FRANKLIN COUNTY WATER DISTRICT

FLOOD RELIEF PROJECT ALTERNATIVES

PRELIMINARY ENGINEERING REPORT

FINAL | March 2017

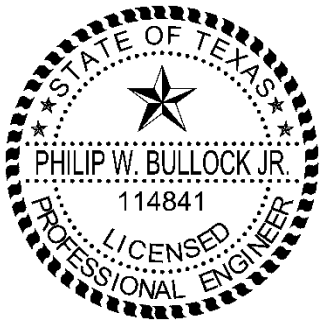
TBPE No. F-882

FRANKLIN COUNTY WATER DISTRICT

FLOOD RELIEF PROJECT ALTERNATIVES

PRELIMINARY ENGINEERING REPORT

FINAL | March 2017



TBPE No. F-882

10375 RICHMOND AVENUE, SUITE 1625 • HOUSTON, TEXAS 77042 • P. 281.872.4512 • F. 281.872.4505

Contents

Appendices

Figures, Tables, Graphs, and Charts

Abbreviations

Arroyo	Arroyo Environmental
BC	Benefit Cost
BbB	Bernaldo
Carollo	Carollo Engineers, Inc.
CWA	Clean Water Act
CWSRF	Clean Water State Revolving Fund
CSSUD	Cypress Springs Special Utility District
Deere	Deere & Ault Consultants
EPA	Environmental Protection Agency
Excel	Microsoft Excel
FHWA	Federal Highway Administration
FMA	Flood Mitigation Assistance Grant
FPA	floodplain administrator
FCWD	Franklin County Water District
FrB	Freestone
H&H	Hydrology and Hydraulics
HEC-HMS	Hydrologic Engineering Center's Hydrologic Modeling System
KfC	Kirvin
LBS	Lake Bob Sandlin
LCS	Lake Cypress Springs
LoTP	Lake O' the Pines
LWCF	Land and Water Conservation Fund
msl	mean sea level
Na	Nahatche
NFIP	National Flood Insurance Program
NWI	National Wetland Inventory
NETMWD	North East Municipal Water District
OPCC	Opinion of Probable Construction Cost
PER	Preliminary Engineering Report
PDM	Pre-Disaster Mitigation Grants
RL	Repetitive Loss

REFA	Revised Existing Frequency Analysis
RAS	River Analysis System
TMs	Technical Memorandums
TCELCP	Texas Coastal and Estuarine Land Conservation Program
TCEQ	Texas Commission on Environmental Quality
TDPW	Texas Department of Parks and Wildlife
TDRA	Texas Department of Rural Affairs
GLO	Texas General Land Office
THC	Texas Historical Commission
TNRIS	Texas Natural Resources Information System
TPWD	Texas Parks and Wildlife Department
TWDB	Texas Water Development Board
DFund	Texas Water Development Fund
Ud	Udorthents
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WAM	Water Availability Modeling
WoC	Woodtell – fine sandy loam
WoE	Woodtell– loam-silty clay loam
WSE	water surface elevation

Preliminary Engineering Report

FRANKLIN COUNTRY WATER DISTRICT

1.0 Introduction

On December 27, 2015, the Lake Cypress Springs (LCS) watershed experienced a historic flooding event that caused lake waters to rise to record levels. The Water Surface Elevation (WSE) rose to a maximum of 383.92 feet above mean sea level (msl) or 5.92 feet above the conservation pool of the reservoir, set constant at 378.00 msl. Boats, houses, and boathouses experienced significant damage from the event costing many property owners, including the district, thousands of dollars in damages.

As a result, the Franklin County Water District (FCWD), which owns and operates LCS, tasked Carollo Engineers, Inc., (Carollo) with preparing and submitting this Preliminary Engineering Report (PER) to determine feasible solutions to curtail flood events similar to the December 2015 event.

1.1 Purpose of this Report

This report identifies, broadly describes, and generally evaluates flood control projects and improvements or modifications to LCS operations that could significantly reduce current and future flooding of residential structures around the lake. Flood damage reduction benefits are estimated in this report and used to identify the feasibility for possible implementation.

The overall purpose of this PER is to explore the FCWD's options for flood control prevention on LCS by studying high-level baseline structural and operational alternatives to curtail flooding around the lake. The purpose of this report is also to study the hydraulic feasibility of the alternatives proposed, determine the requirements from various regulatory agencies to construct said alternatives, and outline the costs associated with each alternative evaluated.

The projects identified and broadly described in this PER are intended to identify and assess potentials for large-scale projects with features that could be phased and implemented over the years to cost-effectively reduce current flooding within the FCWD LCS studied boundary. The results of this PER should serve as a roadmap to summarize the feasibility of proposed flood relief projects that have high potential to have long-term cost effectiveness in reducing flooding. The overall decision to implement a specific proposed alternative and the process to determine how to fund a large-scale flood relief project is solely left up to the FCWD, as Carollo was not authorized to recommend a specific alternative for selection.

For this PER, approximations and professional judgment are incorporated into the development and assessment of decisions. Proposed projects are described and evaluated only at a planning level, with the full intention that a detailed engineering study will be required before any one project or portion of any one project developed in this PER can actually be implemented.

1.2 LCS and the Dam

LCS is a manmade lake located in Franklin County in northeast Texas. It consists of an approximately 75-square mile watershed and a dam. The dam, located on Big Cypress Creek, is a tributary of the Cypress Bayou.

The dam is a 5,230-feet long earth-fill embankment with a top crest at an elevation of 395.0 feet above msl, NGVD29 (msl). To control the release of flows, the dam was constructed with a morning glory-style service spillway located at the south end of the main dam embankment with a spillway elevation of 378.0 feet above msl. The service spillway has a fish screen from 378.0 msl to 384.0 msl, one foot below the emergency spillway elevation. The speed at which water flows over the spillway is determined by the water pressure in LCS and in Lake Bob Sandlin (LBS) downstream.

To the north of the dam is the emergency spillway, which is an excavated and graded area with an elevation 385.0 feet above msl with a crest length of 1,000 feet. The emergency spillway has never been engaged in the history of the reservoir. The only controlled releases of water are performed with a low-flow 18-inch valve structure that releases water into the bottom of the morning-glory type service spillway, which the District uses to meet obligations with the downstream water-right owners.

Figure 1 below shows a vicinity location of LCS. A detailed map showing LCS and the drainage area can be found in Appendix A: Maps. Figure 2 shows a schematic diagram of LCS's spillway, including the lake and conservation pool's elevations, the morning glory spillway, FCWD water customer intake elevations, and LBS.

Figure 1: Vicinity Map

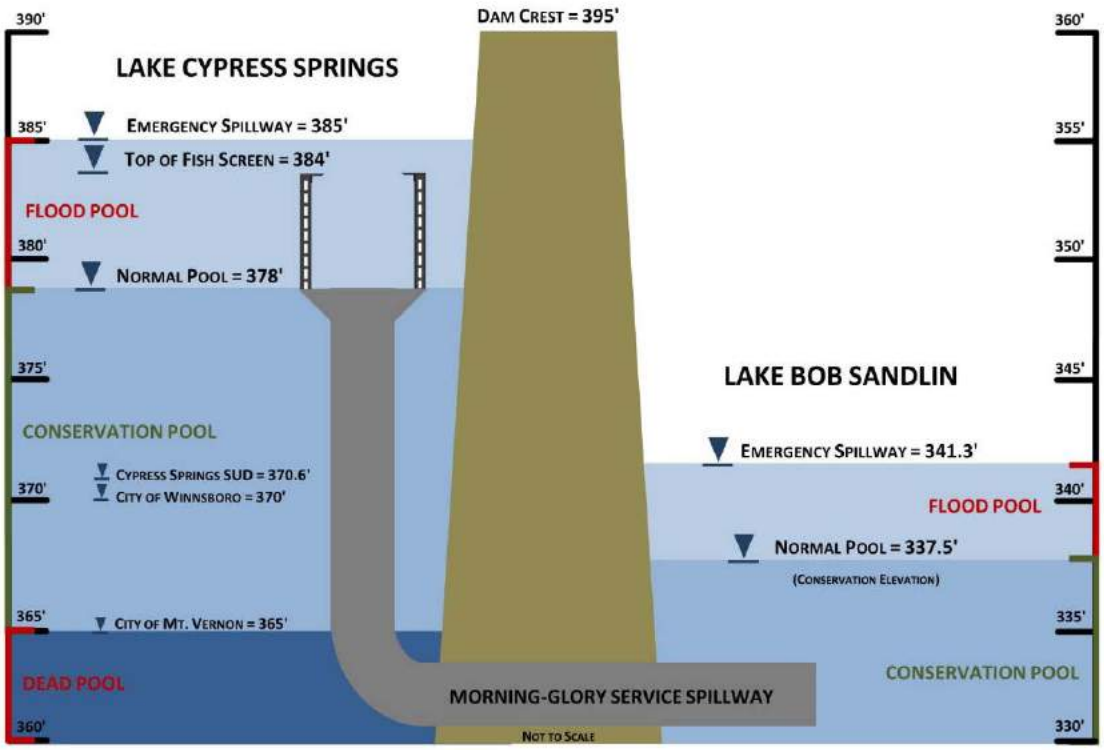


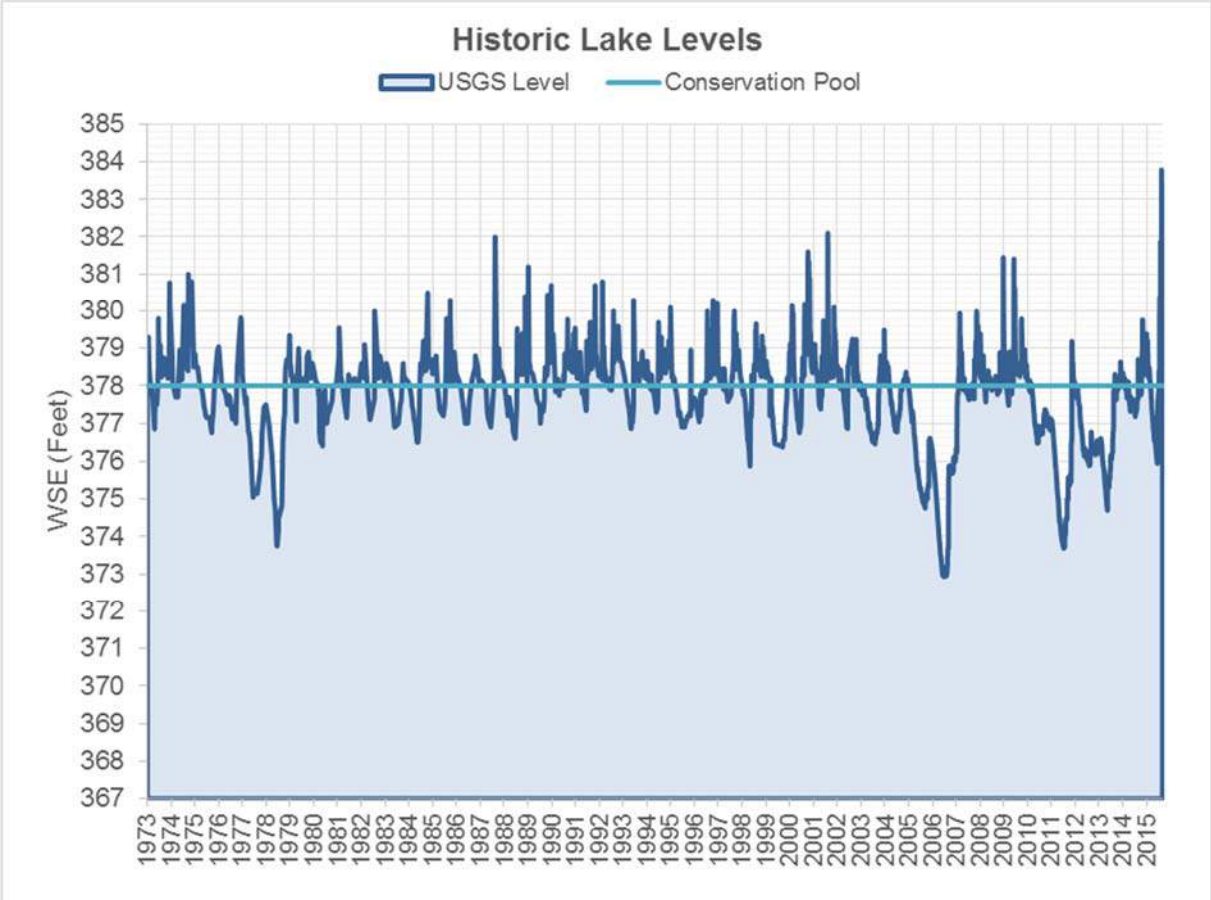
Figure 2: LCS Dam and Spillway Schematic

1.3 Historic Lake Levels and Previous Flood Events

Graph 3 below shows lake levels for LCS between 1973 and 2015. As the figure shows, LCS is not a constant level lake and has endured several droughts and floods where water levels rose or fell above or below the conservation pool elevation of 378 msl (shown as the cyan line).

Significant droughts occurred in 1978, 2006, and 2011, when water levels dropped to 374, 373, and 374, feet respectively. In addition to the flooding event of 2015, significant floods occurred in 2001, and 2009, when waters rose to 382, and 381 feet respectively.

On December 27, 2015, the LCS watershed experienced a historic flooding event that caused lake waters to rise to record levels. The WSE in LCS rose to a maximum of 383.92 feet above msl or 5.92 feet above the conservation pool of the reservoir set at 978.00 msl. As shown in Figure 4 below, and as presented in the Public Stakeholder Meeting 1, the reservoir experienced an approximated 350-year event based on a previous frequency analysis curve provided by FCWD to Carollo.



Graph 3: Historic Lake Levels

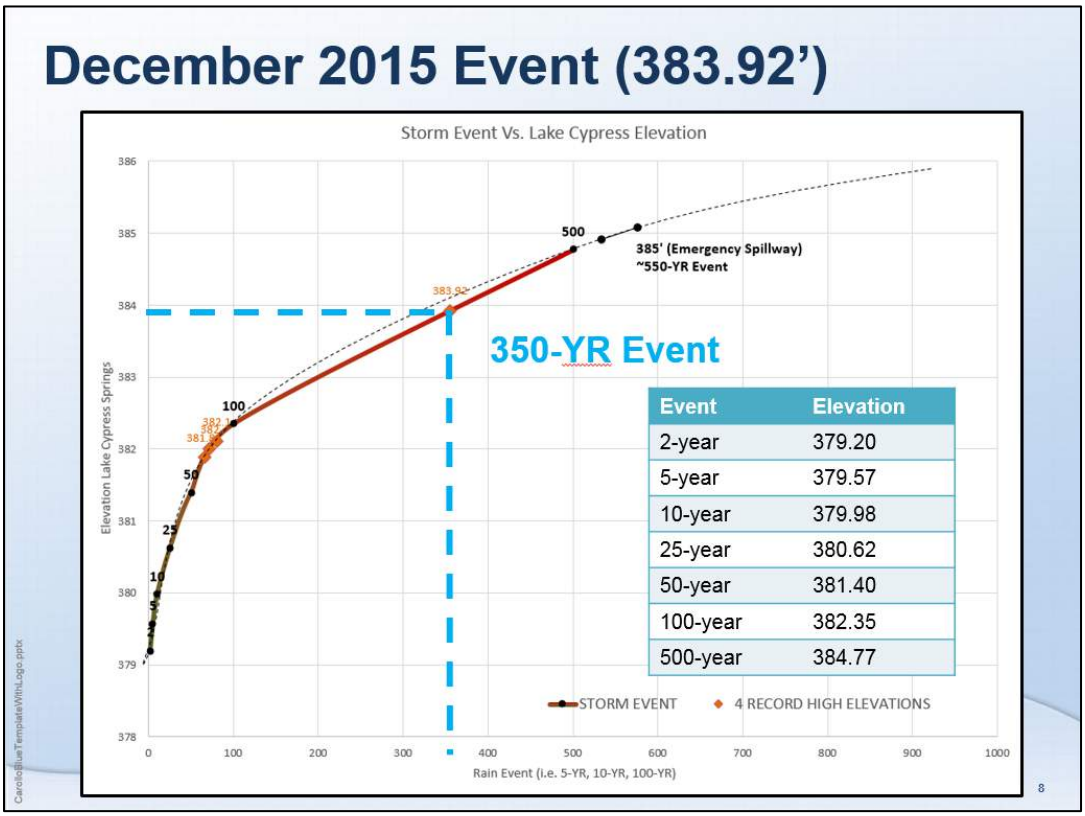


Figure 4: Slide from Public Stakeholder Meeting 1

2.0 Data Gathering

A significant amount of data was gathered for this PER. This section outlines the various data that was gathered and its source.

2.1 Archival Data Gathered

2.1.1 FCWD Data

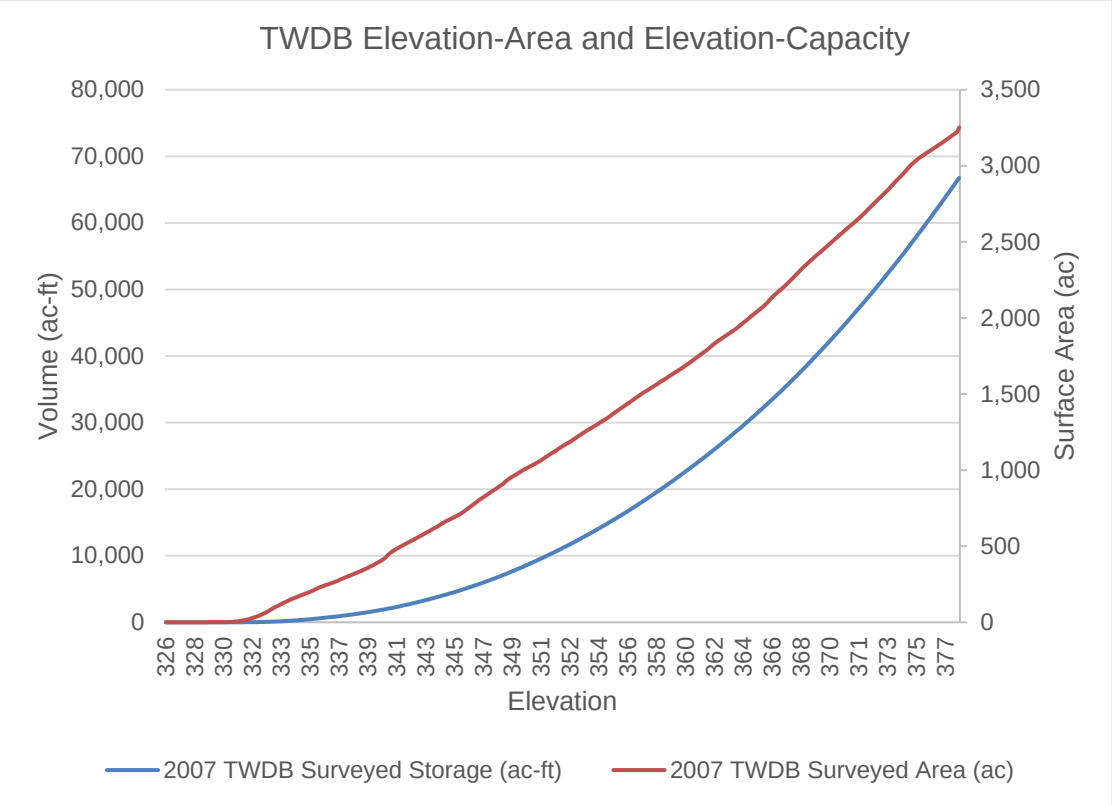
The FCWD provided Carollo sufficient archival information used in this evaluation. This data generally included:

- Design files for the LCS dam, emergency spillway, and morning glory spillway
- Current FCWD rules and regulations
- Previous hydraulic analysis completed for the morning glory spillway and low-flow service outlet
- Design files for the morning glory spillway fish screen
- Water right information, certificate of adjudications, TCEQ reported uses, customer information, etc.
- Historic lake elevation information
- Landowner parcel information
- Models (HEC-RAS and HEC-HMS) discussed in subsequent sections of this report

2.1.2 3rd Party Data

TWDB Lake Survey. In July 2007, the Texas Water Development Board (TWDB) completed the *Volumetric and Sedimentation Survey of LCS*. The results of this volumetric survey showed that LCS has a total reservoir capacity of 66,756 acre-feet and encompasses 3,252 surface acres at conservation pool elevation (378.0 feet above msl, NGVD29). The results also showed that LCS has accumulated 3,807 acre-feet of sediment since impoundment in 1970. Appendix D: Reports contains the full report.

The report's elevation-capacity and elevation-area curves formed the foundation for the LCS models developed and described in this report. Graph 5 below shows the lake's volume relative to its elevation (left- y axis) and the lake's surface area relative to its elevation (right- y axis).



Graph 5: TWDB Elevation-Area and Elevation-Capacity Curves

USGS Data. The United States Geologic Survey (USGS) provides surface-water (lake elevation) and atmospheric (rainfall) gauge data used by Carollo in this evaluation. Additionally, the FCWD keeps archived records of lake elevation data, partially supplemented by USGS gauge data (when available within the period of record). Figure 6 below shows the local USGS gauges. Use of USGS gauge data is documented where necessary in this report.

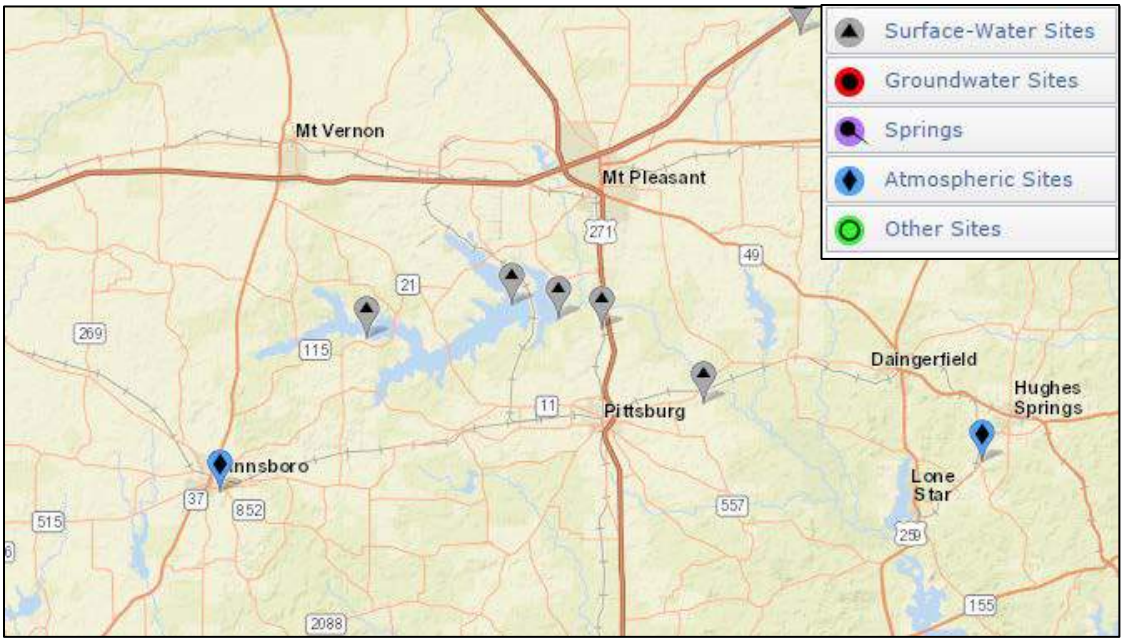


Figure 6: Local USGS Gauge Locations

New USGS Rainfall Gauge. It was identified that neither the Winnsboro atmospheric gauge nor the gauge located near Hughes Springs (both shown in Figure 6 above) provided the Carollo with enough information to determine the amount of rainfall that fell on the lake and/or within the Lake's watershed region. As a result, it was difficult to create any forecasting tool to relate rainfall amounts (inches) to rise in WSE in LCS (ft.). A task to create a forecasting tool was not part of this PER scope, but the beginning stages of correlating rainfall data to WSE rise in LCS is underway. The first step in this process is the installation of a USGS rainfall gauge on LCS.

At the request of the FCWD, a new USGS atmospheric rainfall gauge was installed where the surface water site currently exists. This gauge will begin to supply the District with valuable rainfall data for future predications on how LCS will respond to a specific rain event. The gauge had an initial cost of $2,000 and annual maintenance was also charged. It was installed June 2016 with the lake level equipment at the Operations Office.

LiDAR Data. For the Andy's Creek Analysis completed in Section 6.1.3 below, LiDAR data was gathered from the Texas Natural Resources Information System (TNRIS) to acquire cross sectional information of Andy's Creek.

2.2 Existing Models

The Hydrologic Engineering Center's Hydrologic Modeling System (HEC-HMS) is a software used by engineers to model water systems similar to the District LCS system, and provides interactive simulations for the complete hydrologic processes of dendritic watershed systems. The HEC also provides engineers with a River Analysis System (RAS) model that typically works concurrently HMS to complete detailed hydraulic simulations of the system.

The FCWD provided Carollo with a set of HEC-HMS models and HEC-RAS models (HEC-HMS and HEC-RAS models) previously completed by another consultant for requirements from TCEQ on the dam breach analysis. The HEC-RAS models were not used, as detailed hydraulic analysis of alternatives was completed in Microsoft Excel rather than HEC-RAS. Conversely, the HEC-HMS models were suspected to contain valuable hydrologic information that could be used in this evaluation. The HEC-HMS models gave Carollo a first look at approximations of storage-discharge and elevation-storage for use in this analysis. A process of accuracy evaluation comparing known lake data and record data (volumetrics, as-build design sheets, spillway parameters) was subsequently performed to determine if these models could serve as a foundation for this PER analysis. Changes to improve the accuracy of these models are discussed in Section 5.2: Revised Conditions Modeling in the report. With minor modifications, the HEC-HMS models were determined to be of sufficient accuracy and contained useful information that Carollo built upon for the evaluation of proposed structural and operational alternatives.

Carollo ran the out-of-box model provided by the District and developed the frequency analysis shown in Table 7 below. This frequency analysis matched the analysis performed in the document titled "Frequency Analysis" dated September 22, 2009 provided in Appendix D: Reports. A modified Frequency Analysis was developed from the Revised Existing Model discussed in Section 5.2 Revised Existing Model in this report.

Table 7: Existing Model Frequency Analysis

Event	Elevation
2-year	379.20
5-year	379.57
10-year	379.98
25-year	380.62
50-year	381.40
100-year	382.35
500-year	384.77

2.3 Structural Elevation Survey

Carollo completed an elevation survey of LCS. Arroyo Environmental (Arroyo) was hired to provide Carollo with a single x,y,z point for each finished slab elevation around the entire lake. In Figures 8 and 9 below, each orange point represents a house and identifies the house's elevation.

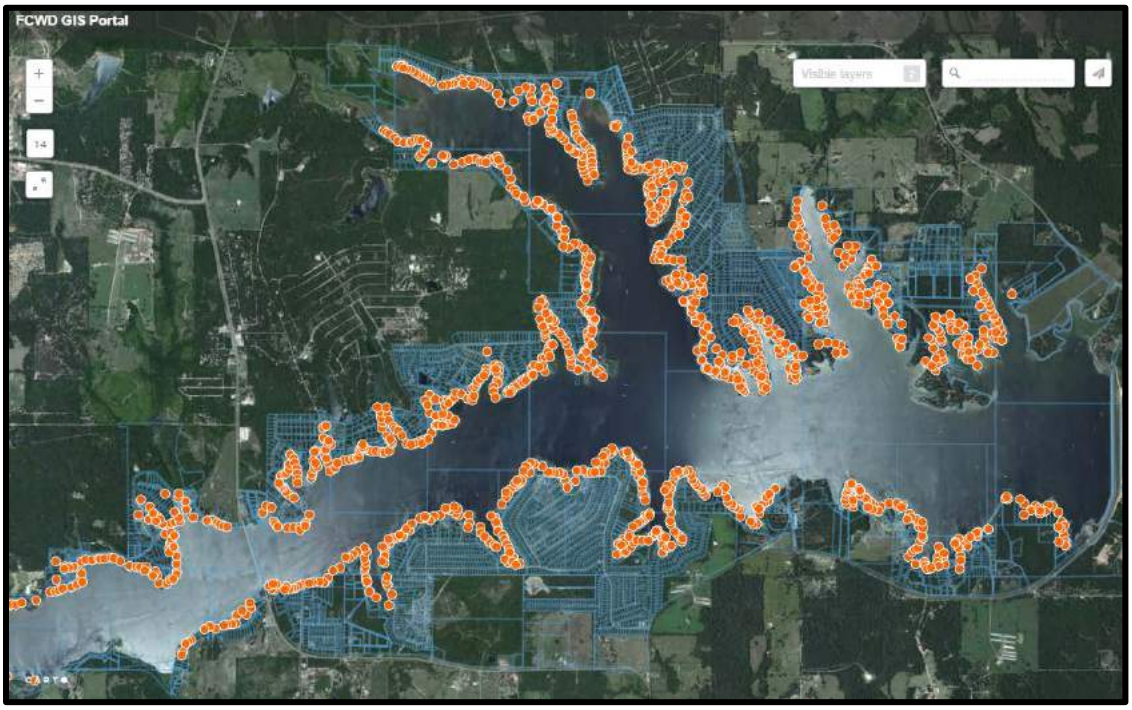


Figure 8: Structural Elevation Survey Points

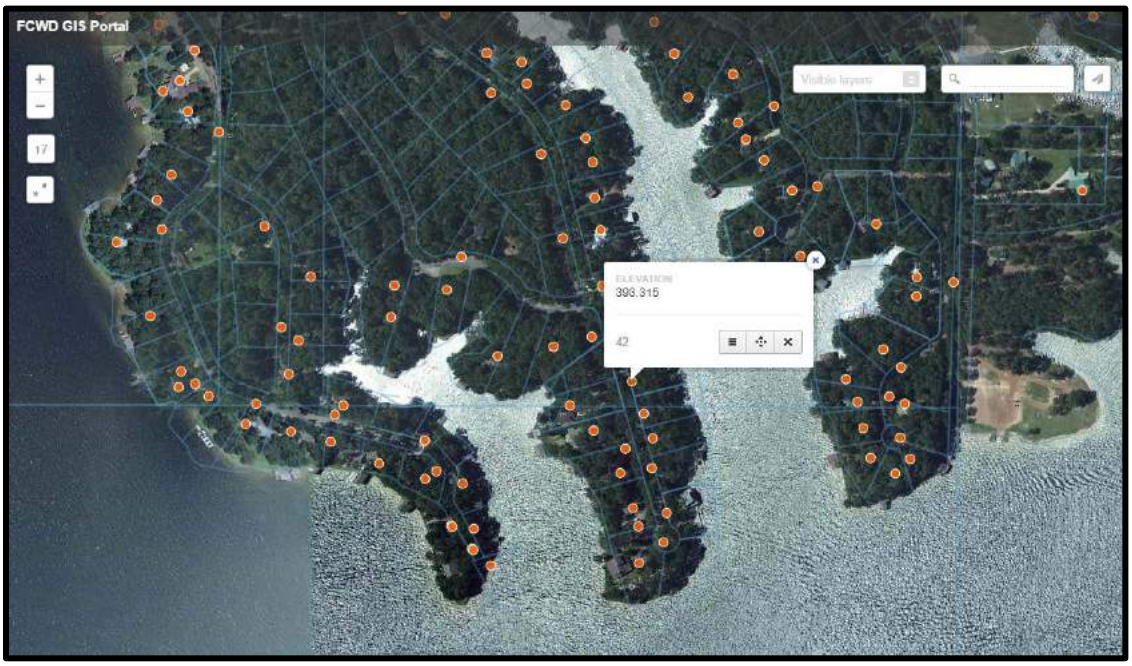
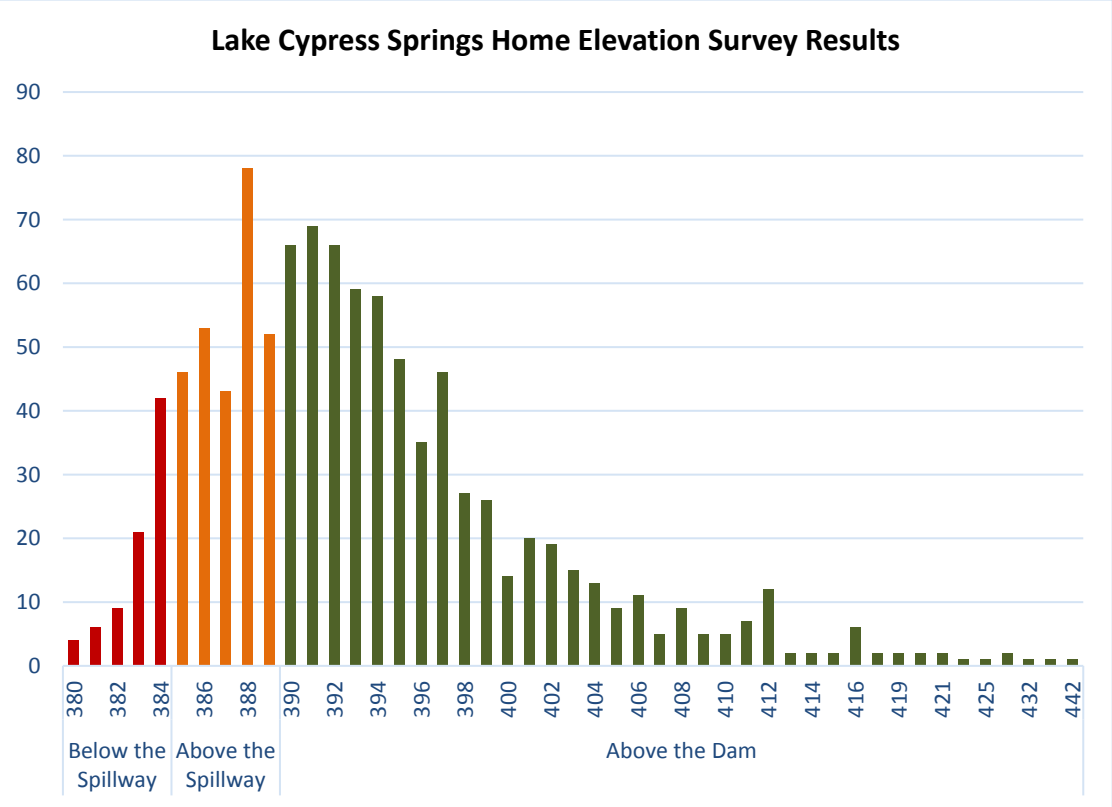


Figure 9: Zoomed View – Structural Elevation Survey Points

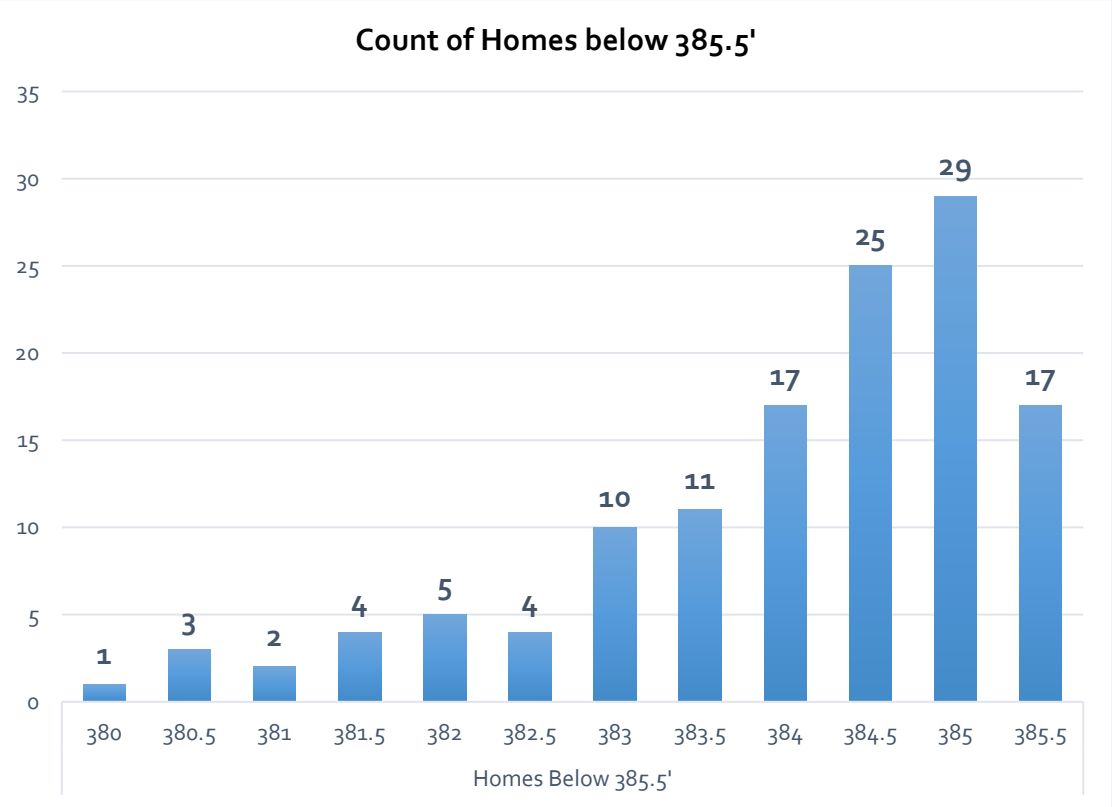
Graph 10 below shows the results of the entire elevation survey. As the figure shows, a majority of the houses are above the emergency spillway's elevation of 385.0 msl.

Of the 1,025 houses surveyed, 82 (approximately 8 percent) are below the emergency spillway's elevation of 385.0 msl. Additionally, 272 (approximately 26 percent) are above the emergency spillway but below the dam's designed elevation of 395.0 msl, and 689 houses (approximately 67 percent) are above the dam's elevation. This means that 961 (approximately 94 percent) houses are above the emergency spillway's elevation.



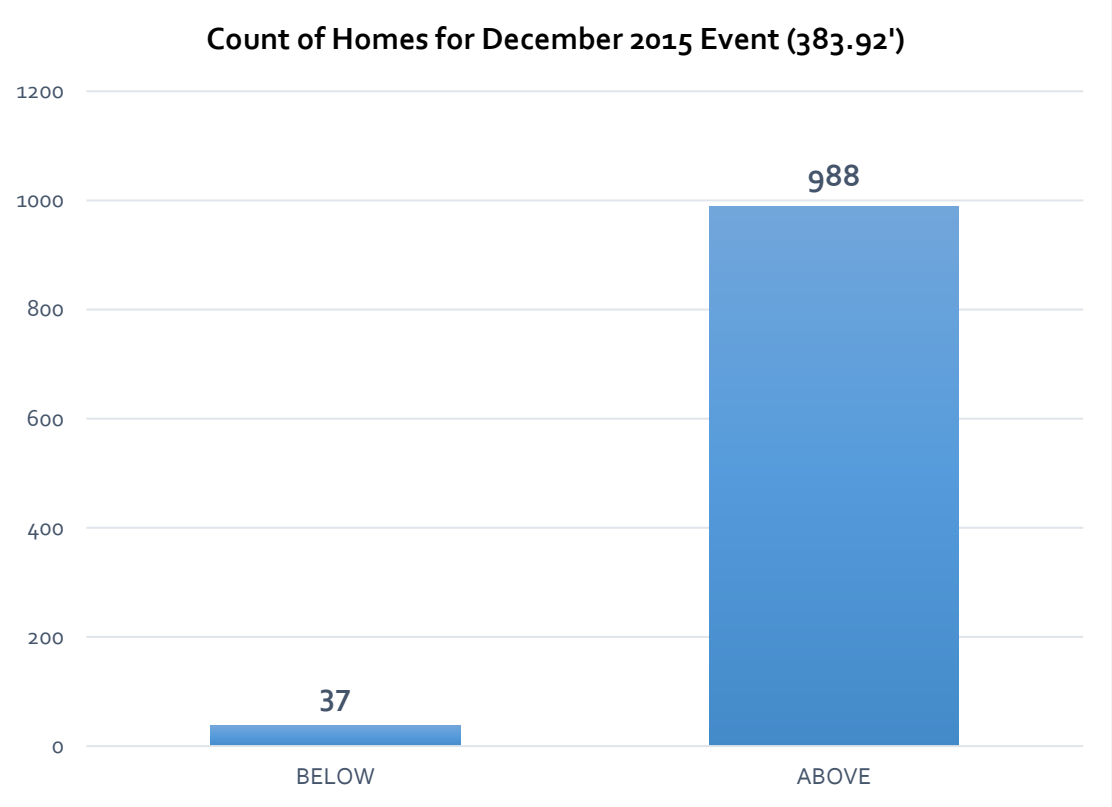
Graph 10: Elevation Survey Results

Graph 11 below shows the 82 houses below the spillway's 385.0 msl elevation. It also includes houses between 385.0 and 385.5 (17 houses). As show, there is a right skew toward the higher elevations, with a majority of houses above 383.0.



