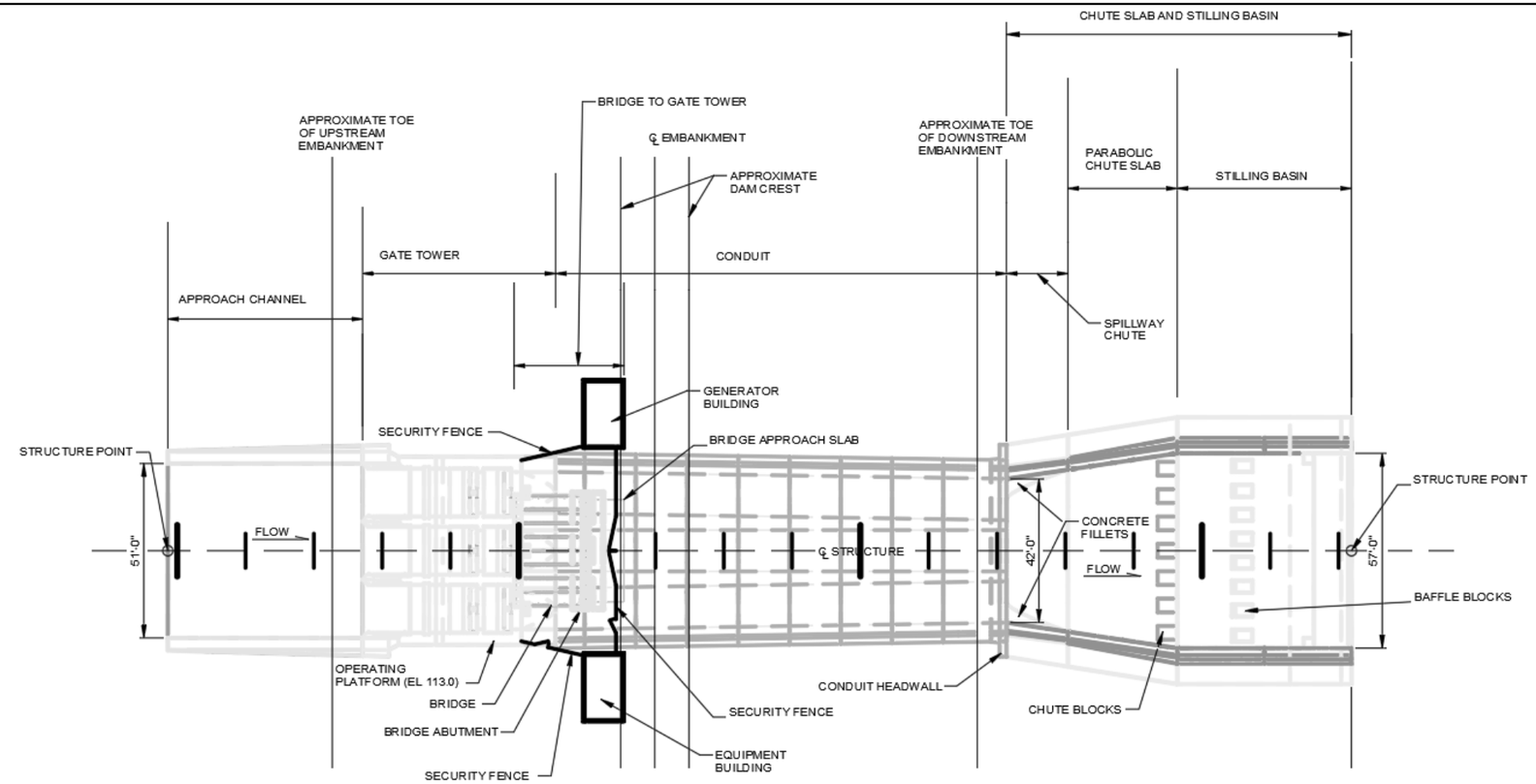


Profile Plan

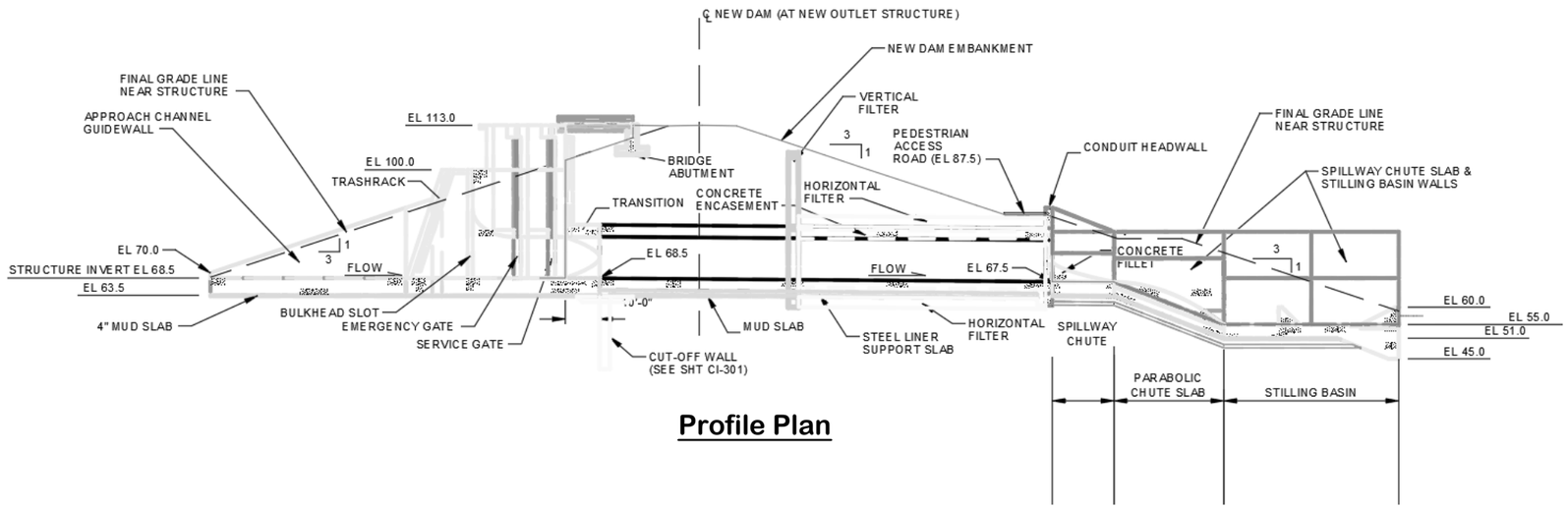
Outlet Works Plan and Profile
Addicks Reservoir

Plate 2-04

US Army Corps of Engineers ®
Galveston District



Structural Feature Plan

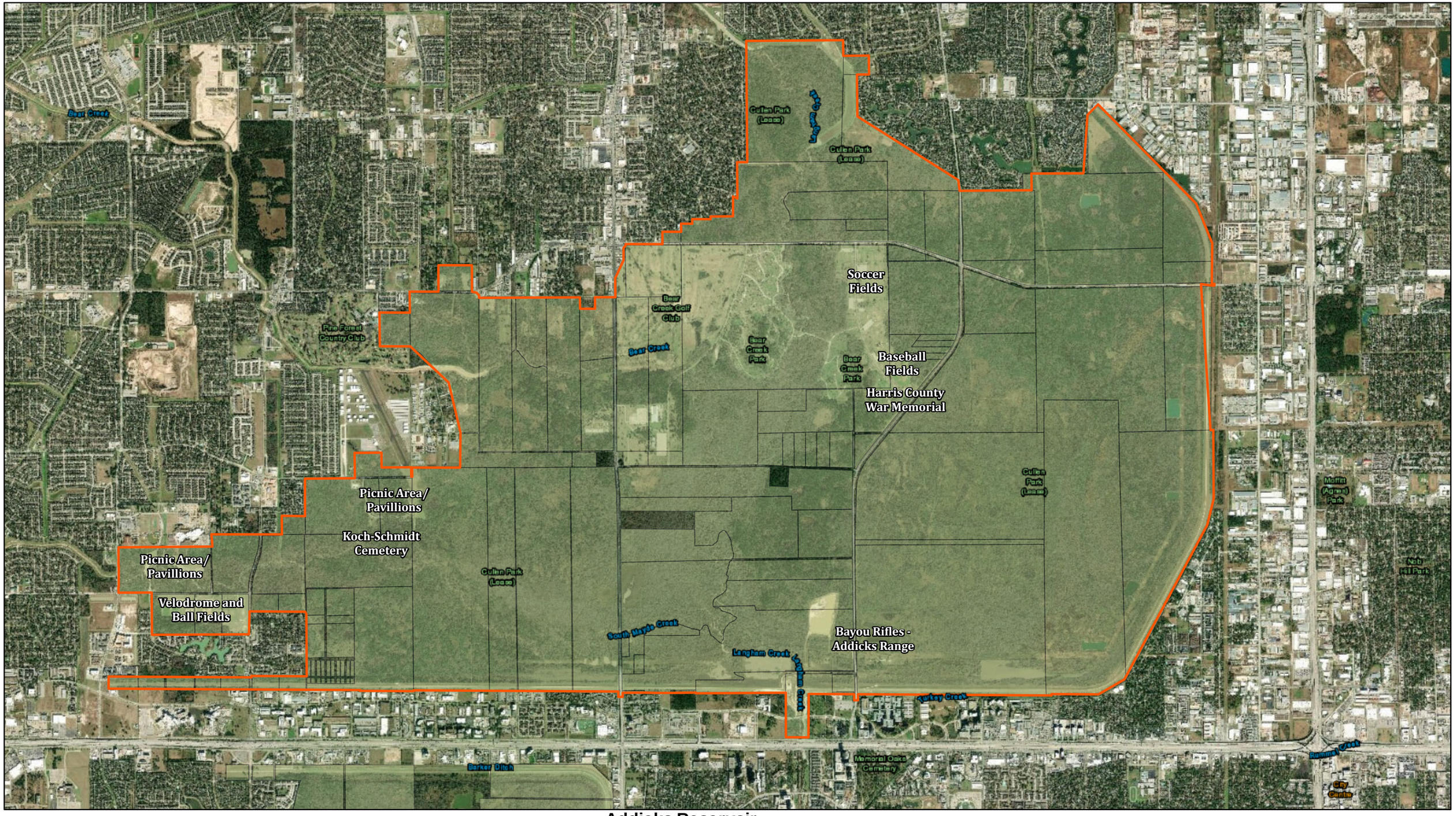


Profile Plan

Outlet Works Plan and Profile
Barker Reservoir

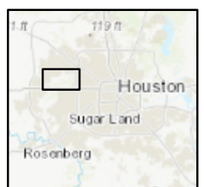
Plate 2-05

US Army Corps of Engineers ®
Galveston District



Legend

Addicks Reservoir



Addicks Reservoir
Public Facilities

Plate 2-06

0 0.5 1 2 3 4 Miles

The data is only a representation of features on the earth completed by a computer program from raw data obtained from different sources and is not necessarily, in whole or in part, based upon any physical recording, study or survey, professional or otherwise, of the covered property. This information is not intended as a substitute for a field survey by a professional or any other use or application that requires legal or engineering accuracy.