Graph 11: Focused Chart on Homes Below the Emergency Spillway

Graph 12 focuses on the December 2015 record high event showing the number of houses that theoretically flooded based on the survey. Of the 1,025 houses surveyed, only 37 (approximately 4 percent) were below the flood elevation of 383.92 msl or 5.92 feet above the conservation pool of the reservoir set at 978.0 msl. The vast majority of houses, approximately 96 percent, remained above the record high December 2015 event.



Graph 12: December 2015 Flooded Homes

2.4 Lakefront Sampling

FCWD, at the request of Carollo, gathered a series of lakefront samples to support the conclusions in this study and to support additional rules and regulation modifications that were proposed and adopted subsequent to the November and December 2015 flooding events. These samples helped FCWD understand the types of assets existing around the lake and provided the District with indicators for future regulation. These lakefront samples were also used in this PER for the development of the damage curve.

2.4.1 Boat Floating Height

Boat floating height, as schematically shown in Figure 13 below, is defined as the distance from the WSE to the highest point on the boat. Said another way, the boat floating height is the distance from the water to the first lift obstruction in a boathouse boat lift. The boat floating height was estimated by FCWD staff for 100 vessels around the lake and the results are shown in Figure 14 below, as a bell curve. As shown, the average boat floating height was determined to be 5.5 ft. with a conservative maximum of about 9 ft.

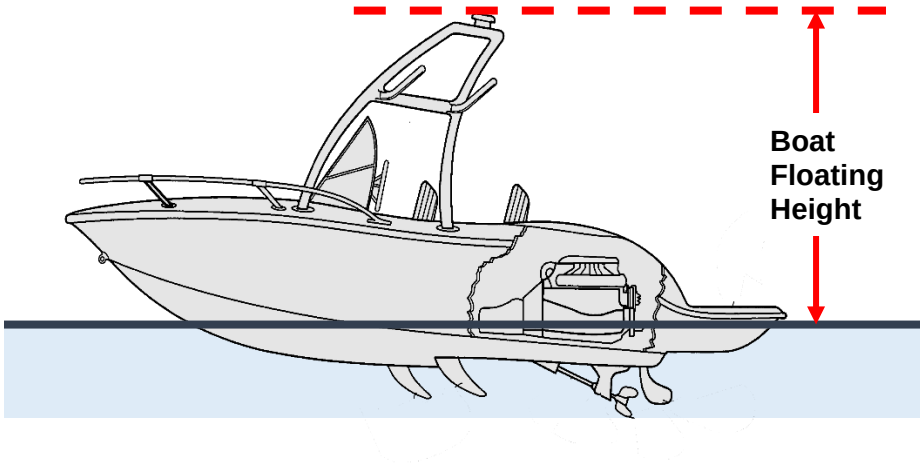
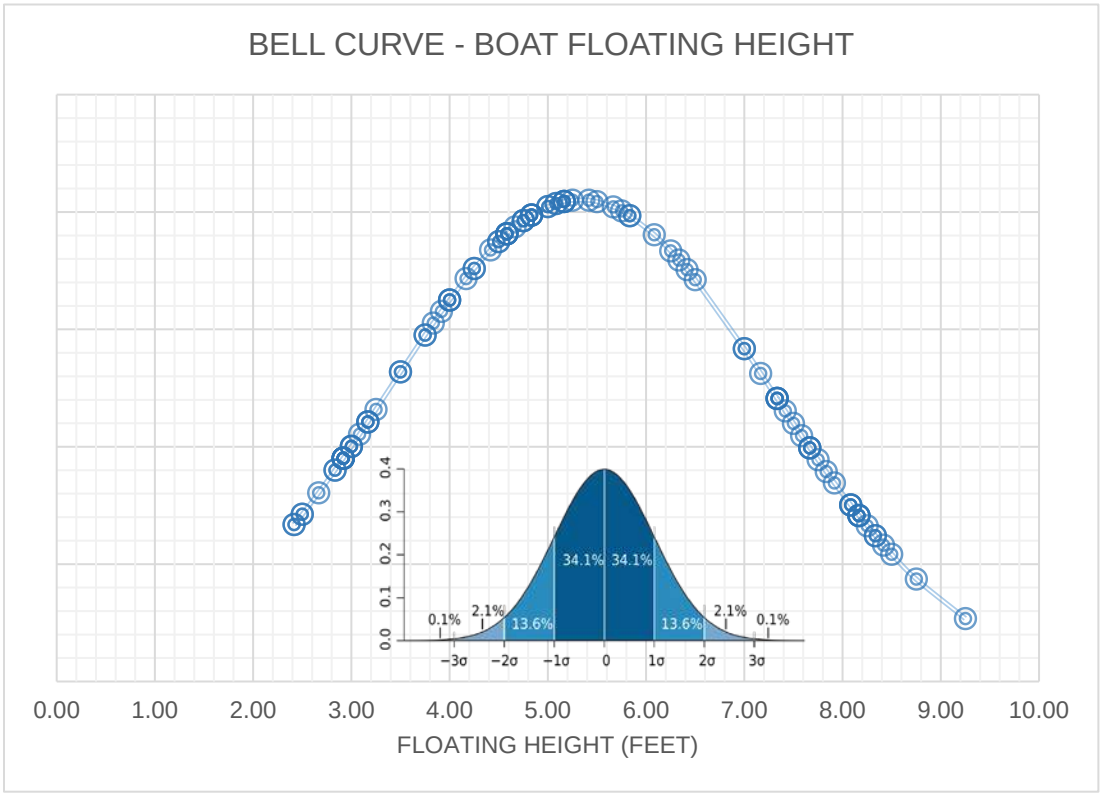


Figure 13: Boat Floating Height Schematic



Graph 14: Boat Floating Height Bell Curve

2.4.2 Boathouse Measure Downs

Boathouse measure downs, as schematically shown below in Figure 15 below, is defined as the distance from the conservation WSE (378' msl) to the top of the decking material. Said another way, this measurement represents the height a deck would stand above the water surface if the lake was at conservation pool. The boathouse measure downs dimension was obtained by FCWD staff for 100 boathouses around the lake, and the results are shown in Figure 16 below, as a bell curve. As shown, the average measure-down was determined to be 25 inches.

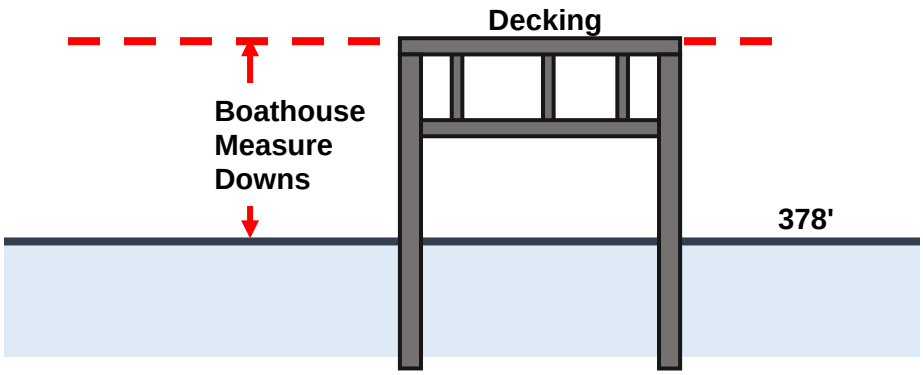
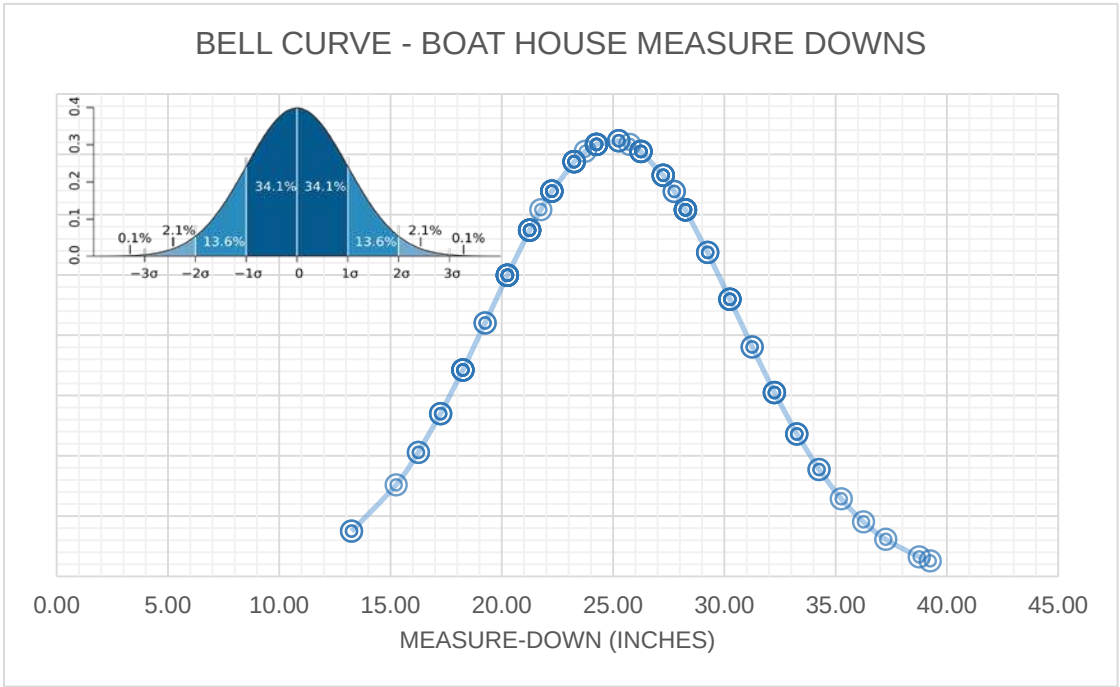


Figure 15: Boathouse Measure Downs Schematic



Graph 16: Boathouse Measure Downs Bell Curve

2.4.3 Retaining Wall Measure Downs

Retaining wall measure downs, as schematically shown below in Figure 17, is defined as the distance from the conservation WSE of 378' msl to the top of a retaining wall. The retaining wall measure downs was obtained by FCWD staff for 100 retaining walls around the lake and the results are shown in Figure 18 below, as a bell curve. As shown, the average retaining wall was determined to be approximately 23 inches, approximately 2-inches lower than the average boat house deck elevations.

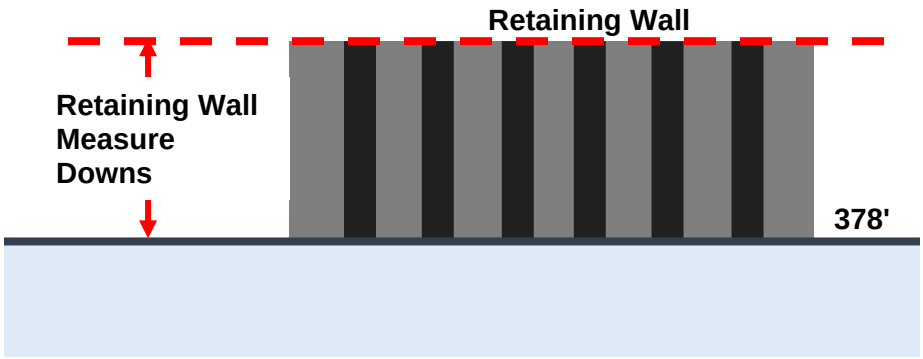
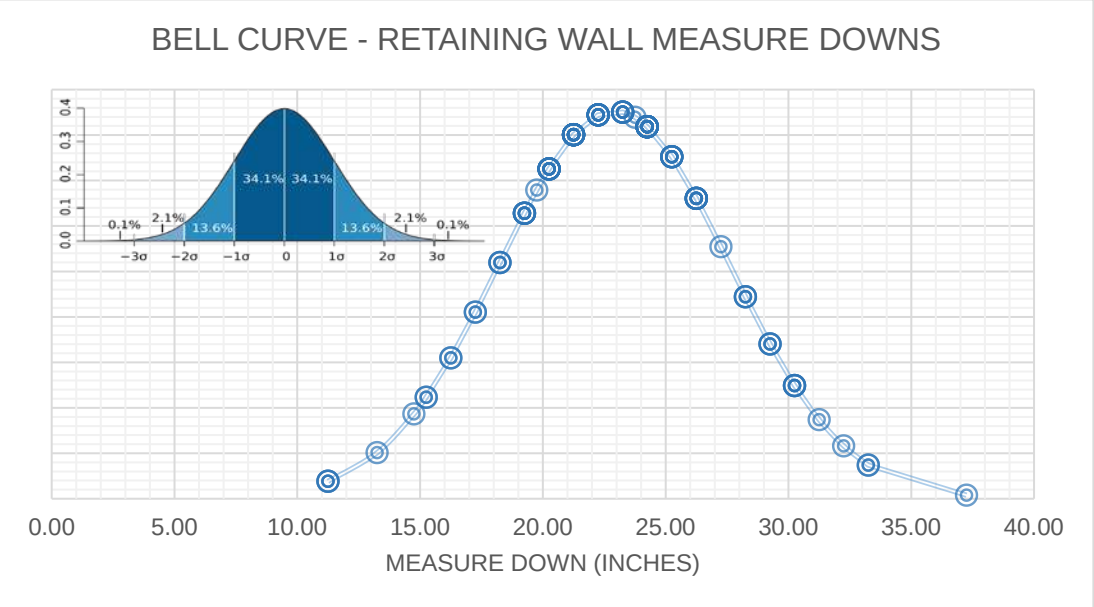


Figure 17: Retaining Wall Measure Down Schematic

2.4.4 Retaining Wall Measure Downs

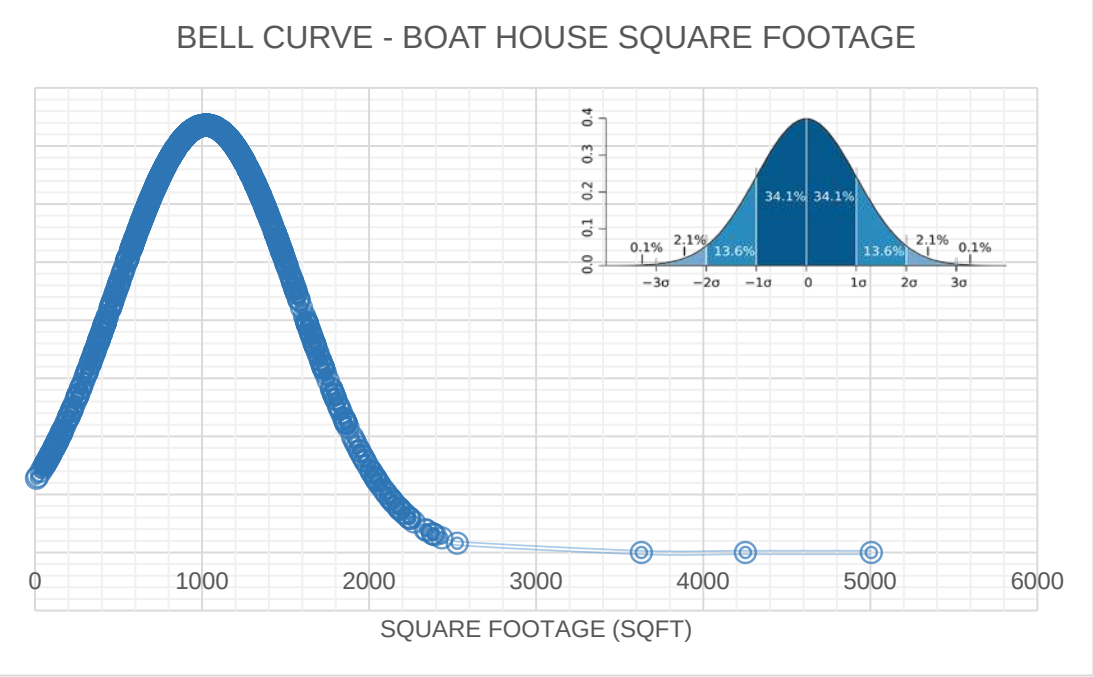
Retaining wall measure downs, as schematically shown below in Figure 17, is defined as the distance from the conservation WSE of 378' msl to the top of a retaining wall. The retaining wall measure downs was obtained by FCWD staff for 100 retaining walls around the lake and the results are shown in Figure 18 below, as a bell curve. As shown, the average retaining wall was determined to be approximately 23 inches, approximately 2-inches lower than the average boat house deck elevations.



Graph 18: Retaining Wall Measure Down Bell Curve

2.4.5 Boat House Square Footage

Instead of conducting a site sample, Carollo was able to determine boat house square footage around the lake by backing out square footage from the fees assessed per square-foot constructed on FCWD property. As shown below in Figure 19, boathouse's, on average, are 1,000 square-feet with a conservative maximum of 2,500 sf. There were only 3 boathouses on LCS that exceeded 2,500 sf.



Graph 19: Boat House Square Footage Bell Curve

2.5 Damage Survey

The scope of this PER included an assessment of damage from the December event using data from the District's website.

To assess damage from the December 2015 event, the District posted a survey on its website for property owners to complete. The survey was completely voluntary and asked property owners about the damage they experienced and the costs incurred. During the time the survey was available online, the District received 73 responses. Below in Table 20 is a summary of the responses.

Table 20: Damage Survey Results

Total Damage Cost	**$1,400,325.15**
Total Structural Damage Cost	$571,642.00
Average Total Structural Cost	$38,169.14
Total Boathouse Damage Cost	$303,144.50
Average Boathouse Damage Cost	$7,496.16
Total Retaining Wall Damage Cost	$64,561.00
Average Retaining Wall Damage Cost	$3,397.95
Total Other Damage Cost	$460,977.65
Average Other Damage Cost	$14,634.57
TOTAL DAMAGE COST	**$1,400,325.15**

Table 21 below presents the detailed results of this survey. According to the survey, the total cost of reported damage was $1,400,325. The total cost of damages to boathouses was $303,144, and the total cost of damages to structures was $571,642. House damage accounted for 36.99 percent of the total cost of reported damage.

Table 21: Damage Survey Breakdown

	Structural Components			
	House	Guest House	Garage	Storage Building
Number Reported	17	3	4	14
Percent of Total Cost	36.99%	0.63%	0.62%	2.58%
Total Damage Cost *Per Reported*	$518,022	$8,800	$8,750	$36,070
Average Damage Cost *Per Reported*	$30,472	$2,933	$2,188	$2,576

	Boathouse Components		Retaining Walls
	Boat-house	Deck or Dock	Retaining Wall
Number Reported	48	32	19
Percent of Total Cost	13.55%	8.09%	4.61%
Total Damage Cost *Per Reported*	$189,803	$113,342	$64,561
Average Damage Cost *Per Reported*	$3,954	$3,542	$3,398

	Other Components		
	Water Pump	Vehicles	Boats
Number Reported	35	7	39
Percent of Total Cost	4.61%	1.60%	26.71%
Total Damage Cost *Per Reported*	$64,493	$22,400	$374,084
Average Damage Cost *Per Reported*	$1,843	$3,200	$9,592

As Chart 22 shows, approximately 37 percent of the total damage from the flood was to houses. Boats were the next most damaged property type, accounting for approximately 27 percent of total damages. Combined, houses and boats accounted for approximately 64 percent of the total damage. Boathouses accounted for 14 percent of the total damaged property and other assets made up the reminder.

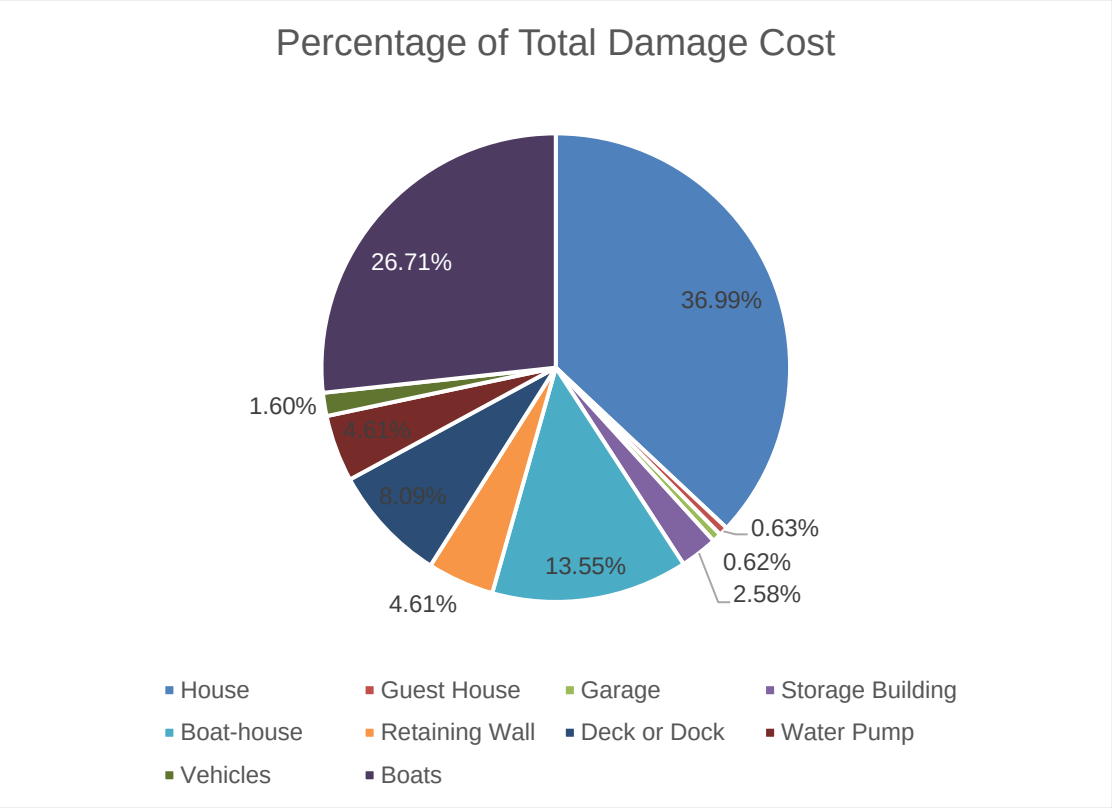


Chart 22: Percent of Total Damage Pie Chart

The Chart 23 below shows the same information but tally's survey responses instead of damages. This graph shows fairly even consistency, which indicates that most residents that experienced damages and reported these damaged through this damage survey experienced a uniform amount of damaged on their property comparatively to other residents.

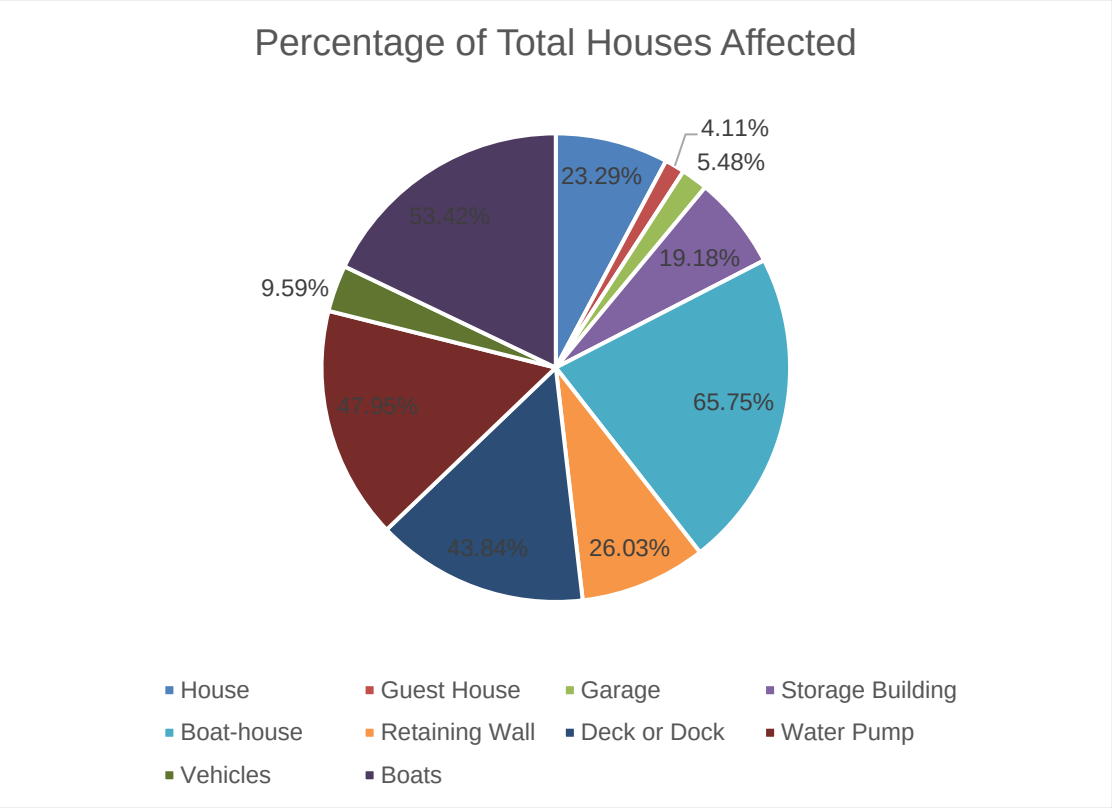


Chart 23: Percent of Total Houses Affected Pie Chart

3.0 DEVELOPMENT OF THE DAMAGE CURVE

As the water surface in LCS rises, damages associated with each increment of rise (ft.) can be approximated using various sources of gathered information. Additionally, each increment of rise in WSE causes damages to different assets around the reservoir. For example, a rise from conservation pool of 378' msl to 379' msl (+1 foot), for all intents and purposes, would cause no damage ($0.00) to residential assets around the reservoir, as residents are adequately equipped to handle a rise of this nature. On the other hand, a similar rise in WSE of +1 foot from 381' msl to 382' msl would cause flooding damages to residential assets around LCS. The development of the damage curve approximates this damage based on the rise in WSE of LCS.

The development of the damage curve is an important tool in establishing the direct monetary damage that would theoretically occur around the reservoir at each increment of WSE rise. Carollo developed the damage curve to estimate approximated damages for each 0.5 foot of rise in the reservoir.

The damage curve was developed with the best available information and, where necessary, engineering judgment. For the assets around LCS, a damage curve was created from the following information:

- Damage Survey – Results from the District's flood damage survey for the record-event (383.92 ft. above msl), discussed in detail in Section 2.3 above.
- Elevation Survey – Results from the Arroyo elevation survey of finished floor elevations.
- Estimates from a "cost of flooding" tool developed by the National Flood Insurance Program (NFIP). This tool estimates the cost of damage to the average 2,000 square foot home according to the depth of water inundation.
- Engineering judgment used primarily to establish the WSE approximations where damages would start to occur and where damages would plateau.

3.1 Damage Categories

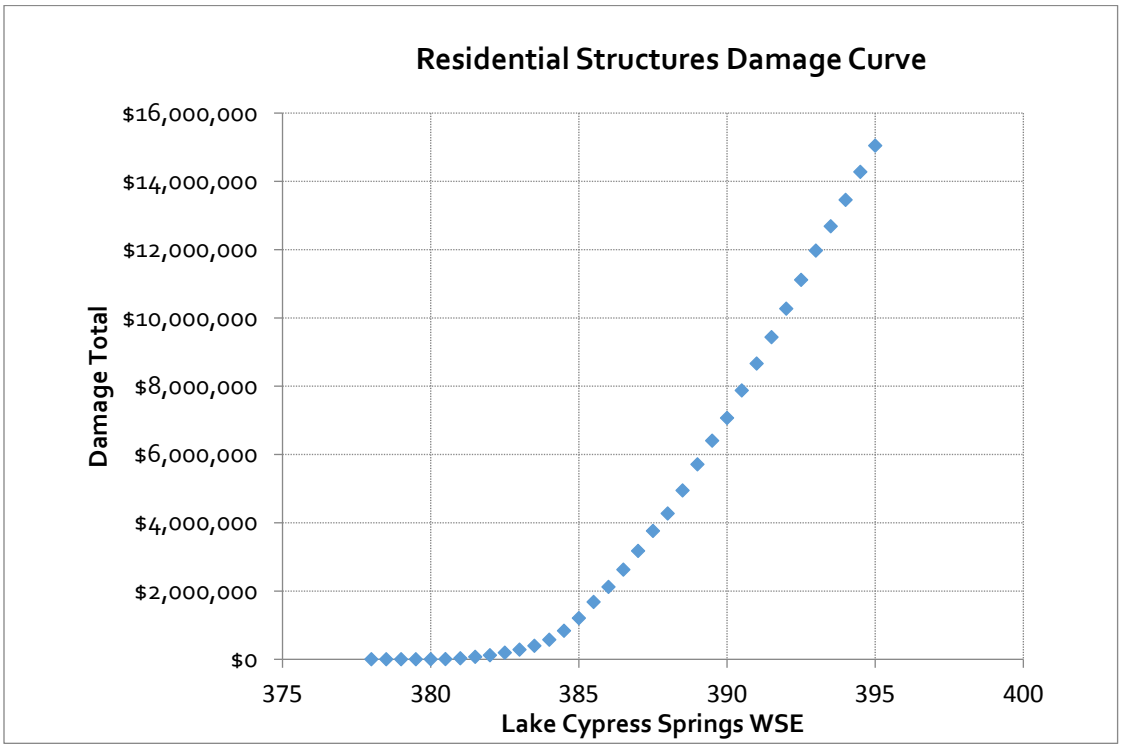
As the damage accumulation around LCS totals differently for different asset categories, it was necessary for Carollo to develop an individual damage curve for each category of assets. For each category of assets around the reservoir, a category-specific damage curve was developed. Damage for each 0.5 ft. in WSE rise was approximated by first approximating a damage curve for each of the damage components and second, but totaling each of the damage components into a single damage curve.

3.1.1 Residential Structures

To develop the residential structures category component of the damage curve, Carollo used the Damage Survey results, the Elevation Survey results, and the NFIP cost of flooding tool developed by FEMA. In fact, the damage curve for residential structures was developed differently than other assets because of the Elevation Survey's existence. The Elevation Survey allowed Carollo to pinpoint the exact number of houses that would theoretically flood in any given simulation. Carollo was able to estimate the damages that would be approximated by a flood event for each 0.5 rise in WSE.

The LCS Damage Survey reported a total loss to residential structures of $571,642 for the rise of WSE to 383.92' msl. This value gives a single point on the damage curve. The NFIP cost of flooding tool developed by FEMA provided the remaining points on the curve.

The Floodsmart.gov Flooding Damages based on Depth of Water Inundation are attached in Appendix C: Additional Tables. This table summarizes the output from the FEMA tool that provided approximate damages to houses for specific inundation depths. This was normalized to LCS and used in the residential structures damage curve shown in Graph 24 below.



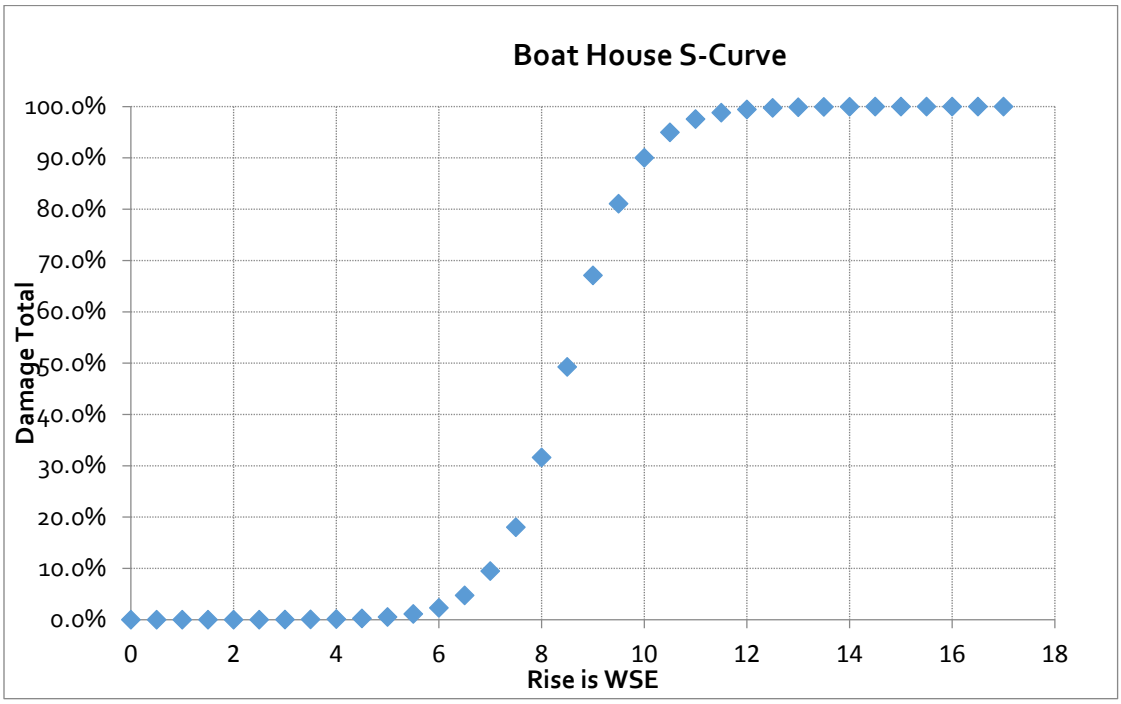
Graph 24: Residential Structures Damage Curve

3.1.2 Boat Houses

Per the boathouse measure downs sample completed on LCS and discussed earlier in the report, boathouses at LCS are typically built with a deck at 24-inches (2 feet) above the conservation pool (378' msl). Thus, boathouses are not inundated around the reservoir until a specific point. At that point, most become inundated quickly (within a foot or two of additional WSE rise).

Unlike many other lakes in Texas, residents around LCS appear to be very familiar with fluctuations in the reservoir's WSE and corresponding inundation of their boathouse. In fact, anecdotal evidence suggests that damages to boathouses do not occur until a significant rise in WSE above the deck boards of the boathouse. For this damage curve assessment, Carollo assumed that no boathouses are damaged until a WSE of 5 feet (383' msl). When WSEs rise by 9 feet, nearly 50 percent of the boathouses experience damage and at a WSE increase of 12 feet, 100 percent of the boathouses are damaged.

Graph 25 represents the S-curve showing the percentage of boathouse damage occurring with a corresponding rise in WSE above 378 feet. This curve was utilized in the total damage curve discussed below and shown in Graph 30.

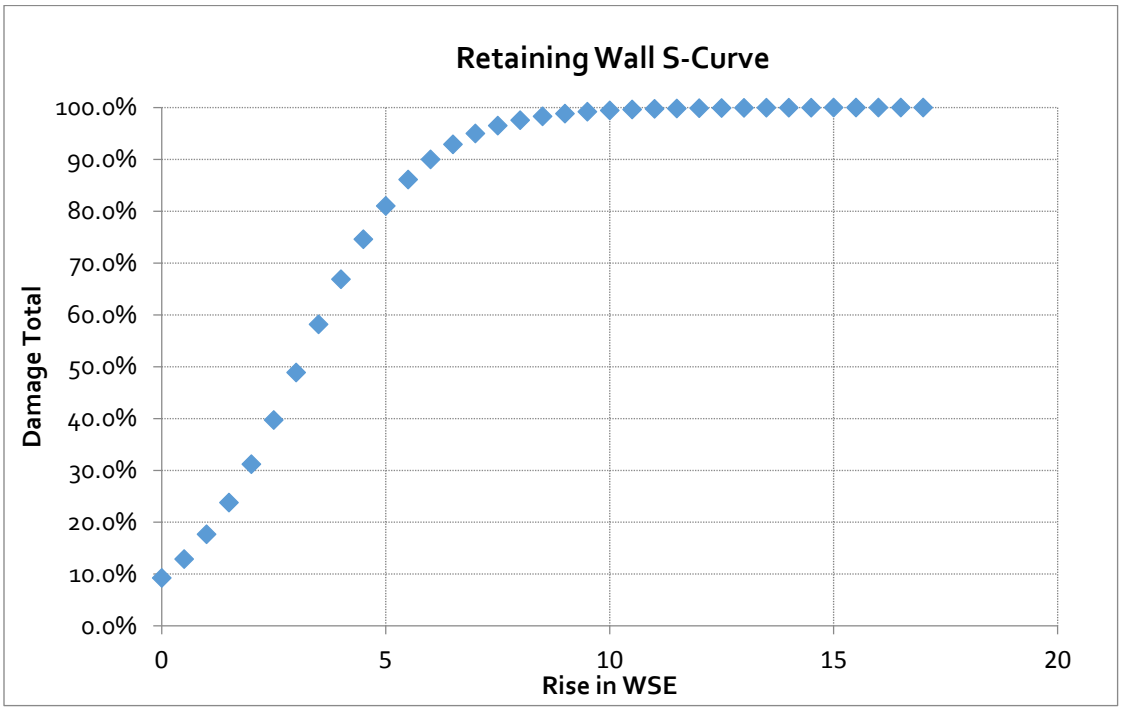


Graph 25: Boat House S-Curve

3.1.3 Retaining Walls

Because of wave action acting on a retaining wall, retaining walls experience the most damage when the water surface rises just over the wall and quickly dissipates as water continues to rise. Per the retaining wall measure downs sample completed on LCS and discussed earlier in the report, retaining walls on LCS are typically built with a top at 23-inches (~2 feet) above the conservation pool (378' msl).

As the figure shows, ten percent of retaining walls are assumed to be inundated at 378 feet, and approximately 50 percent inundated when the elevations rises by 5 feet. When the WSE rises by approximately 9 feet, it is assumed that 100 percent of the retaining wall damage has occurred. Graph 26 is an S-curve showing the percentage of retaining walls damage associated with a corresponding WSE rise above conservation pool.

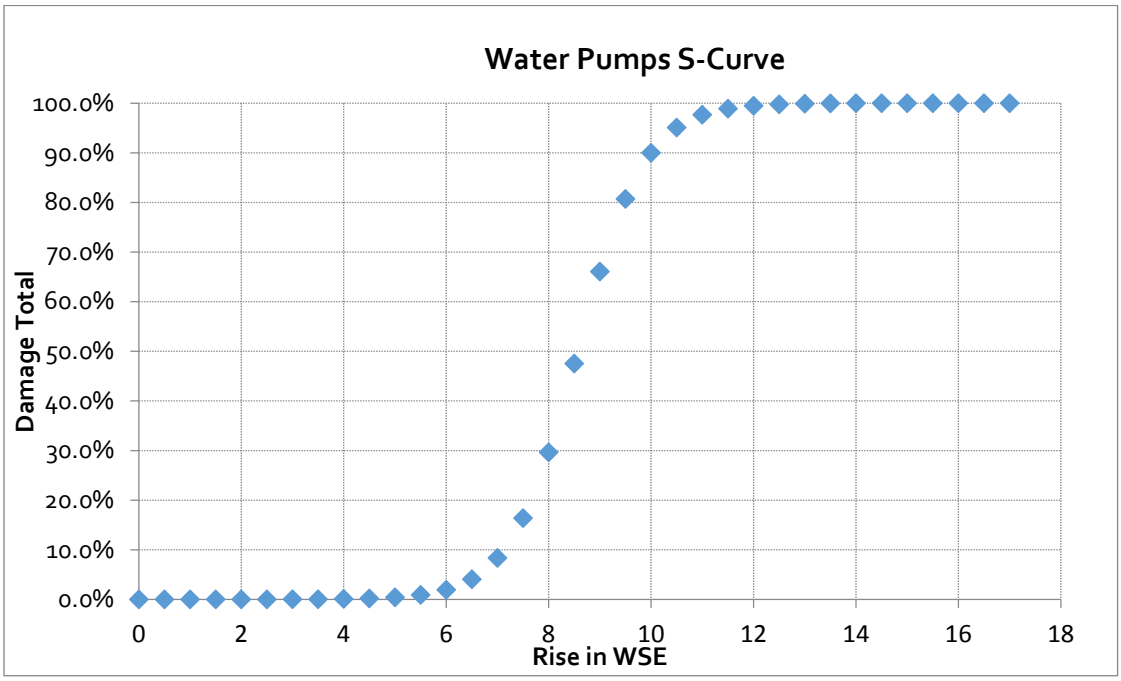


Graph 26: Retaining Wall S-Curve

3.1.4 Water Pumps

Anecdotal evidence suggests that most people tend to put water pumps for irrigation purposes on top of their retaining walls under a block/brick or some type of riser (typically 18 inches to 2 feet). Similar in form to the S-curve of boathouses above, it is assumed that no water pumps are inundated until a certain point. Then, the percentage increases sharply until all water pumps are inundated.

It is assumed that no water pumps are inundated until an increase of 6 feet. With an increase of 8.5 feet, 50 percent are inundated. Nearly all are inundated with an increase of 12 feet. Graph 27 is an S-curve of the percentage of water pumps inundated when the WSE rises above 378 feet.

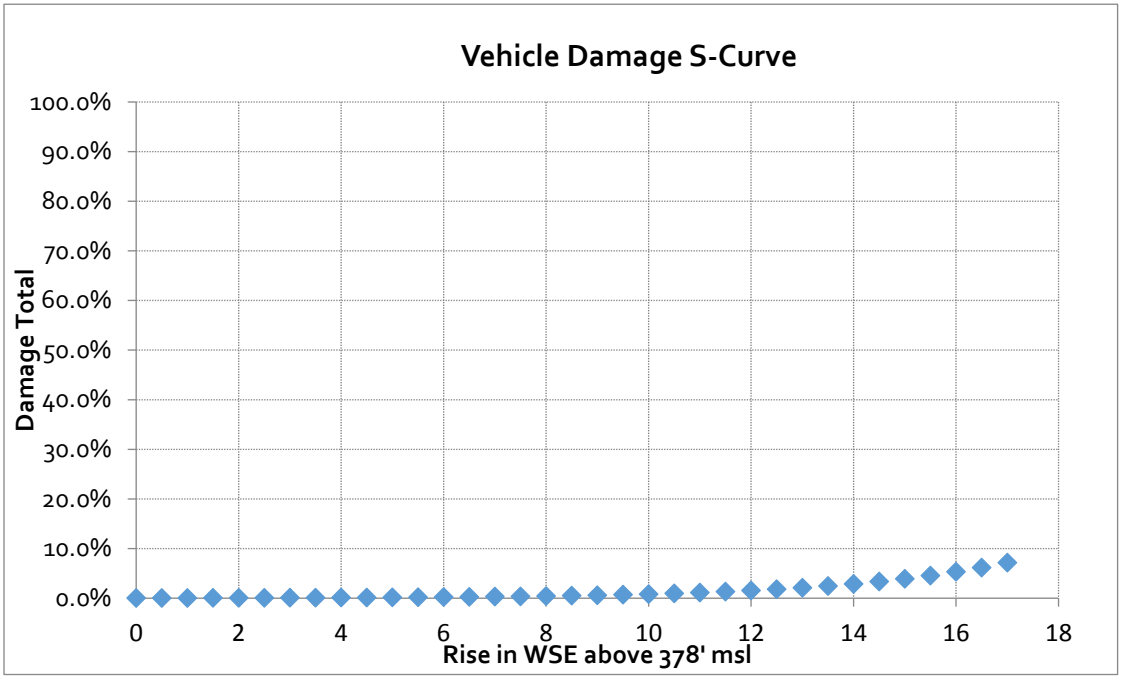


Graph 27: Water Pumps S-Curve

3.1.5 Vehicles

Property owners around LCS are anecdotally classified as "weekend goers" and "vacationers." In one public forum, it was identified by attendees that only 10 percent of the owners around the lake claim primary residence at their LCS home. Additionally, the FCWD prohibits the rental of a lakeside home through services like Craigslist, AirBNB, etc. These factor have contributed significantly to Carollo's assessment of vehicular damages. Because vehicles can be moved easily and because vacationers consistently take their vehicles with them when they leave their property, they are not frequently inundated from a storm event. Thus, as the figure shows, only 1 percent of vehicles are inundated with an increase of 10.5 feet, and only 7.2 percent are inundated with an increase of 17 feet. At no point are all vehicles inundated.

Graph 28 is an S-curve showing the percentage of inundated when the WSE rises above conservation pool of 378' msl.



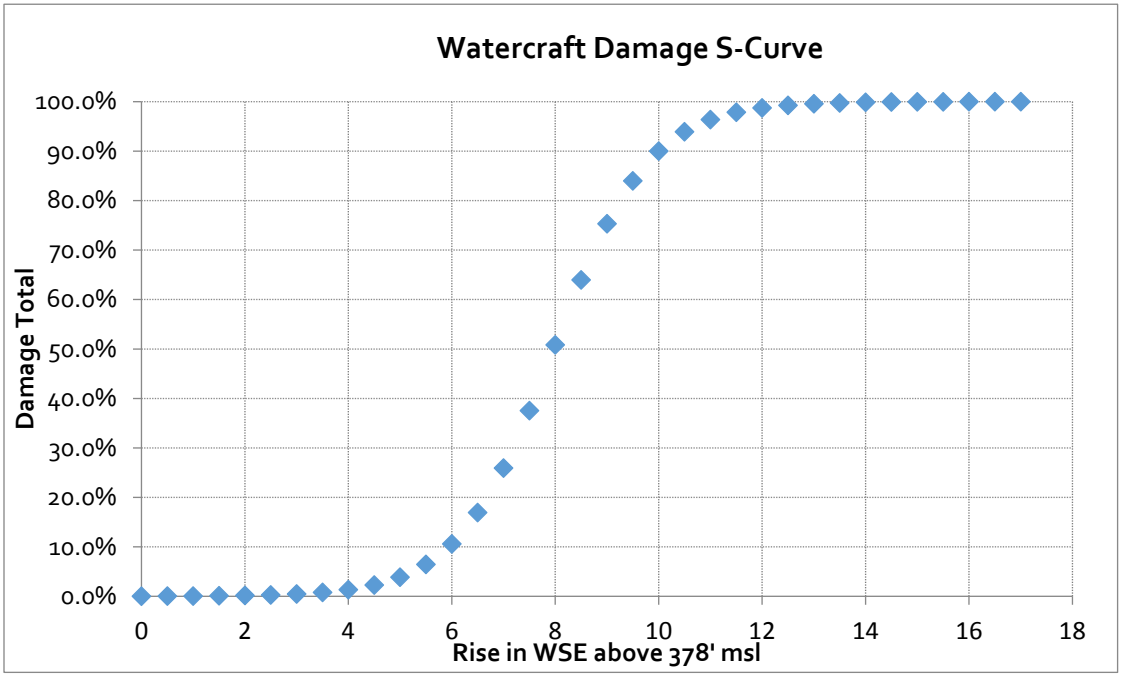
Graph 28: Vehicle Damage S-Curve

3.1.6 Watercraft

LCS has no regulations that restrict a person from building a boathouse too low to the water and not accounting for natural flucuations in the WSE. As the WSE in LCS rises, watercraft lifted in boathouses will begin to float off of their cradle. At some point, watercraft will be unable to rise in the boathouse and will be inundated and flooded by reaching the lift obstructions/roof of the boathouse. This causes damages to both watercraft and sometime the boathouse itself. Additionally, as mentioned above, most property owners around the lake do not reside permanently at the lake. This means that many watercraft owners are unable to respond to a rapid rise in WSE by removing their boat from its cradle before total inundation. With these considerations in mind, Carollo developed a damage curve for watercraft.

Watercrafts are similar to boathouses and retaining walls, in that the S-curve rises steeply at a certain point and then plateaus when all watercraft are inundated. For LCS, Carollo assumed no watercraft is inundated with an increase of two feet, and approximately 50 percent are inundated with an increase of 8 feet. An increase of 12 feet causes nearly all watercraft to be inundated.

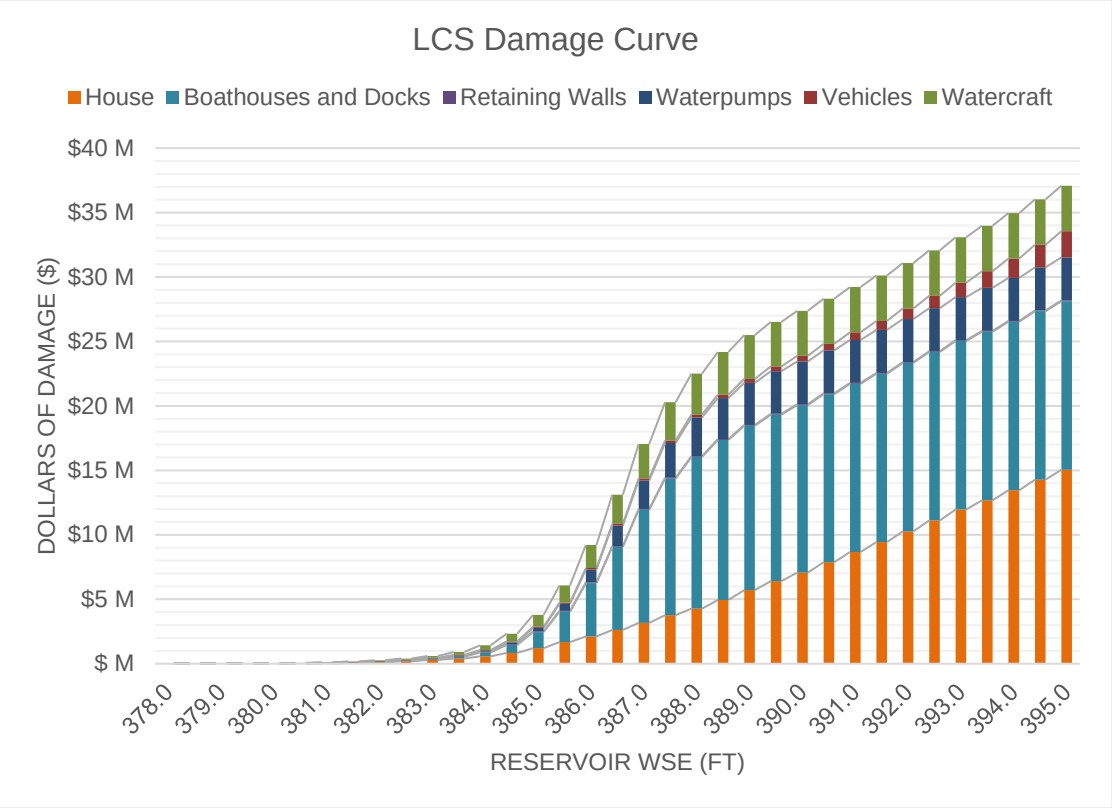
Graph 29 shows the S-curve for the percentage of watercraft inundated when the WSE rises above 378 feet.



Graph 29: Watercraft Damage S-Curve

3.2 Total Damage Curve

Graph 30 below shows the total damage curve created from an accumulation of the S-curves in earlier sections, depicting the amount of damage in dollars at different WSEs. The graph shows the approximated cost of damage to houses, boathouses and docks, retaining walls, water pumps, vehicles, and watercraft.



Graph 30: Total LCS Damage Curve

According to the figure, damage begins when the WSE rises to 380' msl. However, it does not significantly increase until 385' msl. At that point, the reservoir will experience much greater damage per foot of WSE rise.

4.0 ALTERNATIVES IDENTIFICATION

4.1 Stakeholder Involvement

Carollo regularly involved the community when evaluating alternatives for this PER. On May 17, 2016, Carollo held a board meeting to discuss alternatives. On April 5, 2016, Carollo held a public meeting with stakeholders of LCS.

Carollo continued to involve stakeholders during preliminary discussions of high-level alternatives. On July 7, 2016, Carollo presented the Hydraulic Analysis and Stakeholder Meeting for the FCWD Preliminary Engineering Report. During this presentation, stakeholders gave input to Carollo on ideas they thought could solve flooding-related problems around the lake.

4.2 Alternatives Presented to the Public

In an attempt to exhibit full transparency and encourage engagement of lakefront home-owners, suggestions from the community were requested to be used in the PER recommendation of feasibility. From various stakeholder meetings, five baseline structural alternatives and a single (1) operational alternative (6 in total) were presented during a public forum (and outlined in this section). Subsequently, the list of baseline alternatives was filtered from the original six (6) down to three (3) structural alternatives and a single (1) operational alternatives (4 in total) to be evaluated in greater detail with hydrologic modeling, agency review, and cost analysis.

From the July 27, 2016 presentation and subsequent communication with stakeholders, five structural alternatives and one operational alternative were identified as either (A) potentially feasible by Carollo or (B) highly publicized by the public as a potential alternative prior to the meeting. The full presentation with additional detail can be found in Appendix B: Presentations. These alternatives were identified as follows:

1. Building an additional canal at the emergency spillway.
2. Installing box culverts at the dam.
3. Constructing a tainter gate system.
4. Building a pump station.
5. Constructing a second morning glory spillway.

Each alternative, its high-level first-look feasibility, and a cost scale are described in the following subsections.

4.2.1 Alternative 1: Additional Canal at the Emergency Spillway

Alternative 1 proposes the construction of a second canal on the emergency spillway that connects to Andy's Creek with a canal bottom elevation near 378.0 msl. When water rises above conservation pool, it would enter the canal and flows through FM3122, into Andy's Creek, and then into LBS.

The canal could be constructed of a variety of materials, including natural soil, concrete, or articulated concrete block. Vegetation, articulated concrete block, or a combination of the two could line it. For the canal's culvert crossing at FM3122, cast-in-place culverts, bridges, low-profile culverts, or low water crossings could be used. Road improvements would be required on FM3122. Furthermore, shortened culvert pipes (because of road clearance) would be required, decreasing conveyance ability and increasing the number of barrels required.

This alternative had a high feasibility rating and was chosen as one of the three alternatives to consider for additional investigation.

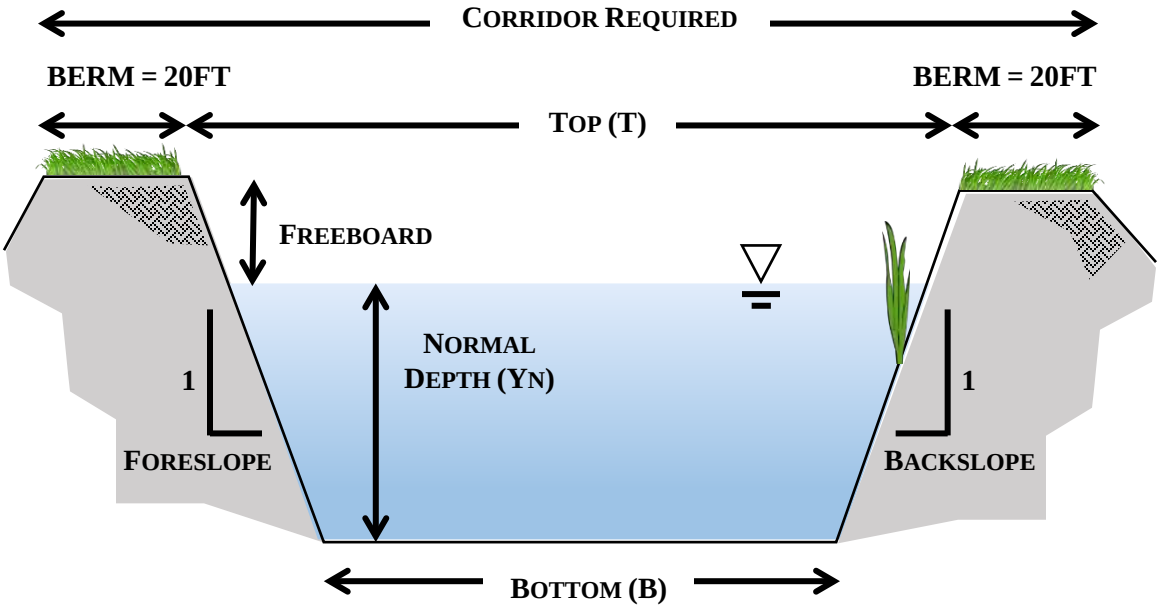


Figure 31: Canal Section Parameters

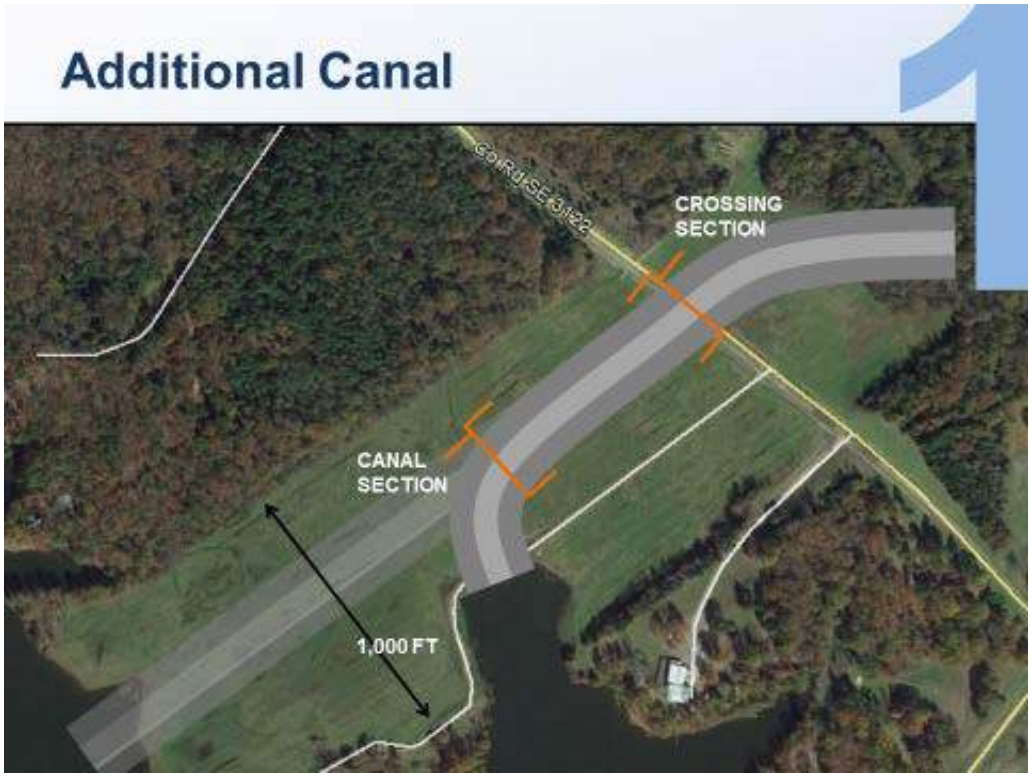


Figure 32: Alternative 1 Slide from Public Stakeholder Meeting 2

4.2.2 Alternative 2: Box Culverts at the Dam

Alternative 2 proposes a series of box culverts on the south end of the dam, directly north of the existing morning glory spillway. These culverts would be constructed to convey flows underneath the dam, sending flows to LBS down an improved (concrete lined) dam backslope.

In addition to the installation of the culvert pipes, this alternative would require road improvements to FM3007 to accommodate for open cut installation. Boring or hand-tunneling could be a possibility for this installation by creating a cofferdam boring pit, but the feasibility of this was not fully explored.

This alternative had a high feasibility rating and was chosen as one of the three alternatives to consider for additional investigation.

Figure 33: Alternative 2 Slide from Public Stakeholder Meeting 2

4.2.3 Alternative 3: Tainter Gates

Alternative 3 proposes adding Tainter gates to the LCS system. Although costly, tainter gates allow for the ability to have high control on WSEs in the reservoir. Gates can be repositioned according to FCWD operations allowing for tighter control and flexibly on controlling the flood pool. As shown in Figure 34, LBS currently operates with four (4) tainter gates; these gates would be similar in size to the proposed gate system in Alternative 3.

Although, not initially considered for investigation, Alternative 3 was chosen as one of the three alternatives to be considered for additional investigation due to high feasibility rating.

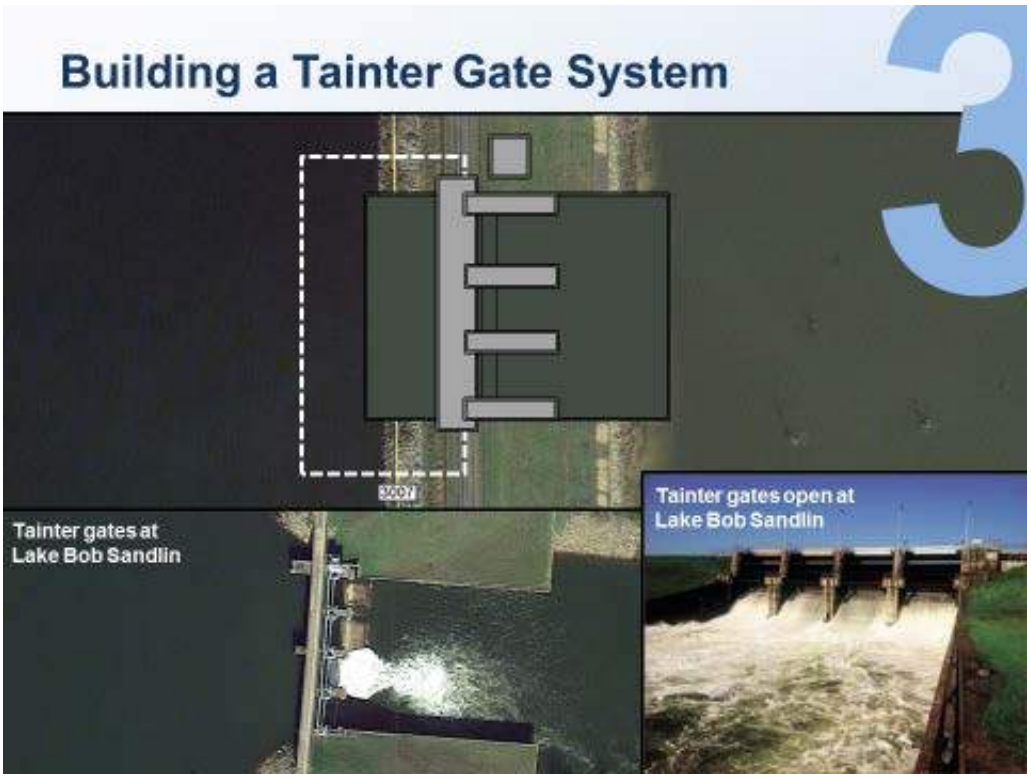


Figure 34: Alternative 3 Slide from Public Stakeholder Meeting 2

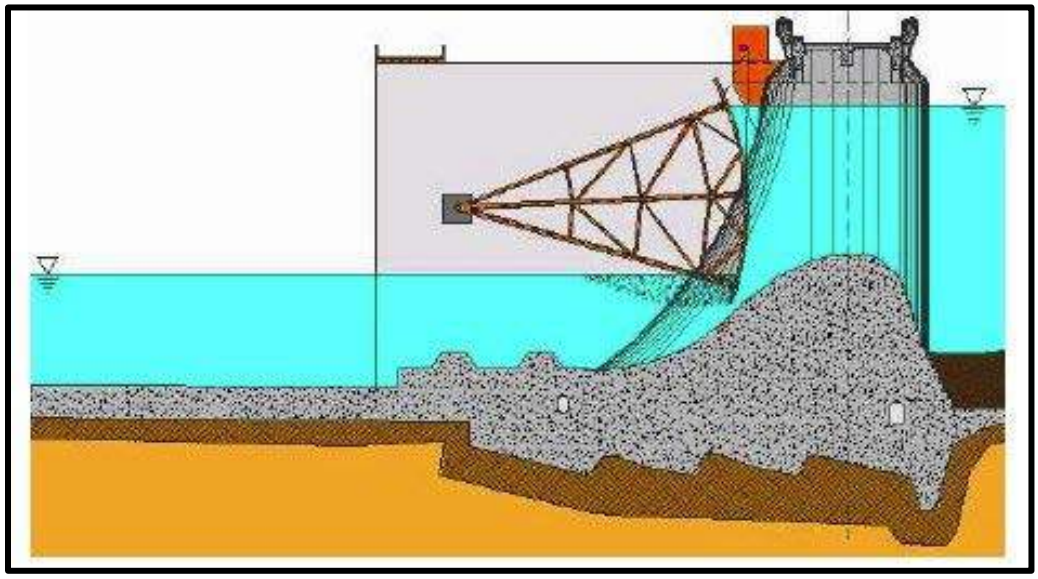


Figure 35: Tainter Gate Schematic

4.2.4 Alternative 4: Pump Station at the Dam

Alternative 4 proposes to build a new pump station along the north end of the dam. The pump station would use a series of pumps to move flood waters up and over the dam to LBS.

The volume of water required to be pumped over the dam to minimize a rise in the lake's surface water elevation makes this alternative unfeasible. In fact, analysis of this option simply in terms of inflows to LCS shows a necessary pump station size bigger than any Carollo is familiar with anywhere in the world.

This alternative had a low feasibility rating and was not chosen as one of the three alternatives to consider for additional investigation.

Figure 36: Alternative 4 Slide from Public Stakeholder Meeting 2

4.2.5 Alternative 5: Second Morning Glory

Alternative 5 proposes a second morning glory spillway to be built near the existing morning glory spillway by boring methods through the dam. A second morning glory spillway would provide additional flows to LBS.

When analyzing this alternative in comparison to other alternatives, no benefit of this alternative was identified over Alternative 2. Although a morning glory spillway does have the ability to convey more flows than a same-size box culvert pipe, the depth of installation in-the-wet on the existing dam poses great concern.

This alternative had a low feasibility rating and was not chosen as one of the three alternatives to consider for additional investigation.

Figure 37: Alternative 5 Slide from Public Stakeholder Meeting 2

4.2.6 Other Alternatives

In addition to these five (5) alternatives, a single additional alterative was determined to be feasible, at first glance, based on the public forum discussion during this presentation. This alternative involved the lowering of County Road SE 3122 (the road crossing the emergency spillway) to an elevation of 378' msl (or some elevation slightly above 378 feet). The lowering of the road would only be necessary in the approximately 1,000 ft. crossing the emergency spillway. It was discussed at the public forum that this solution would not be accepted by TxDOT as a feasible alternative. The inundation of this roadway in a lower probability storm event was considered unacceptable by their standards. This was confirmed by a TxDOT representative as discussed in Section 8.4 below. Inundation of the entire spillway would cause wash-out and damage the roadway. It could also pose a safety concern. A designed crossing of the water is necessary.

4.3 Selected Structural Alternatives

From this public stakeholder meetings, the following two structural alternatives were identified, at a high level, to be conceptually feasible:

- Selected: Alternative 1: Additional canal at the emergency spillway.
- Selected: Alternative 2: Box culverts at the dam.

As the hydraulic modeling of these alternatives progressed, it was subsequently determined that the Alternative 3 should be also evaluated. This is further discussed in this report below. Alternative 4 and 5 were determined at a high level to be either hydraulically infeasible or too costly to evaluate further.

- Additionally Selected: Alternative 3: Tainter Gates
- Not Selected: Alternative 4: Pump Station
- Not Select: Alternative 5: 2nd Morning Glory

4.4 Operational Alternative

In addition to Structural Alternatives, the FCWD could also provide flooding relief by changing operations of the reservoir. Although the pros and cons would need to be weighed by the district, an Operational Alternative of lowering the conservation pool of the reservoir was recommended by some attendees in the public forums. As such, the FCWD thought it was important to fully understand the implications of a lowered reservoir. This alternative would involve lowering the reservoir level to a new conservation pool either permanently, during the non-recreational season (winter months primarily), or predictively before a major storm event. If, for example, the conservation pool of the reservoir was lowered by a single (1) foot, the reservoir would respond differently to a large storm event because this additional foot would act as a storage pool and mitigate flooding damages.

Lowering the reservoir to a new pool permanently will have long-term effects on water supply (firm yield and water reliability), as doing so would cause the reservoir to experience lower summer levels than in the past. Furthermore, during droughts like the one in 2011, the WSE of the reservoir would be impacted possibly leaving the FCWD unable to fulfil contracted water obligations. Also, lowering of the reservoir in winter months only is not feasible with the current configuration of the morning-glory and low-flow service outlet spillway. The morning-glory itself gives the FCWD no control on the reservoir elevation. The 18 inch low-flow service outlet spillway does provide the FCWD with some ability to lower the reservoir levels. With that said, the service outlet spillway is used to meet obligations downstream and was calculated to only have the ability to lower the WSE in the lake by 1-foot in 1-month. Lastly, predicting a future storm events effect on the WSE in the reservoir is also not feasible given the districts inability to rapidly control the WSE in the LCS.

Carollo completed a modeled evaluation of the Operational Alternative which is presented in detail below in 5: Modeling of Alternatives.

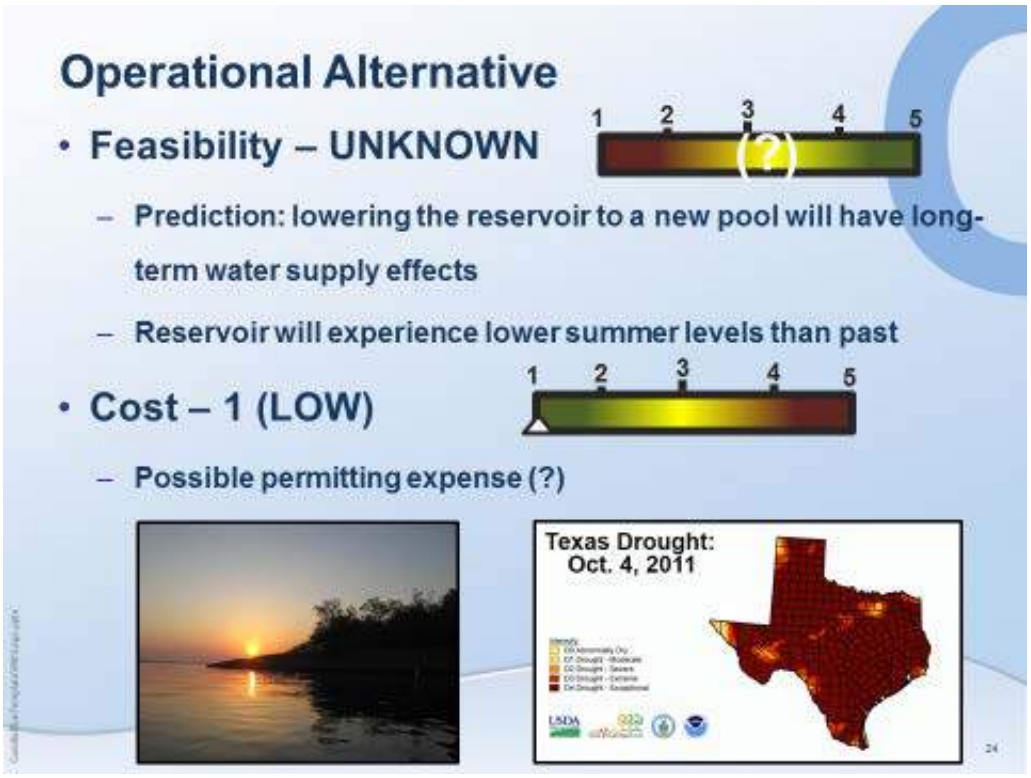
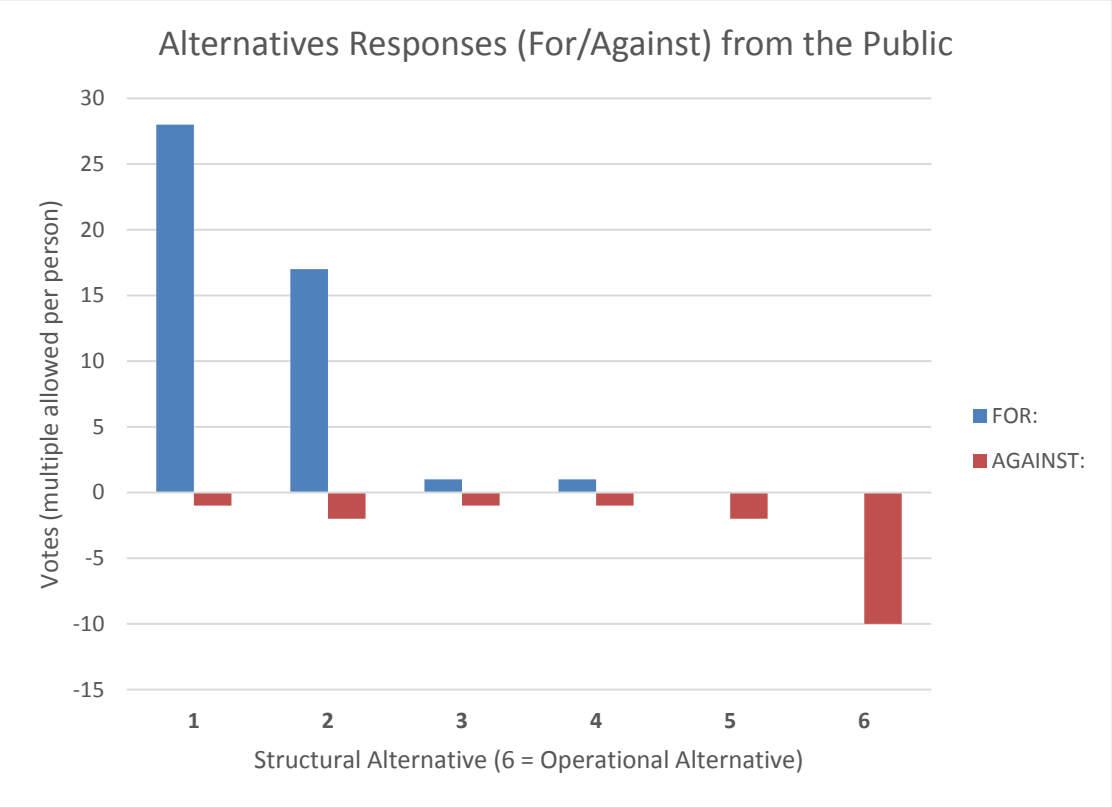


Figure 38: Alternative 6 Slide from Public Stakeholder Meeting 2

4.5 Public Comments

Carollo asked for public response related to the various alternatives (structural and operational) presented during the public forum. A summary of these comments (generally for or against) is presented below in Graph 39, and a detailed list of the responses is included in Appendix C: Additional Tables. Note: multiple responses for each alternative were allowed (for example, a person could speak favorably for Alternative 1 and Alternative 2, and both were tallied).



Graph 39: Public Comment Results

5.0 MODELING OF ALTERNATIVES

5.1 Hydrology and Hydraulics (H&H)

The study of water is classified into two primary categories of hydrology and hydraulics, which both include the study of water properties and behaviors. Because of this, it is often difficult to understand the difference between the two:

- Hydrologic analyses are performed to quantify the volumetric flow rate (typically measured in cubic feet per second) of water draining from a watershed over time. The amount of water that flows from a given watershed depends heavily on its characteristics (e.g., size, land use, land cover, steepness, etc.) and the abundance of water (e.g., the intensity and duration of a precipitation event, or releases from an upstream dam).
- Hydraulic analyses are performed to determine the depth of flow, flow velocity, and forces from flowing water on a hydraulic structure. These studies are necessary components in the design and analysis of structures used to convey water.

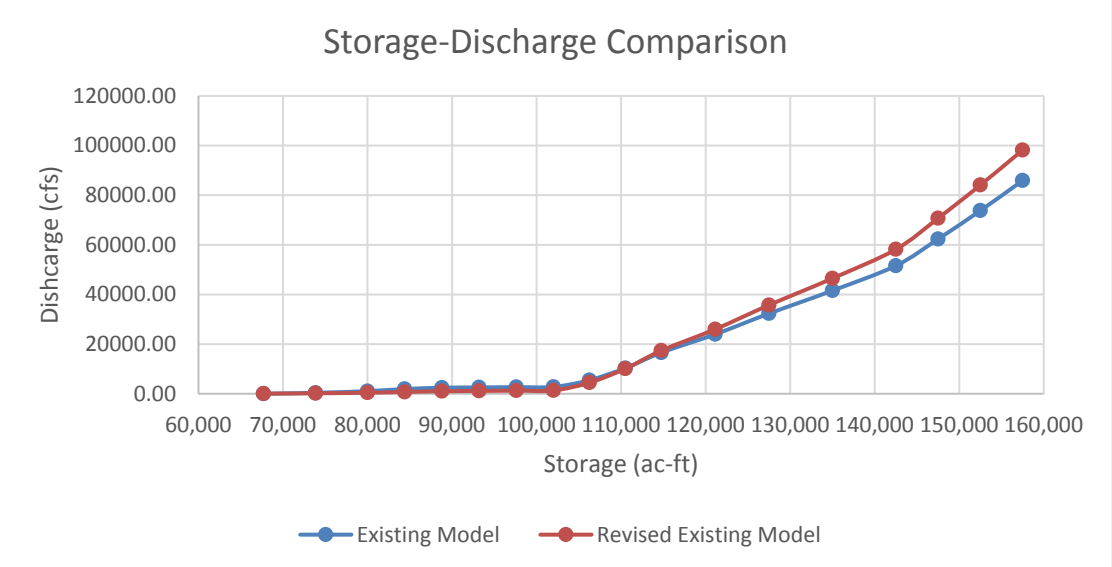
In this PER analysis, Carollo performed both hydraulic and hydrologic evaluations as described in this modeling section. With that said, there was a higher concentration on the hydrologic system as a whole and not on the hydraulics of each alternative. Hydraulics of each evaluation was performed at a high-level, but Carollo recommends a much more detailed hydraulic evaluation using a software like HEC-RAS before the design of any alternative is considered. Additionally, the hydraulics for different water gates (i.e. Alternative 3A, 3B, and 3C) convey water differently depending on the manufacturer and type of gate chosen. A detailed hydraulic analysis would be required to confirm that the gate hydraulics match the flood relief goals.