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Galveston District

Legend

Barker Reservoir

Barker Reservoir
Public Facilities

Plate 2-07

0 0.5 1 2 3 4 Miles

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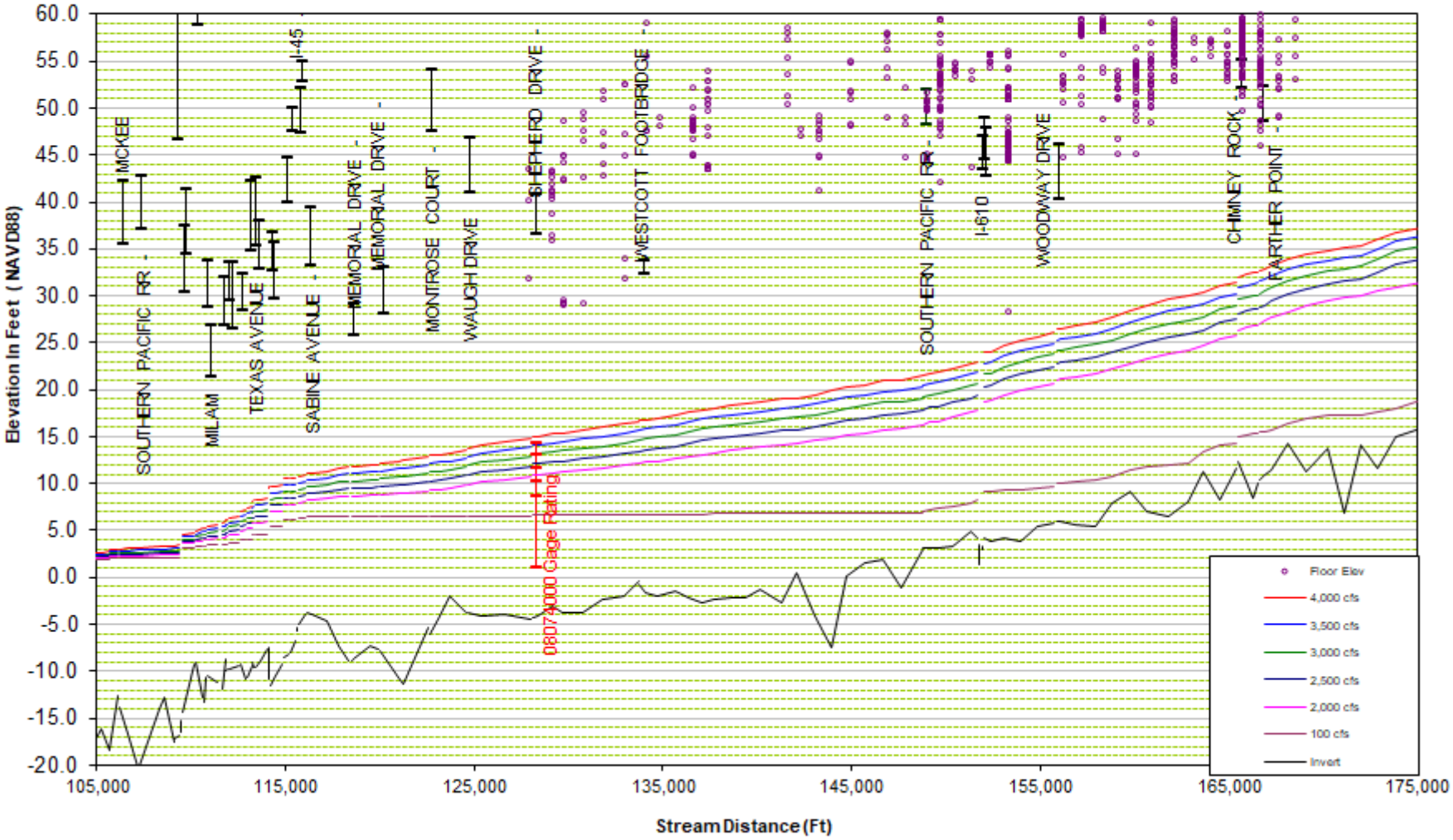
Galveston District

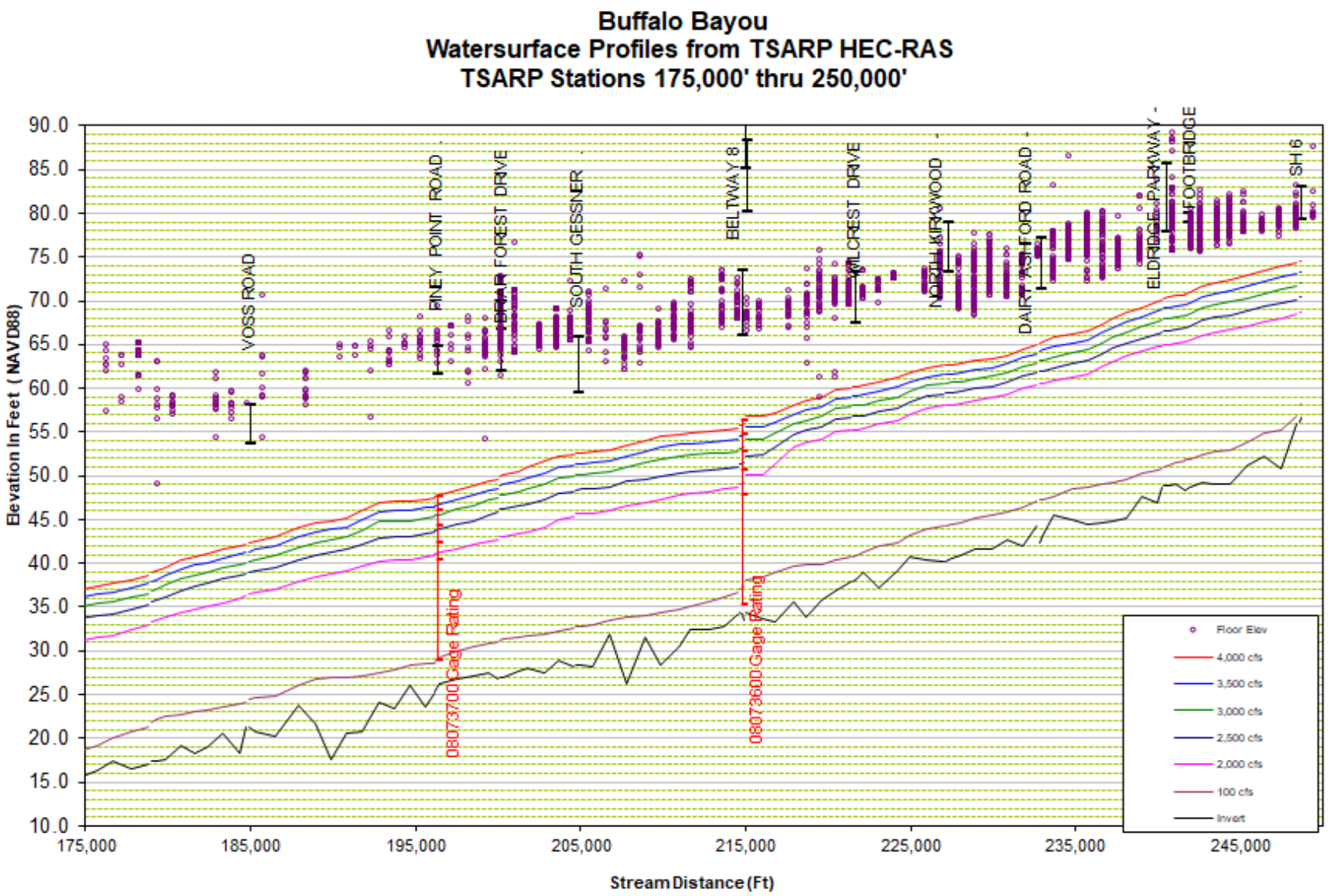


Water Surface Profiles and Floor Elevations
Buffalo Bayou

Note: Elevations are NAVD88

US Army Corps of Engineers ®
Galveston District

Plate 3-01



Water Surface Profiles and Floor Elevations
Buffalo Bayou

Note: Elevations are NAVD88

US Army Corps of Engineers ®
Galveston District

Plate 3-02

Legend

- Addicks Reservoir
- Barker Reservoir
- Addicks Watershed
- Barker Watershed
- Cypress Creek Watershed
- Buffalo Bayou Watershed

N W E S

Drainage Area Map
Addicks, Barker, Cypress Creek, and Buffalo Bayou Watersheds

Plate 4-01

0 2.5 5 10 15 20 Miles

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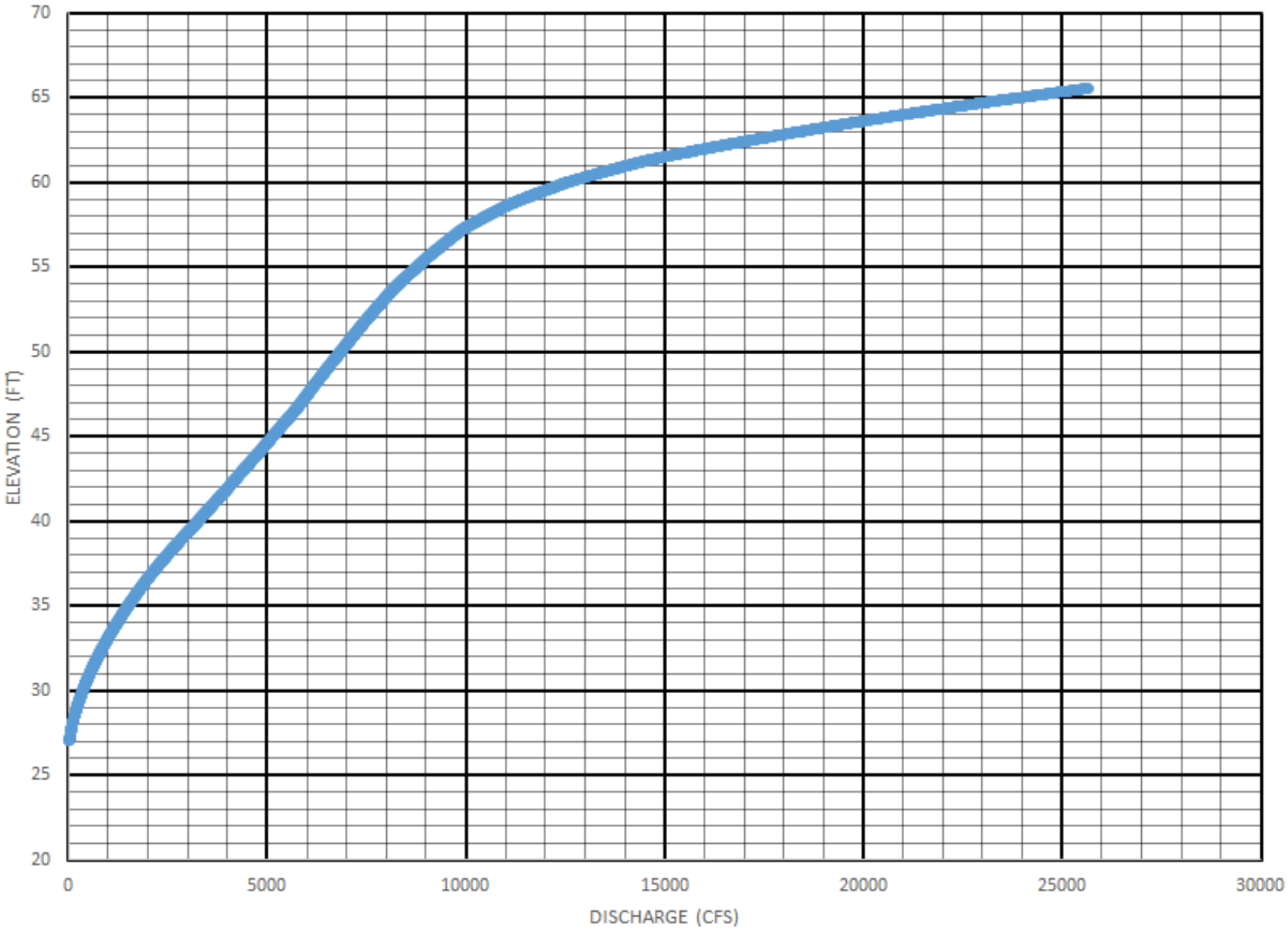

Discharge Rating Curve
Buffalo Bayou at Piney Point

Note: Elevations are NAVD88

Rating curve established 31 October 2018

US Army Corps of Engineers ®
Galveston District

Plate 4-02

USGS Station Number	National Weather Service (NWS) ID	Description
8073500	ADBT2	BUFFALO BAYOU NR ADDICKS, TX
8073000	ADDT2	ADDICKS RES NR ADDICKS, TX
8072600	BAHT2	BUFFALO BAYOU AT STATE HWY 6 NR ADDICKS, TX
8072500	BAKT2	BARKER RES NR ADDICKS, TX
8072730	BBAT2	BEAR CREEK NR BARKER, TX
8072300	BBKT2	BUFFALO BAYOU NR KATY, TX
8074000	BBST2	BUFFALO BAYOU AT HOUSTON, TX
8068740	HCHT2	CYPRESS CREEK AT HOUSE-HAHL RD NR CYPRESS, TX
8068700	HOCT2	CYPRESS CK AT SHARP RD NR HOCKLEY, TX
8068720	KHOT2	CYPRESS CK AT KATY-HOCKLEY RD NR HOCKLEY, TX
8072760	LLYT2	LANGHAM CK AT W LITTLE YORK RD NR ADDICKS, TX
8073700	PPTT2	BUFFALO BAYOU AT PINEY POINT, TX
8072700	SMAT2	S MAYDE CREEK NR ADDICKS, TX
8073600	WSBT2	BUFFALO BAYOU AT W BELT DR AT HOUSTON, TX
8072800	LCAT2	LANGHAM CREEK NR ADDICKS, TX
8072350	BBCT2	BUFFALO BAYOU NR FULSHEAR, TX

Legend

- Addicks Reservoir
- Barker Reservoir

Stream Gauge Locations

- Stream Gauges

N W E S

Stream Gauge Locations
Addicks and Barker Reservoirs

Plate 5-01

0 2 4 8 12 16 Miles

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Jersey Village
Bear Creek
Bear Creek Golf Club
Bear Creek Park
Cullen Park (Lease)
Cullen Park (Lease)
Whiteoak Bayou
Melrose Park
Memorial City Mall
Hunters Creek Village
Memorial Park
Houston
Terry Hershey Park
Buffalo Bayou
Club
Falcon Point
Harris
Fort Bend
Cinco Ranch
George Bush Park
Royal Oaks Country Club
West University Place
Rice University
Mason Park
Bellaire
NRG Park
Mission Bend
Harris
Harris
Jones Creek
Oyster Creek
Meadows Place
Wildcat
Law Park

1
2
3
4
5
6

Legend

- Addicks
- Barker

Constant_Flow

- 3,000 cfs
- 6,000 cfs
- 10,000 cfs
- 15,000 cfs
- 20,000 cfs

N
W E
S

Index Map

1 2 3 4 5 6

Constant Flow Inundation Maps
Addicks and Barker Reservoirs
Harris County, Texas
Plate 5-02

0 1.25 2.5 5 7.5 10 Miles

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Galveston District

Bridge Deck Elevation
79.5 ft. - S. Mayde Creek

Water Surface Elevation
81.1 ft. - 20,000 cfs
80.1 ft. - 15,000 cfs
79.0 ft. - 10,000 cfs
77.9 ft. - 6,000 cfs
74.9 ft. - 3,000 cfs

Bridge Deck Elevation
81.1 ft - State Highway 6

Water Surface Elevation
86.5 ft - 20,000 cfs
85.3 ft. - 15,000 cfs
83.8 ft. - 10,000 cfs
81.8 ft. - 6,000 cfs
78.0 ft. - 3,000 cfs

Bridge Deck Elevation
77.2 ft. - Dairy Ashford Rd

Water Surface Elevation
77.5 ft. - 20,000 cfs
76.5 ft. - 15,000 cfs
74.1 ft. - 10,000 cfs
70.1 ft. - 6,000 cfs
67.0 ft. - 3,000 cfs

Bridge Deck Elevation
73.2 ft. - Kirkwood Rd

Water Surface Elevation
73.3 ft. - 20,000 cfs
70.9 ft. - 15,000 cfs
67.5 ft. - 10,000 cfs
64.8 ft. - 6,000 cfs
61.8 ft. - 3,000 cfs

Bridge Deck Elevation
80.7 ft. - Eldridge Parkway

Water Surface Elevation
81.1 ft. - 20,000 cfs
80.1 ft. - 15,000 cfs
78.9 ft. - 10,000 cfs
77.9 ft. - 6,000 cfs
74.9 ft. - 3,000 cfs

Addicks
Bear Creek
Buffalo Bayou
Terry Hershy Park
Memorial Oaks Cemetery
Turkey Creek
Nottingham Park
Kroger

Legend

Constant_Flow

- 3,000 cfs
- 6,000 cfs
- 10,000 cfs
- 15,000 cfs
- 20,000 cfs

N W E S

Index Map

1 2 3 4 5 6

Constant Flow Inundation Map Section 1
Addicks and Barker Reservoirs
Harris County, Texas
Plate 5-03

0 0.25 0.5 1 1.5 2 Miles

US Army Corps of Engineers ®
Galveston District

Bridge Deck Elevation
73.2 ft. - Kirkwood Rd

Water Surface Elevation
73.3 ft. - 20,000 cfs
70.9 ft. - 15,000 cfs
67.5 ft. - 10,000 cfs
64.8 ft. - 6,000 cfs
61.8 ft. - 3,000 cfs

Bridge Deck Elevation
71.9 ft - Wilcrest Dr.

Water Surface Elevation
71.1 ft - 20,000 cfs
68.2 ft. - 15,000 cfs
65.4 ft. - 10,000 cfs
62.6 ft. - 6,000 cfs
59.6 ft. - 3,000 cfs

Bridge Deck Elevation
72.3 ft - Sam Houston Pkwy

Water Surface Elevation
68.0 ft - 20,000 cfs
64.4 ft. - 15,000 cfs
61.5 ft. - 10,000 cfs
58.5 ft. - 6,000 cfs
55.3 ft. - 3,000 cfs

Bridge Deck Elevation
77.2 ft. - Dairy Ashford Rd

Water Surface Elevation
77.5 ft. - 20,000 cfs
76.5 ft. - 15,000 cfs
74.1 ft. - 10,000 cfs
70.1 ft. - 6,000 cfs
67.0 ft. - 3,000 cfs

Bridge Deck Elevation
65.7 ft. - S. Gessner

Water Surface Elevation
61.7 ft. - 20,000 cfs
58.9 ft. - 15,000 cfs
56.0 ft. - 10,000 cfs
52.8 ft. - 6,000 cfs
47.1 ft. - 3,000 cfs

Nottingham Park
Town & Country Village
Bendwood Park
Ulla
Buffalo Bayou
Memorial
Houston
Bunker Hill Village
Terry Hershy Park
Lakeside Country Club
Kroger
Briarforest Area
Francklo Park

Legend

Constant_Flow

- 3,000 cfs
- 6,000 cfs
- 10,000 cfs
- 15,000 cfs
- 20,000 cfs

N W E S

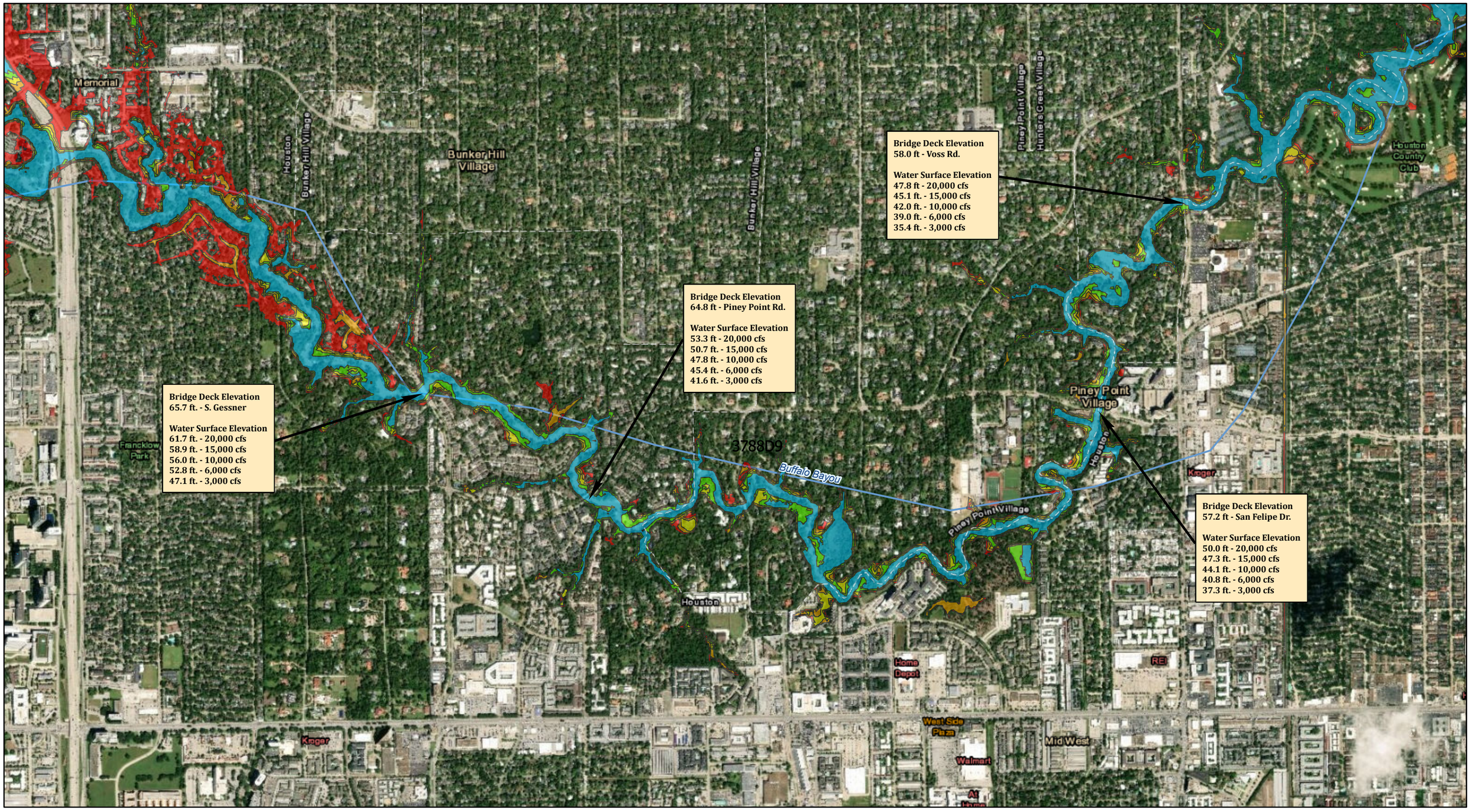
Index Map

1 2 3 4 5 6

Constant Flow Inundation Map Section 2
Addicks and Barker Reservoirs
Harris County, Texas
Plate 5-04

0 0.25 0.5 1 1.5 2 Miles

US Army Corps of Engineers ®
Galveston District



Legend

Constant_Flow

- 3,000 cfs
- 6,000 cfs
- 10,000 cfs
- 15,000 cfs
- 20,000 cfs

N W E S

Index Map

1 2 3 4 5 6

Constant Flow Inundation Map Section 3
Addicks and Barker Reservoirs
Harris County, Texas
Plate 5-05

0 0.25 0.5 1 1.5 2 Miles

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Galveston District

Bridge Deck Elevation
83.9 ft - Eldridge Pkwy

Water Surface Elevation
45.4 ft - 20,000 cfs
42.7 ft. - 15,000 cfs
40.0 ft. - 10,000 cfs
37.2 ft. - 6,000 cfs
33.7 ft. - 3,000 cfs

Bridge Deck Elevation
58.0 ft - Voss Rd.

Water Surface Elevation
47.8 ft - 20,000 cfs
45.1 ft. - 15,000 cfs
42.0 ft. - 10,000 cfs
39.0 ft. - 6,000 cfs
35.4 ft. - 3,000 cfs

Bridge Deck Elevation
48.0 ft. - W. Loop Fwy N (610)

Water Surface Elevation
41.0 ft. - 20,000 cfs
37.8 ft. - 15,000 cfs
34.3 ft. - 10,000 cfs
30.7 ft. - 6,000 cfs
27.5 ft. - 3,000 cfs

Hedwig Village
Hunters Creek Village
Briar Branch
Spring Branch
Hunters Creek Village
Houston
Buffalo Bayou
Buffalo Bayou
Memorial Park
Houston Country Club
Greater Uptown
Xerox
Uptown Park
Piney Point Village
Grady Park

Legend

Constant_Flow

- 3,000 cfs
- 6,000 cfs
- 10,000 cfs
- 15,000 cfs
- 20,000 cfs

N W E S

Index Map

1 2 3 4 5 6

Constant Flow Inundation Map Section 4
Addicks and Barker Reservoirs
Harris County, Texas
Plate 5-06

0 0.25 0.5 1 1.5 2 Miles

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Galveston District

Bridge Deck Elevation
48.0 ft. - W. Loop Fwy N (610)

Water Surface Elevation
41.0 ft. - 20,000 cfs
37.8 ft. - 15,000 cfs
34.3 ft. - 10,000 cfs
30.7 ft. - 6,000 cfs
27.5 ft. - 3,000 cfs

Bridge Deck Elevation
39.3 ft. - Shepard Dr.

Water Surface Elevation
34.8 ft. - 20,000 cfs
31.0 ft. - 15,000 cfs
26.4 ft. - 10,000 cfs
21.6 ft. - 6,000 cfs
16.3 ft. - 3,000 cfs

Bridge Deck Elevation
29.8 ft. - Studemont St.

Water Surface Elevation
32.2 ft. - 20,000 cfs
28.3 ft. - 15,000 cfs
23.5 ft. - 10,000 cfs
18.8 ft. - 6,000 cfs
13.9 ft. - 3,000 cfs

Bridge Deck Elevation
44.7 ft. - Waugh Dr./Heights Blvd.

Water Surface Elevation
32.5 ft. - 20,000 cfs
28.7 ft. - 15,000 cfs
24.1 ft. - 10,000 cfs
19.4 ft. - 6,000 cfs
14.6 ft. - 3,000 cfs

Memorial Park Municipal Golf Course
Memorial Park
Memorial Park
Wess Park
Xerox
Uptown Park
Target
Highland Village
Afton Oaks/River Oaks Area
River Oaks Park
River Oaks Country Club
Hogg Bird Sanctuary Park
Buffalo Bayou
Buffalo Bayou
Washington Avenue Coalition/Memorial Park
Cleveland Park
Spotts Park
Buffalo Bayou/Tinsley Jamail (Lee And Joe) Skate Park
Autry Park
River Oaks Shopping Center
Neartown - Montrose

Legend

Constant_Flow

- 3,000 cfs
- 6,000 cfs
- 10,000 cfs
- 15,000 cfs
- 20,000 cfs

N W E S

Index Map

1 2 3 4 5 6

Constant Flow Inundation Map Section 5
Addicks and Barker Reservoirs
Harris County, Texas
Plate 5-07

0 0.25 0.5 1 1.5 2 Miles

The data is only a representation of features on the earth completed by a computer program from raw data obtained from different sources and is not necessarily, in whole or in part, based upon any physical recording, study or survey, professional or otherwise, of the covered property. This information is not intended as a substitute for a field survey by a professional or any other use or application that requires legal or engineering accuracy.