5.2 Revised Existing Model

5.2.1 Elevation Discharge Modifications

Carollo acquired a previous storage-discharge curve developed during the LCS dam breech analysis modeling for TCEQ completed in 2009. The models used the HEC-HMS software developed by the United States Army Corps of Engineers (USACE).

The model provided good insight and a foundation for the modeling completed in this PER evaluation. Carollo performed a check to determine if the model represented the best available storage-discharge relationship. As shown in Graph 40 below, Carollo made modifications to this storage-discharge relationship per new hydraulic curves developed for each discharge component (service spillway, morning glory spillway, emergency spillway, and dam). The previous work completed on the storage-discharge relationship was considered to be accurate from an industry-standard perspective for dam breech. Carollo made modifications to the curve to update it based on best available information for the purpose of this PER evaluation. The differences between the two models are shown below in Graph 40 below, and all cases were within 0.1 ft. of the existing model. For the purpose of this PER, the raw model acquired from FCWD is considered the Existing Model, and the revised model updated to reflect the best available information is considered the Revised Existing Model.



Graph 40: Storage Discharge Comparison (Existing vs. Revised Existing)

5.3 Development of the REFA Curve

The Existing Model provided the district with a frequency analysis. This analysis ties the modeling results to specific WSEs in the reservoir. The Revised Existing Frequency Analysis (REFA) was developed with the revised storage-discharge relationship. The Existing Model and Revised Existing modeling results are shown below in Table 41.

Some alternatives, further discussed in this report, were completed using the 350-yr hydrologic simulation, as the December 2015 record event for the reservoir was determined to be approximately a 350-year event. Additionally, the 1,000-year and 5,000-year hydrologic simulations were completed for some of the modeled alternatives, although these values should be considered less-accurate. Events of greater magnitude than the 500-yr event must utilize interpolated rainfall amounts and durations (as statistical information related to these events is not available through Technical Paper 40 or Atlas of Depth Duration Frequency of Precipitation Annual Maxima for Texas). Interpolated results outside of the normal curve are difficult to accurately calibrate.

Table 41: REFA Results

Rain Event	Probability	Existing Model	Revised Existing Model	Difference
2-year	0.50000	379.2	379.1	+0.1
5-year	0.20000	379.6	379.5	+0.1
10-year	0.10000	380.0	379.9	+0.1
25-year	0.04000	380.6	380.5	+0.1
50-year	0.02000	381.4	381.3	+0.1
100-year	0.01000	382.3	382.3	0.0
350-Year	0.00285	N/A	384.7	N/A
500-Year	0.00200	384.8	384.9	-0.1
1000-year	0.00100	N/A	387.1	N/A
5000-year	0.00100	N/A	390.0	N/A

6.0 HYDRAULIC ALTERNATIVES EVALUATION

Of the five alternatives outlined in Section 4, Alternative 1 and 2 were selected for further analysis. Additionally, after the hydraulic analysis was completed on Alternative 1 and 2, Alternative 3 was considered much more hydraulically feasible than Alternative 1 or 2, and was subsequently included in this PER for hydraulic modeling and analysis. The following sections describe hydrologic modeling of these alternatives to determine the overall effect each one has on the lake's WSEs.

6.1 Structural Alternative 1 – Additional Canal at the Emergency Spillway

6.1.1 HY-8 Software

HY-8 is a software program utilized by the Federal Highway Administration (FHWA) to evaluation culvert hydraulics under roadways. The HY-8 program allows for many culvert-related parameters to be adjusted and provided Carollo the best stage-discharge relationship for Alternative 1 culvert's hydraulics. The software will not allow for complex simulations like tainter gates, which is why the software was only utilized to determine the capacity of culverts in Alternative 1 and Alternative 2. Below in Figure 42 is one screenshot of the program's interface, showing the variety of parameters available for adjustment.

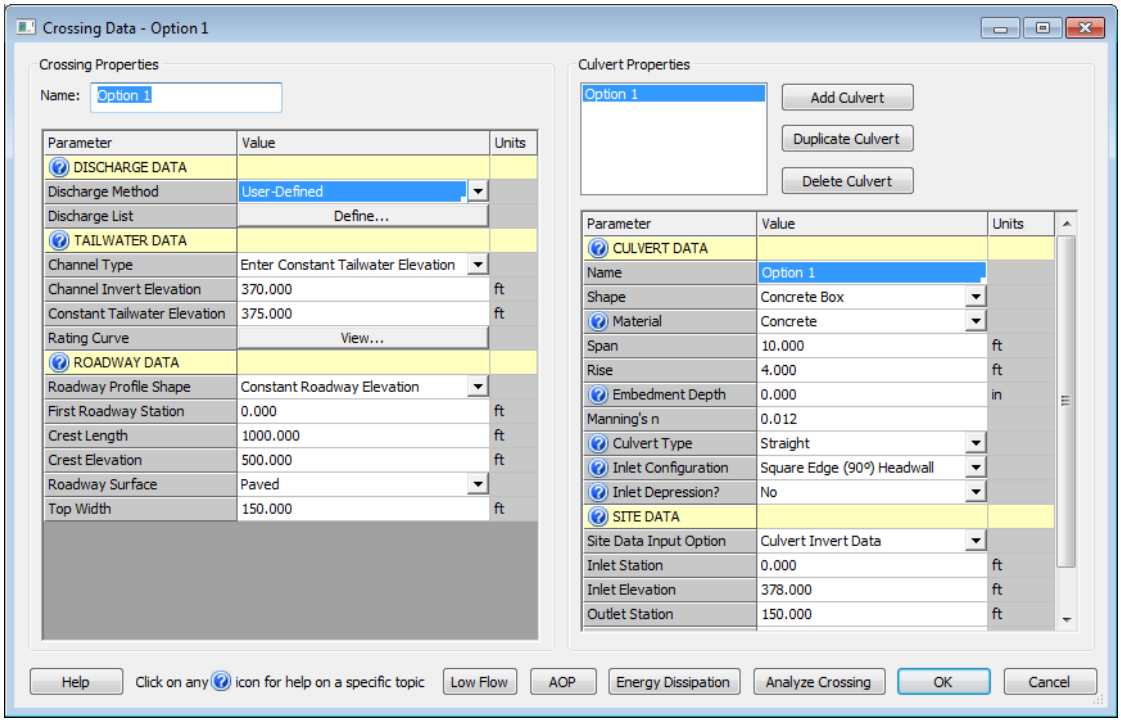


Figure 42: HY-8 Program Interface

6.1.2 Modeling

Modeling for Alternative 1 and 2 was completed in three (3) phases.

1. A HY-8 model, as described above, was developed to provide Carollo with a stage-discharge relationship for a single culvert pipe.
2. A Microsoft Excel (Excel) stage-discharge relationship was developed that included the other LCS hydraulic components of discharge (morning glory spillway, service spillway, and emergency spillway). This spreadsheet was previously started by another engineering consultant (to evaluate the service spillway hydraulics) and subsequently updated by Carollo to include other hydraulic calculations during a previous work authorization (i.e. not in this PER). The HY-8 stage-discharge hydraulic curves were added to the total stage-storage relationship for the Alternatives 1 and 2 and then multiplied by the proposed barrel count. This created a complete stage-discharge relationship for LCS.

3. A Revised Existing HEC-HMS model was then developed for Alternative 1, 2, and 3 to utilize the stage-storage relationship created in the Excel stage above. This model utilized watershed parameters of the basin, stage storage relationships from the Volumetric and Sedimentation Survey of LCS, downstream lake parameters, and rainfall frequency parameters to give Carollo a resultant stage-frequency curve. The 100-year elevation was set to 381.0 as the elevation of 380.0 was found to be infeasible.

6.1.3 Concerns with Andy's Creek

Andy's Creek is located downstream of LCS' emergency spillway. In fact, during an emergency flood that would engage the emergency spillway at elevation 385.0 feet msl, Andy's Creek would carry flows from the emergency spillway to LBS. Because Alternative 1 would involve discharging lake floodwaters into Andy's Creek, it was required to confirm if the creek has sufficient capacity for additional flood-flows. Additionally, Carollo was provided anecdotal evidence that during the December 2015 record flood event, Andy's Creek was over capacity flooding all major crossings downstream. As shown in Figure 43 below, Carollo evaluated a high-level capacity of four (4) cross sections.

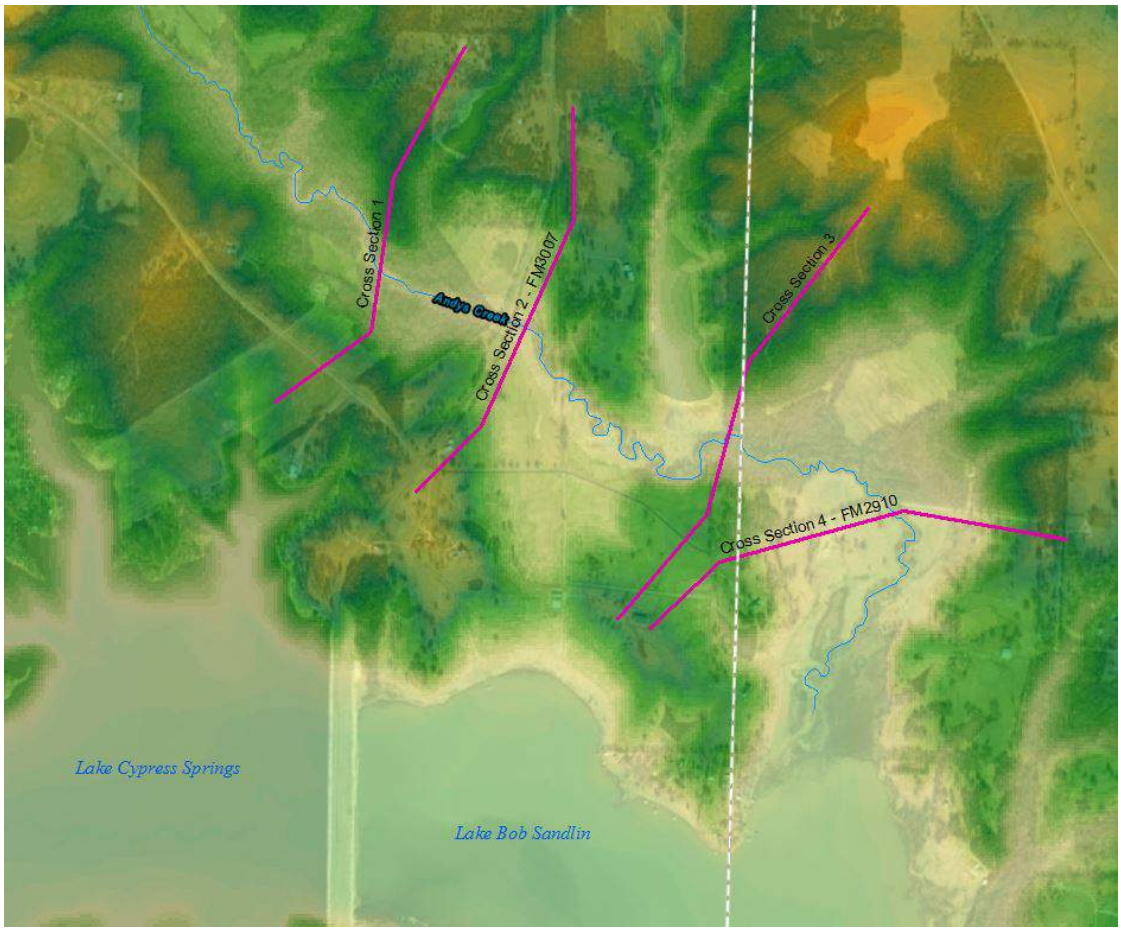
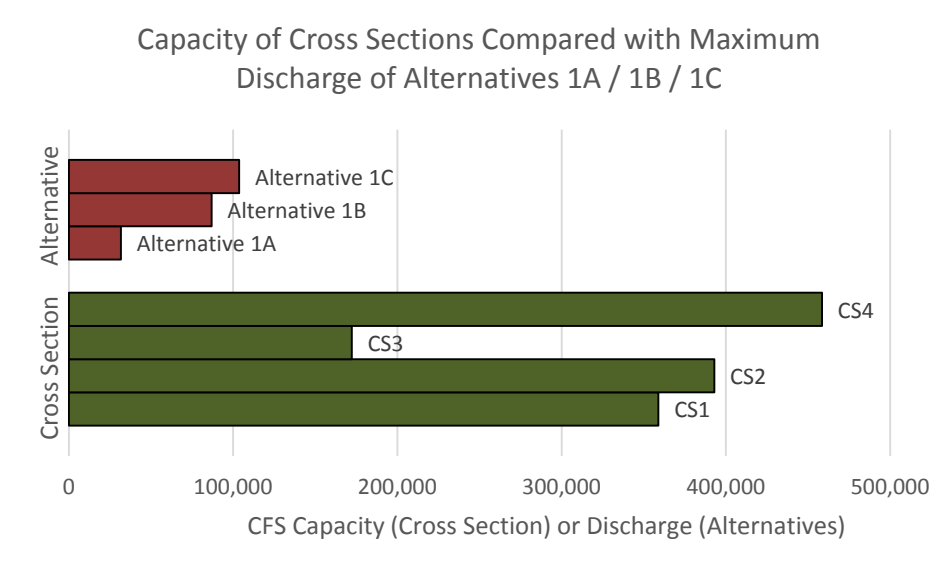


Figure 43: Andy's Creek Cross Sections

Graph 44 below shows the capacity of Andy's creek cross section compared to the proposed discharges of Alternative 1A, 1B, and 1C. As shown, the required additional flows to be put into Andy's Creek by Alternative 1 makes up a substantial volume of the total available conveyance ability of the creek (about 1/4 or 1/5 of the total). Results completed in this analysis do not support the construction of Alternative 1.



Graph 44: Andy's Creek Capacities

It is very important to note that the analysis above was completed at a very high-level because of the hydraulic infeasibility of Alternative 1 at the start of the analysis. Capacity calculations for the four cross-sections were only completed by using the relationship of Q=VA, where Flow (capacity in cfs) is simply the maximum cross sectional area multiplied by the likely velocity of the water. The assumed velocity of the water for this analysis was 15 ft./s and the cross sectional area was determined by using LiDAR data.

Land Acquisition for Footprint or Floodwaters. In addition to issues with the physical conveyance of the water down the creek and into LBS, Andy's Creek lies on private property. It is unclear if flooding Andy's Creek would require the acquisition of land surrounding the potentially flooded areas downstream of the emergency spillway due to the impact of Alterative 1.

6.1.4 Modeling Results Summary

Alternative 1 modeling produced unanticipated results. First, the projected barrel count (i.e. 10' X 10' culvert pipes) needed to convey the flows coming into LCS from a 100-yr, 350-yr, and 500-yr rainfall events through the dam were under-estimated. At first glance, a pipe similar in size to the existing morning glory spillway should "double" the capacity of the system and provide anticipated relief. Although that is true, results showed that volume quantities entering LCS peak extremely fast at extremely high rates, and the contribution of discharge from the morning glory spillway is almost negligible. As shown in Table 45 below, the frequency analysis for a LCS system with no morning glory spillway (i.e. removing the morning glory completely from the model) produced WSE's that were almost identical to the Existing Conditions. This fact,

identified only after modeling the system, resulted in a necessary 10' X 10' box-culvert barrel count of 71, 203, and 243 barrels to mitigate for the 100-yr, 350-yr, and 500-yr storm events respectively. In the recent flood events, LCS has performed as it was designed to in the recent flood events.

Table 45: No Morning Glory Modeling Results

Rain Event	Probability	Revised Conditions	No Morning Glory or SS	Difference
2-year	0.50000	379.1	379.1	0.0
5-year	0.20000	379.5	379.5	0.0
10-year	0.10000	379.9	380.0	+0.1
25-year	0.04000	380.5	380.7	+0.2
50-year	0.02000	381.3	381.5	+02
100-year	0.01000	382.3	382.5	+0.2
350-Year	0.00285	384.7	384.6	-0.1
500-Year	0.00200	384.9	385.2	-0.3
1000-year	0.00100	387.1	387.2	-0.1
5000-year	0.00100	390.0	390	0.0

Table 46: Alternative 1A, 1B, and 1C Modeling Results

			1 - STRUCTURAL ALTERNATIVES		
			Option 1A	Option 1B	Option 1C
Rain Event	Probability	Revised Conditions	100-YR 71 barrels	350-YR 203 barrels	500-YR 243 barrels
2-year	0.50000	379.1	378.9	378.8	378.7
5-year	0.20000	379.5	379.2	379.0	379.0
10-year	0.10000	379.9	379.6	379.3	379.2
25-year	0.04000	380.5	379.9	379.6	379.5
50-year	0.02000	381.3	380.5	379.9	379.8
100-year	0.01000	382.3	**381.0**	380.3	380.1
350-Year	0.00285	384.7	382.1	**381.0**	380.9
500-Year	0.00200	384.9	382.4	381.3	**381.0**
1000-year	0.00100	387.1	N/A	N/A	N/A
5000-year	0.0002	390.0	N/A	N/A	N/A

Table 47 below show WSE savings from the construction of Alternative 1 (A, B, and C) compared to the existing conditions on the lake. For example, in a 50-year event, Alternative 1A would "save" the FCWD 0.8 feet of WSE when compared to the existing conditions.

Table 47: Alternative 1A, 1B, and 1C WSE Savings Results

			1 - STRUCTURAL ALTERNATIVES		
			Option 1A	Option 1B	Option 1C
Rain Event	Probability	Revised Conditions	100-YR 71 barrels	350-YR 203 barrels	500-YR 243 barrels
2-year	0.50000	379.1	0.2	0.3	0.4
5-year	0.20000	379.5	0.3	0.5	0.5
10-year	0.10000	379.9	0.3	0.6	0.7
25-year	0.04000	380.5	0.6	0.9	1.0
50-year	0.02000	381.3	0.8	1.4	1.5
100-year	0.01000	382.3	1.3	2.0	2.2
350-Year	0.00285	384.7	2.6	3.7	3.8
500-Year	0.00200	384.9	2.5	3.6	3.9

If the modeling results had shown an anticipated 10' X 10' barrel count between 3 and 10, attaining the necessary hydraulic relief from such an Alternative would likely be feasible. With barrel counts significantly above 10, space limitations become a concern in the emergency spillway corridor. Additionally, Carollo has hydraulic concerns surrounding the ability of Andy's Creek to convey flows necessary to mitigate for the 100-yr, 350-yr, and 500-yr storm events. As a result, Carollo deems Alternative 1 to be hydraulically infeasible.

6.2 Structural Alternative 2 – Box Culverts at the Dam

Since the hydraulic analysis for Alterative 2 is almost identical to the analysis to Alternative 1, the modeling results for Alternative 2 are presented in less detail in this portion of the PER.. Although Alternative 2 is located on the Dam instead of on the emergency spillway, the hydraulics of a pipe system to convey flood flows is very similar. With that said, the differences between Alterative 1 and Alternative 2 primarily lie with the canal segment necessary in Alterative 1 (but not Alternative 2) and the Andy's Creek hydraulic analysis. As shown in previous depictions of an Alternative 2, flood waters would be passed through the dam down the backside and directly into LBS avoiding the need for creek conveyance.

6.2.1 Modeling

Similar to Alternative 1, modeling for Alternative 2 was performed in three (3) phases by completing.

1. A HY-8 model.
2. A Microsoft Excel (Excel) stage-discharge relationship for Alternative 2.
3. A Revised Existing HEC-HMS model for Alternative 2.

6.2.2 Modeling Summary

Table 48: Alternative 2A, 2B, and 2C Modeling Results

			2 - STRUCTURAL ALTERNATIVES		
			Option 2A	Option 2B	Option 2C
Rain Event	Probability	Revised Conditions	100-YR 72 barrels	350-YR 204 barrels	500-YR 244 barrels
2-year	0.50000	379.1	378.9	378.8	378.7
5-year	0.20000	379.5	379.2	379.0	379.0
10-year	0.10000	379.9	379.6	379.3	379.2
25-year	0.04000	380.5	379.9	379.6	379.5
50-year	0.02000	381.3	380.5	379.9	379.8
100-year	0.01000	382.3	**381.0**	380.3	380.1
350-Year	0.00285	384.7	382.1	**381.0**	380.9
500-Year	0.00200	384.9	382.4	381.3	**381.0**
1000-year	0.00100	387.1	N/A	N/A	N/A
5000-year	0.0002	390.0	N/A	N/A	N/A

Table 49 below show WSE savings from the construction of Alternative 2 (A, B, and C) compared to the existing conditions on the lake. For example, in a 100-year event, Alternative 2B would "save" the FCWD 2.0 feet of WSE when compared to the existing conditions.

Table 49: Alternative 2A, 2B, and 2C WSE Savings Results

			2 - STRUCTURAL ALTERNATIVES		
			Option 2A	Option 2B	Option 2C
Rain Event	Probability	Revised Conditions	100-YR 72 barrels	350-YR 204 barrels	500-YR 244 barrels
2-year	0.50000	379.1	0.2	0.3	0.4
5-year	0.20000	379.5	0.3	0.5	0.5
10-year	0.10000	379.9	0.3	0.6	0.7
25-year	0.04000	380.5	0.6	0.9	1.0
50-year	0.02000	381.3	0.8	1.4	1.5
100-year	0.01000	382.3	1.3	2.0	2.2
350-Year	0.00285	384.7	2.6	3.7	3.8
500-Year	0.00200	384.9	2.5	3.6	3.9

6.3 Structural Alternative 3 – Tainter Gate System

6.3.1 Modeling

The tainter gate system in Alternative 3 was considered for modeling after Alternative 1 and 2 proved to by hydraulically infeasible.

6.3.2 Modeling Summary

Table 50: Alternative 3A, 3B, and 3C Modeling Results

Rain Event	Probability	Revised Conditions	3 - STRUCTURAL ALTERNATIVES		
			Option 3A	Option 3B	Option 3C
			100-YR 1 gates	350-YR 2 gates	500-YR 3 gates
2-year	0.50000	379.1	378.0	378.0	378.0
5-year	0.20000	379.5	378.0	378.0	378.0
10-year	0.10000	379.9	378.3	378.0	378.0
25-year	0.04000	380.5	378.6	378.0	378.0
50-year	0.02000	381.3	379.1	378.0	378.0
100-year	0.01000	382.3	**379.7**	378.4	378.0
350-Year	0.00285	384.7	381.1	**379.4**	378.4
500-Year	0.00200	384.9	381.5	379.6	**378.6**
1000-year	0.00100	387.1	N/A	N/A	N/A
5000-year	0.0002	390.0	N/A	N/A	N/A

Table 51 below show WSE savings from the construction of Alternative 3 (A, B, and C) compared to the existing conditions on the lake. For example, in a 350-year event, Alternative 3B would "save" the FCWD 5.3 feet of WSE when compared to the existing conditions.

Table 51: Alternative 3A, 3B, and 3C WSE Saving Results

Rain Event	Probability	Revised Conditions	3 - STRUCTURAL ALTERNATIVES		
			Option 3A	Option 3B	Option 3C
			100-YR 1 gates	350-YR 2 gates	500-YR 3 gates
2-year	0.50000	379.1	1.1	1.1	1.1
5-year	0.20000	379.5	1.5	1.5	1.5
10-year	0.10000	379.9	1.6	1.9	1.9
25-year	0.04000	380.5	1.9	2.5	2.5
50-year	0.02000	381.3	2.2	3.3	3.3
100-year	0.01000	382.3	2.6	3.9	4.3
350-Year	0.00285	384.7	3.6	5.3	6.3
500-Year	0.00200	384.9	3.4	5.3	6.3

6.4 Operational Alternatives Evaluation

6.4.1 Operational Alternatives

As discussed above, in addition to Structural Alternatives, the FCWD could also provide flooding relief by changing operations of the reservoir. If, for example, the conservation pool of the reservoir was lowered by a single (1) foot, the reservoir would respond differently to a large storm event because this additional foot would act as a storage pool and mitigate flooding damages.

Carollo completed Water Availability Modeling (WAM) modeling to determine the effects of lowering the reservoir to a new conservation pool. A series of five (5) scenarios were evaluated ranging from 0.5 feet lower than existing conservation pool to 4 feet lower.

Table 52: Operational Alternatives Summary

Alternative	Conservation Pool	Difference in WSE
Existing	378.0 ft msl	0
Alternative 6A	377.5 ft msl	-0.5 ft
Alternative 6B	377.0 ft msl	-1.0 ft
Alternative 6C	376.0 ft msl	-2.0 ft
Alternative 6D	375.0 ft msl	-3.0 ft
Alternative 6E	374.0 ft msl	-4.0 ft

These results and an explanation of the WAM process is provided below.

6.4.2 Water Rights and Contracts

In the mid-1880s, the Texas Legislature adopted a system that authorized the appropriation of water use by the state. The appropriations system (or prior appropriations system) requires those wishing to use the State's surface waters to file and seek state permission through the TCEQ. Under this system, "first in time, first in right," the earlier established water users were deeded to have a senior priority to use the water over junior water right holders. Anyone wishing to use surface water in Texas (with only a few exceptions) is now required to hold such a certificate or receive new permission from the state in the form of a "water right."

The FCWD has a series of water rights through TCEQ enabling the impoundment of water (forming LCS), and enabling the sale of their impounded water through water contracts with various municipalities. The current obligations to deliver raw water to customers include:

- Cypress Springs Special Utility District (CSSUD)
- City of Winnsboro
- City of Mt. Vernon

Additionally, the City of Mt. Pleasant has purchased a portion of the impounded water in LCS and has a complex history (not outlined in this PER). FCWD has agreed to deliver this water through the dam to the City of Mt. Pleasant, if available and as requested.

These water obligations to the three (3) customers and the City of Mt. Pleasant through water contracts/agreements are very important to the district's revenue stream, but more importantly, are considered an obligation that can only be met by selling firm-yield water from the reservoir. A modification to the operations of LCS (i.e. lowering the conservation pool) could modify the yield of the reservoir and cause an inability to meet contract obligations in severe drought times. Carollo recommends that lowering the reliability of contracted water is a non-starter and could have severe legal consequences. Any operational change by manipulating the conservation pool elevation of LCS should be considered for legal ramifications of not meeting a water obligation in a drought scenario.

6.4.3 Water Availability Modeling

The WAM is a computer-based simulation predicting the amount of water that would be in a river or stream under a specified set of conditions.

Currently the TCEQ staff uses two models in evaluating water availability and reliability for granting new water rights:

- The Full Authorization (WAM run3) simulation, in which all water rights holders utilize their maximum authorized amounts and return no flows back into the system. The WAM run3 represents the current state of water development from a legal and regulatory standpoint. It depicts a conservative condition that would be expected if all users fully exercised their current water rights. WAM run3 is the run that the TCEQ uses specifically for water rights permitting.
- The Current Conditions (WAM run8) utilizes historical diversions to simulate a more representative model of actual conditions in the river environment. Instead of using the maximum authorized amounts, the WAM run8 simulation uses the historical average 10 year diversion amount for each water right and returns average return-flows back into the system. It is primarily used by the TCEQ to evaluate applications for term water rights and amendments.

Each of the two runs (run3 and run8) are modeled separately by TCEQ for all river basins in Texas. For this report, Carollo used the Guadalupe River Basin Full Authorization (WAM run3) model. The Current Conditions (WAM run8) model was not available through the TCEQ website with the following message: "Current Conditions files for this basin are being update and are not available at this time."

Water Right availability and reliability can be determined utilizing WAM run3. The model output can calculate three particular factors related to reliability:

- Period Reliability – representing the water supply period diversion reliability percentage. This percentage indicates the percent of years from 1940 to 1997 in which full diversions could be attained for the analyzed water right.
- Volume Reliability – representing the water supply volumetric diversion reliability percentage. This percentage indicates the percent of volume from years 1940 to 1997 that could be diverted for the analyzed water right.
- Mean Shortage – representing the difference between permitted flows and actual available flows from years 1940 to 1997.

6.4.4 Modeling Results

FCWD and its corresponding water rights in LCS are represented in the models provided to Carollo by the TCEQ. The Code pertinent to the FCWD water rights are presented below in Figure 53. Carollo ran the raw model files to determine the firm yield of the FCWD existing water rights and then ran the various Operational Alternatives through the WAM to determine the impact to firm yield of the reservoir.

```
WRA10340   10500     MUN19700720   1                        60404560301    4560
CYPRESS
WSLKCYPS   72800
WRA10340    1000     MUN19660131   1                        60404560302    4560
CYPRESS
WSLKCYPS   72800
WRA10340     210     IRR19700720   1                        60404560303    4560
CYPRESS
WSLKCYPS   72800
WRA10340    3590     IND19700720   1                        60404560304    4560
CYPRESS
WSLKCYPS   72800
WRA10340       0     REC19660131   1                        60404560305    4560
CYPRESS
WSLKCYPS   72800
```

Figure 53: WAM Code

Table 54: Operational Alternatives Results

Alternative	Conservation Pool	Difference in WSE	Firm Yield (ac-ft)	Difference (ac-ft)
Existing	**378.0 ft msl**	**---**	**13,943**	**---**
Alternative 6A	377.5 ft msl	-0.5 ft	13,597	346
Alternative 6B	377.0 ft msl	-1.0 ft	13,251	692
Alternative 6C	376.0 ft msl	-2.0 ft	12,560	1,383
Alternative 6D	375.0 ft msl	-3.0 ft	11,873	2,070
Alternative 6E	374.0 ft msl	-4.0 ft	11,188	2,755

Results from the WAM analysis are shown above in Table 54. The results do show an impact on the firm yield of the reservoir if the conservation pool is lowered by any amount.

Given the firm yield impacts and implications to wholesale water contracts, Carollo cannot recommend that lowering the conservation pool to provide flooding relief as feasible alternative.

7.0 ANCILLARY ALTERNATIVES EVALUATION

Ancillary alternatives are alternatives the District should explore regardless of any structural or operational alternatives it adopts. With ancillary alternatives, the District can maintain the current configuration (i.e., not modify facilities or add additional structures) while deploying additional measures to lower the risk of damage to residential structures. This means the District will continue to use the existing morning glory spillway to discharge flows exceeding 378 feet msl into LBS while exploring ancillary alternatives and the feasibility of the structural and operational alternatives.

The District can explore the following ancillary alternatives:

- FEMA Floodplain Mapping.
- Modifications to the District's Rules and Regulations.
- Lake Closures.

Section 7 describes these ancillary alternatives.

7.1 FEMA Floodplain Mapping

Congress created the NFIP in 1968 as part of the National Insurance Act. With this program, if enrolled, property owners in participating communities can purchase insurance in exchange for state and community floodplain management regulations that meet or exceed the NFIP's minimum requirements.

It is clear that FEMA mapping has not been developed for the areas surrounding LCS. With that said, participation in the NFIP program is the first step to getting future maps developed for the area.

Carollo investigated, through contacts at FEMA and the TWDB, the LCS level of participation to determine if any areas around the lake are participating in the NFIP. As it stands today, the level of participation in the NFIP is somewhat unclear, however, what is clear is that the County is participating in the NFIP. The County has never been mapped, but did enter the program effective 07/28/2000. This means that, although not immediate, FEMA mapping is scheduled to be completed at some point in the future. With mapping will come additional regulations and mandates for construction in the floodplain/floodway.

Currently the County Judge is the designated as the floodplain administrator (FPA) by court order, meaning that it is the County's responsibility to enforce FEMA policy in the county. Figure 55 below shows all information Carollo was able to determine about the Franklin Counties involvement in the NFIP.

Community Overview

Community:	FRANKLIN COUNTY*	**State:**	TEXAS
County:	FRANKLIN COUNTY	**CID:**	480235

Program:	Emergency	**Emergency Entry:**	07/28/2000	**Regular Entry:**	
Status:	PARTICIPATING			**Status Effective:**	07/28/2000
Current Map:		**Study Underway:**	YES	**Level of Regs:**	
FIRM Status:	NEVER MAPPED			**Initial FIRM:**	
FHBM Status:	NEVER MAPPED			**Initial FHBM:**	

Probation Status:			
Probation Effective:		**Probation Ended:**	
Suspension Effective:		**Reinstated Effective:**	
Withdrawal Effective:		**Reinstated Effective:**	

CRS Class / Discount:				**Policies in Force:**	22
Effective Date:				**Insurance in Force:**	$962,500.00
CAV Date:		**Workshop Date:**	11/16/2010	**No. of Paid Losses:**	10
CAC Date:	06/01/2007	**GTA Date:**	09/17/2013	**Total Losses Paid:**	$364,440.45
☐ **Tribal Community**		**Community Website:**		**Sub. Damage Claims Since 1978:**	0
☐ **Upton Jones Claims**		☐ **HMGP Projects**			
☐ **ICC Claims**		☐ **FMA Projects**			

Figure 55: FEMA Overview for Franklin County

7.1.1 Modifications to the District's Rules and Regulations

With this alternative, the District can add, change, or delete certain rules and regulations to minimize risk and protect its residents. Carollo developed three Technical Memorandums (TMs) that describe the existing rules and regulations for lakefront structures and recommend changes. A summary of these TMs is provided below.

- **TM No. 1:** This TM evaluated the several permitting agencies' rules and regulations for retaining walls, dredging, and fill work. It recommended adding specific language regarding retaining walls and dredging.
- **TM No. 2:** This TM researched the requirements of several permitting agencies and provided engineering recommendations for the permitting of private on-water structures including boat houses, docks, piers, platforms, and stationary inflatable devices. It recommended removing the "view rule" and amending the recommended square footage of piers or boathouses. It also recommended modifying a boathouse's maximum total internal height requirement.
- **TM No. 5:** This TM evaluated the District's permitting practices for residential structures used for engineering recommendations. Specifically, Carollo looked into defining minimum floor slab elevations, grandfathering in existing non-conforming structures, and the defining and rectifying requirements for other structures. The TM recommended adding definitions for finished areas, rules for designing and constructing various structures and spaces, and requirements for mechanical, HVAC, electrical, and plumbing equipment. It also recommended ways to grandfather in residential structures.

For more information, consult TM No. 1, TM No. 2, and TM No. 5 in Appendix C: Rules and Regulation TMs.

7.1.2 Lake Closures

Carollo analyzed LCS to recommend when and how the District should close LCS to recreational traffic. This effort included the following:

- Investigating the capacity, elevations, and flood management options at Texas lakes similar to LCS.
- Analyzing the percentage of days LCS and LBS were flooded relative to the other lakes evaluated.
- Determining the number of lake closures for the other lakes studied.

LCS remains above the conversation pool more than the other lakes analyzed. Compared to other lakes, LCS is a moderately volatile conservation pool.

Carollo recommends a lake closure elevation of 2.50 feet msl above a conservation pool of 378.00 feet msl (or an elevation of 380.5 feet msl).

8.0 JURISDICTIONAL ASSESSMENT AND IDENTIFICATION OF POSSIBLE PERMITTING REQUIREMENTS

Carollo performed an environmental review for the structural alternatives proposed in this PER to determine the high-level feasibility of construction on the dam (Alternatives 2 and 3) and/or emergency spillway (Alternative 1). As a subconsultant to Carollo, Arroyo assisted with performing a desktop review of potential environmental liabilities present near the proposed project area including: threatened and endangered species review, jurisdictional waters and wetland review, historical/archeological area review, review of potential environmental permitting requirements, and preliminary coordination with pertinent environmental agency staff.

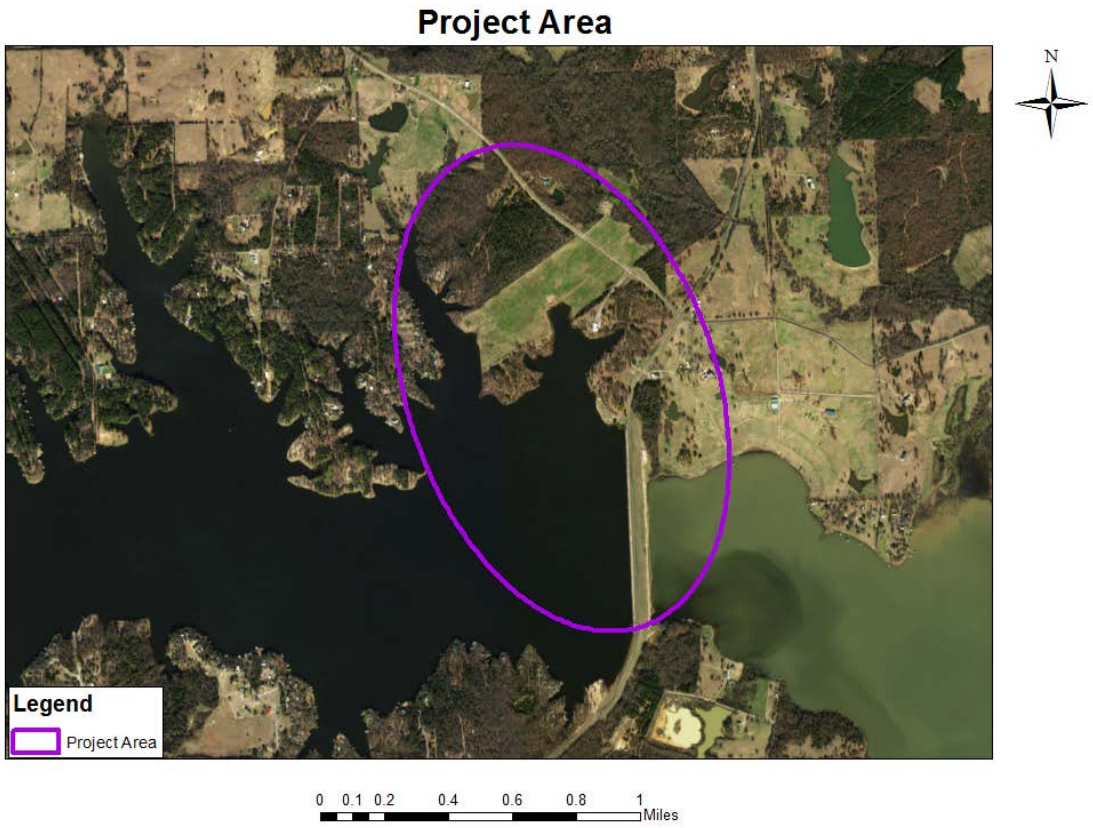


Figure 56: Environmental Proposed Project Area

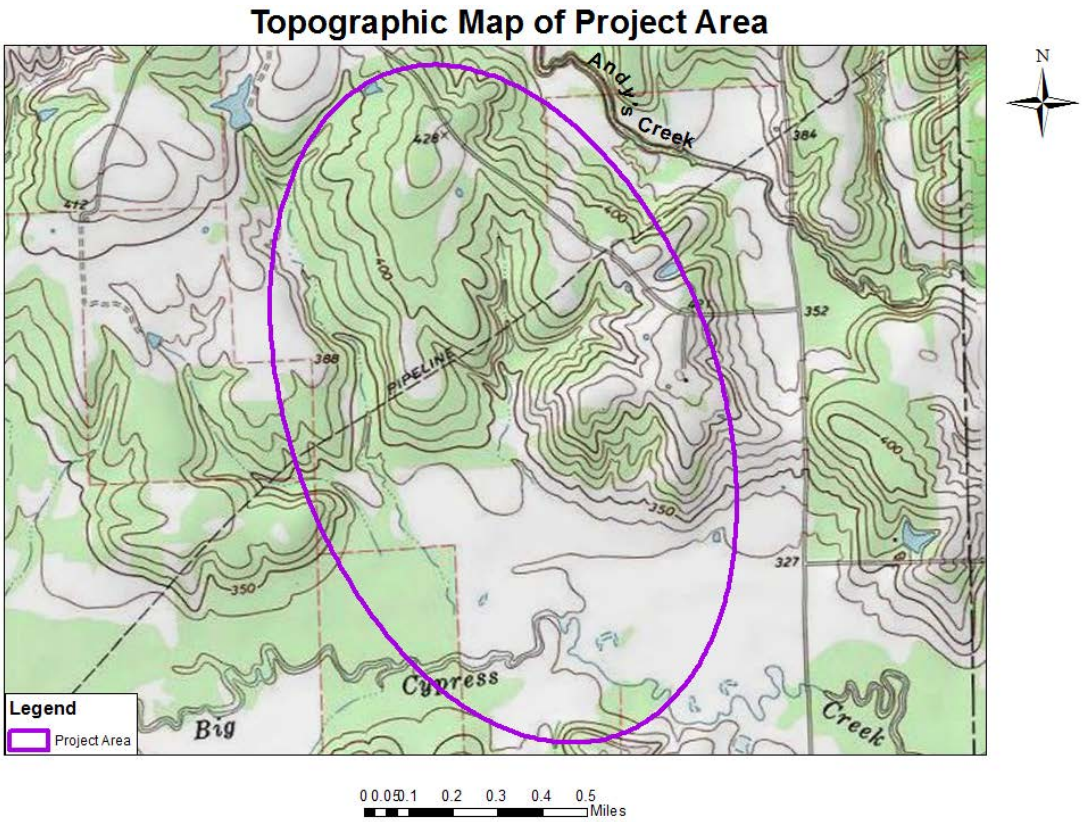


Figure 57: Topographic Map of the Proposed Project Area

This area is located on the border of two Environmental Protection Agency (EPA) Level III ecoregions, East Central Texas Plains and the South Central Plains (Figure 54). The South Central Plains, commonly referred to as the "Piney Woods," is considered the western edge of the coniferous forest. This ecoregion was originally dominated by a pine-hardwood forest mix. Currently, two thirds of the ecoregion is dominated by loblolly and shortleaf pine stands. The East Central Texas Plains are also known as the "Post Oak Savannah." Historically the vegetation has been post oak savannah vegetation, thus differing from the Piney Woods to the east and the prairies to the north, south, and west. This ecoregion also has a unique dense underlying clay pan that differs from surrounding ecoregions.