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Galveston District

Bridge Deck Elevation
44.7 ft. - Waugh Dr./Heights Blvd.

Water Surface Elevation
32.5 ft. - 20,000 cfs
28.7 ft. - 15,000 cfs
24.1 ft. - 10,000 cfs
19.4 ft. - 6,000 cfs
14.6 ft. - 3,000 cfs

Bridge Deck Elevation
29.8 ft. - Studemont St.

Water Surface Elevation
32.2 ft. - 20,000 cfs
28.3 ft. - 15,000 cfs
23.5 ft. - 10,000 cfs
18.8 ft. - 6,000 cfs
13.9 ft. - 3,000 cfs

Bridge Deck Elevation
35.6 ft. - Rusk St.

Water Surface Elevation
29.4 ft. - 20,000 cfs
25.5 ft. - 15,000 cfs
20.5 ft. - 10,000 cfs
14.9 ft. - 6,000 cfs
9.4 ft. - 3,000 cfs

Bridge Deck Elevation
31.2 ft. - Louisiana St.

Water Surface Elevation
25.7 ft. - 20,000 cfs
21.7 ft. - 15,000 cfs
16.8 ft. - 10,000 cfs
11.4 ft. - 6,000 cfs
5.6 ft. - 3,000 cfs

Bridge Deck Elevation
36.5 ft. - S. Jensen Dr.

Water Surface Elevation
18.4 ft. - 20,000 cfs
14.3 ft. - 15,000 cfs
10.0 ft. - 10,000 cfs
3.6 ft. - 6,000 cfs
-1.4 ft. - 3,000 cfs

Legend

Constant_Flow

- 3,000 cfs
- 6,000 cfs
- 10,000 cfs
- 15,000 cfs
- 20,000 cfs

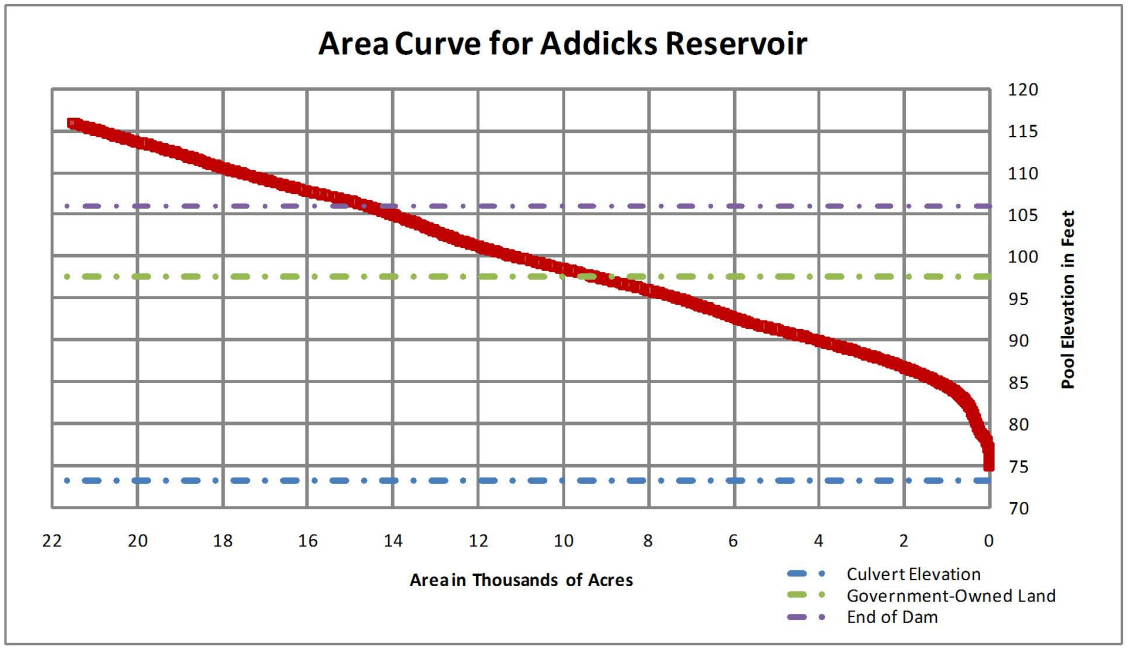
N W E S

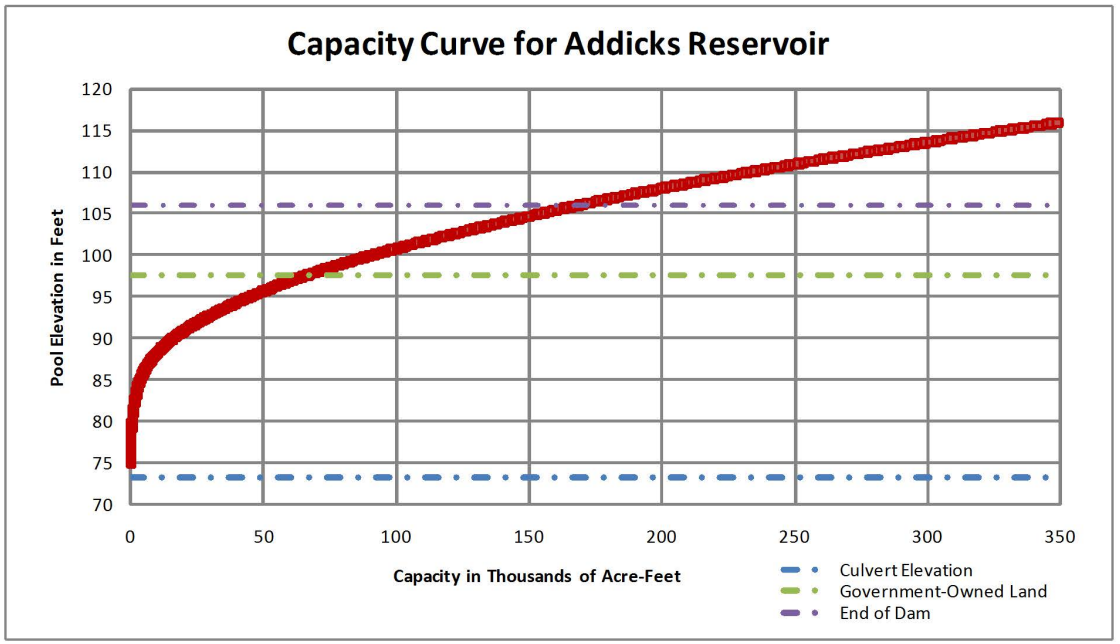
Index Map

Constant Flow Inundation Map Section 6
Addicks and Barker Reservoirs
Harris County, Texas
Plate 5-08

0 0.25 0.5 1 1.5 2 Miles

US Army Corps of Engineers ®
Galveston District



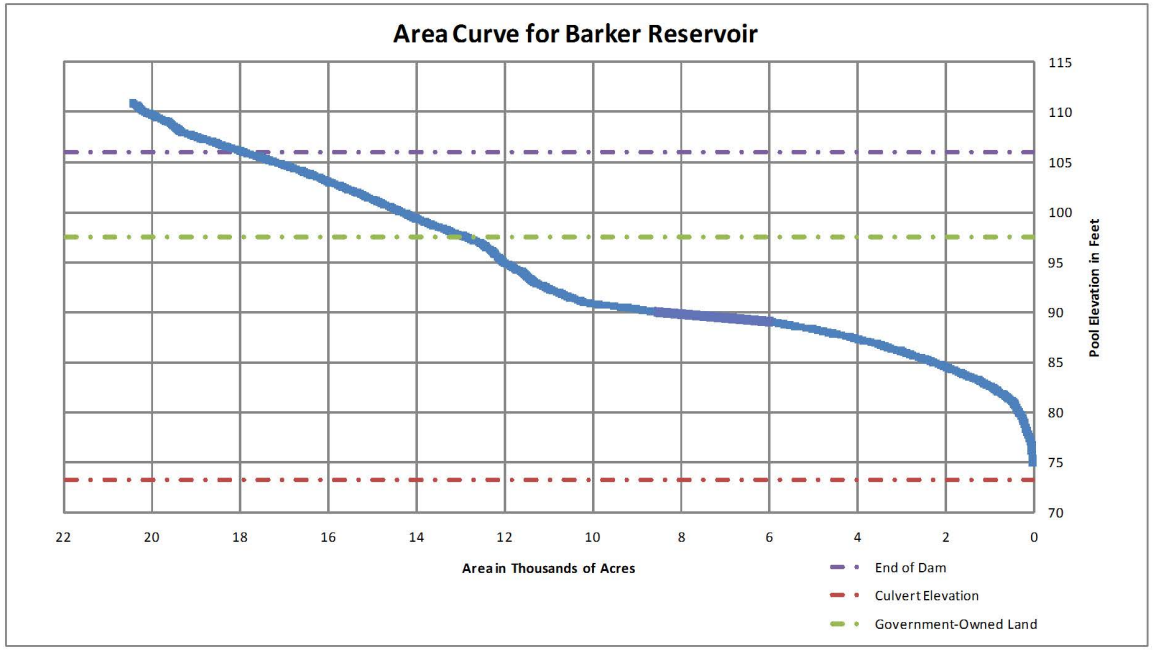


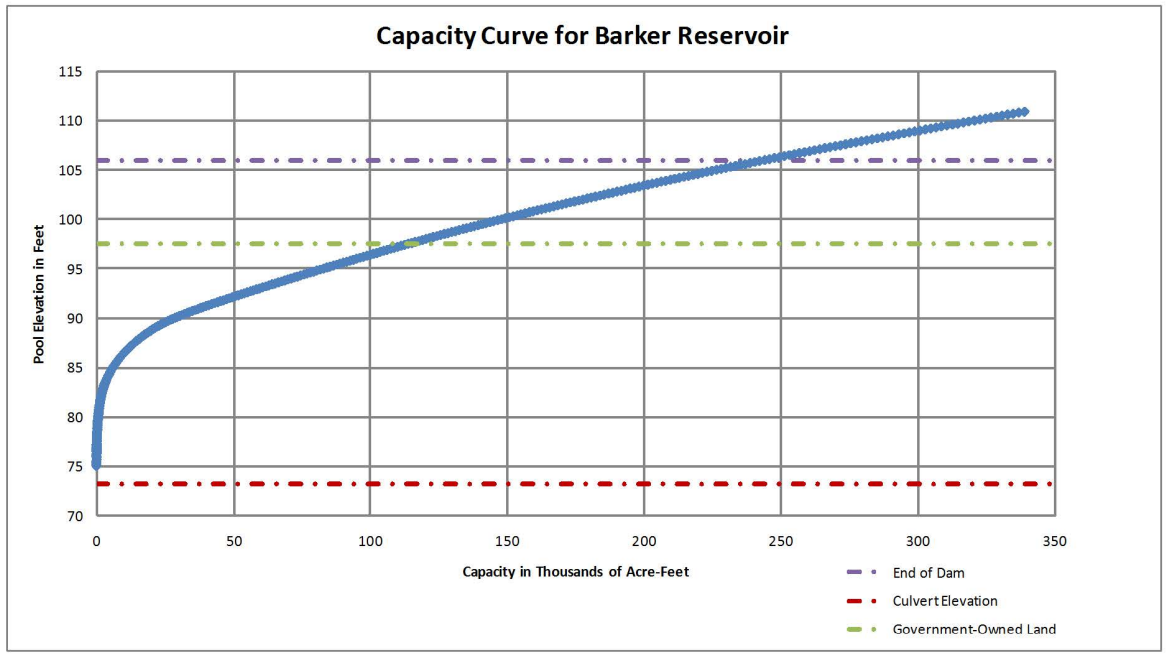
Area-Capacity Curves - Addicks Reservoir

Note: Elevations are NAVD88

US Army Corps of Engineers ®
Galveston District

Plate 7-01





Area-Capacity Curves - Barker Resorvoir

Note: Elevations are NAVD88

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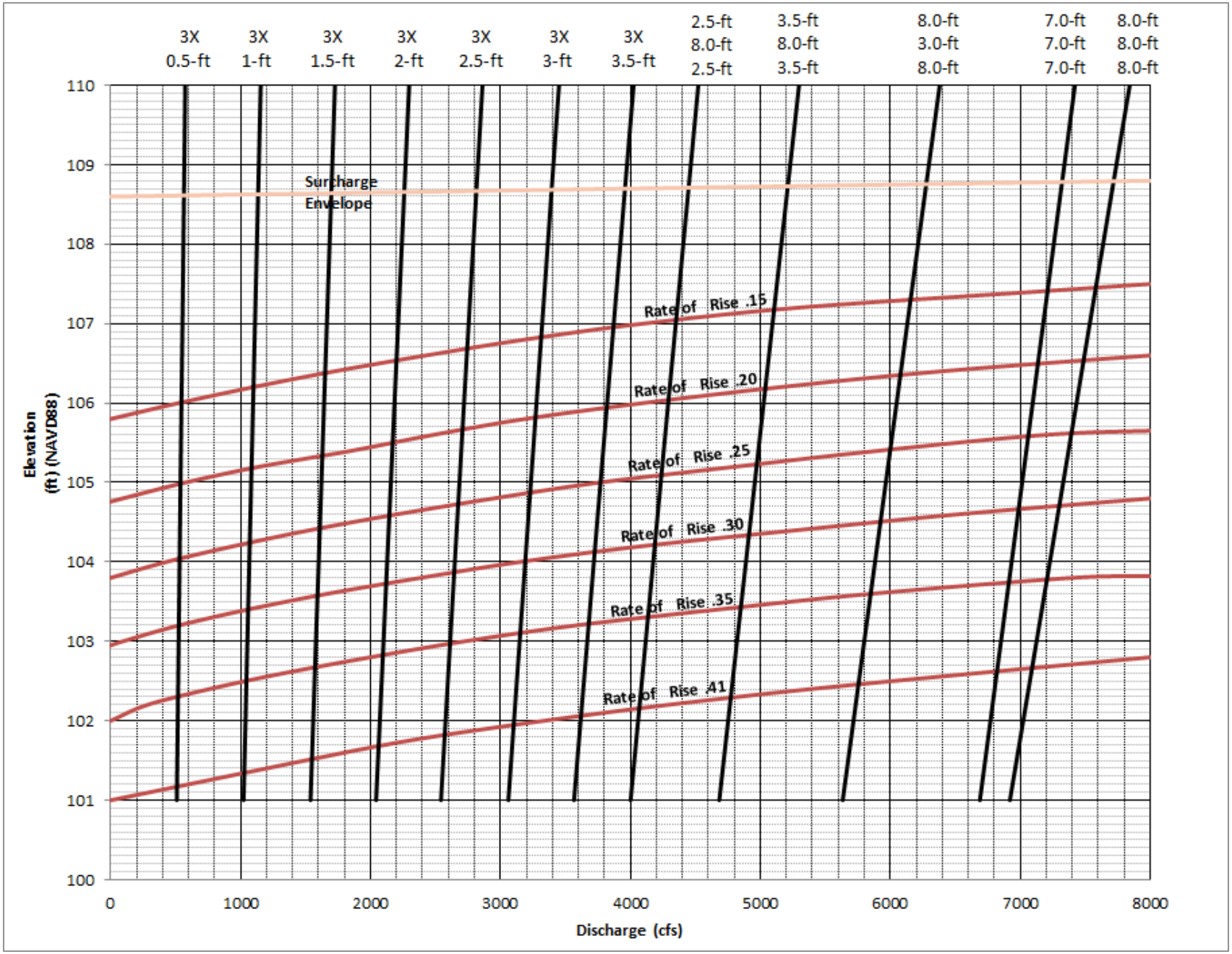
Galveston District

Plate 7-02



Induced Surcharge Operation Schedule
Addicks Reservoir

Source: Derived from the Addicks and Barker Dam Safety Modification Report, July 2015

Note: Provisional until compliant with the USACE Civil Works Review Policy.

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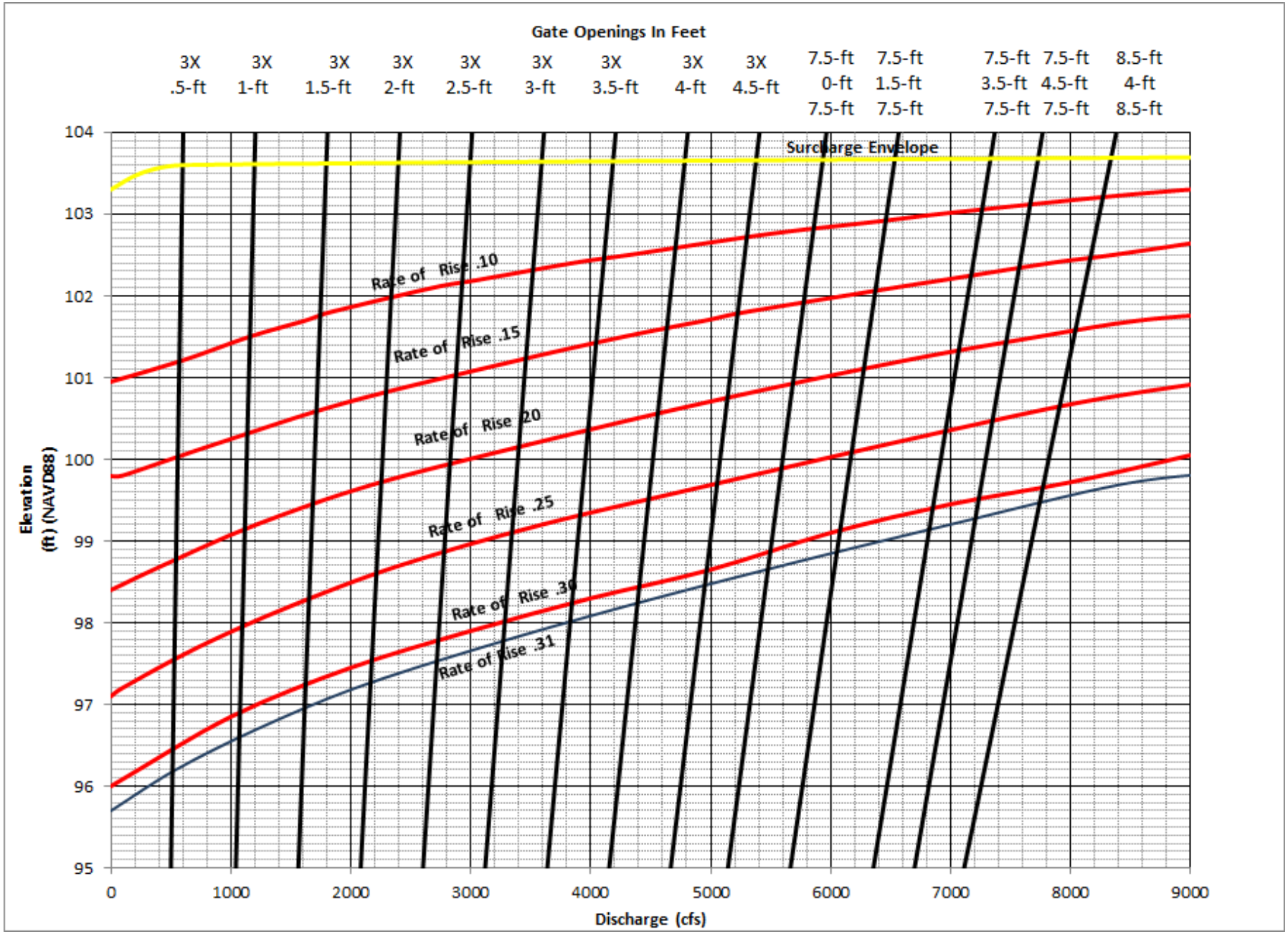
Galveston District

Plate 7-03



Induced Surcharge Operation Schedule
Barker Reservoir

Source: Derived from the Addicks and Barker Dam Safety Modification Report, July 2015

Note: Provisional until compliant with the USACE Civil Works Review Policy.

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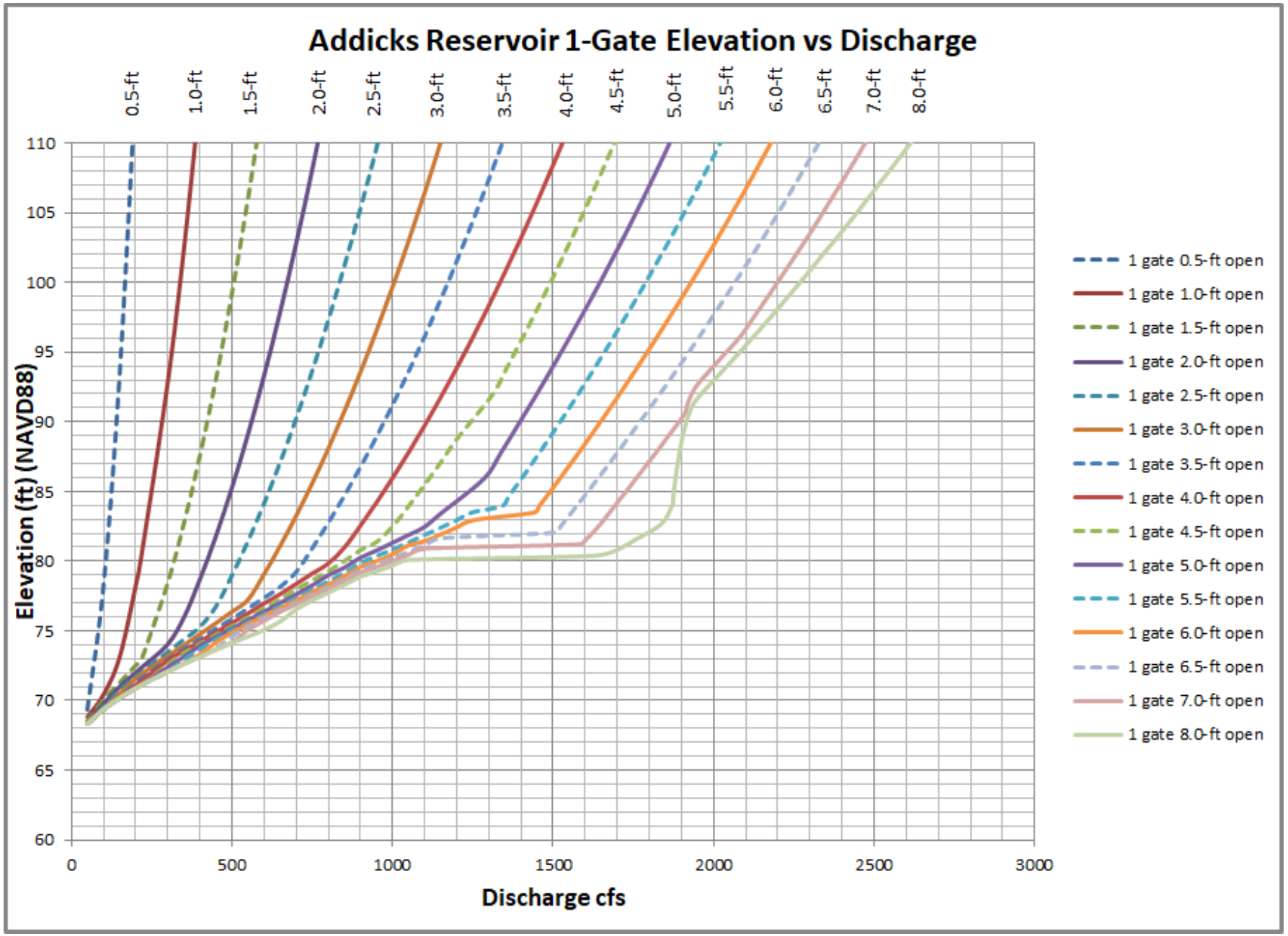
Plate 7-04



Outlet Works Rating Curves
Addicks Reservoir

Source: Derived from the Addicks and Barker Dam Safety Modification Report, July 2015

Note: Provisional until compliant with the USACE Civil Works Review Policy.