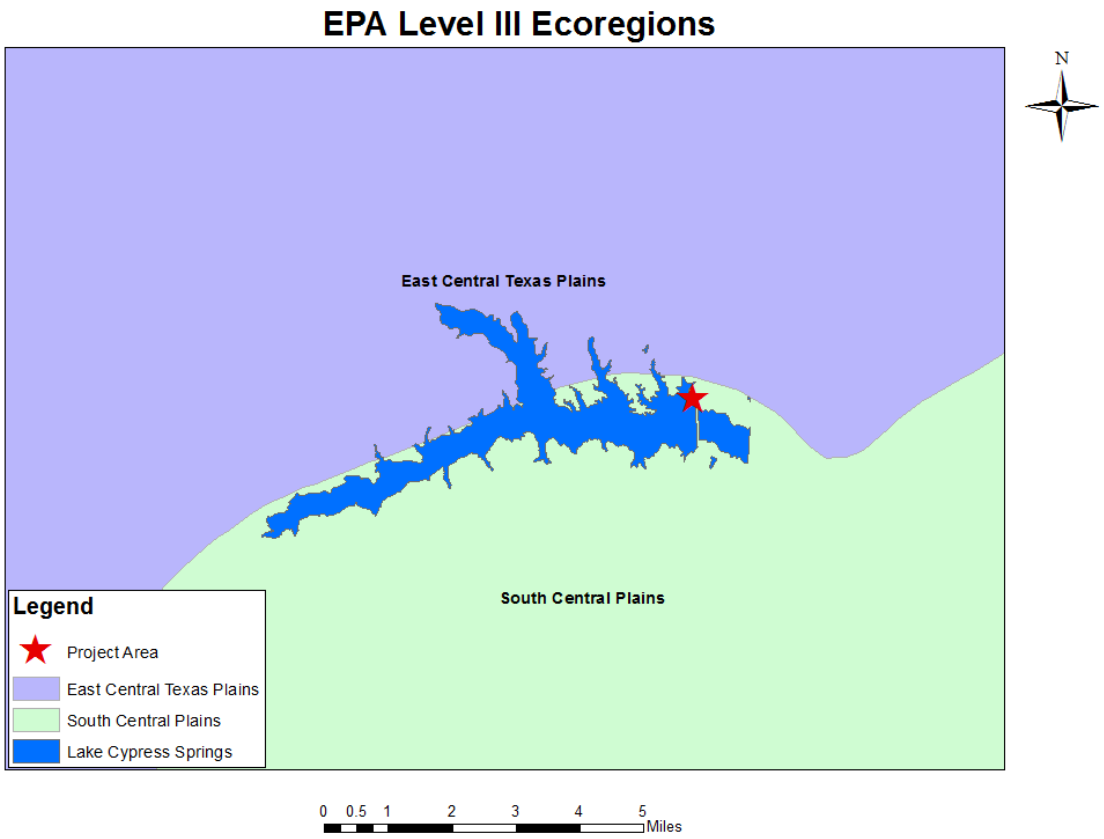


Figure 58: Proposed Project Area Ecoregions

Soils within the proposed project area can be generally described as being of a sandy loam mixture with some soils having more silt or clay portions (Figure 55). Slopes within the project area range from less than five percent (Freestone [FrB] – fine sandy loam, Kirvin [KfC] – very fine sandy loam, Bernaldo [BbB] – Urban land complex, Woodtell [WoC] – fine sandy loam, Nahatche [Na] – loam-silty clay loam) to five to twenty percent (Woodtell [WoE] – fine sandy loam; USDA 1990). Udorthents (Ud) is described as loamy and clayey, and is associated with the emergency spillway area. Nahatche is described as frequently flooded and is along Andy's Creek.

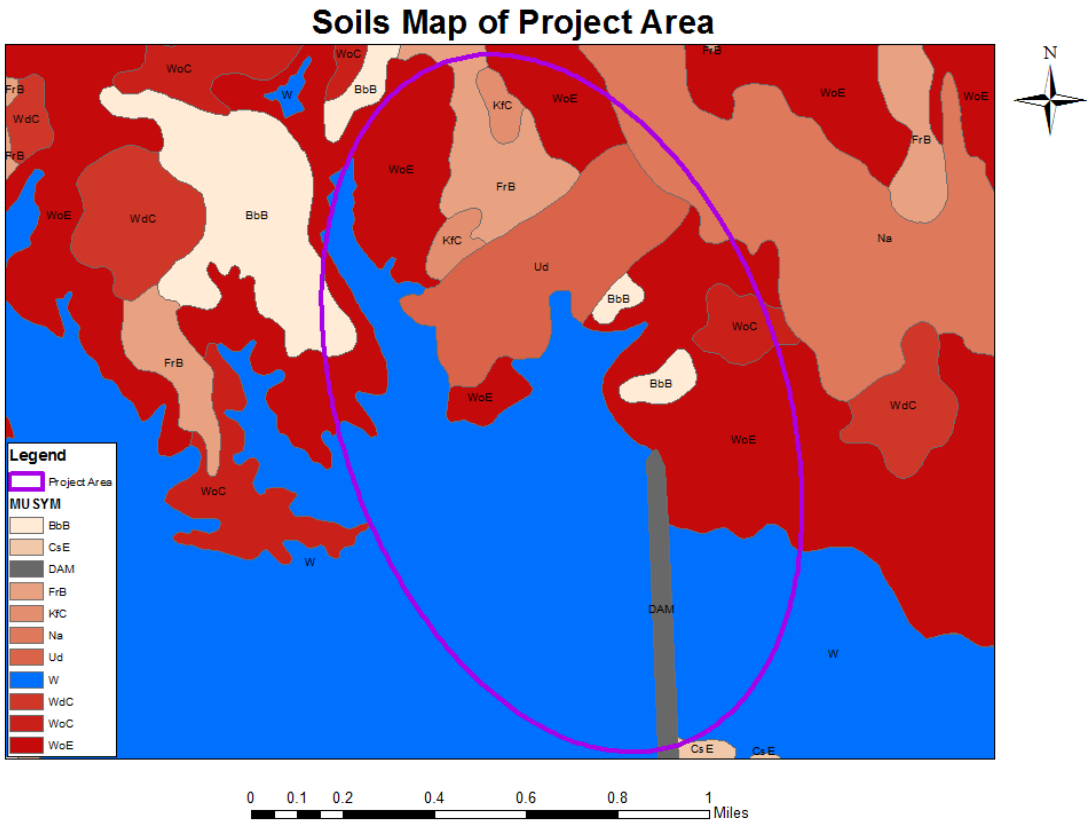


Figure 59: Proposed Project Soils Map

8.1 Sedimentation, Biological, and Wetland Impacts (USACE)

8.1.1 Threatened and Endangered Species

A review of federal and state threatened and endangered species was conducted for the proposed project area (Appendix A). Analysis of the data gathered during the desktop review show critical habitat for several species likely to occur within the project area. It is assumed if critical habitat for a species is present then species are likely to occur. Andy's Creek will likely contain critical habitat for these species. Species likely to occur include: state threatened fish such as the blackside darter (Percina maculata), creek chubsucker (Erimyzon oblongus), and a state threatened mussel, southern hickorynut (obovaria jacksoniana), and state threatened birds, bachman's sparrow (Aimophila aestivalis), bald eagle (Haliaeetus leucocephalus), and state threatened reptiles, alligator snapping turtle (Macrochelys temminckii), northern scarlet snake (Cemophora coccinea copei), timber rattlesnake (Crotalus horridus).

Additionally, a preliminary response received from United States Fish and Wildlife Service (USFWS) after initial coordination efforts identified several federal endangered species as likely to have critical habitat present or the species is likely to be present within the project area. These species include: least tern (Sterna antillarium), piping plover (Charadrius melodus) and red knot (Calidris camutus rufa).

8.1.2 Jurisdictional Waters and Adjacent Wetlands

Any jurisdictional waters or adjacent wetlands identified within the project area are regulated under Sections 401 and 404 of the Clean Water Act (CWA). LCS is considered a jurisdictional water ("Water of the United States" and "Water of the State"). Figure 56 shows wetlands areas identified by the National Wetland Inventory (NWI; USFWS 2016) within the proposed project area. Two wetland types are shown on the NWI map, Freshwater Emergent and Freshwater Forested/Shrub. These wetlands are seen at the base of the dam near the potential location of Alternatives 2 and 3. Wetland areas that have a hydrologic connection to jurisdictional waters are considered jurisdictional as well. While Figure 56 does not depict any wetland areas near the current emergency spillway (where Alternative 1 would impact), emergent wetland vegetation was observed during a 2016 topographic survey (Arroyo and Carollo, 2016) along the shoreline of the emergency spillway.

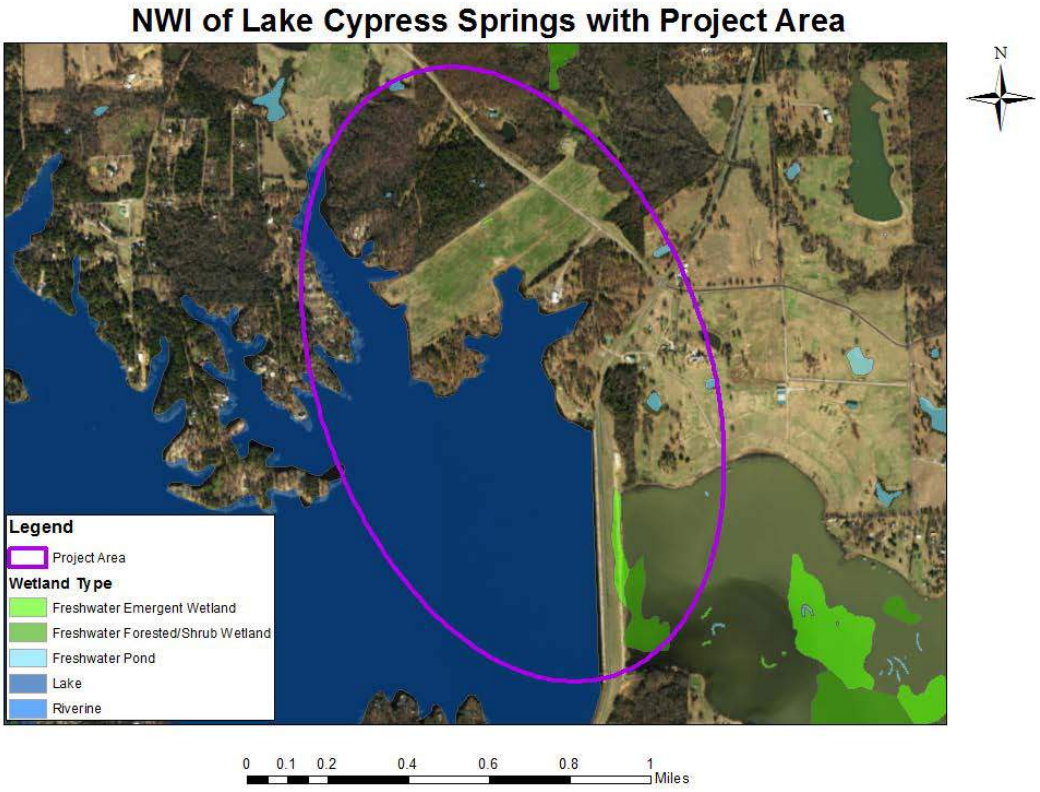


Figure 60: National Wetland Inventory Map of Proposed Project Area

8.1.3 Historic/Archeological

No historical significant sites were identified within the Texas Historical Commission (THC) database.

8.2 Permitting

8.2.1 Section 401 of the Clean Water Act

Section 401 of the Clean Water Act regulates the water quality resulting from the discharge of fill material to jurisdictional waters and upland disposal sites. This program is administered by the TCEQ and is part of the USACE Section 404 Permit process. TCEQ's 401 Water Quality Certification must be issued to a Section 404 permit and ensures project activities will not impact water quality to jurisdictional waters.

8.2.2 Section 404 of the Clean Water Act

Section 404 of the Clean Water Act regulates the discharge of fill material into jurisdictional waters of the United States and the State of Texas. This program is administered by the USACE and includes environmental reviews and comments from the EPA, USFWS, TCEQ, Texas Parks and Wildlife Department (TPWD), Texas General Land Office (GLO) and other regional groups. Both options of this project would have activities which would result in direct or incidental fill material being placed in jurisdictional waters and as such would require a Section 404 permit from the USACE.

There are several types of Section 404 permits including: a Nationwide Permit (for common activities which are minimal in scale and environmental impacts), an Individual Permit – Tier I (for projects that do not fit Nationwide Permit constraints, with project impacts less than three acres or 1,500 linear stream feet) and an Individual Permit – Tier II (for individual project impacts greater than three acres or 1,500 linear stream feet). The timeline to attain a Section 404 permit is highly variable and dependent on many aspects such as project size, the presence of threatened and endangered species habitat, etc. Time to receive a Nationwide Permit can be up to 90 days from the time of permit application submittal. Time to receive an Individual Permit can range from 120 days (for a simple Tier I project) to several years for large complex projects.

8.2.3 Section 408 of the United States Code

"Section 14 of the Rivers and Harbors Act of 1899 and codified in 33 USC 408 (commonly referred to as "Section 408") authorizes the Secretary of the Army, on the recommendation of the Chief of Engineers of the US Army Corps of Engineers (USACE), to grant permission for the alteration or occupation or use of a USACE civil works project if the Secretary determines that the activity will not be injurious to the public interest and will not impair the usefulness of the project." (USACE 2016)

Initial coordination with the USACE Fort Worth District resulted in a preliminary decision from USACE staff that a Section 408 permit would not be required.

8.3 Environmental Plan Moving Forward

A strategic plan that outlines necessary environmental permitting and supporting information for each of the two proposed project options is described below. A Section 404 permit and 401 Water Quality Certification would be required for either option.

Prior to beginning the Section 404 permit application several environmental studies would need to be conducted to provide scientific documentation on the extent of jurisdictional wetlands, the presence of threatened and endangered species critical habitat, the presence or absence of threatened and endangered species (if critical habitat is found), a stream assessment of Andy's Creek (including stream channel, water quality, habitat and biological data collection), a hydrology study of Andy's Creek and a hydrology study of LBS.

Additional secondary environmental impacts could occur depending on the proposed project alterations. Alterations to lake levels could impact the natural inundation of forested and emergent wetland areas that rely on the current water level conditions. Arroyo staff do not feel mitigation for these secondary impacts will be required as part of this project due to the flood control nature of the project. However, only the USACE and EPA can make that determination.

8.3.1 Project Alternative 1 Additional Requirements

Proposed Project Option 1 includes the creation of an additional canal within the existing emergency spillway to lower the emergency spillway elevation. Channel dimensions have not yet been determined, however the canal would extend from the current LCS shoreline to the confluence of Andy's Creek (approximately 4,000 linear feet).

Proposed Project Option 1 would likely require an Individual Section 404 Permit (Tier I) based on the size (should not have impacts above the three acres or 1,500 linear stream feet) and complexity of the proposed project option and the potential environmental impacts to shoreline wetland vegetation, forested wetland vegetation and a stream channel.

8.3.2 Required Studies

Wetland Determination and Delineation. Based on the Section 404 permitting requirements a wetland determination and wetland delineation would need to be conducted. This work would follow USACE methodologies (USACE 1987 and 2010) and would include the evaluation of onsite vegetation, soils, and hydrology. A wetland delineation report would be produced and included with the Section 404 permit application.

Threatened and Endangered Species Critical Habitat Surveys. Based on the Section 404 permitting requirements and environmental agency review (specifically, TPWD and USFWS) a critical habitat survey would need to be conducted for species identified in "Threatened and Endangered Species" (see Appendix A) as being likely to occur. This critical habitat survey would focus on terrestrial species only, because the stream assessment described in the following section would include a threatened and endangered aquatic species critical habitat survey. A supplemental report documenting individual findings would be included with the Section 404 permit application.

In evaluating the critical habitat survey from a cost perspective, it should be noted that additional requirements could be required:

- Work does not include individual presence/absence surveys for threatened and endangered species because it is not known if critical habitat exists onsite. These studies will be added as necessary.
- Impacts will primarily occur on the existing dam structure; therefore, critical habitat of threatened and endangered species associated with Andy's Creek were not evaluated for Alternative 2, but could contain critical habitat.
- Individual presence/absence surveys for threatened and endangered species was not evaluated because it is not known if critical habitat exists onsite. These studies could be added as necessary.

Stream Assessment. Based on Section 404 permitting requirements and 401 Water Quality Certification a stream assessment would need to be conducted to evaluate existing stream conditions of Andy's Creek. Work would include stream channel, water quality, habitat and biological data collection, and would follow TCEQ and/or USACE stream methodologies (TCEQ 2012, TCEQ 2014 and USACE 2015). This work would also include critical surveys for aquatic threatened and endangered species. A supplemental report documenting individual findings would be included with the Section 404 permit application.

Hydrology. A hydrology study of the receiving water, Andy's Creek, would need to be conducted to ensure negative impacts to the stream are avoided, minimized and mitigated for. Work would include the collection of stream cross-sections, development of a Hydrologic Model (e.g. HEC-RAS) for Andy's Creek and evaluation of frequency and magnitude of flow events due to the proposed modification of the emergency spillway. Work would also include an evaluation of potential stream degradation. Information would inform on additional mitigation requirements, if needed. A supplemental report documenting individual findings would be included with the Section 404 permit application.

An additional detailed hydrology study would need to be conducted to investigate effects of increased flood flows from Andy's Creek on LBS. This work would evaluate the potential flooding impacts to creek-side and lakeside properties, as well as a hydraulic impacts analysis to LBS, as discussed in Section 8.5 below.

8.4 FM3122 and FM3007 (TxDOT)

Carollo discussed Alternative 1, 2, and 3 with TxDOT representative Daniel Taylor, who is the Sulphur Springs Area Engineer TxDOT – Paris District. His assessment of the project was rather straightforward. TxDOT, according to Daniel, would be willing to work with the FCWD to examine, temporarily close, or relocate either FM3122 road for Alternative 1 or FM3007 across the LCS dam for Alternatives 2 and 3. Daniel was also able to confirm that a "low water crossing" at the spillway without some conveyance underneath is not a feasible solution to the flooding problem. This suggestion is outlined in Section 4.2.6: Other Alternative. TxDOT generally prefers to elevate improved roadways and is very reluctant to lower them.

Daniel also noted:

> *"In discussing your proposals with our Director of Operations, he suggested that any proposed work could be handled via donation agreement. This would require us being provided a set of plans detailing the proposed work, estimated cost. Whoever performs the work will have to be bonded and insured. The process can be lengthy we will probably need to begin work on this immediately once y'all come up with a proposed course of action."*

8.5 Downstream Stakeholders

8.5.1 LBS

LBS and the Fort Sherman Dam are located directly downstream of LCS on Big Cypress Creek 5 miles southwest of Mount Pleasant in Titus, Camp, and Franklin counties. The reservoir has a surface area of 9,004 acres (roughly 3X that of LCS), a maximum depth of 65.6 feet, and was constructed in 1977. Residential areas have been moderately developed around the lake and in some areas downstream of the reservoir on Big Cypress Creek. The reservoir contains an emergency spillway that has never been engaged.

Figure 61: Lake Bob Sandlin

Because the reservoir is directly downstream of LCS, it would be affected by a larger water release from LCS under the proposed scenarios in this PER. Carollo met with Titus County Fresh Water Supply District #1 (TCFWSD#1), the reservoir controlling authority of LBS, to discuss their concerns with proposals to increase the water release rate on LCS.

Carollo met with Darrell Grubbs, the Executive Director of TCFWSD#1 to present options and discuss concerns over structural alternatives presented in this PER. Overall, TCFWSD#1 was amendable to the proposal of the installation of a physical structure on LCS that would alleviate flooding by sending floodwaters to LBS at an elevated rate. However, Mr. Grubbs expressed concerns over the hydraulic analysis of such a system.

As shown below in Figure 62, TCFWSD#1 is able to physically control the water level in LBS reservoir, unlike LCS, with a series of four (4) tainter gates. A Tainter gate is a water-control floodgate with a radial arm used to control the release of water from an impoundment. A side view of a tainter gate takes the shape of a wedge-section of cylinder. Pressure forces from the water surface act perpendicular to the wedge section, resulting in all pressure forces acting through the single pivot point of the gate. This makes construction and operation of the lift easier. The tainter gate system on LBS allows TCFWSD#1 to control releases from the reservoir from increased amounts of rainfall in the basin or inflows from LCS and Lake Monticello.

In the event that LCS releases an additional surge of water into LBS from increased WSE, the tainter gates on LBS would need to mitigate any rise in WSE to LBS. Additionally, downstream of LBS, Big Cypress Creek could experience the flooding effects of a LCS water surge if increased flows through the gates are conveyed downstream. In the event of a proposed structural alternative coming to realization, Mr. Grubbs would request supporting analyses outlining the effects of the proposed structural alternatives to Andy's Creek (if Option 1 is proposed), LBS, the dam, the tainter gate system, and Big Cypress Creek. A high-level approximation of cost to complete such analysis is included in the Opinion of Probable Construction Cost (OPCC) in Appendix E.

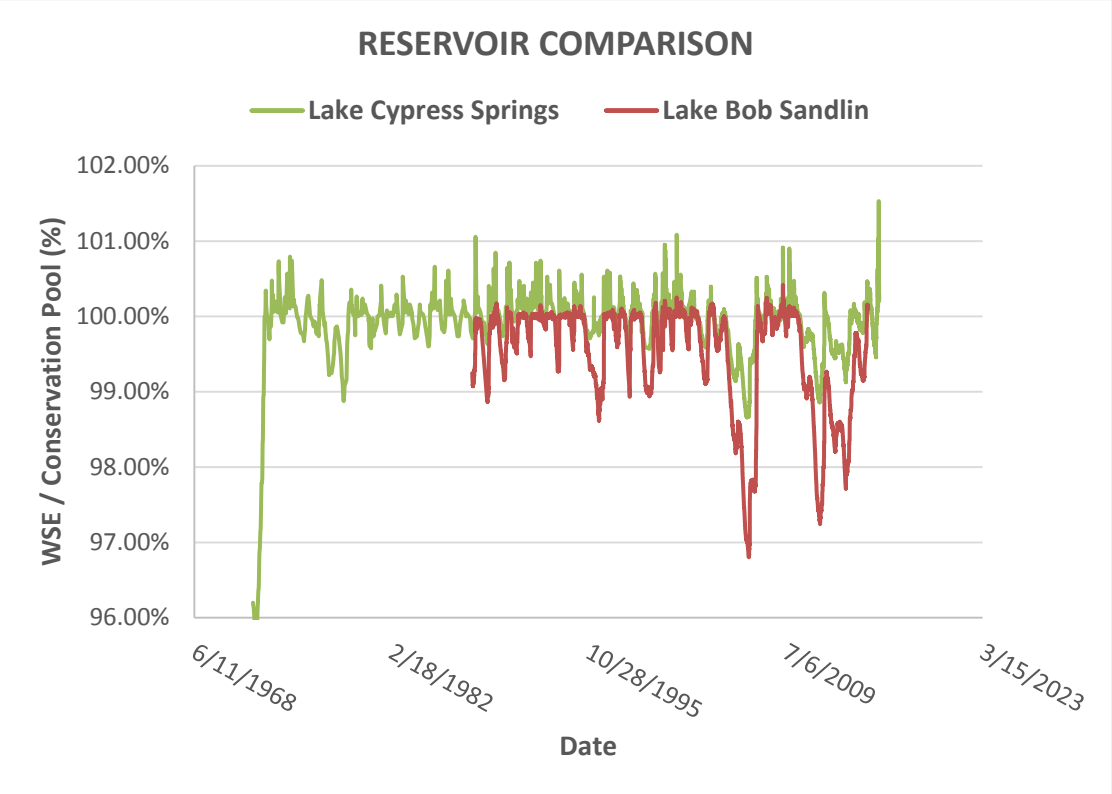


Figure 62: LBS Historic Lake Level Results Comparison

Figure 63: LBS Tainter Gate System

8.5.2 Lake O' the Pines (LOTP)

In comparison to LCS, Lake O' the Pines (LoTP) is a very different reservoir in many respects. Located downstream of LCS on Big Cypress Creek and primarily in Marion County, the dam is located approximately 8.5 miles (13.7 km) west of Jefferson. The reservoir has a surface area of 19,780 acres in the summer, and 18,700 acres in the winter (more than 5X that of LCS), with a maximum depth of 49.5 feet, and was constructed in 1958. Unlike LCS and LBS, residential areas have not been developed around the lake because of its primary purpose as a flood control reservoir with a significant volume of flood-pool storage, and significant spikes in water surface rise. It is used for recreational purposes, but development on the lake is limited. The lake is used to supply water to the North East Municipal Water District (NETMWD) and their customers and to provide flood protection to Shreveport, Louisiana and the Red River.

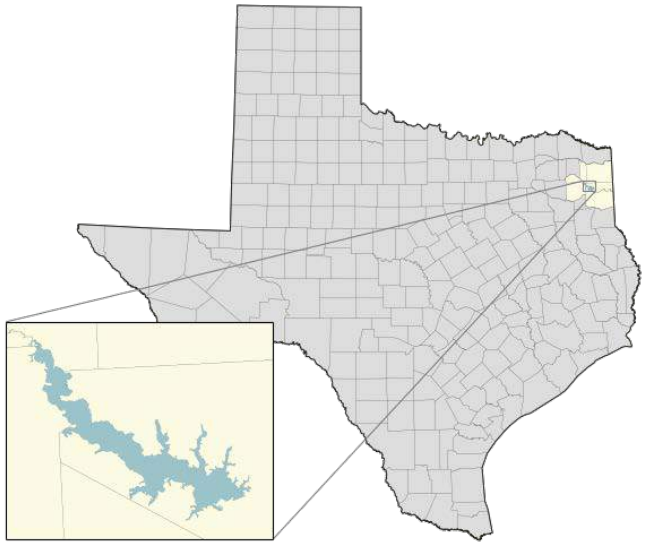


Figure 64: Lake O' the Pines

Similar to its discussions with TCFWSD#1, Carollo met with NETMWD to discuss concerns it has with a large water release downstream from LCS. Carollo met with Walt Sears, the Executive Director of NETMWD to present conceptual options and discuss concerns over structural alternatives presented in this PER. In similar nature to TCFWSD#1, NETWMD was amendable to the proposal of the installation of a physical structure on LCS that would alleviate flooding by sending floodwaters to LBS first, and eventually down to LoTP at an elevated rate. Although the hydraulics of the system was a concern to NETMWD, Walt was less concerned over the volume impact, as LoTP was built before LCS, LoTP was built specifically for flood control purposes, and because LCS accounts of only a small portion of their total drainage area. Mr. Sears also expressed concerns over the water quality impact of such a system and questioned the water quality of raw flood flows from LCS.

As shown below in Figure 65 below, LoTP experiences large surges of water and significant spikes in WSEs. Because the reservoir is located very far downstream in the basin, the reservoir experiences water quality variation from activities occurring basin-wide. Flooding from upstream developed systems can have negative impacts on water quality. Trash floatables, dissolved constituents, eroded soils, petroleum products, and other materials that make their way into the water system will ultimately be contained in LoTP. Because of this, LoTP can experience a large variability in inflow water quality that has an impact on the quality of the entire reservoir. In the event that LCS releases an additional volume of water from flooding upstream, water would first need to pass through LBS and then downstream to LoTP. For any proposed structural alternative coming to realization, Mr. Sears would request supporting analyses outlining the hydraulic effects of the proposed structural alternatives to LoTP and the dam. Additionally, Mr. Sears would request an analysis on the effect of water quality and siltation from the flood waters. A high-level approximation of cost to complete such analysis is included in the OPCC.

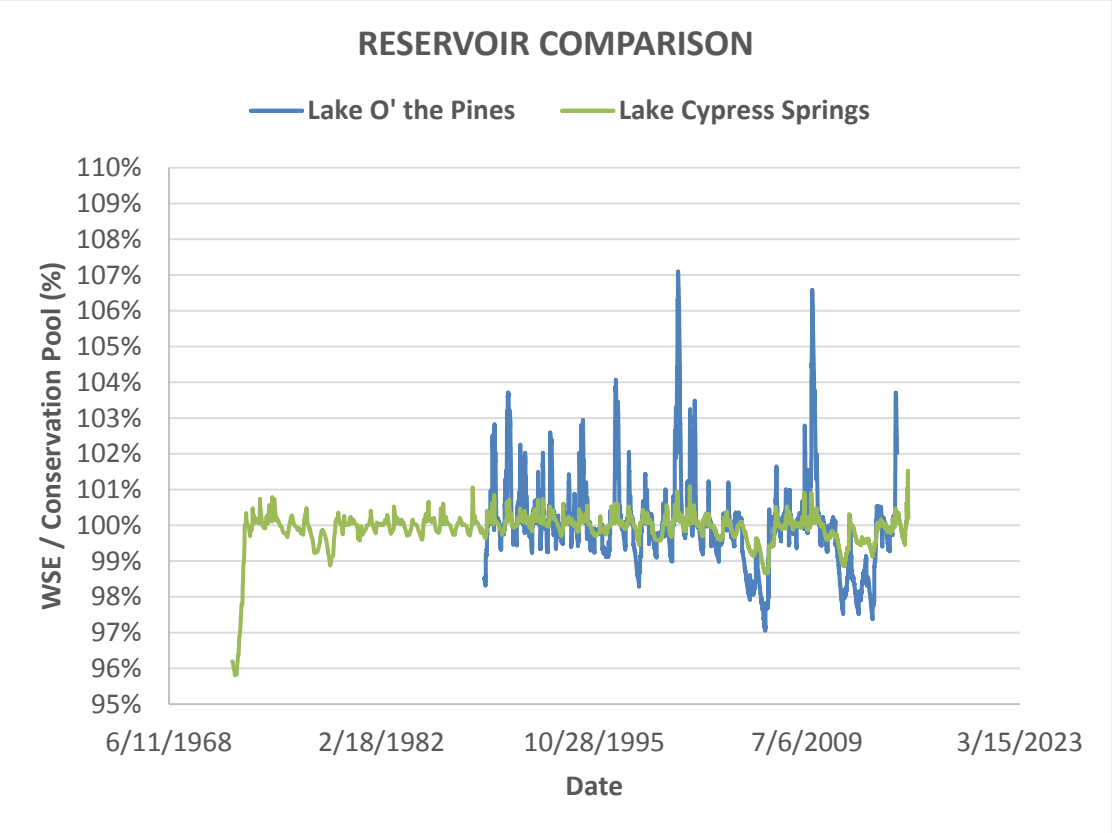


Figure 65: LOTP Historic Lake Level Results Comparison

9.0 EMERGENCY SPILLWAY EVALUATION

9.1 Andy's Creek

9.2 Purpose of Emergency Spillway

The LCS Emergency Spillway is located directly north of the dam. The spillway, acting as a large "water runway" conveys water down the 1,000 wide excavated property owned by the FCWD, over FM3122, and into Andy's Creek. Andy's Creek is used to convey the water to LBS downstream of LCS. The emergency spillway was designed with FM3122 acting as the highest point at 385.0 msl. Areas north-east and south-west of the roadway gradually slant to Andy's Creek and the lake respectively. An aerial of the emergency spillway is shown below in Figure 66.

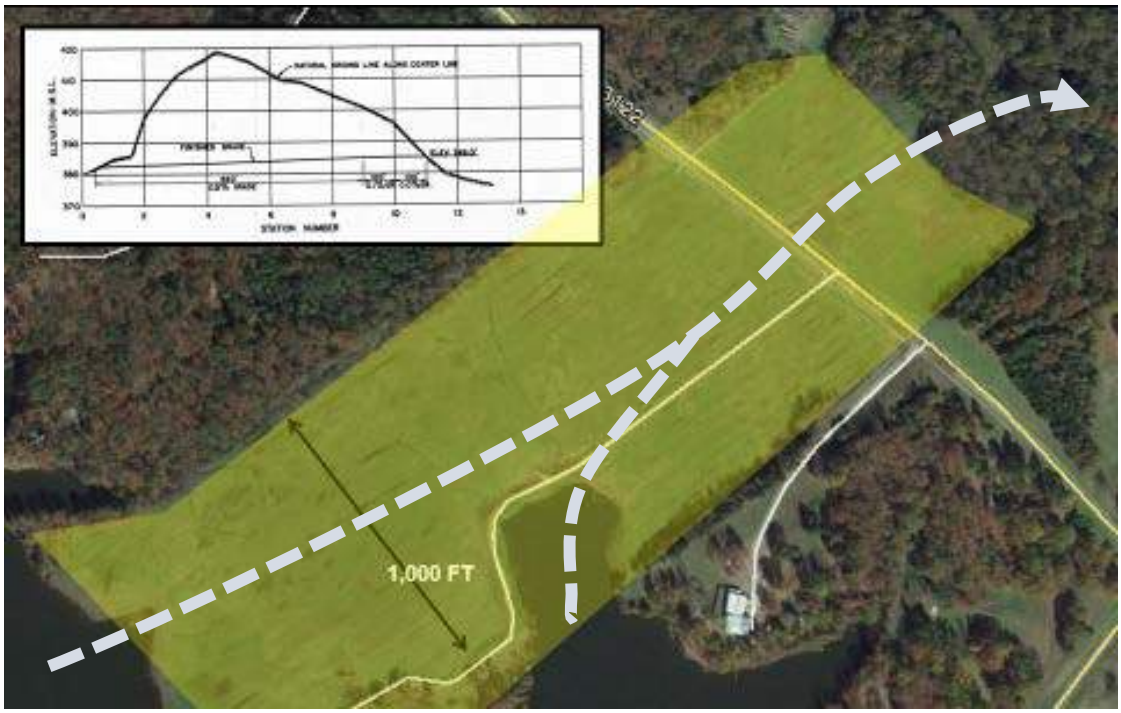


Figure 66: LCS Emergency Spillway

9.3 Survey Comparison to Design

During the public forms meetings for this PER, it was brought to the attention of FCWD that the emergency spillway, in part or in full, might have changed in elevation from the time it was constructed. Although the emergency spillway was not engaged in the 350-yr December 2015 event, elevation changes to the spillway contradicting the design, particularly increased ground surface elevation, could leave LCS vulnerable in events that would engage the spillway. In the past, the spillway has been used for some agricultural purposes, which could explain the altered topography of the spillway over time. Anecdotal evidence suggested that the ground to the south-west of the roadway might, in-fact, be higher in elevation than the roadway, a contradiction to the design.

Carollo was retained to determine if the emergency spillway currently exists as the design intended. Carollo utilized a survey that was completed in 2006 and compared it to the original dam plans completed in 1966 to determine if there has been additional fill accumulated on the spillway. As shown in Figure 67 below, the existing emergency spillway did exhibit, in most areas, an excess of fill above the designed ground elevation. Areas in red represent the accumulation of fill and areas of green represent areas of depression below the design surface. Additionally, the cross section, situated down the center of the emergency spillway, below in Figure 67, also shows the accumulation of fill, with the red line showing the existing ground surface elevation, and the green line showing the designed surface. Larger, more-readable, figures of this schematic can be found in Appendix A: Maps.