Plate 7-05

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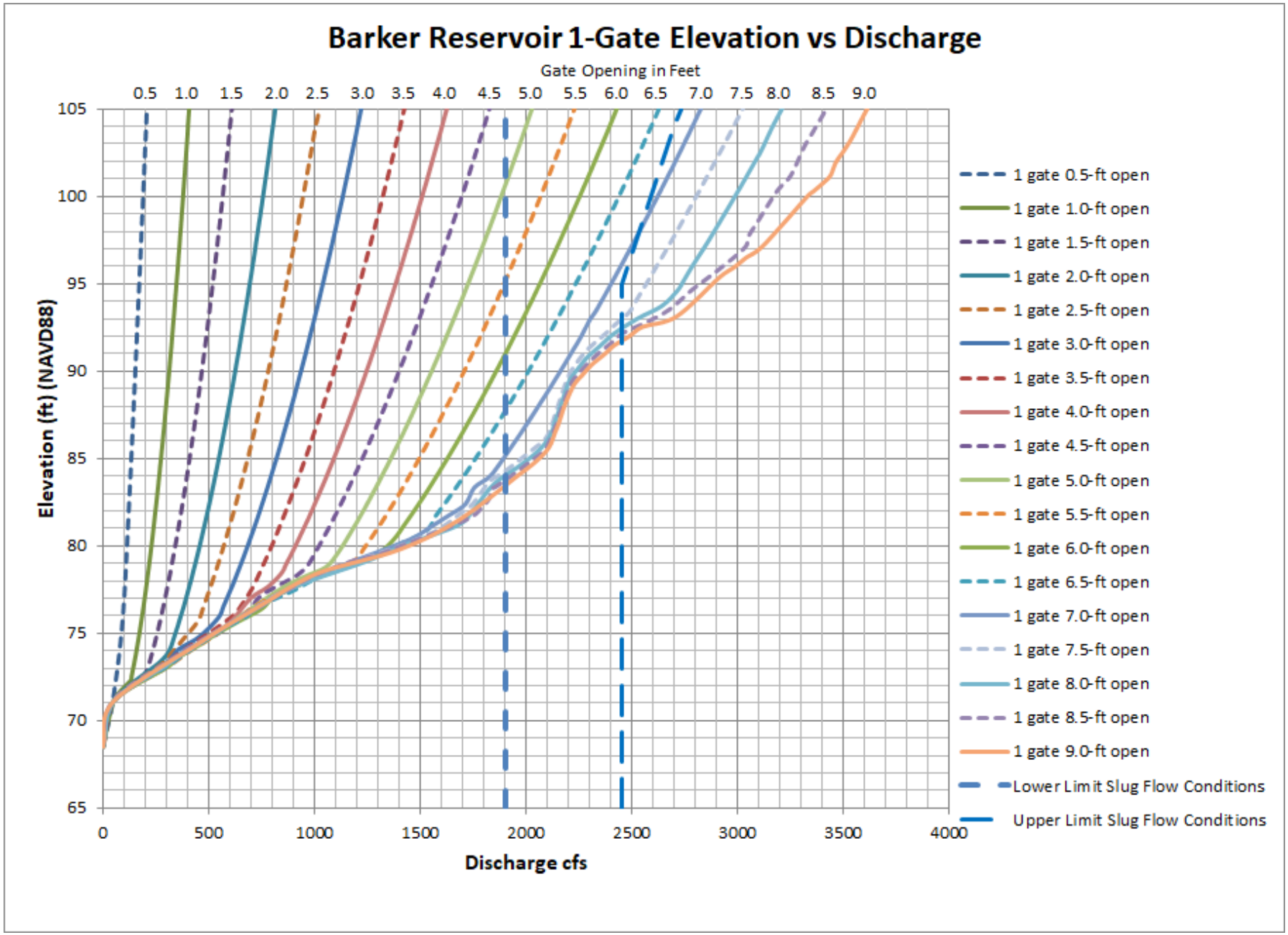

Outlet Works Rating Curves
Barker Reservoir

Source: Derived from the Addicks and Barker Dam Safety Modification Report, July 2015

Note: Provisional until compliant with the USACE Civil Works Review Policy.

Plate 7-06

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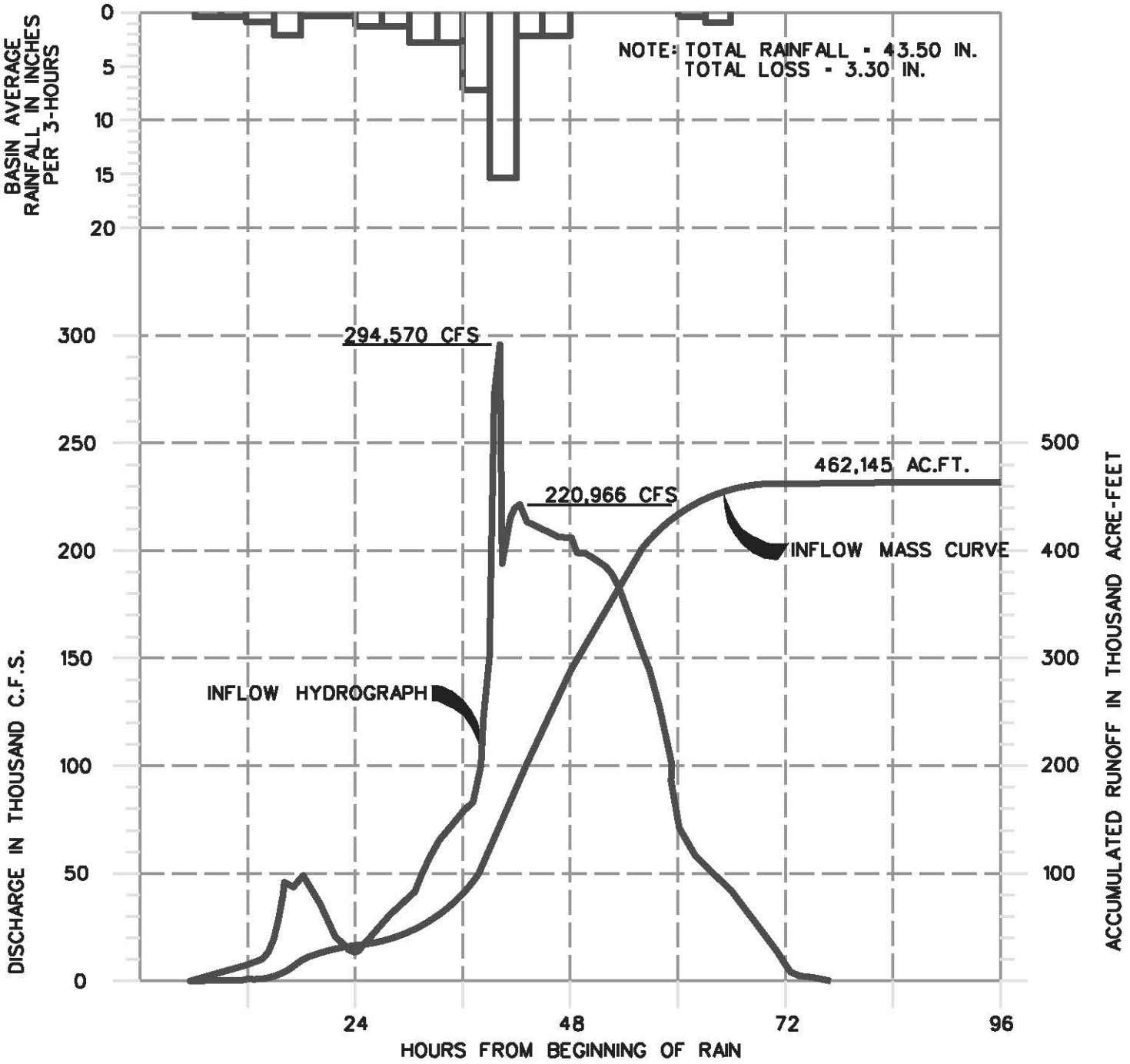

1977 Spillway Design Flood - Addicks Reservoir

Plate 8-01

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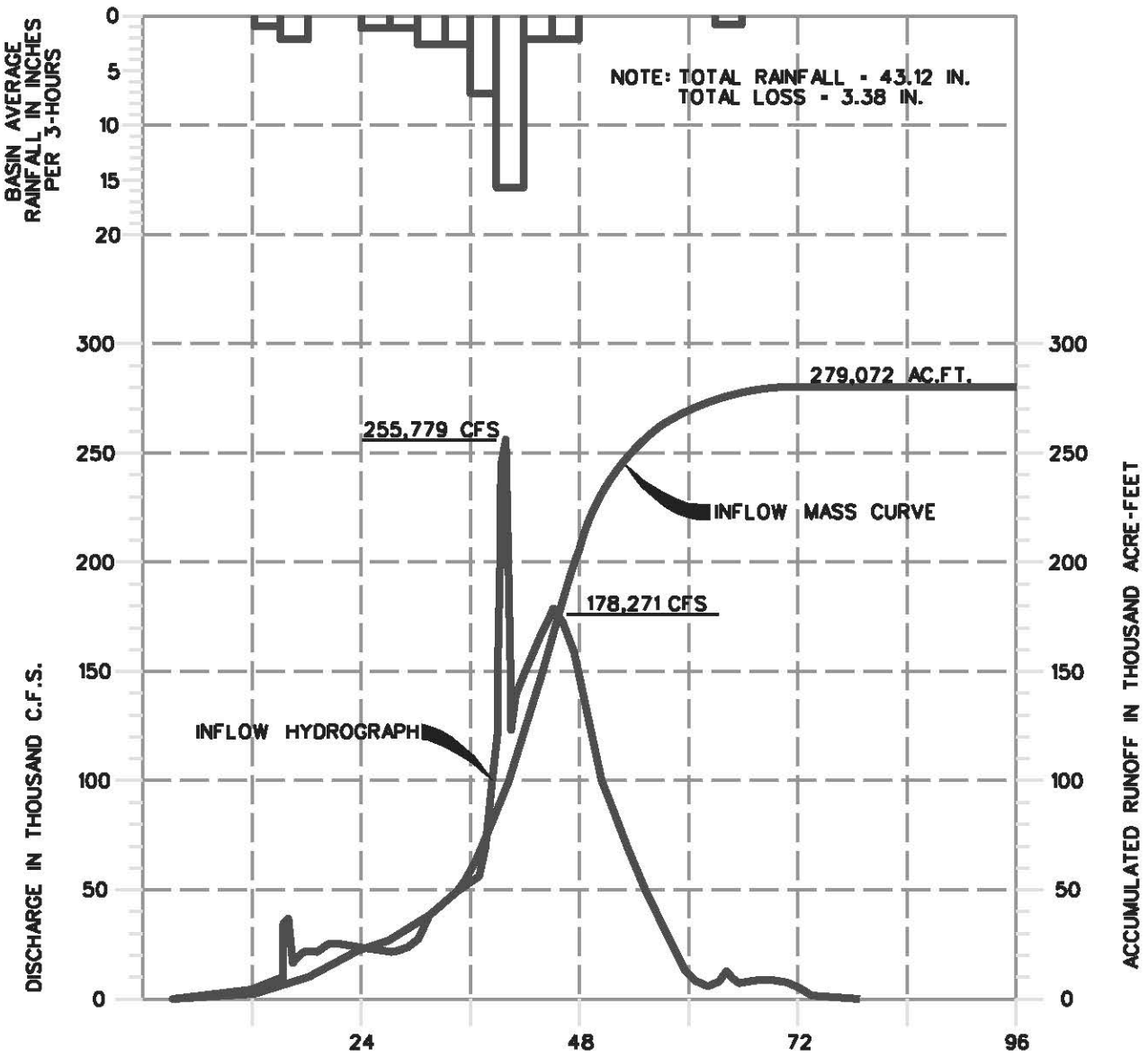
Galveston District



1977 Spillway Design Flood - Barker Reservoir

Plate 8-02

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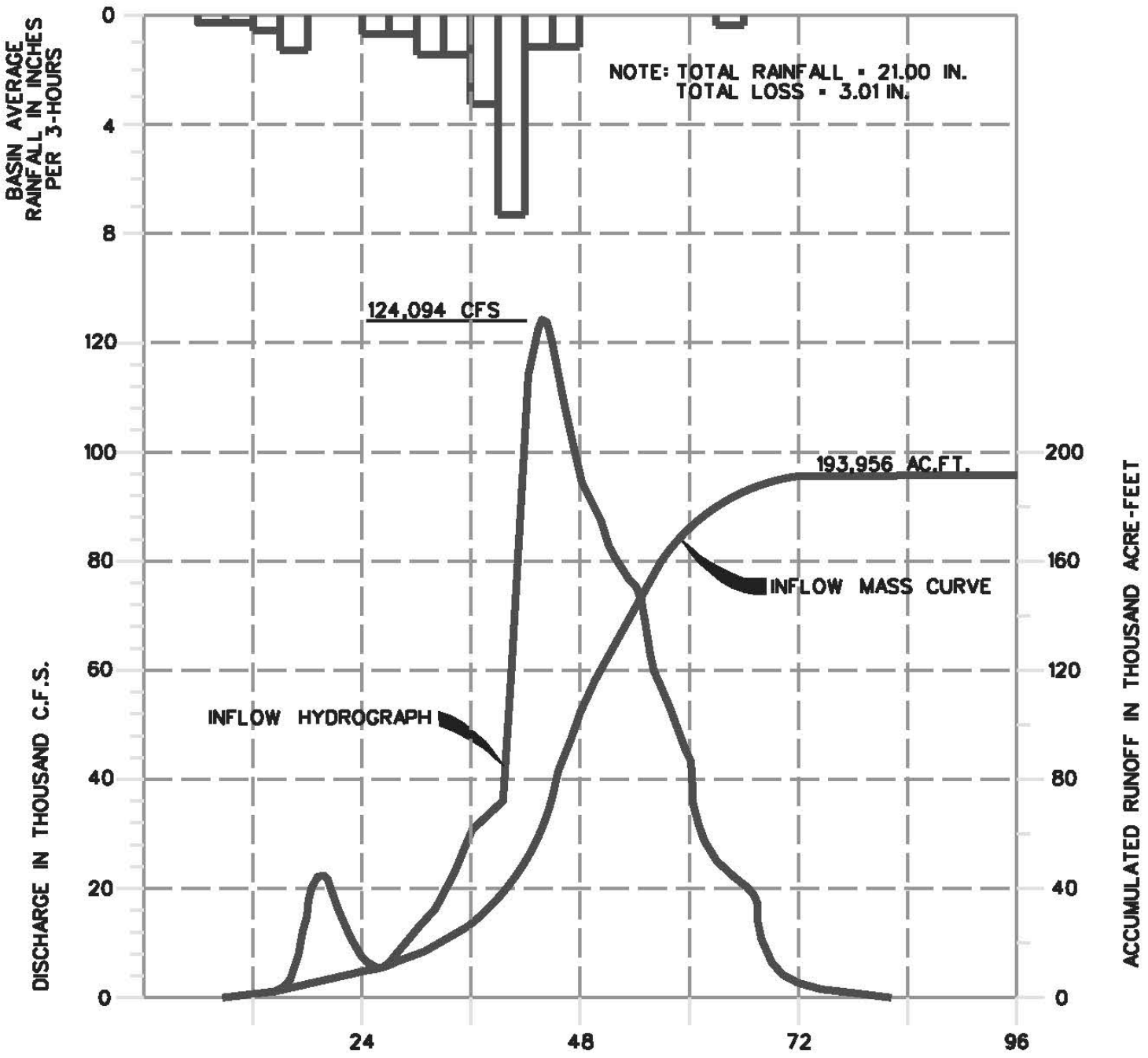

1977 Standard Flood - Addicks Reservoir

Plate 8-03

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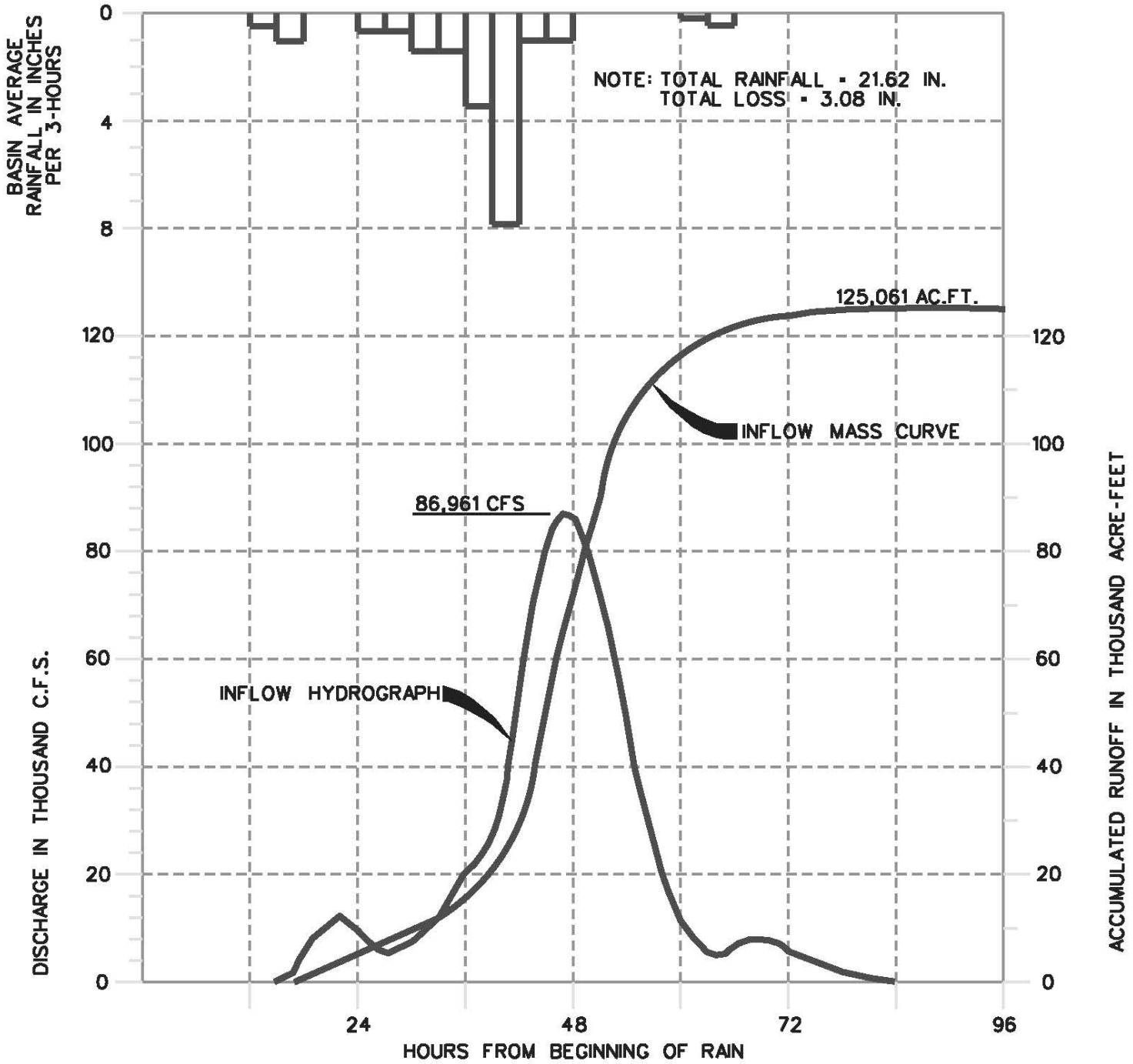

1977 Standard Flood - Barker Reservoir

Plate 8-04

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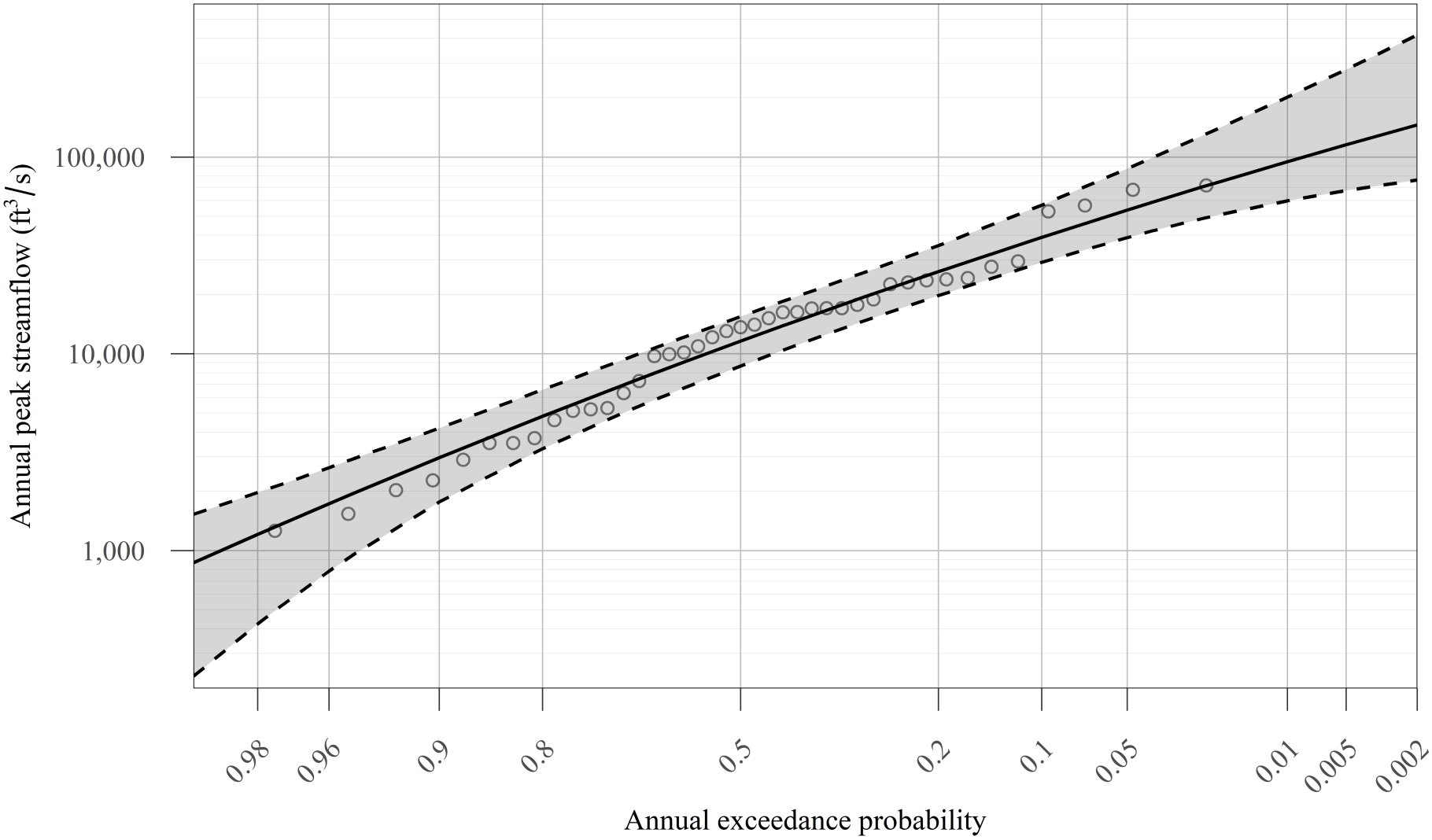

Pool Inflow-Frequency Curve
Addicks Reservoir

Note: Provisional until compliant with the USACE Civil Works Review Policy.

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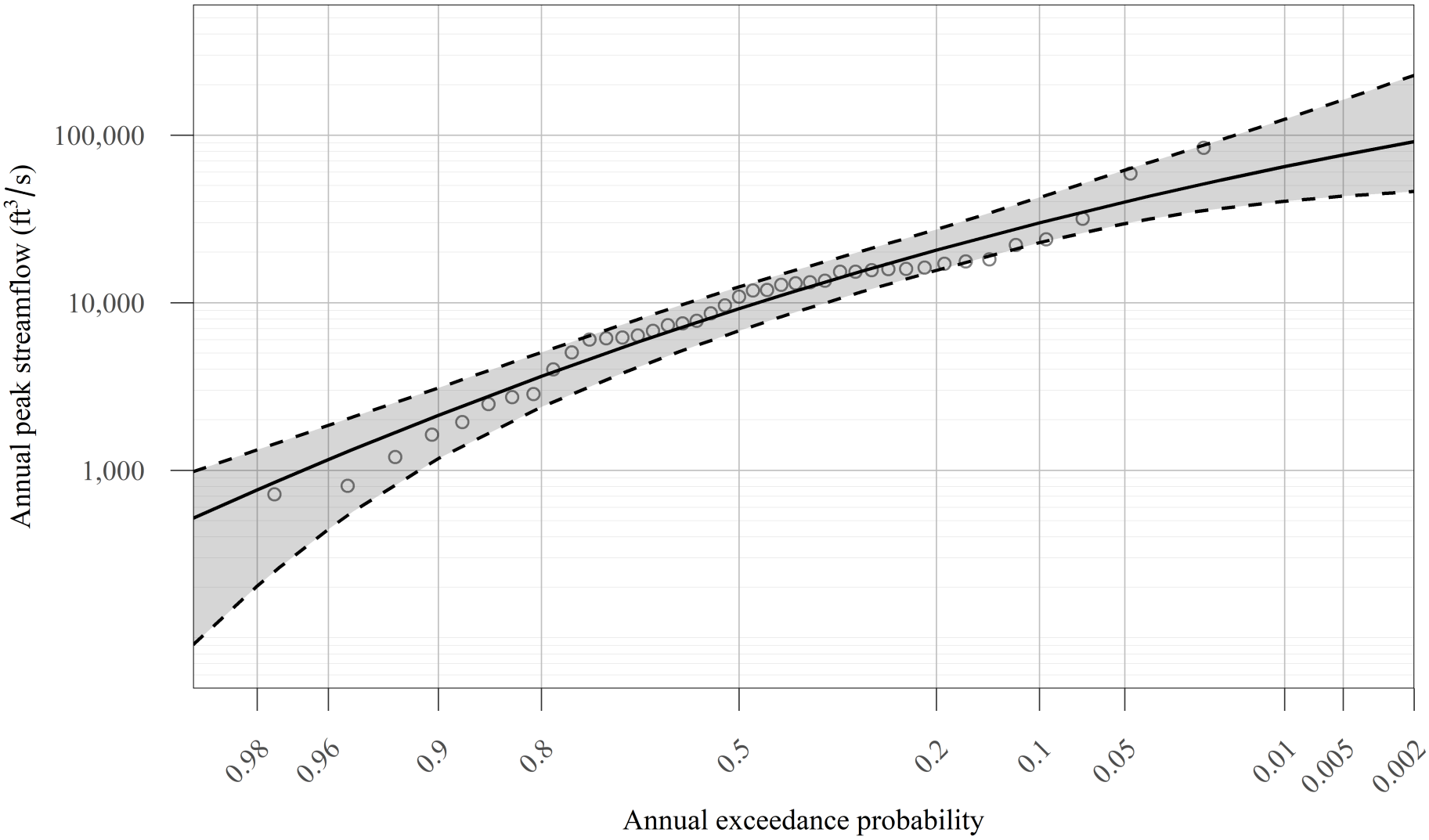
Galveston District

Plate 8-05



Pool Inflow-Frequency Curve
Barker Reservoir

Note: Provisional until compliant with the USACE Civil Works Review Policy.