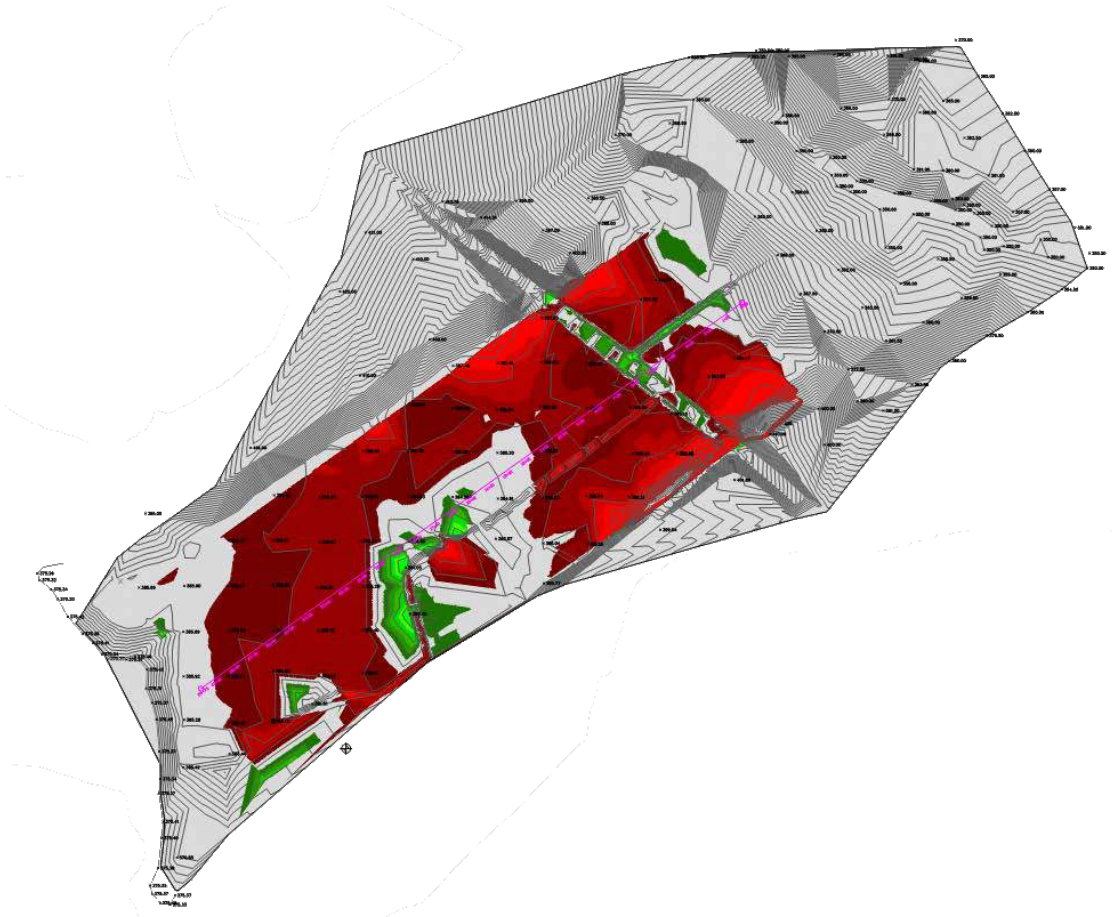


Figure 67: LCS Emergency Spillway Elevation Comparison

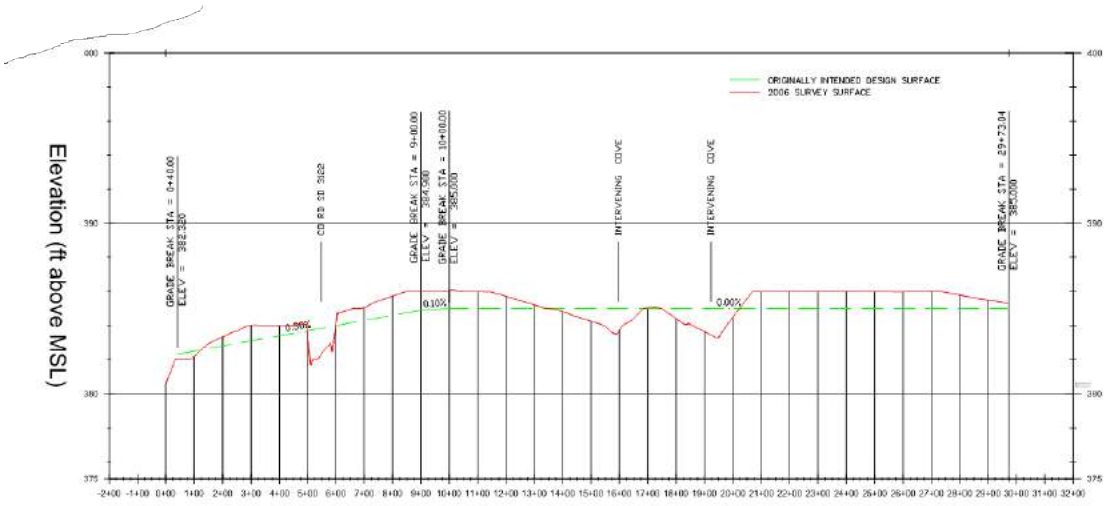


Figure 68: LCS Emergency Spillway Cross Section

9.4 Hydraulic Discussion

Based on the configuration of the emergency spillway, Carollo suspects that surplus fill from the spillway was excavated for use on the dam. The emergency spillway, at its narrowest point along FM3122 is 1,000 ft. wide. Flood waters from LCS can enter this area from either the south-west of the spillway or the south of the spillway.

In the event that FCWD decides to remove fill from the emergency spillway corridor, it is possible that only the south tributary entrance into the spillway would need to be excavated. If this is possible, it would be also likely that excavated spoils could be deposited onto the western second half. See Figure 69 below. This restoration potential could significantly reduce restoration costs.

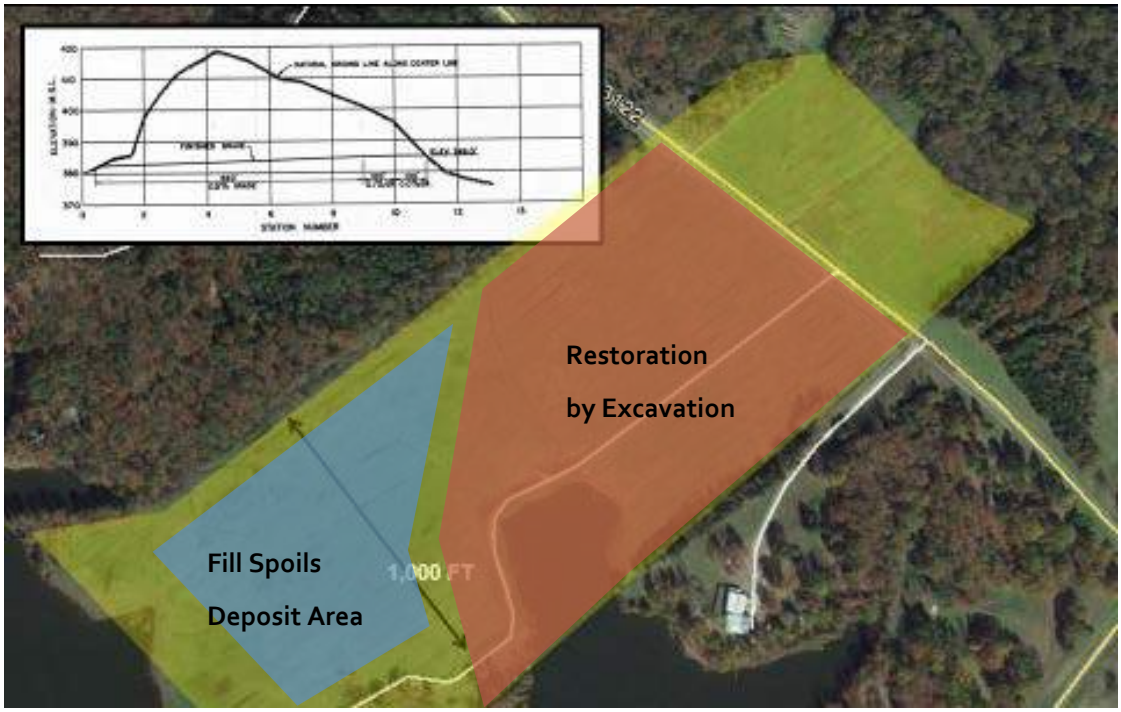


Figure 69: Emergency Spillway Restoration Schematic

9.5 Other Considerations

Arroyo has indicated that there is the possibility of wetlands developed in the emergency spillway corridor. It is possible that an environmental survey of the emergency spillway would be needed prior to excavation. The environmental implications of a potential flood relief project (Alternatives 1, 2, and 3) are further discussed in Section 8: Jurisdictional Assessment and Identification of Possible Permitting Requirements. Many of these recommendations and requirements could also be required for the restoration of the emergency spillway. Carollo recommends that FCWD consult with an environmental consultant to understand the implications of restoration of the emergency spillway.

A hydraulic analysis to determine if the spillway can be divided into two portions is recommended. As discussed above, it is possible that the south-western portion of the emergency spillway was excavated for use on the dam and not for hydraulic purposes. A hydraulic analysis to confirm that the south tributary could handle the entirety of the flood flows from LCS would need to be completed prior to restoration.

10.0 OPINION OF PROBABLE CONSTRUCTION COST

10.1 Presentation and Discussion of Costs

The OPCC represents Carollo's estimate of what a proposed engineering project would cost, in today's dollars. These costs include an approximation of costs necessary to investigate, permit, engineer/design, and construction a proposed project. They also include a 20 percent contingency, consistent with industry standard for planning estimates of this nature. The OPCC does not included the cost of FCWD staff necessary to support the project, nor does it include some of the documented unknowns, primarily land acquisition needs if required.

A summary version of the OPCC is presented below in Table 70. A detailed OPCC that breaks the category items into individual takeoff items can be found in Appendix E: OPCC.

Table 70: Summary of Alternative Costs

	ALTERNATIVE 1		
ITEM CATEGORIES	**1A**	**1B**	**1C**
Startup and SW3P Items	$642,526	$1,788,644	$2,136,139
Canal Items	$7,174,574	$20,501,685	$24,540,203
Road Crossing Items	$11,295,307	$31,346,107	$37,422,107
Closeout and Other Items	$2,570,000	$7,190,000	$8,590,000
Design Fees	$3,734,861	$9,225,048	$11,021,624
Contingency	**20%** $5,083,454	**20%** $14,010,297	**20%** $16,742,015
OPCC TOTAL COST	**$30,501,000**	**$84,062,000**	**$100,452,000**

	ALTERNATIVE 2		
ITEM CATEGORIES	**2A**	**2B**	**2C**
Startup and SW3P Items	$485,259	$1,173,943	$1,381,980
Emergency Spillway Items	$349,885	$349,885	$349,885
Dam Crossing Items	$12,142,763	$33,366,896	$39,798,452
Closeout and Other Items	$3,305,000	$4,625,000	$5,025,000
Design Fees	$2,924,936	$5,928,285	$6,984,224
Contingency	**20%** $3,841,569	**20%** $9,088,802	**20%** $10,707,908
OPCC TOTAL COST	**$23,049,000**	**$54,533,000**	**$64,247,000**

	ALTERNATIVE 3		
ITEM CATEGORIES	**3A**	**3B**	**3C**
Mobilization	$120,400	$154,800	$197,800
Structure Costs	$14,439,975	$18,973,300	$23,906,625
Closeout and Other Items	$2,236,474	$2,938,076	$3,702,440
Design Fees	$3,027,027	$3,817,426	$3,702,440
Contingency	**20%** $3,964,775	**20%** $5,176,721	**20%** $6,497,079
OPCC TOTAL COST	**$23,789,000**	**$31,060,000**	**$38,982,000**

The hydraulic modeling of Alternatives 1 and 2 resulted in a barrel count exceeding feasibility, in part because of space limitations, but primarily because of the associated costs. This can easily be seen in the cost difference between Alternative 1-2 and Alternative 3.

10.1.1 Location of Alternative 3

Because Alternative 3 (3A, 3B, and 3C) required cost estimates for materials that were uncommon and that could fluctuate significantly with project location, Carollo hired Deere & Ault Consultants (Deere), Inc. to provide feedback on constructability of Alternative 3 and provide cost-related recommendations. The costs presented in the section above were reviewed by Deere.

Additionally, Deere recommended moving the location of Alternative 3 off of the Dam (a different location than previously presented in Carollo's public presentations). This would allow for construction of Alternative 3 without affecting the dam core and allow for a shorter cofferdam with a minimized water control system, both a significant concern of Deere from a constructability perspective. Two schematics of Alternative 3 were also provided by Deer and are presented in Appendix A: Maps.

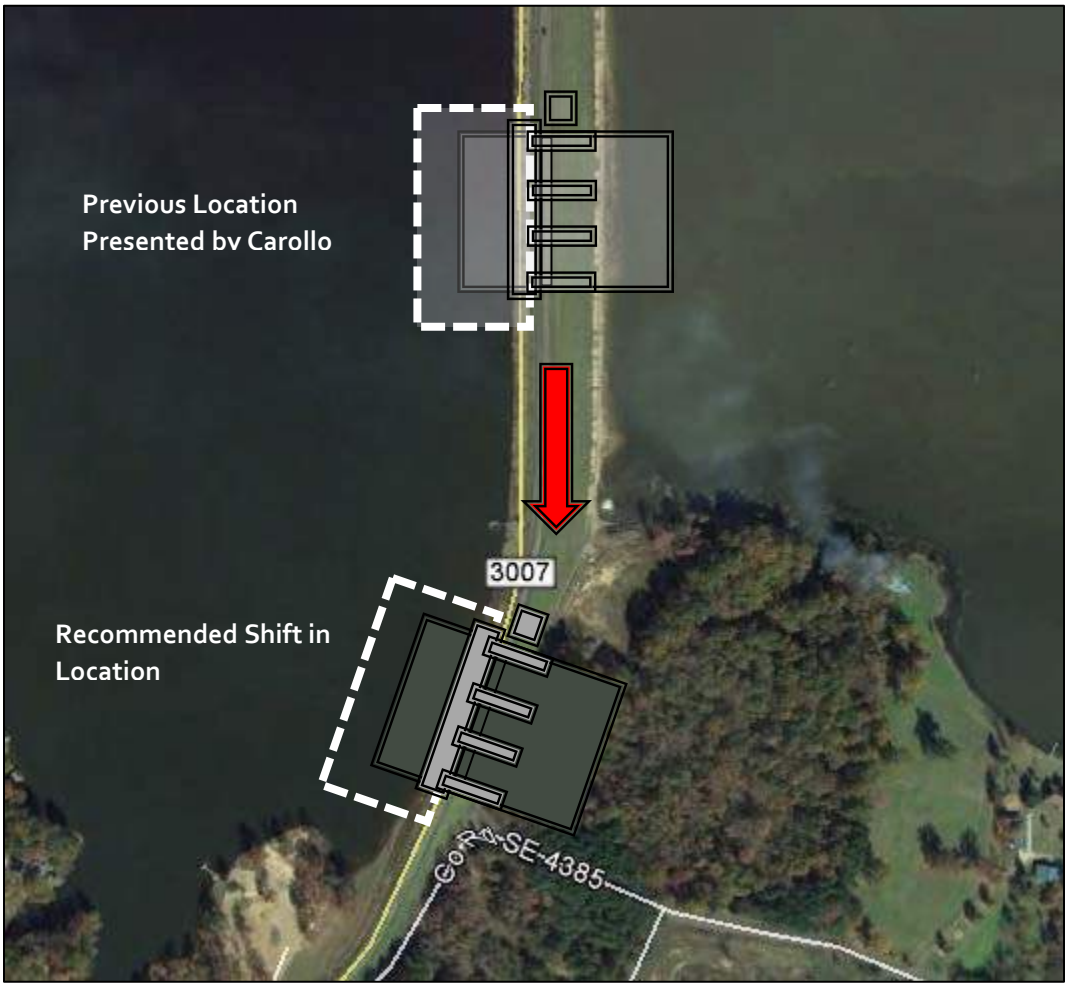


Figure 71: Location Change for Alternative 3

10.1.2 REFA Damages

Carollo used the total damage curve developed in Section 5.3: Development of the REFA Curve to predict the amount of damage that would occur to the reservoir at each 0.5 foot incident rise in WSE. To complete the cost-benefit analysis for each Alternative, it was first necessary to determine the damages associated with each rain event frequency. As shown in Table 72 below, Carollo determined the damage at each frequency analysis interval using the Total Damage Curve. As shown, significant damage to the reservoir starts to occur after the 50-year event, growing incrementally as the storm frequency grows in severity.

Table 72: REFA with Damage Curve Results

Rain Event	Probability	Revised Existing Model	Damages to Lakefront Property around LCS
2-year	0.50000	379.1	**$28,082**
5-year	0.20000	379.5	**$34,305**
10-year	0.10000	379.9	**$42,498**
25-year	0.04000	380.5	**$65,167**
50-year	0.02000	381.3	**$147,205**
100-year	0.01000	382.3	**$347,890**
350-Year	0.00285	384.7	**$2,910,117**
500-Year	0.00200	384.9	**$3,495,949**
1000-year	0.00100	387.1	N/A
5000-year	0.00100	390.0	N/A

10.1.3 Cost-Benefit

Project cost estimates are beneficial for budgetary planning purposes. The ratio of cost of a project compared to the benefit to the community is an important factor to be considered when making a selection of project alternatives. Using the revised existing frequency analysis, Carollo was able to utilize the Damage Curve to compute an approximation of damage around the reservoir that would occur in each storm event. The Benefit Cost (BC) Ratio was determined by dividing the OPCC for each Alternative by the likely damage for each storm event (i.e. BC Ratio = Damages to Lakefront Properties / Capital Cost). The breakdown of cost-benefit for each subproject is shown below in Table 73, 74, and 75 for Alternatives 1, 2, and 3 respectively.

Table 73: Cost Benefit for Alternative 1

			ALTERNATIVE 1		
			1A	1B	1C
Rain Event	Probability	Revised Model Conditions	100-YR 71 barrels	350-YR 203 barrels	500-YR 243 barrels
CAPITAL COSTS →		---	**$30.5 M**	**$84.1 M**	**$100.5 M**
2-year	0.50000	$28,082	$25,342	$24,158	$22,974
5-year	0.20000	$34,305	$29,637	$26,526	$26,526
10-year	0.10000	$42,498	$36,353	$31,193	$29,637
25-year	0.04000	$65,167	$42,498	$36,353	$34,305
50-year	0.02000	$147,205	$65,167	$42,498	$40,450
100-year	0.01000	$347,890	$106,660	$56,919	$48,671

Rain Event	Probability	Revised Model Conditions	ALTERNATIVE 1		
			1A	1B	1C
			100-YR 71 barrels	350-YR 203 barrels	500-YR 243 barrels
350-Year	0.00285	$2,910,117	$291,700	$106,660	$98,361
500-Year	0.00200	$3,495,949	$375,985	$147,205	$106,660
	100-YR BC RATIO		0.79%	0.35%	0.30%
	350-YR BC-RATIO		8.58%	3.33%	2.80%
	500-YR BC-RATIO		10.23%	3.98%	3.37%

Table 74: Cost Benefit for Alternative 2

Rain Event	Probability	Revised Model Conditions	ALTERNATIVE 2		
			2A	2B	2C
			100-YR 72 barrels	350-YR 204 barrels	500-YR 244 barrels
CAPITAL COSTS →		---	$23.0 M	$54.5 M	$64.2 M
2-year	0.50000	$28,082	$25,342	$24,158	$22,974
5-year	0.20000	$34,305	$29,637	$26,526	$26,526
10-year	0.10000	$42,498	$36,353	$31,193	$29,637
25-year	0.04000	$65,167	$42,498	$36,353	$34,305
50-year	0.02000	$147,205	$65,167	$42,498	$40,450
100-year	0.01000	$347,890	$106,660	$56,919	$48,671
350-Year	0.00285	$2,910,117	$291,700	$106,660	$98,361
500-Year	0.00200	$3,495,949	$375,985	$147,205	$106,660
	100-YR BC RATIO		1.05%	0.53%	0.47%
	350-YR BC-RATIO		11.36%	5.14%	4.38%
	500-YR BC-RATIO		13.54%	6.14%	5.28%

Table 75: Cost Benefit for Alternative 3

Rain Event	Probability	Revised Model Conditions	ALTERNATIVE 3		
			3A	3B	3C
			100-YR 1 gates	350-YR 2 gates	500-YR 3 gates
CAPITAL COSTS →		---	$23.8 M	$31.1 M	$39.0 M
2-year	0.50000	$28,082	$16,104	$16,104	$16,104
5-year	0.20000	$34,305	$16,104	$16,104	$16,104
10-year	0.10000	$42,498	$18,805	$16,104	$16,104
25-year	0.04000	$65,167	$21,790	$16,104	$16,104
50-year	0.02000	$147,205	$28,082	$16,104	$16,104
100-year	0.01000	$347,890	$38,402	$19,706	$16,104
350-Year	0.00285	$2,910,117	$120,175	$32,749	$19,706
500-Year	0.00200	$3,495,949	$174,235	$36,353	$21,790

Rain Event	Probability	Revised Model Conditions	ALTERNATIVE 3		
			3A	3B	3C
			100-YR 1 gates	350-YR 2 gates	500-YR 3 gates
	100-YR BC RATIO		1.30%	1.06%	0.85%
	350-YR BC-RATIO		11.73%	9.26%	7.41%
	500-YR BC-RATIO		13.96%	11.14%	8.91%

Alternative 3A gives the district the best benefit-cost ratio for the 100-yr, 350-yr, and 500-yr storm events. The 500-yr BC-Ratio was approximately 14 percent for Alternative 3A, which means in a single 500-year event, the community would receive 14 percent of their capital investment returned.

10.1.4 Issues with High-Level Cost Approximations

In examining options in regard to cost, several important cost mitigating factors should be recognized:

- Because this PER is a planning study, estimated costs are conservative and include a 20 percent construction contingency for unanticipated costs. The contingency factor does not include items documented to not be included in the cost estimate (for example, land acquisition).
- The total cost for some identified project elements are dominated by excavation costs. Excavation costs can vary widely from project to project due to the issue of haul and disposal and other uses of the excavated material. This project contains excavation cost uncertainty. Closer disposal sites to the project or other identified uses for the fill material will lead to cheaper costs. This is particularly important regarding the cost to restore the emergency spillway, as excavation spoil location is unknown until hydraulic analysis can be completed.
- Carollo is unable to account for fluctuation in cost of material, labor components or unforeseen contingencies. The cost estimate has been prepared prior to the finalization of any actual construction plans and specifications and, therefore is subject to change.
- The OPCC was made on the basis of professional experience and qualifications. It represents Carollo's best judgment as a professional design consultant familiar with the construction industry.
- The OPCC is a preliminary cost estimate only. Experience indicates that a fewer number of bidders may result in higher bids, conversely an increased number of bidders may result in more competitive bids.
- The cost to complete each task should be considered high-level and subject to change as detailed information (survey, environmental, permitting, funding, etc.) is developed. Methods of analysis used in the development of the cost estimate are consistent with a planning level of this detail.

- The cost required to complete each bid item is intended only as 1) a guide for preliminary and follow-on detailed engineering and 2) a basis for preliminary estimate of time to complete the intended modifications. While procedures consistent with this cost estimate are generally employed, approximations and engineering judgment was used because of the planning level nature of this exercise and the unpredictability of specific cost items.

10.2 Funding Strategies

Prior to the discussion of these funding strategies, it must be noted that Carollo was not engaged in determining specific funding strategies for the FCWD. The strategies discussed here represent Carollo's knowledge of previous flood-relief funding provided to similar agencies. This section represents a foundation of possible options that need further exploration. A funding source that is potentially accessible for a particular project would depend upon the purpose of the project, the anticipated benefits of the project, estimated overall cost of the project, contributors and the amount of participation by various contributors in providing project funding, and those who benefit from a particular project. The available funding amounts, the direct qualifications required, the application process, the data gathering and/or manipulation of data for the application process, etc. were not investigated in this process.

Provided that limitations on use of funds are consistent with the project of interest, potential strategies to most effectively use available funds include the following:

- Phasing of construction to spread funding needs over time.
- Expanding internal funding options to use funds from sources under the control of the FCWD.
- Joint development of projects with other local and regional entities.
- Impact fees.
- Accessing external funding to generate funds from non-FCWD sources.

These options are discussed in the following sections.

10.2.1 Project Phasing and Project Decomposition

Large scale, expensive projects can be considered for phased construction, except if the project operation does not lend itself to phased development because of operational issues.

For projects to be phased the first phase should usually include downstream impact studies, hydraulic analysis, ROW acquisition (if needed) and environmental permitting since inability to obtain ROW or permits would render a project infeasible. For projects that could be phased, the project can be decomposed into sub-projects such that each phase is within feasible funding limits, with each sub-project reach composing a separate project to be built over time.

10.2.2 Developing Additional Internal Funding

Internal funding is project funding provided by the FCWD. This funding may be combined with revenue from other sources to generate the necessary funds for a particular project. Internal funding may come from existing or new sources, the latter developed to supplement existing traditional sources.

Traditional sources of funding support the FCWD's general fund which can be utilized for a variety of purposes. Some traditional sources are following:

- General sales tax
- Property tax
- General license and permit fees
- Fines and forfeitures
- Engineering/civil permits

Consideration can also be given to funds limited to specific purposes, such as the following:

- Service Improvement Fees (e.g., flooding relief fees): These fees are collected for the specific purpose of generating revenue for funding of improvements for certain types of facilities (e.g., a flooding relief infrastructure project). These fees are typically the same for each household and/or business and independent of any use levels. The authority to collect such fees can be established by ordinance.
- Water District Fee Assignment: These fees are collected by the water district for the purpose of construction, management, and operation of the system.
- Special Assessments: These are fees collected from a particular set of individuals or business enterprises that are favorably impacted by a flood relief project. Assessments can be either one-time charges or charges of short duration for the particular benefits received because of the project.
- Department Transfers: These fees are collected from other operations in the FCWD that can be transferred to a flood relief project if benefits to other operations could be identified (i.e. less cleanup budget necessary for flooding occurrences).

10.2.3 Joint and Cooperative Funding of Projects

By combining FCWD funds with other public agency funds for specific projects, projects that would not be otherwise built can be built using fund leveraging. Partnering with TxDOT, Franklin County, TPWD, or other special districts is an option to use funds available through these agencies. Using cooperative arrangements, external sources can be combined with FCWD funds for projects which benefit both the county and partners in the project.

10.2.4 Coordination with Private Developers

Working in coordination with private developers is accomplished by having certain portions or features of a development funded by the FCWD while the remaining portions are funded by private parties interested in implementing the project. Although common for many municipalities, this option is not a foreseeable funding solution for FCWD because no private developers have been identified that would benefit from the proposed projects in this report.

10.2.5 Impact Fees

Impact fees are fees assessed to the property developers that are used to recover anticipated costs to be incurred in the future by a county or municipal entity because of the additional municipal services (including utility) that will arise because of the project. The impact fees can also be used to recover costs already incurred by FCWD in project development that might arise, for example, from coordination with private developers in the development of projects. Impact fees are commonly assessed at the time of municipal permit application and based upon amount of area to be permitted. The essential features of impact fees are that they be established by ordinance and administered in an unbiased fashion.

10.2.6 External Funding

External funding sources should always be investigated as part of a particular project. If investigation of funding sources is undertaken as part of the PER process, the design of the project can be modified to meet requirements of particular funding sources so that funds from the funding source can be accessed.

Opportunities for funding different projects depend upon where the project is located, where the benefits of the project will be realized, whom the project will benefit, and the type of project.

External funding is typically accompanied by requirements for financial participation by the entity (often termed the "local sponsor") seeking the external funding. The participation party may be a single entity, such the county, or a group of cooperating parties, such as the county, a drainage district, and a city. Some examples of funding sources potentially available for drainage improvement or flood control projects include:

- **FEMA Grants** – these are grants usually administered by the Texas Water Development Board or Department of Emergency Management that are directed to prevention or response to floods. Specific types of grants include:
  - *Pre-Disaster Mitigation Grants (PDM):* This program provides grants and technical assistance to local communities for cost-effective hazard mitigation activities that complement a comprehensive hazard mitigation program to reduce injuries, loss of life, and damage and destruction of property.
  - *Flood Mitigation Assistance Grant (FMA):* The FMA grant program provides federal funding to assist states and communities to fund cost effective measures to reduce or eliminate the long-term risk of flood damage to structures insurable under the NFIP.
  - *Repetitive Loss (RL) Grant Program:* This program provides grants for projects which can be shown by a benefit-cost analysis to reduce repetitive losses to residential structures
- **Texas Water Development Board Loans –** the TWDB operates several loan programs for financing planning, design, construction, improvement or expansion of water and wastewater facilities. Wastewater facilities can be interpreted as to include systems that improve storm water quality. Particular loan programs though which such leverage might be achieved include the following:
  - *Clean Water State Revolving Fund (CWSRF):* Using federal capitalization grants, the TWDB offers low interest loans through the CWSRF. CWSRF loans may be made to any political subdivision with the authority to own or operate a wastewater system to finance wastewater projects or to political subdivisions to finance nonpoint source pollution control or estuary management projects.

- *Texas Water Development Fund (DFund):* The TWDB offers through the DFund loans with interest rates at approximately 0.35 percent above the TWDB's cost of funds through the state general obligation bond-funded program. DFund loans are available for planning, design and construction of various projects, including flood control project. Detention ponds built for flood mitigation and storm water quality improvement may qualify for loans under this program.
- *State Participation Program:* This program enables the TWDB to assume temporary ownership interest in a regional project when the local sponsors are unable to assume the debt for an optimally sized project.

- **Amenity Funding by Texas Department of Parks and Wildlife –** another external funding source to consider is the TDPW. Outdoor Recreation Grants are made available from the TDPW Account and the Land and Water Conservation Fund (LWCF) to local governments for the acquisition and/or development of outdoor recreation sites. These funds are available for acquisition and development of State and local park and recreation areas adjacent to storm water detention facilities. Of the various grant programs administered by the TPWD, the following have potential to provide money for detention pond amenity development:
  - *Outdoor Recreation Grants:* This program provides matching grant funds to municipalities, counties and other local units of government with a population less than 500,000 to acquire and develop parkland or renovate existing public recreation areas.
  - *Indoor Recreation Facility Grants:* This program provides matching funds to municipalities, counties, and other local units of government with a population less than 500,000 for constructing recreation centers, community centers, nature centers and other facilities (buildings). Such facilities might be included as part of the amenity features for some projects.
  - *Regional Grants:* This grant program provides assistance to local governments with the acquisition and development of multi-jurisdictional public recreation areas in the metropolitan areas of the state. It allows cities, counties, water districts, and other units of local government to acquire and develop parkland for both active recreation and conservation opportunities.
  - *Recreational Trail Grants:* TPWD also administers the National Recreational Trails Fund in Texas for the FHWA. This program receives its funding from a portion of federal gas taxes paid on fuel used in non-highway recreational vehicles.
- **State Administered Grant Programs –** Different agencies in the State are involved in administering various grant and loan funds made available from federal sources.
  - *Texas Coastal and Estuarine Land Conservation Program (TCELCP)* – the GLO administers the TCELCP program authorized by federal Public Law 107-00 for the purpose of protecting important coastal and estuarine areas that have significant conservation, recreation, ecological, historical, or aesthetic values, or that are threatened by conversion from their natural or recreational state to other uses [GLO, 2009]. Projects are prioritized for funding by the GLO and focus upon land acquisition for conservation purposes.
  - *Texas Department of Rural Affairs (TDRA)* – the TDRA provides grants for a variety of rural development purposes. Among the grant programs, TDRA sponsors grants for disaster relief (such as hurricane recovery) and rural planning activities. Some of these grant programs could provide funding for drainage improvements and flood control projects:

- *Disaster Relief and Urgent Need Fund:* Assistance available through this fund can be used for eligible relief activities in situations where the Governor of Texas has declared a state disaster or requested a federal disaster declaration.
- *Small Towns Environmental Program:* Funds in this program are used for water and sewer infrastructure improvements utilizing self-help methods such as local volunteer labor resources.
- *Disaster Recovery:* These are funds allocated to local and county entities for recovery from natural disasters, such as hurricanes, for areas designated by the Governor as a disaster area.
- *Community Development Funds:* These are funds available on a biennial basis for public facilities' development, including water and wastewater infrastructure, street and drainage improvements, housing activities, and some other limited purposes.

- **U.S. Army Corps of Engineers Project Monies** – Executive Order No. 11888 (May 24, 1977) provides funds for floodplain management pursuant to the National Environmental Policy Act of 1969, the National Flood Insurance Act of 1968, and the Flood Disaster Protection Act of 1973. It directs the USACE to undertake projects to minimize the impacts of floods on human safety, health, and welfare, and to restore and preserve the natural and beneficial values served by floodplains by acquiring, managing, and disposing of Federal lands and facilities; providing Federally undertaken, financed, or assisted construction and improvements; and conducting Federal activities and programs affecting land-use.
  - USACE has joint participation programs in which local governments can financially participate. This participation is by a local sponsor, which might be the FCWD. The USACE is usually responsible for the design and construction of the projects, but the local participant assumes responsibility for the subsequent operation and maintenance of the constructed facilitates. The following are of particular interest to the authorities of the USACE.

11.0 SUMMARY OF RESULTS AND NEXT STEPS

This PER outlines the methodology used to analyze specific project alternatives and provides the FCWD with the best available information to utilize in making a decision about a path forward.

From various stakeholder meetings, five baseline structural alternatives and a single (1) operational alternative (6 in total) were presented during a public forum. Subsequently, the list of baseline alternatives was filtered from the original six (6) down to three (3) structural alternatives and a single (1) operational alternatives (4 in total) to be evaluated in greater detail with hydrologic modeling, agency review, and cost analysis. This PER presents the results of this entire process, starting with preliminary hydraulic analysis, then stakeholder engagement, and finally the detailed evaluation of each alternative.

The summary results of this PER are presented in Table 76 below in matrix form. This table is subjective based on Carollo's engineering knowledge and understanding of each alternative. The detailed results of each input and the rational leading to the yes-or-no decision presented below should be individually examined by the FCWD using the detailed results of this PER. A detailed evaluation of each of these matrix inputs is presented in this report for evaluation by the FCWD.

Table 76: Roadmap Hurdle

Alternative	Task Hurdle				
	Hydraulic Feasibility	Federal / State Agency Approval is Feasible	Local Agency Approval (Downstream Stakeholders) is Feasible	Cost Feasibility	Minimal Impact to Water Supply
1A	✗	✗	✓	✗	✓
1B	✗	✗	✓	✗	✓
1C	✗	✗	✓	✗	✓
2A	✗	✓	✓	✗	✓
2B	✗	✓	✓	✗	✓
2C	✗	✓	✓	✗	✓
3A	✓	✓	✓	✓*	✓
3B	✓	✓	✓	✓*	✓
3C	✓	✓	✓	✓*	✓
6A	---	✓	✓	✓	✗
6B	---	✓	✓	✓	✗
6C	---	✓	✓	✓	✗
6D	---	✓	✓	✓	✗
6E	---	✓	✓	✓	✗

Legend	
✓	Carollo predicts FCWD's ability to hurdle the task is feasible for specific alternative.
✓*	Carollo predicts FCWD's ability to hurdle the task is feasible, however, cost feasibility and funding options will be determined by the FCWD available funds and policy decisions.
✗	Carollo predicts FCWD would not be able hurdle the requirements for a specific alternative. Feasibility of accomplishment is deemed low.

As shown in the matrix above, Carollo anticipates that Alternatives 3A, 3B, and 3C appear to be the only viable alternatives for FCWD when evaluating the hydraulics, agency approval requirements, concurrence from downstream stakeholders, and impact to water supply. In terms of cost, Carollo deems Alternative 3 to be feasible. With that said, the cost feasibility will truly be determined by the FCWD available funds and policy decisions.

Although Carollo predicts FCWD's ability to hurdle each accomplishment in Alternative 3A, 3B, and 3C is feasible, the roadmap for each hurdle will be costly, time consuming, and each has some risk potential to be pivot into infeasibility. These risks are outlined in this PER and should all be considered by the FCWD when making future decisions about forward paths and funding. It is possible to deploy a phased approach to funding that would minimize the risk to the district if further detailed analysis overturns negative results. This is further discussed below in the next steps.

11.1 Next Steps

Carollo recognizes the roadmap to absolve LCS of flooding issues is full of hurdles. With that said, the path forward could be completed in phases to minimize both costs and risk to the district.

In looking into the future, as shown below in Figure 77, Carollo recommends the District proceed with the next steps for the implementation of Structural Alternative 3 or choose a series of Ancillary Options as outlined in this PER. Proceeding with Structural Alternative 3 would require an analysis of impacts assessment (H&H analysis and water quality assessment) and moving forward with permitting of the structure. These individual components to the overall process should be completed prior to moving forward with the design and construction of the structure. Additionally, funding strategies should be explored by the district to understand how the project will be funded.

Proceeding with Ancillary Alternatives would require the District to further explore effective options that are not structural in nature. Rule modifications and FEMA involvement, in the long-run, could curtail flooding-related damages around the lake in record flooding events. Many of our Ancillary Alternative recommendations have already been analyzed from an engineering perspective and are presented in the Technical Memorandums (Appendix C – Rules and Regulation TMs). Some of the recommendations have already been implemented by the District. The District should continue in an effort to improve their rules and recommendations to protect the public assets.

Lastly, the District has the choice to proceed with both Structural Alternative 3 and a series of Ancillary Alternatives if they choose to.

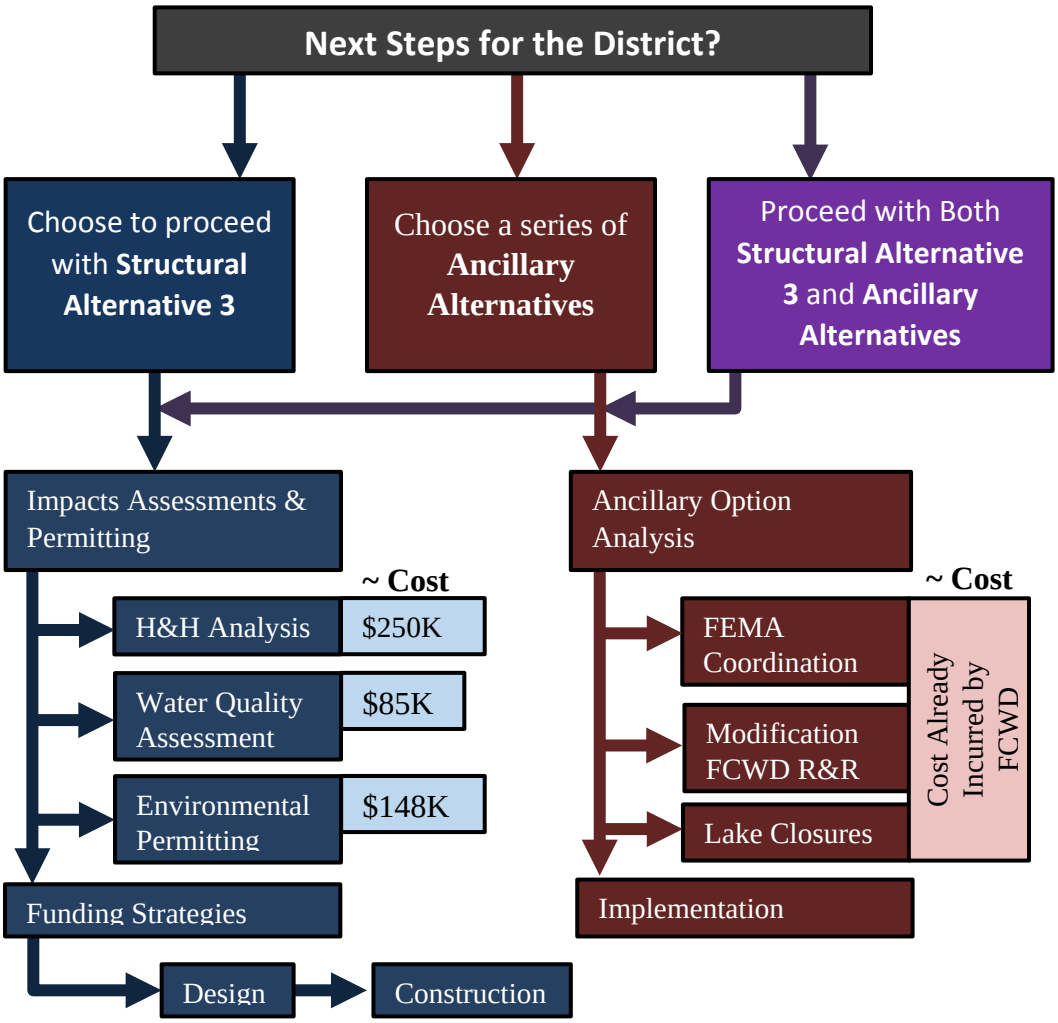


Figure 77: Path Forward

11.1.1 Emergency Spillway

As discussed in Section 9: Emergency Spillway Evaluation, the existing emergency spillway does exhibit, in most areas, an excess of fill above the designed ground elevation. It is recommended that the FCWD, at a minimum, return the spillway to its original design by removing excess fill in areas where accumulation has occurred. The District should also proceed with an investigation to analyze the possibility of only the south tributary entrance into the spillway needing excavation (See Figure 66). This possibility could significantly reduce restoration costs.