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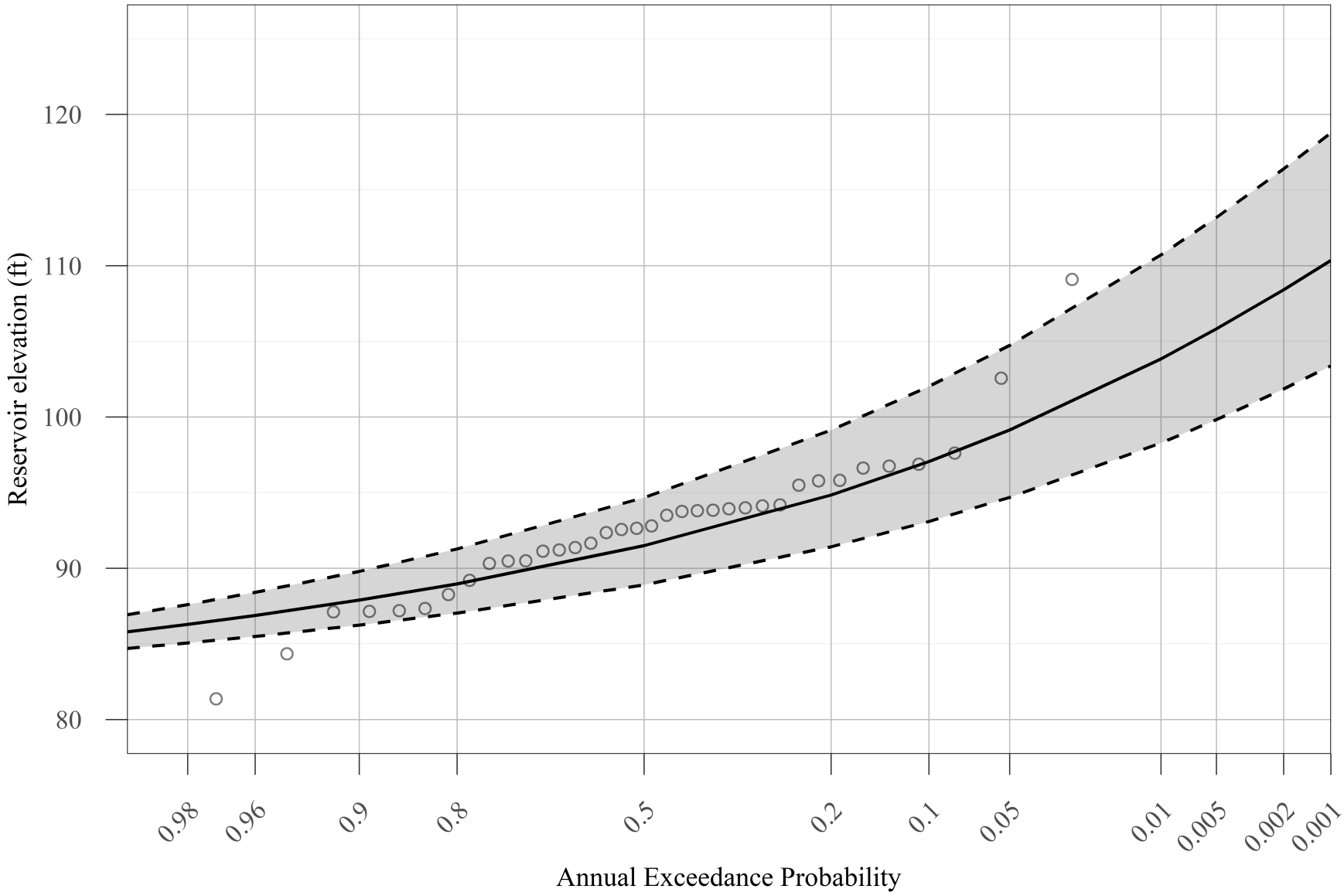
Galveston District

Plate 8-06



Pool Elevation-Frequency Curve
Addicks Reservoir

Note: Provisional until compliant with the USACE Civil Works Review Policy.

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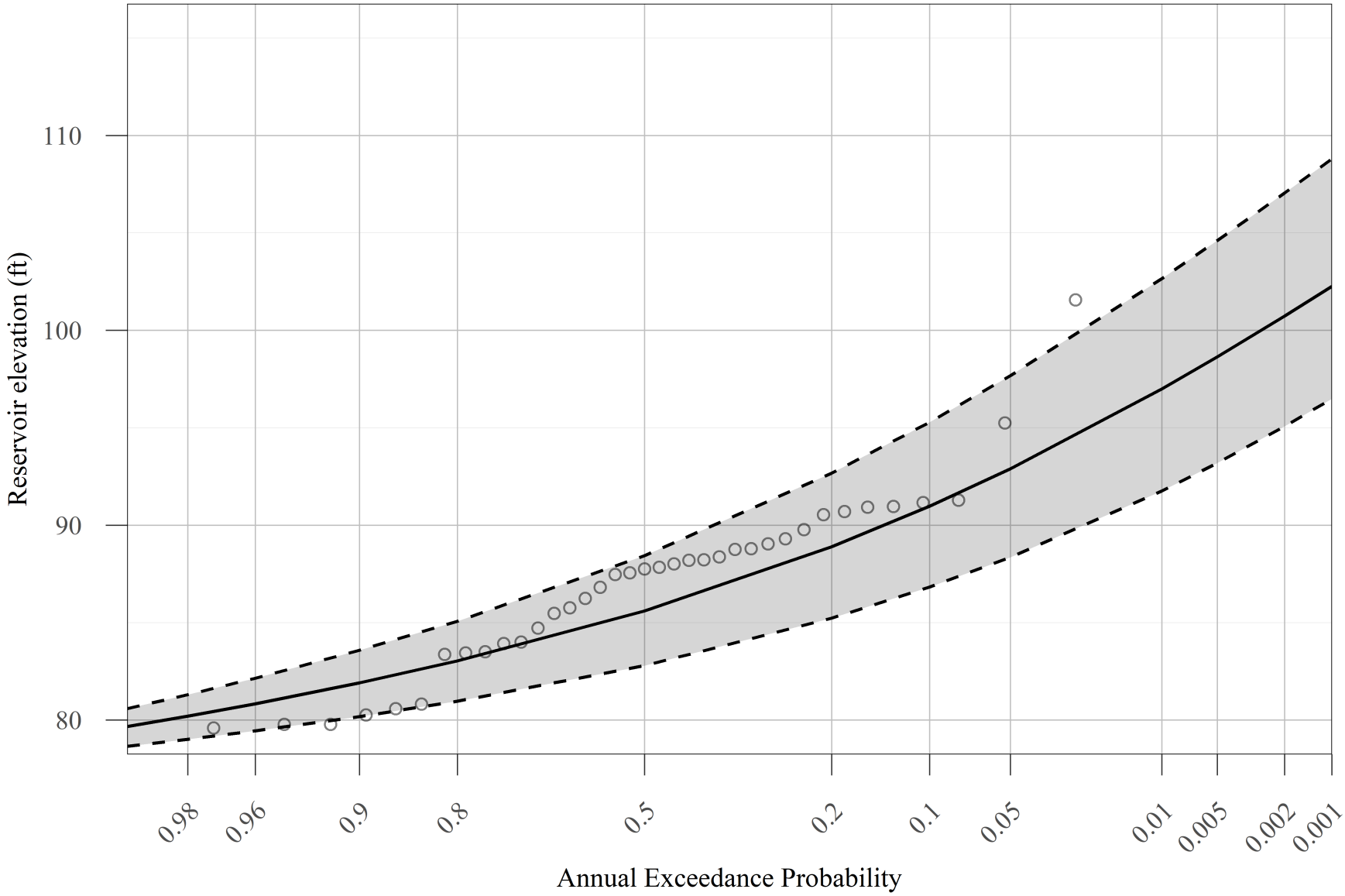
Galveston District

Plate 8-07



Pool Elevation-Frequency Curve
Barker Reservoir

Note: Provisional until compliant with the USACE Civil Works Review Policy.

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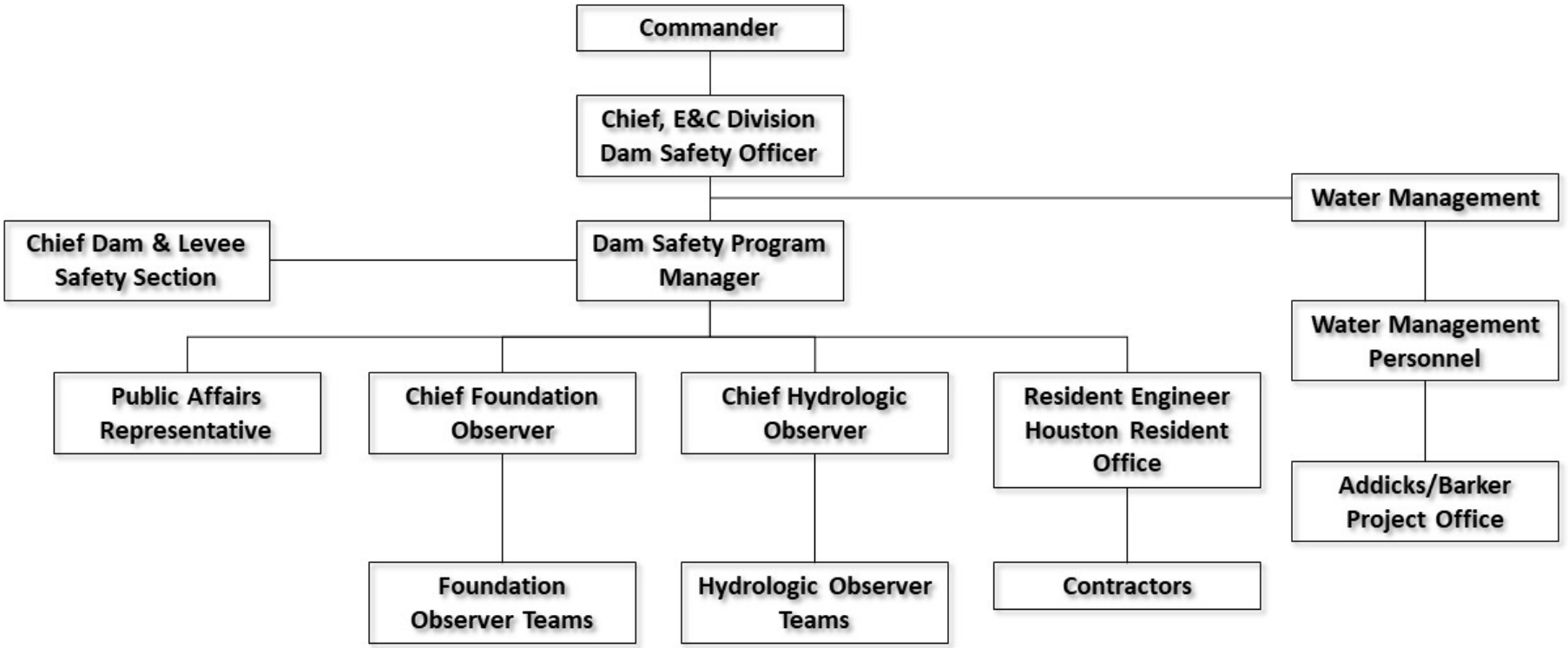
Galveston District

Plate 8-08



Organization and Communication Chart for Water Management

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