12.0 REFERENCES

Arroyo Environmental Consultants, LLC and Carollo Engineers, Inc. 2016. Study of topographic elevation around LCS. Unpublished.

Environmental Protection Agency (EPA). 2013. Primary distinguishing characteristics of Level III Ecoregions of the Continental United States.

Texas Commission on Environmental Quality (TCEQ). 2014. Surface water quality monitoring procedures, volume 2: methods for collecting and analyzing biological assemblage and habitat data. RG-416

Texas Commission on Environmental Quality (TCEQ). 2012. Surface water quality monitoring procedures, volume 1: physical and chemical monitoring methods. RG-415

United States Department of Agriculture (USDA). 1990. Soil survey of Camp, Franklin, Morris, and Titus Counties, Texas. In cooperation with Texas Agricultural Experiment Station and Texas State Soil and Water Conservation Board.

United States Fish and Wildlife Service (USFWS). National Wetland Mapper V2. https://www.fws.gov/wetlands/Data/Mapper.html Website accessed on September 19, 2016.

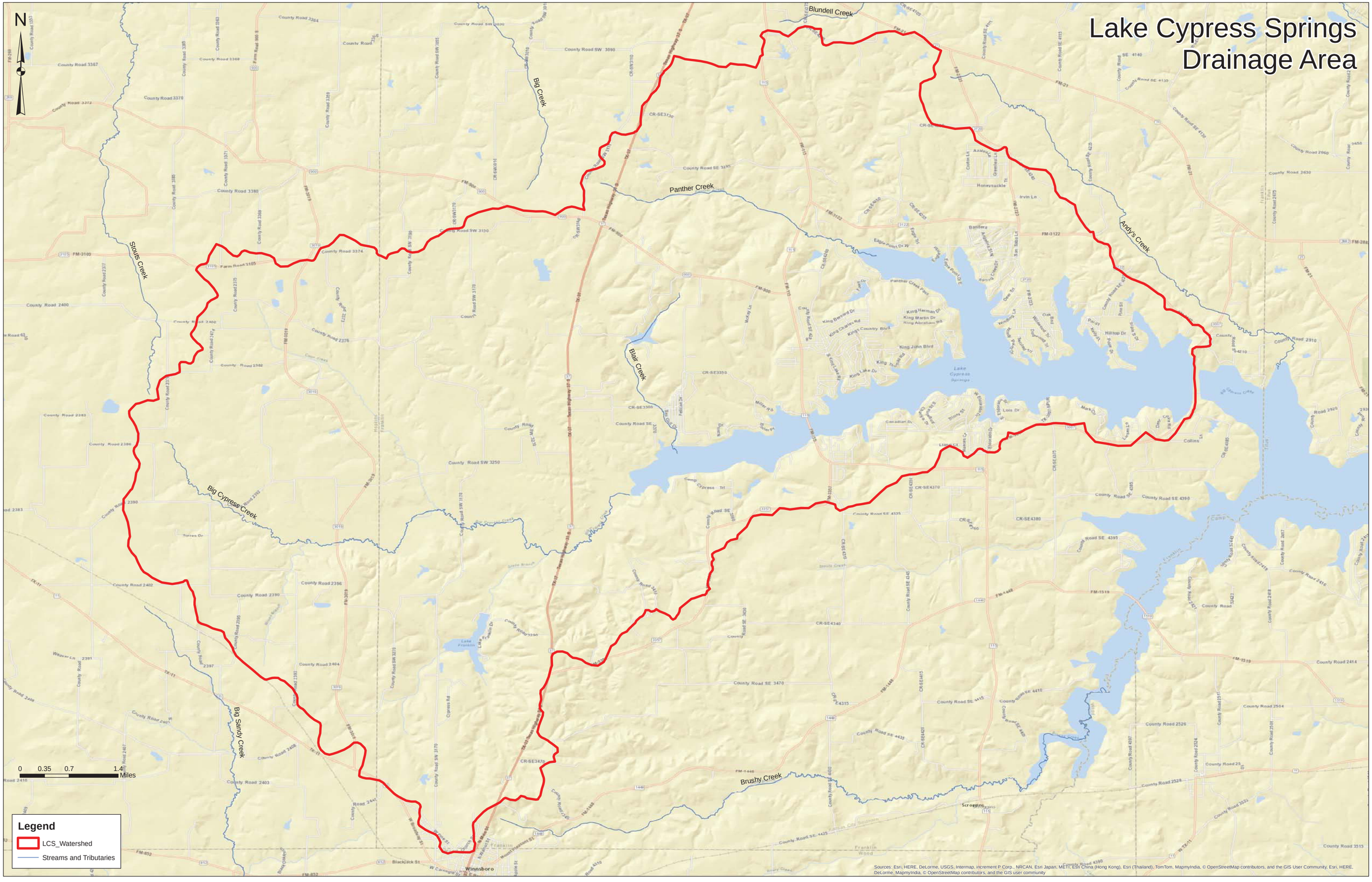
United States Army Corps of Engineers (USACE). 2015. The Texas rapid assessment methods (TXRAM) wetland and streams modules. Version 2.0

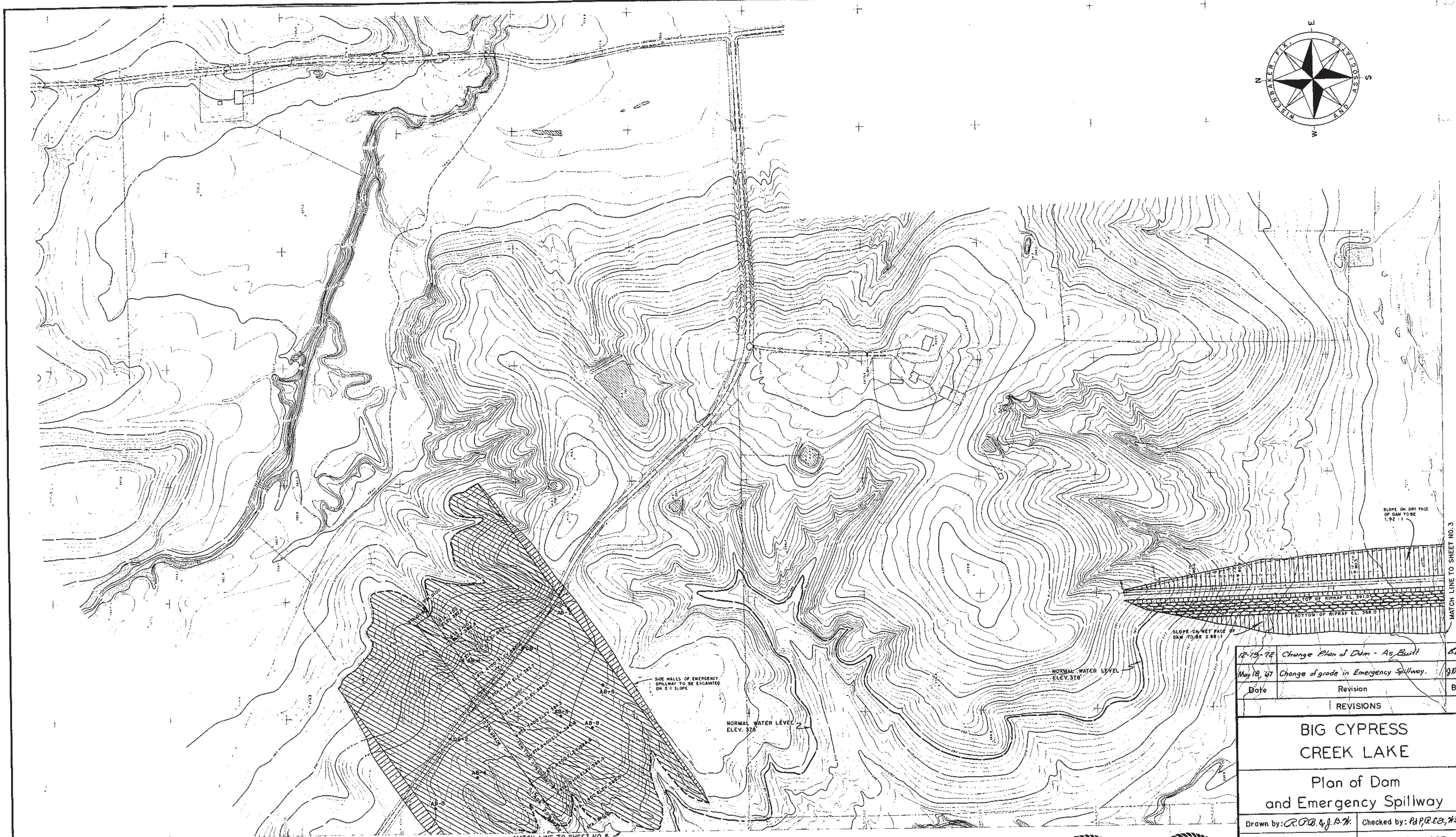
United States Army Corps of Engineers (USACE). 2016. Section 408. http://www.usace.army.mil/Missions/Civil-Works/Section408/ Website accessed on September 20, 2016.

"Tainter Gate." Wikipedia. Wikimedia Foundation, n.d. Web. 10 Nov. 2016.

"U.S. Army Corps of Engineers – Noname Lake Home Page." U.S. Army Corps of Engineers – Noname Lake Home Page. N.p., n.d. Web. 11 Nov. 2016.

APPENDIX A
MAPS


Lake Cypress Springs
Drainage Area
N
Blundell Creek
Big Creek
Panther Creek
Andy's Creek
Stouts Creek
Blair Creek
Big Cypress Creek
Big Sandy Creek
Brushy Creek
Winnsboro
0 0.35 0.7 1.4 Miles
Legend
LCS_Watershed
Streams and Tributaries
Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community, Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community



See sheet no. 5R for profile of spillway.

Note: Elevations are based on datum plane of mean sea level.

STATE OF TEXAS — PAT D. dePAMPHILIS — 11167 — REGISTERED PROFESSIONAL ENGINEER

STATE OF TEXAS — WALTER F. HICKS, JR. — 11170 — REGISTERED PROFESSIONAL ENGINEER

Date	Revision	By
12-19-72	Change Plan of Dam - As Built	E.E.E.
May 18, '67	Change of grade in Emergency Spillway.	J.D.W.

REVISIONS

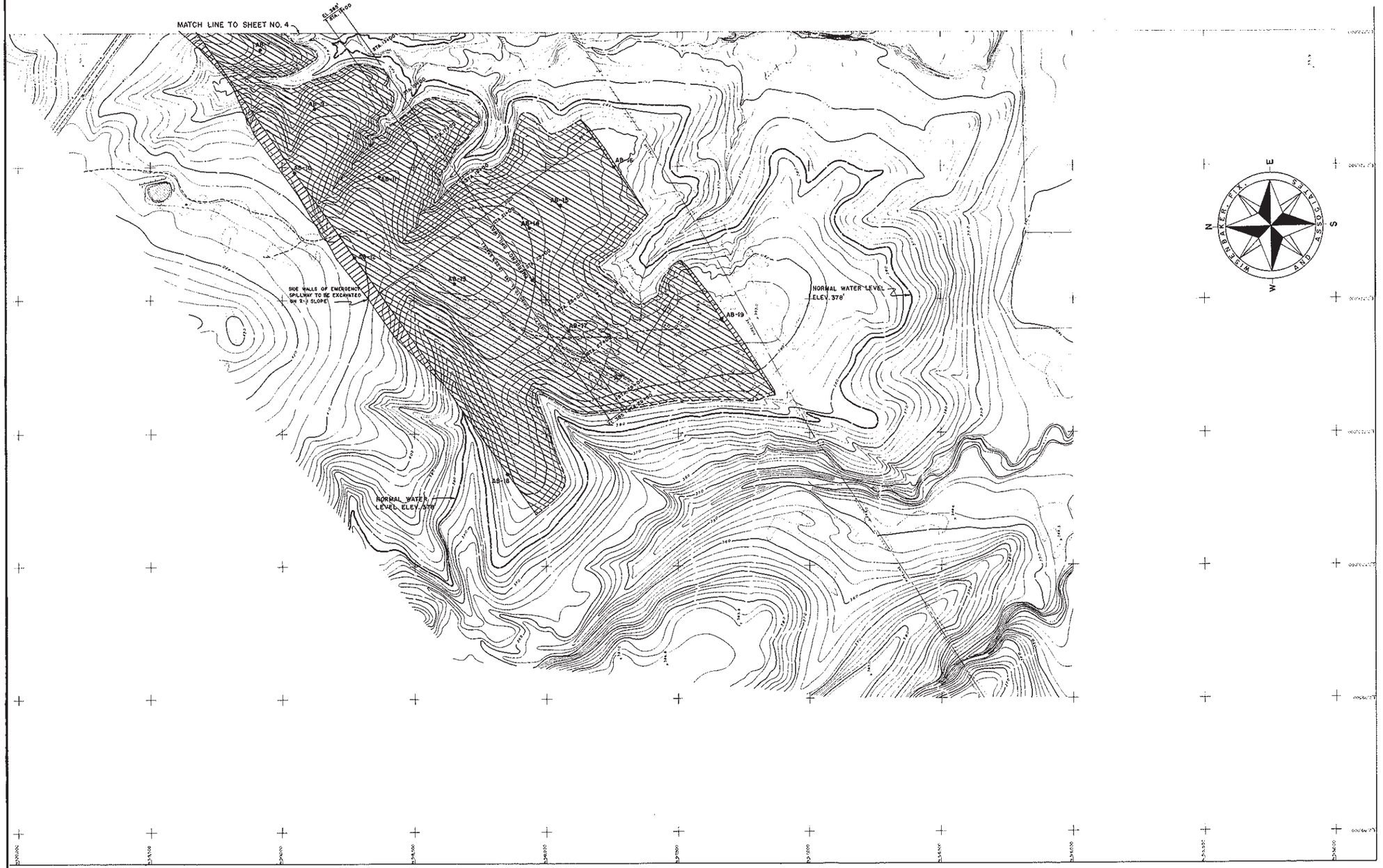
BIG CYPRESS CREEK LAKE

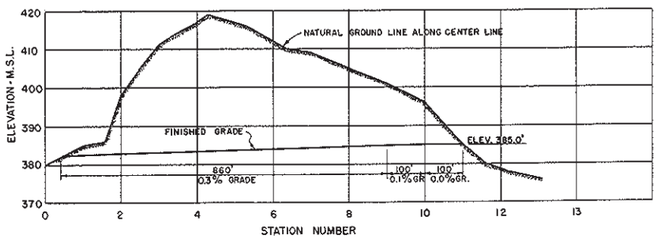
Plan of Dam and Emergency Spillway

Drawn by: R.P.B. & J.D.W.	Checked by: P.d.P., R.E.B., W.F.H.
Job No.: 854	Date: March 14, 1967
Scale: 1 Inch = 200 Feet	

WISENBAKER, FIX, AND ASSOCIATES
Consulting Engineers
Tyler, Texas

Sheet No. 4R of 26 Sheets





PROFILE OF EMERGENCY SPILLWAY
Scale: 1"=20' Vert., 1"=200' Horiz.

NOTE: Elevations are based on datum of mean sea level.

Date	Revision	By
May 18, '67	Profile of Emergency Spillway added.	J.O.F.

REVISIONS

BIG CYPRESS CREEK LAKE

Plan of Emergency Spillway

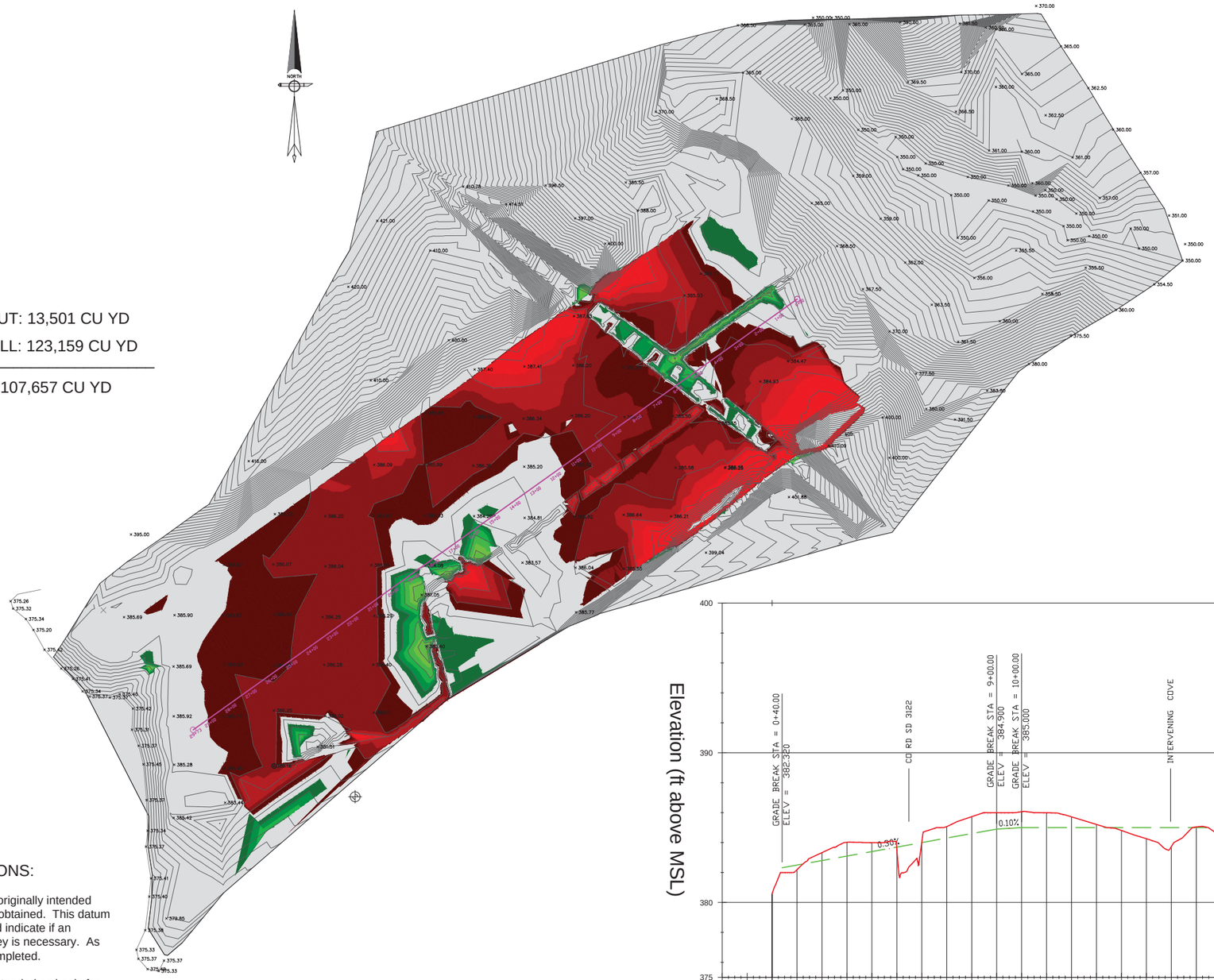
Drawn by: R.G.B. & J.B.M.	Checked by: P.A.P., R.E.S., & W.F.H.
Job No.: 854	Date: March 14, 1967
Scale: 1 Inch = 200 Feet	

STATE OF TEXAS
PAT D. dePAMPHILIS
11167
REGISTERED PROFESSIONAL ENGINEER

STATE OF TEXAS
WALTER F. HICKS, JR.
11170
REGISTERED PROFESSIONAL ENGINEER

WISENBAKER, FIX, AND ASSOCIATES
Consulting Engineers
Tyler, Texas

Prepared for:
Franklin County Water District
P.O. Box 559
Mount Vernon, Texas 75457

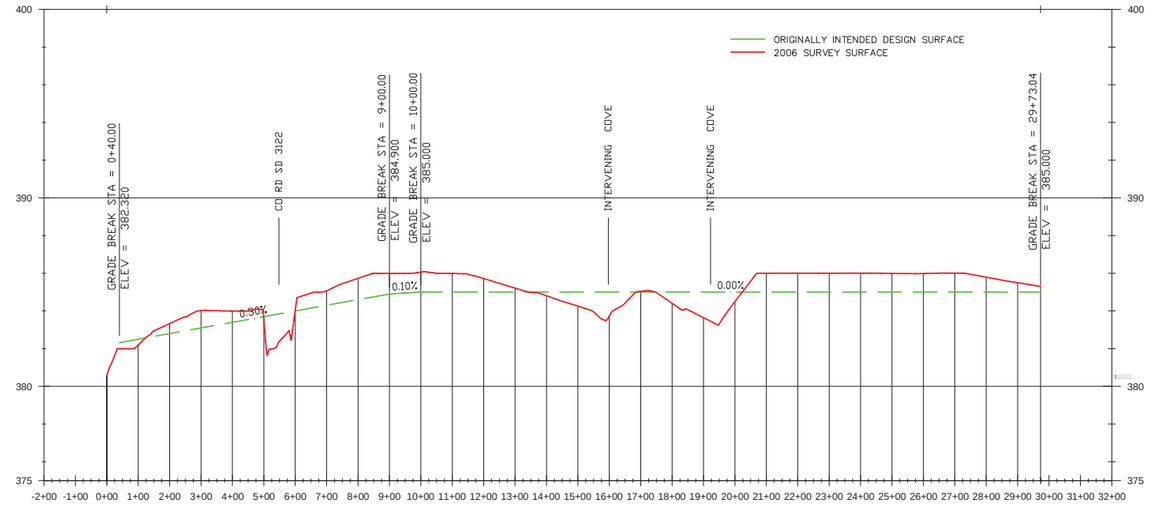


GROSS CUT: 13,501 CU YD

GROSS FILL: 123,159 CU YD

NET FILL: 107,657 CU YD

LOWER ELEV.	UPPER ELEV.	COLOR	DESC.
−3.000	−2.500		2006 TOPO SURVEY IS LOWER THAN ORIGINAL DESIGN
−2.500	−2.000		
−2.000	−1.500		
−1.500	−1.000		
−1.000	−0.500		
−0.500	0.000		NEGLIGIBLE DIFFERENCES
0.000	0.500		
0.500	1.000		2006 TOPO SURVEY IS HIGHER THAN ORIGINAL DESIGN
1.000	1.500		
1.500	2.000		
2.000	2.500		
2.500	3.000		



NOTES & ASSUMPTIONS:

1. Vertical elevation datum for originally intended design surface could not be obtained. This datum is important because it would indicate if an adjustment to the 2006 survey is necessary. As such, no adjustment was completed.

2. Not for construction. Only intended as basis for further discussion.

REV	DATE	BY	DESCRIPTION

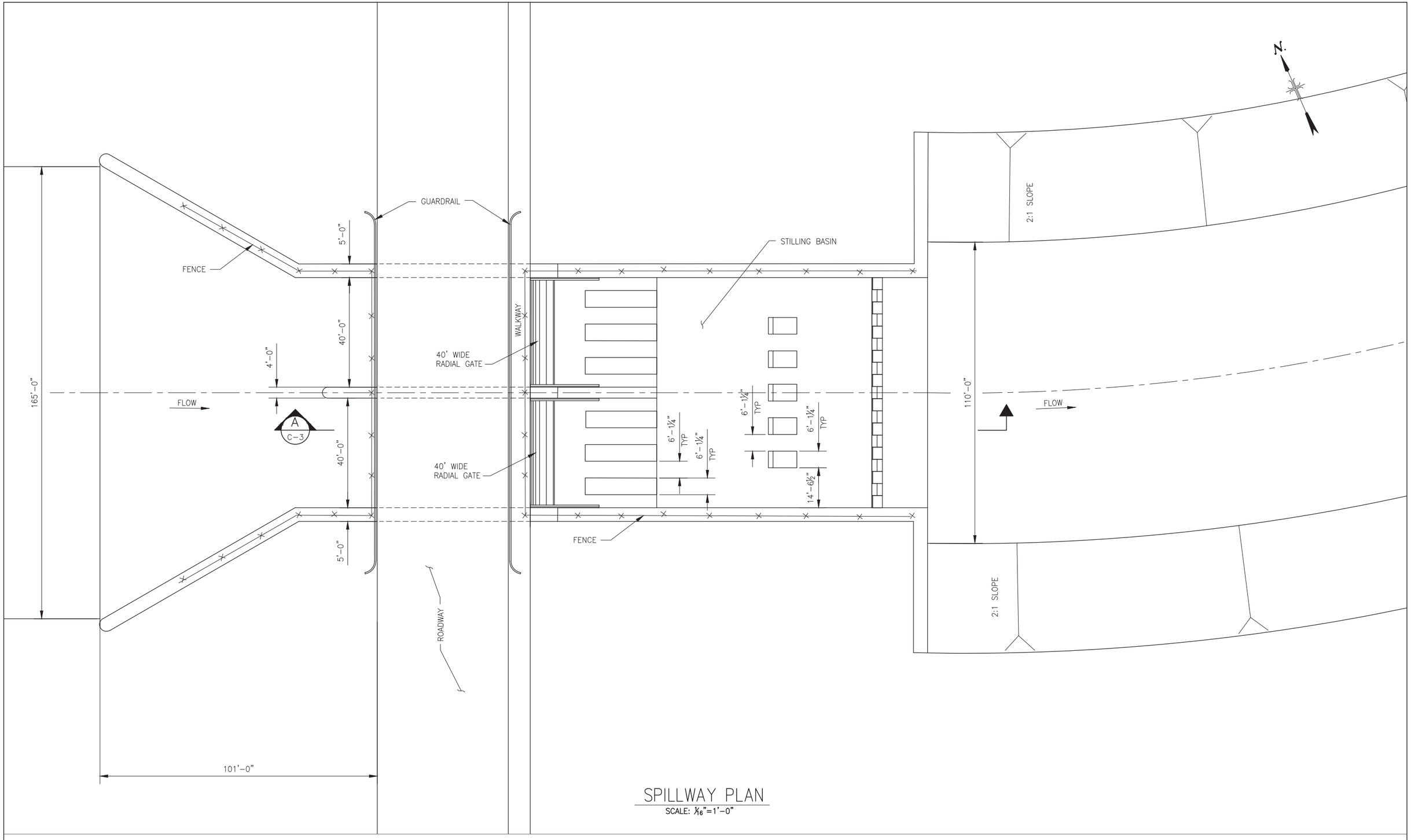
DESIGNED PWB
DRAWN PWB
CHECKED TS / DH
DATE FEBRUARY 2016

STATE OF TEXAS
PHILIP W. BULLOCK JR.
114841
LICENSED
PROFESSIONAL ENGINEER

carollo

FRANKLIN COUNTY WATER DISTRICT (FCWD)
LAKE CYPRESS SPRINGS
ORIGINALLY INTENDED DESIGN VS. 2006 SURVEY

JOB NO. 10070A.00
DRAWING NO. 1 OF 1
SHEET NO. 1 OF 1

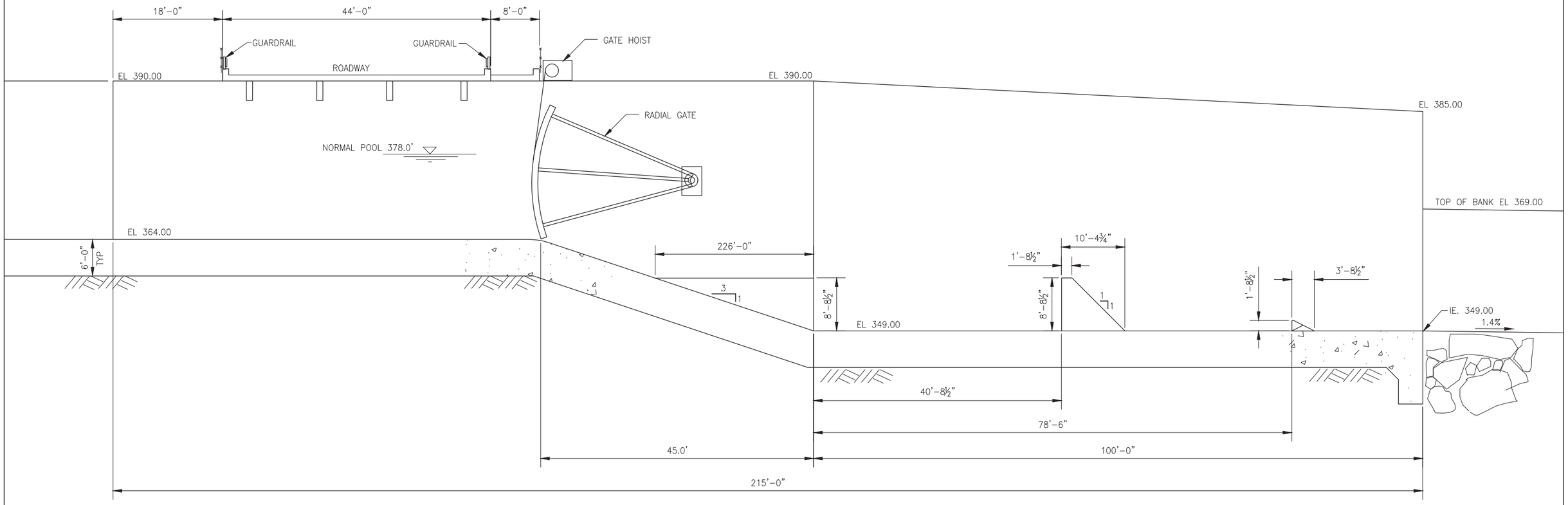


SPILLWAY PLAN

SCALE: 1/16"=1'-0"

DEERE & AULT CONSULTANTS, INC.

carollo



SPILLWAY CROSS-SECTION

SCALE:1/8"=1'-0"

DEERE & AULT CONSULTANTS, INC.

carollo

APPENDIX B

PRESENTATIONS

Presentation of the
Preliminary Engineering Report
Scope of Services

for Franklin County Water District

Tony Smith, P.E.

David Harkins, P.E., PhD.

Phil Bullock, P.E.

May 17th, 2016

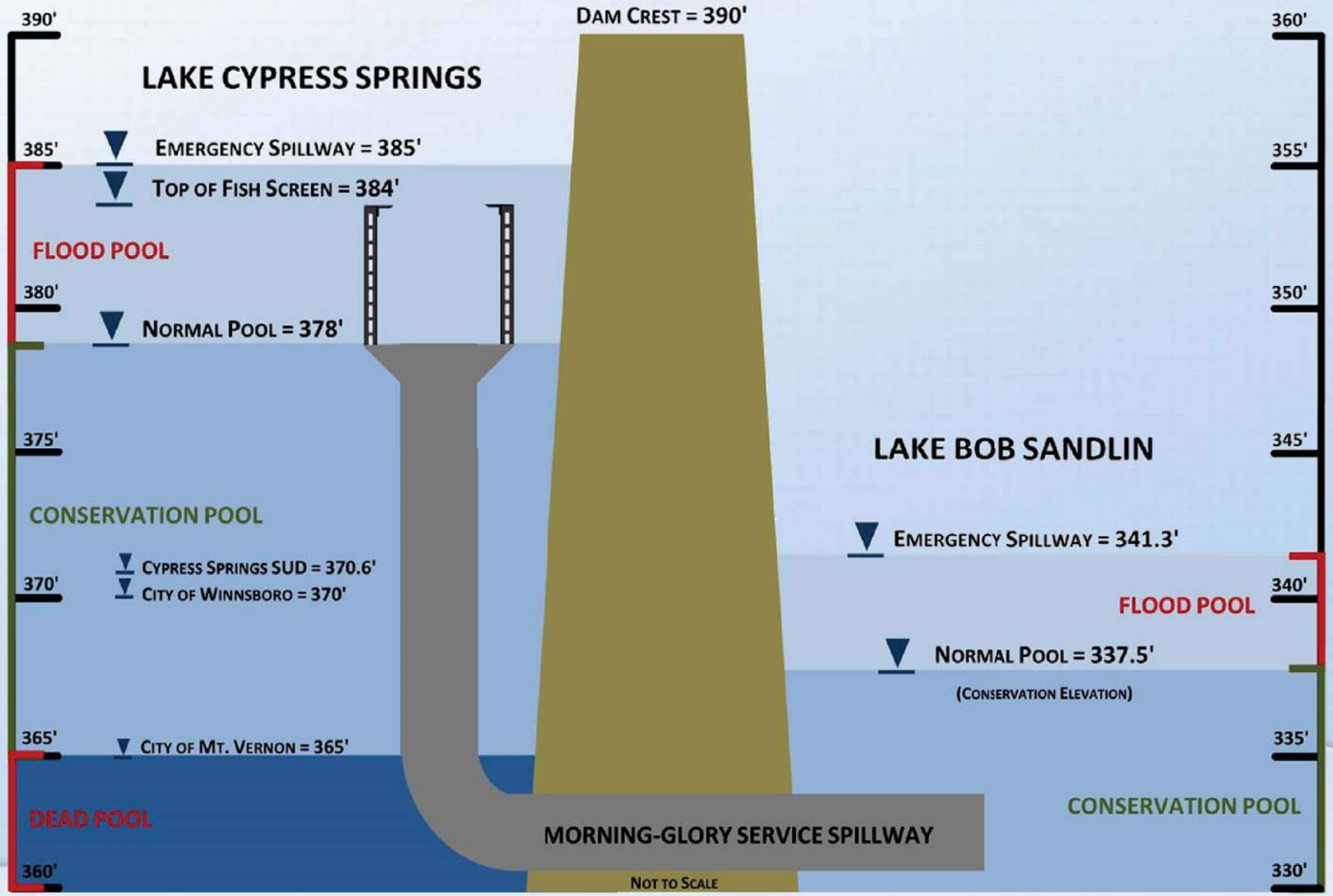
Engineers...Working Wonders With Water®

Carollo delivers national expertise specializing in only water and wastewater

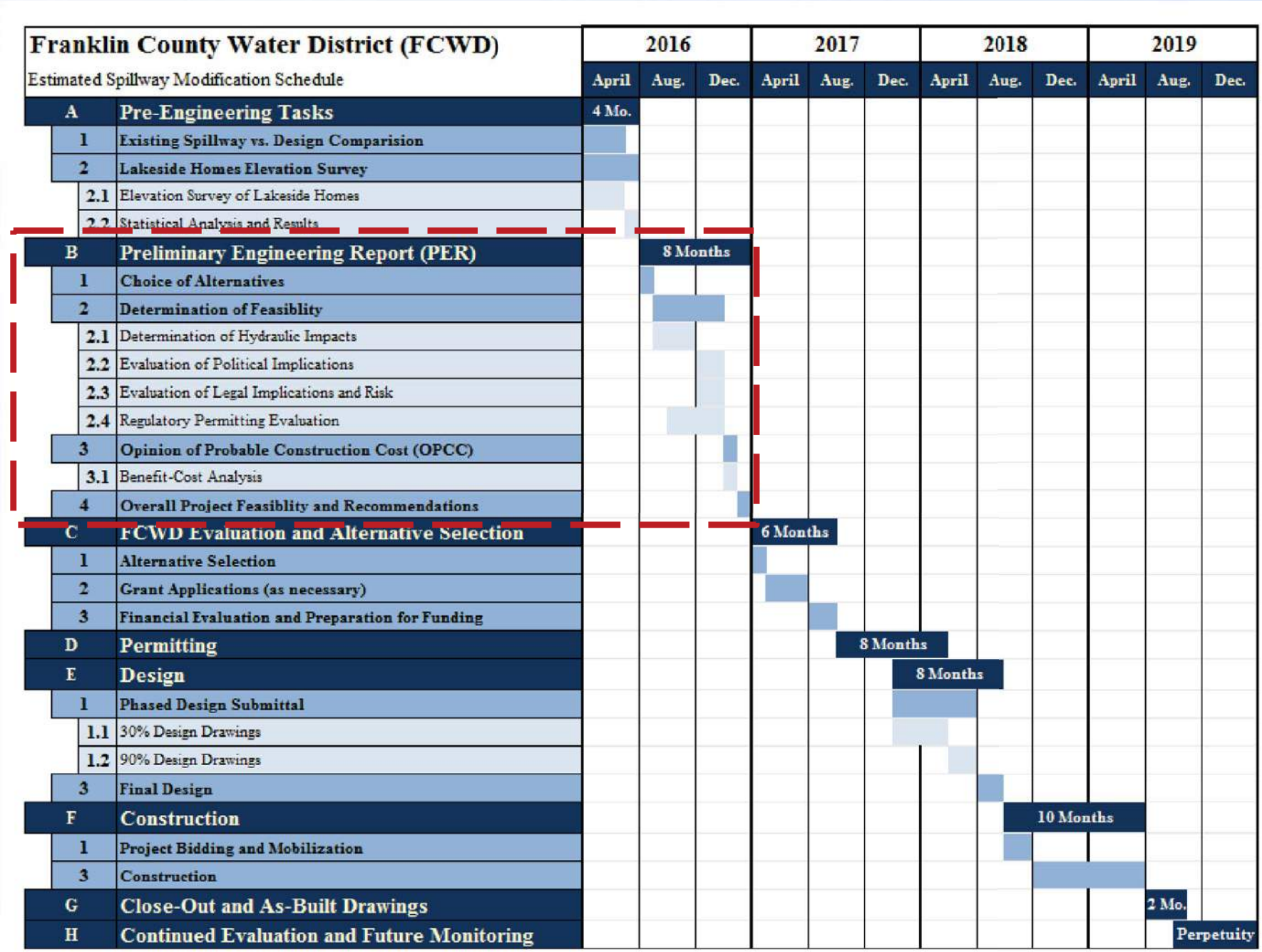
WATER
OUR FOCUS
OUR BUSINESS
OUR PASSION

carollo
Engineers...Working Wonders With Water®

Lake Cypress Springs Spillway

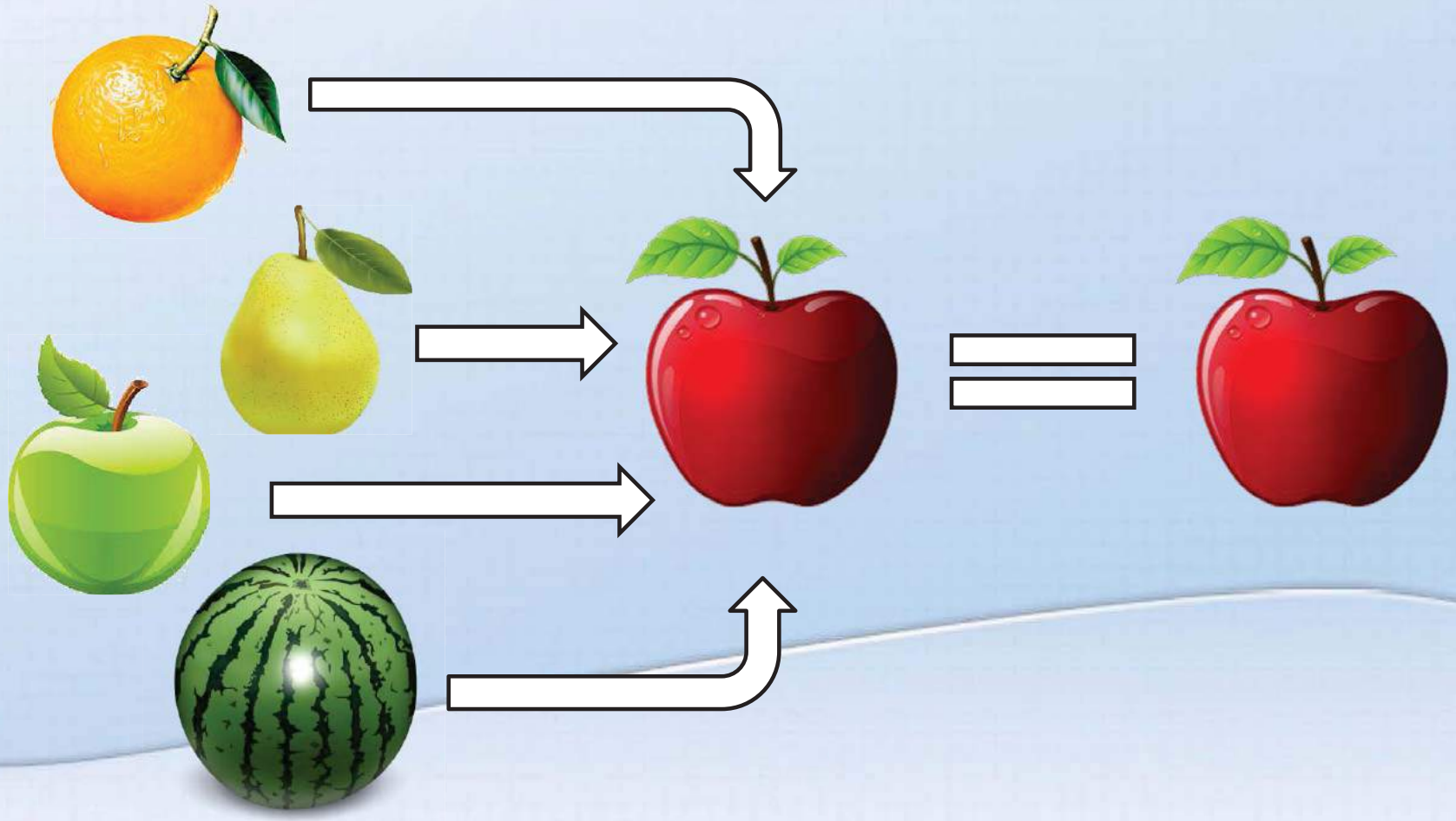


What is a P.E.R.?


Franklin County Water District (FCWD)
Estimated Spillway Modification Schedule
2016
2017
2018
2019
April
Aug.
Dec.
A Pre-Engineering Tasks
4 Mo.
1 Existing Spillway vs. Design Comparision
2 Lakeside Homes Elevation Survey
2.1 Elevation Survey of Lakeside Homes
2.2 Statistical Analysis and Results
B Preliminary Engineering Report (PER)
8 Months
1 Choice of Alternatives
2 Determination of Feasiblity
2.1 Determination of Hydraulic Impacts
2.2 Evaluation of Political Implications
2.3 Evaluation of Legal Implications and Risk
2.4 Regulatory Permitting Evaluation
3 Opinion of Probable Construction Cost (OPCC)
3.1 Benefit-Cost Analysis
4 Overall Project Feasiblity and Recommendations
C FCWD Evaluation and Alternative Selection
6 Months
1 Alternative Selection
2 Grant Applications (as necessary)
3 Financial Evaluation and Preparation for Funding
D Permitting
8 Months
E Design
8 Months
1 Phased Design Submittal
1.1 30% Design Drawings
1.2 90% Design Drawings
3 Final Design
F Construction
10 Months
1 Project Bidding and Mobilization
3 Construction
G Close-Out and As-Built Drawings
2 Mo.
H Continued Evaluation and Future Monitoring
Perpetuity

What is a P.E.R.?

A Preliminary Engineering Report (PER) is a planning document prepared by the Engineer to evaluate the complexity of each alternative and is to be used for an Apples-to-Apples comparison.



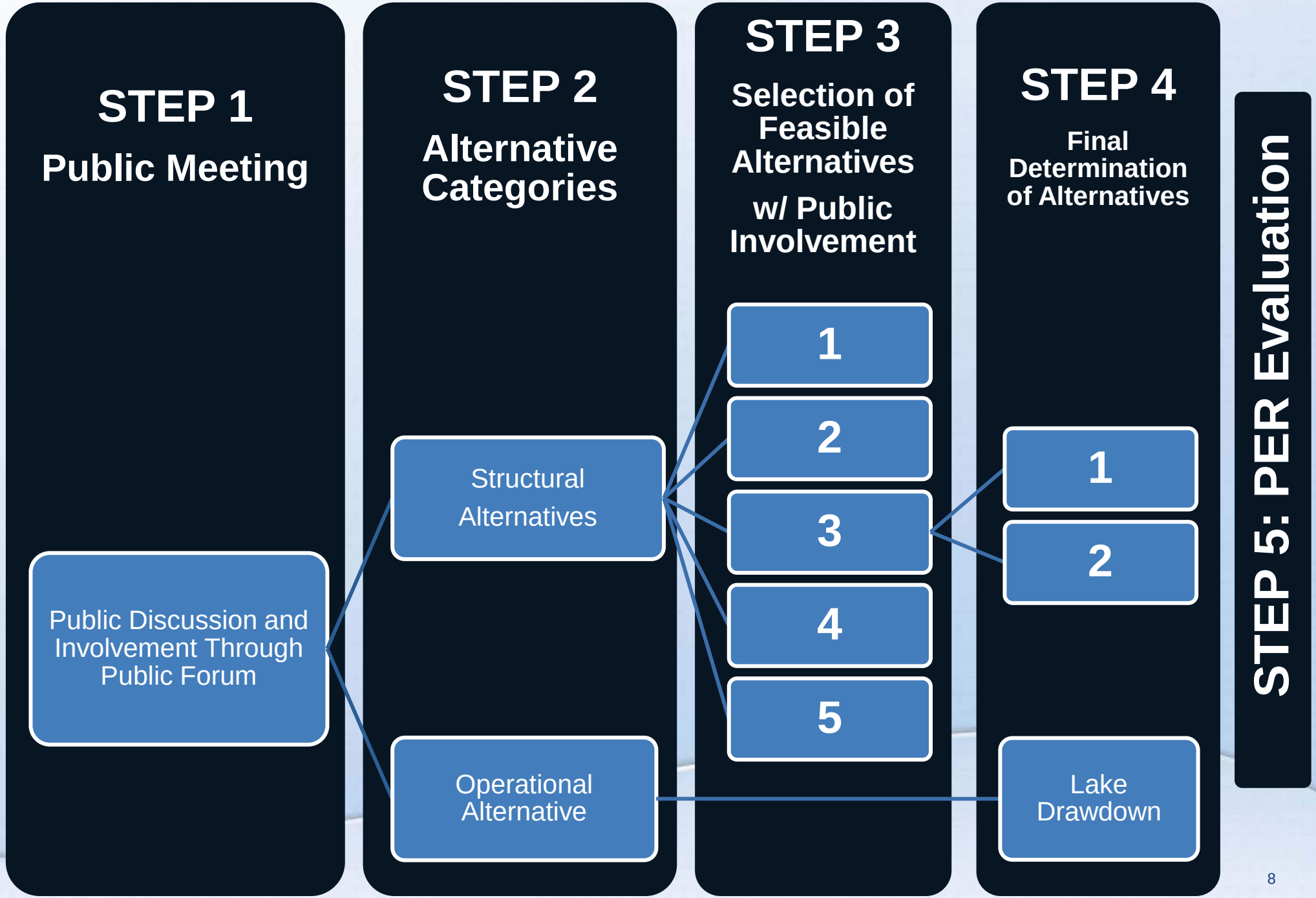
Potential Areas of Consideration

- Stakeholder Assessment Metrics
  - Input from the Stakeholders on alternatives
- Jurisdictional Assessment and Identification of Possible Permitting Requirements
  - US Army Corp of Engineers (USACE)
  - US Environmental Protection Agency (EPA)
  - Texas Commission on Environmental Quality (TCEQ)
  - Texas Department of Transportation (TxDOT)
  - Texas Parks and Wildlife Department (TPWD)
  - Others
- Impacts to Hydraulics – Lake Level Evaluation
- Cost

What is a P.E.R.?

1	2	3	4	5	
Developed Matrix of Alternatives					
Severe	Moderate Considerations		Mild Considerations		
Alternative 1	**Alternative 2A**	**Alternative 2B**	**Alternative 3A**	**Alternative 3B**	**Comparison of Alternatives**
1 Stakeholder Assessment Metrics and Opinions	✓✓✓	✓✓	✗	✓	✗	
2 Jurisdictional Assessment and Identification of Possible Permitting Requirements	✓	✗	✓✓✓	✓✓✓	✗✗	
3 Impacts to Hydraulics (Lake Level Evaluation)	✓	✓	✗	✓✓	✓✓	
4 Cost	✓	✓✓	✓✓	✓✓✓	✓✓✓	

Alternatives Selection Process

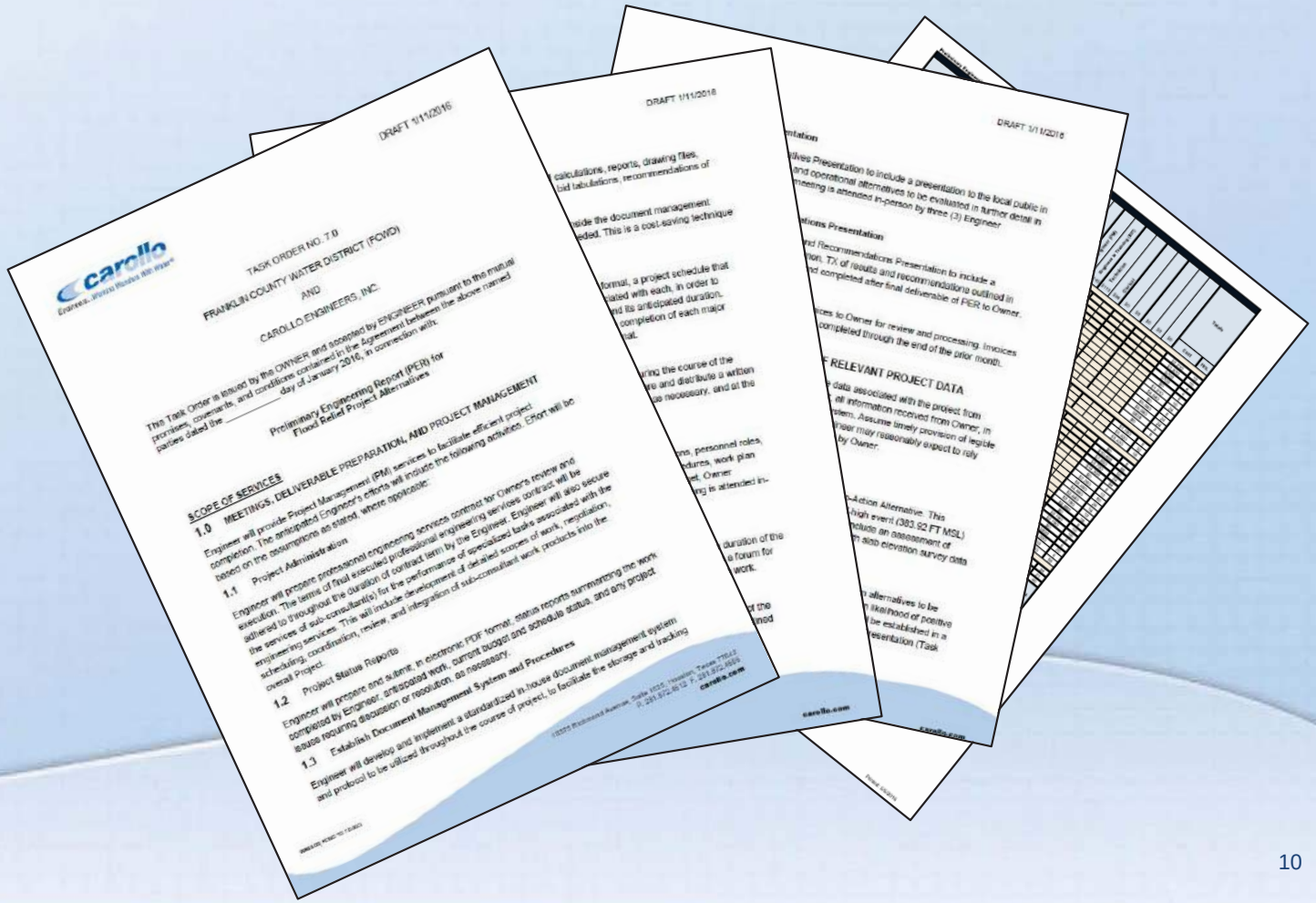


Major Components

- Stakeholder assessment with public forums
- Contacting entities that will have jurisdictional assessment over proposed alternatives
- Redeveloping the Frequency Curve
- Developing a Damage Curve
- Hydraulic (Lake Level) Modeling for proposed alternatives
- Opinion of Probable Construction Cost (OPCC)

Scope of Work

- Cost: $137,000
- Type: Time and Materials
- Schedule to Complete: 7 Months



Questions

Hydraulic Analyses
and Stakeholder Meeting for the
FCWD Preliminary Engineering Report

for Franklin County Water District

Tony Smith, P.E.

David Harkins, P.E., PhD.

Phil Bullock, P.E.

Engineers...Working Wonders With Water®

April 5th, 2016

Carollo delivers national expertise specializing in only water and wastewater

WATER

OUR FOCUS

OUR BUSINESS

OUR PASSION

Lake Cypress Springs

urley

2723

3122

900

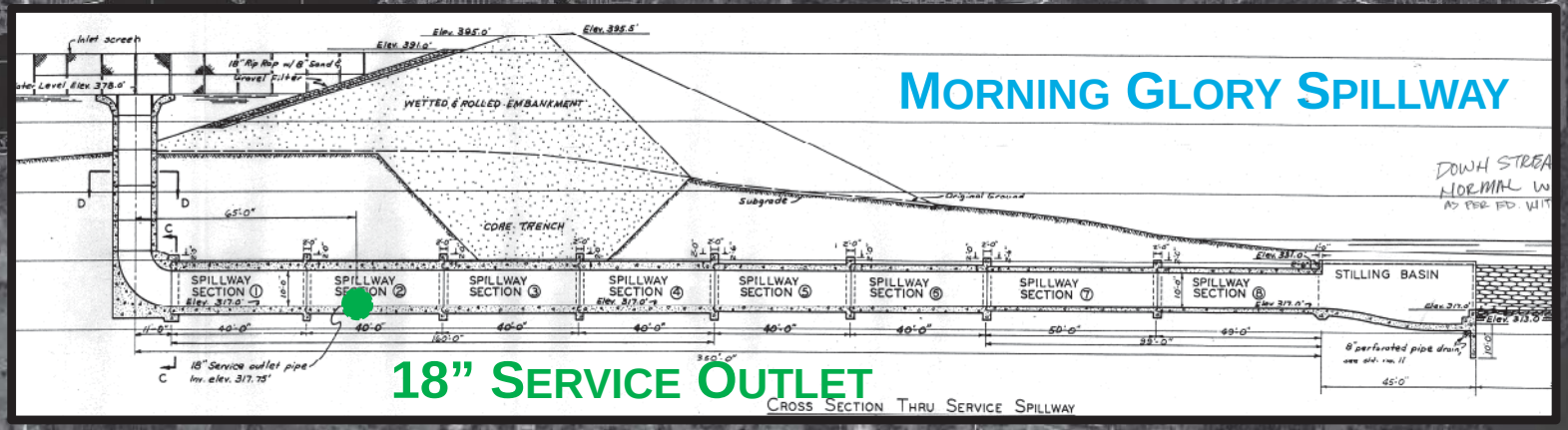
EMERGENCY SPILLWAY

Co Rd SE 3122

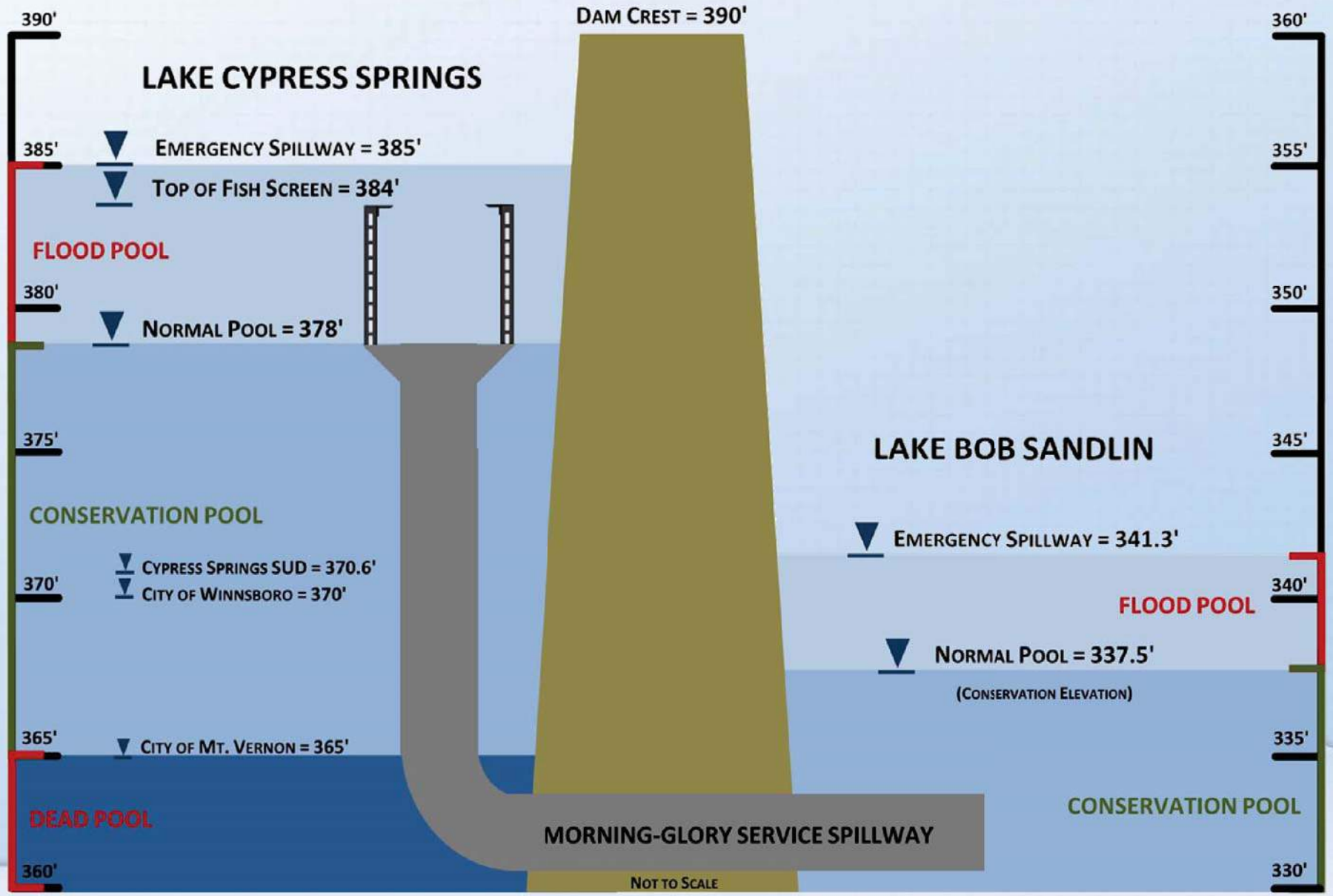
Lake Cypress Springs

LCS DAM

LAKE BOB SANDLIN



Lake Cypress Springs Spillway



18” Service Outlet Function and Abilities

Lake Cypress Springs WSE	Lake Bob Sandlin WSE	Flow Through 18" Conduit	
(feet)	(feet)	(ac-ft/day)	(cfs)
385	337.5	73.27	36.94
384	337.5	72.76	36.68
383	337.5	72.25	36.43
382	337.5	71.74	36.17
381	337.5	71.69	36.14

At 75 ac-ft/day it takes ~43 days to lower the pool by 1 foot (0.28 inches per day)

*** Lake Cypress Springs has a 3,252.33 acre surface-area at conservation pool (TWDB)**

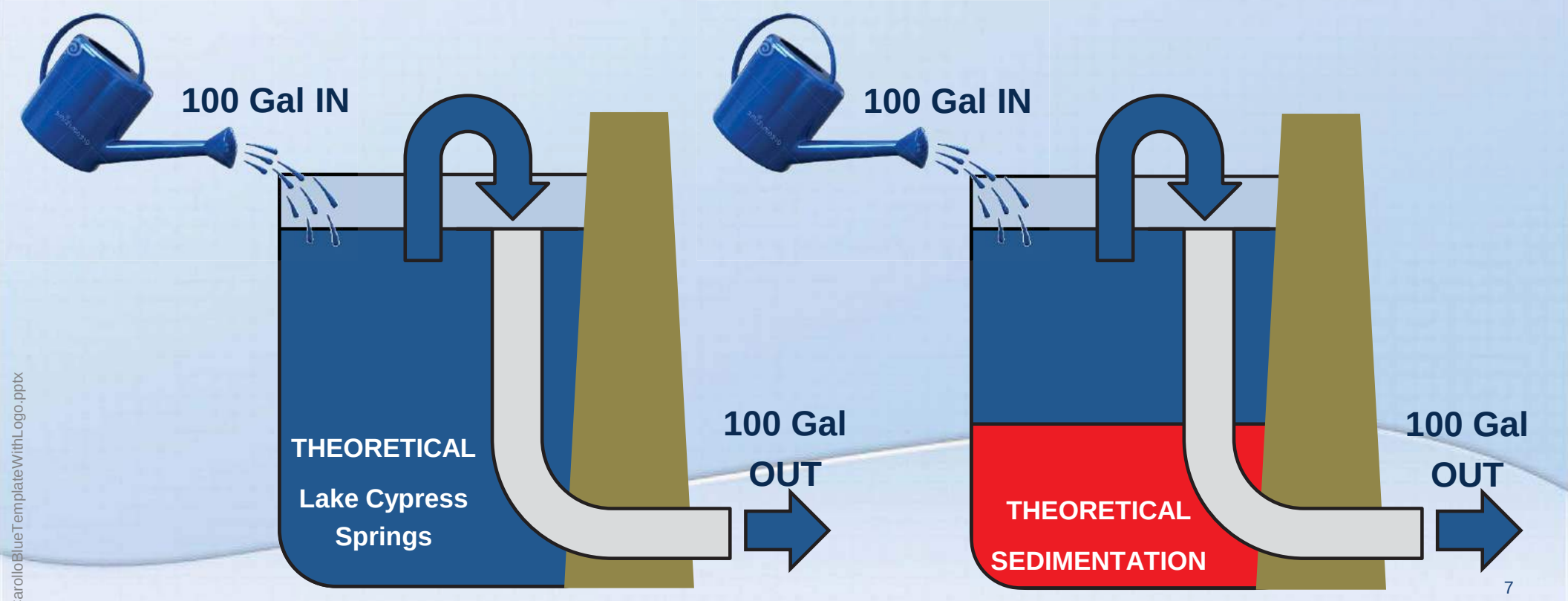
Does Lake Bob Sandlin's Elevation Matter?

Lake Cypress Springs WSE	Lake Bob Sandlin WSE	Total Flow	
(feet)	(feet)	(ac-ft/day)	(cfs)
385	345	2,639.40	1330.70
385	344	2,640.37	1331.18
385	343	2,641.32	1331.67
385	342	2,642.27	1332.14
385	341	2,643.20	1332.61

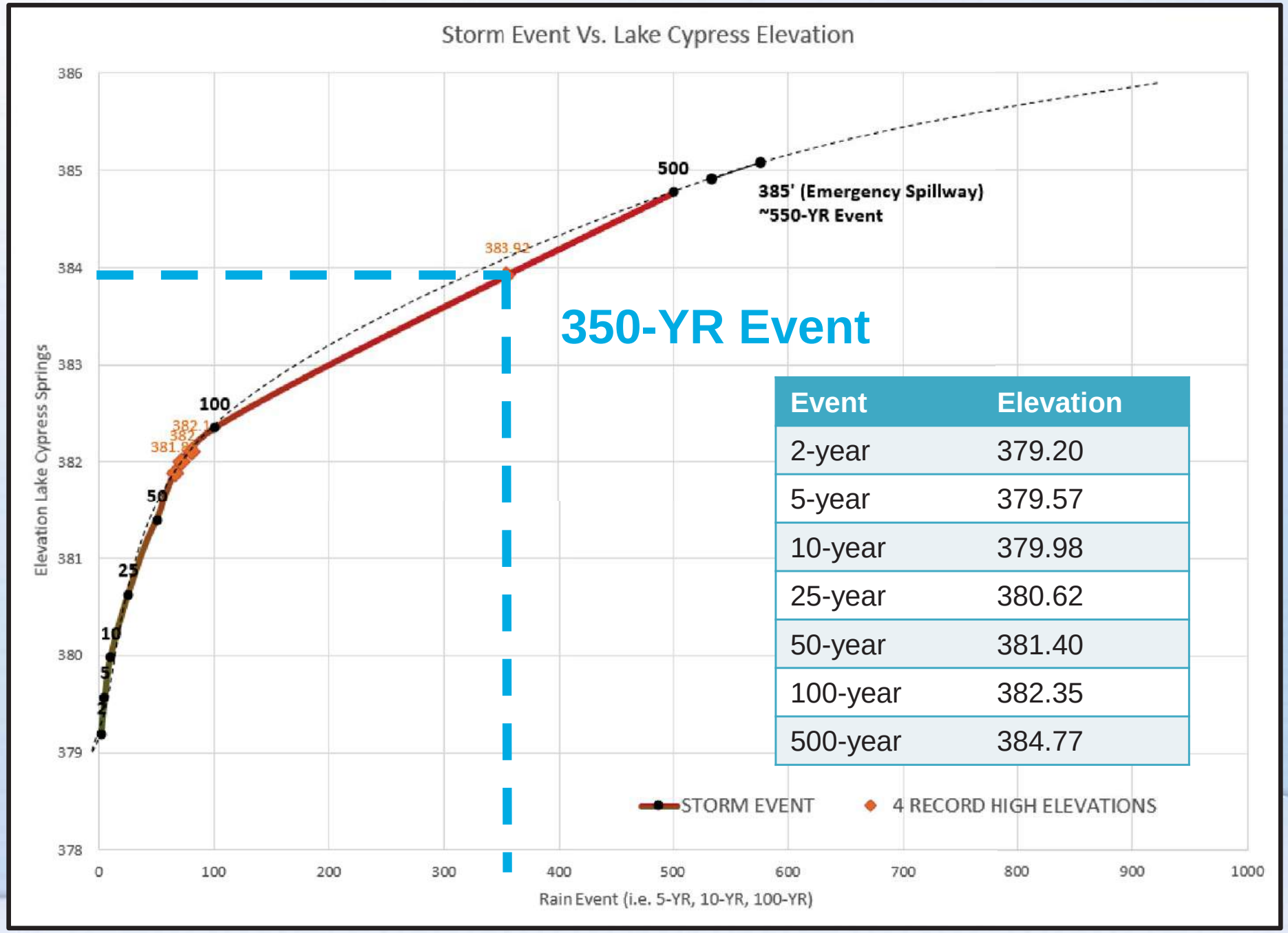
The Lake Level of Bob Sandlin has only minimal effect on Spillway Flows

Can sedimentation cause flooding?

<u>If LCS reservoir elevation is at conservation pool (378') or above</u>, reservoir sedimentation below the conservation pool will not increase flooding



December 2015 Event (383.92')



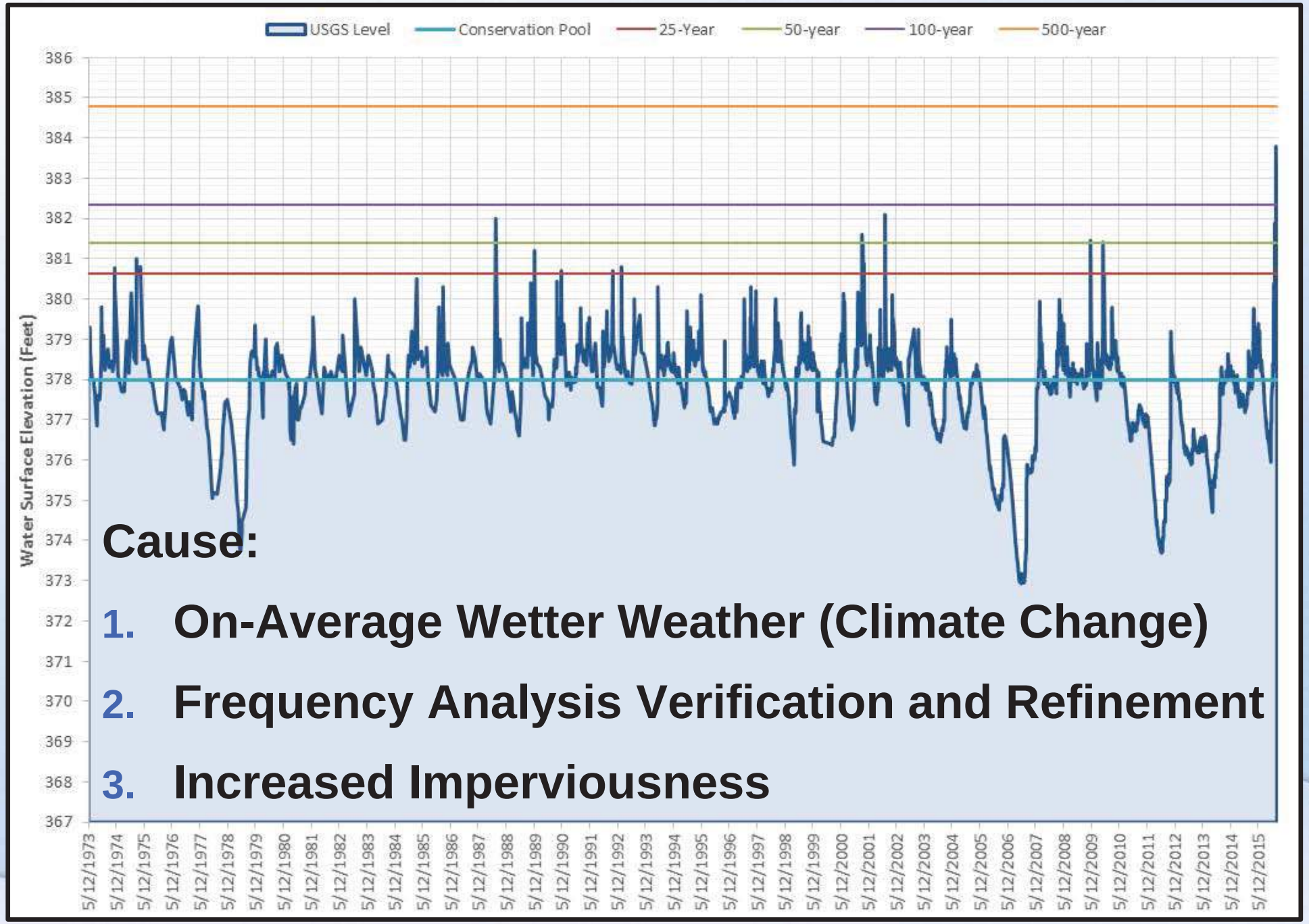
Event	Elevation
2-year	379.20
5-year	379.57
10-year	379.98
25-year	380.62
50-year	381.40
100-year	382.35
500-year	384.77

What is a X-year Storm Event?

A 100-year flood means that there is one chance in 100 (1%) of a flood occurring **in each year**.

A common misinterpretation exists that a 100-year flood is likely to occur only **once in a 100-year period**. In fact, there is approximately a **63.4%** chance of one or more 100-year floods occurring in any 100-year period.

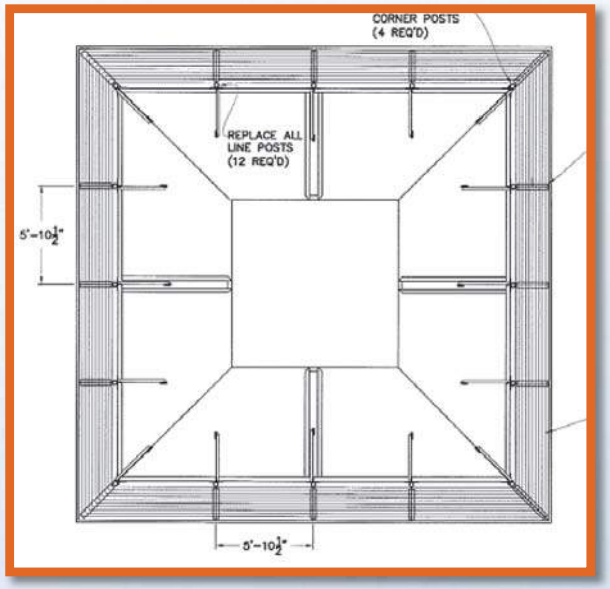
What is a X-year Storm Event?

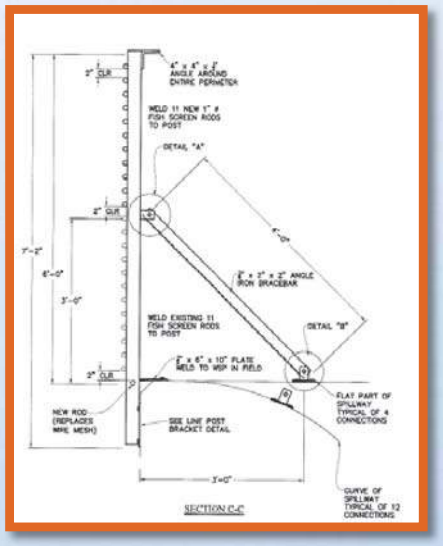


Cause:

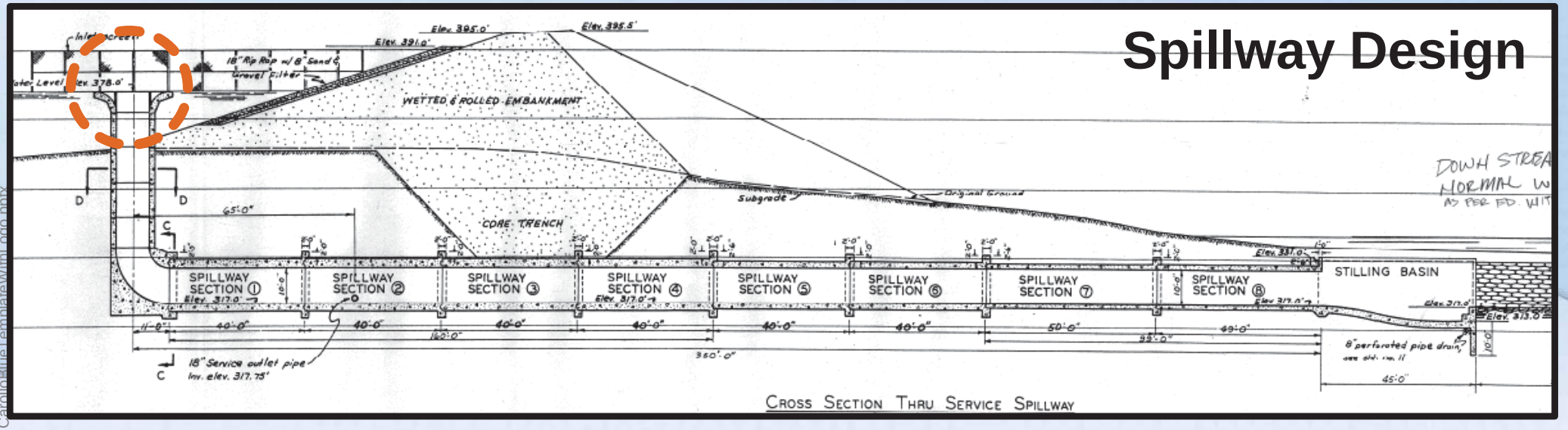
1. **On-Average Wetter Weather (Climate Change)**
2. **Frequency Analysis Verification and Refinement**
3. **Increased Imperviousness**

Fish Screen Design



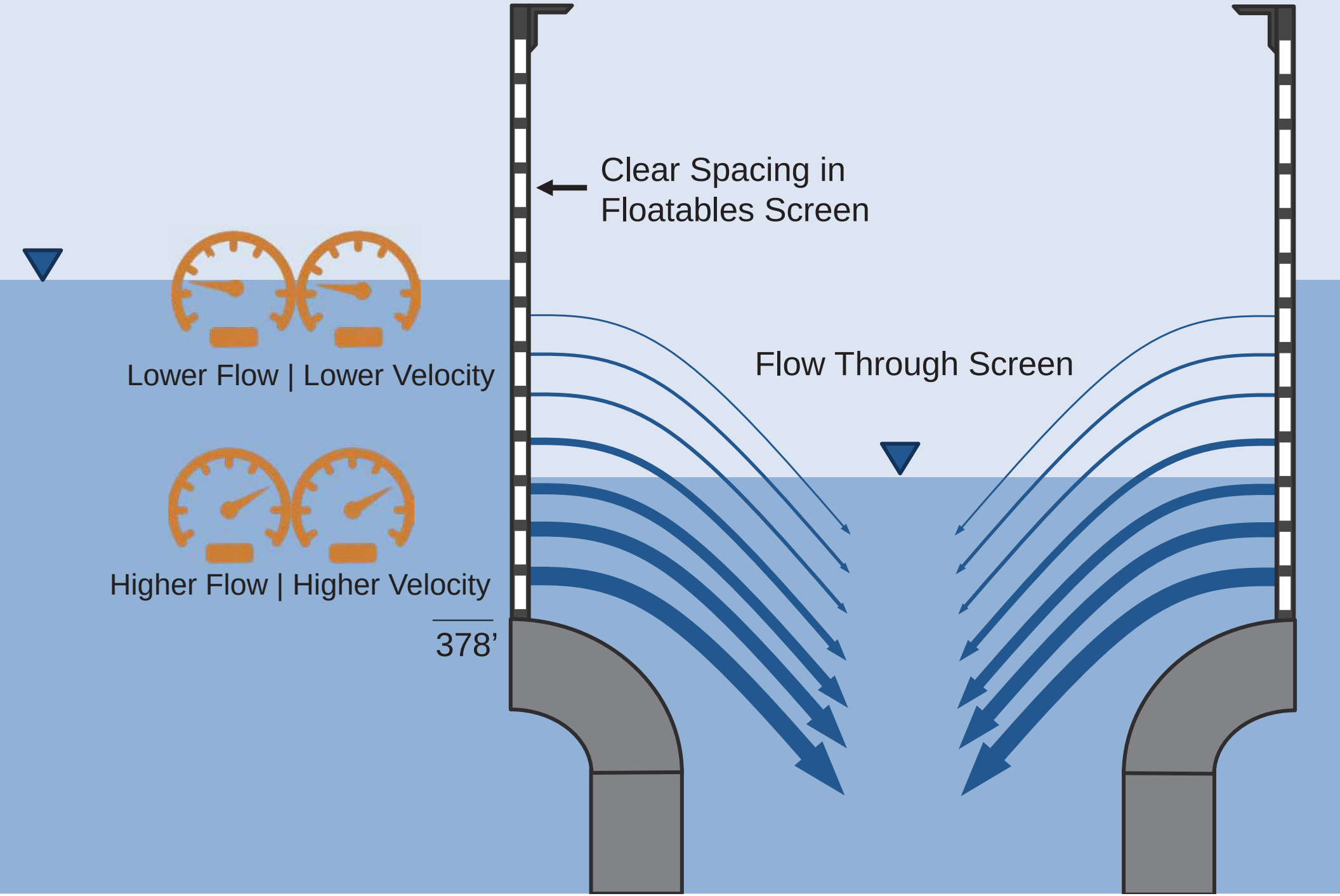


Spillway Design

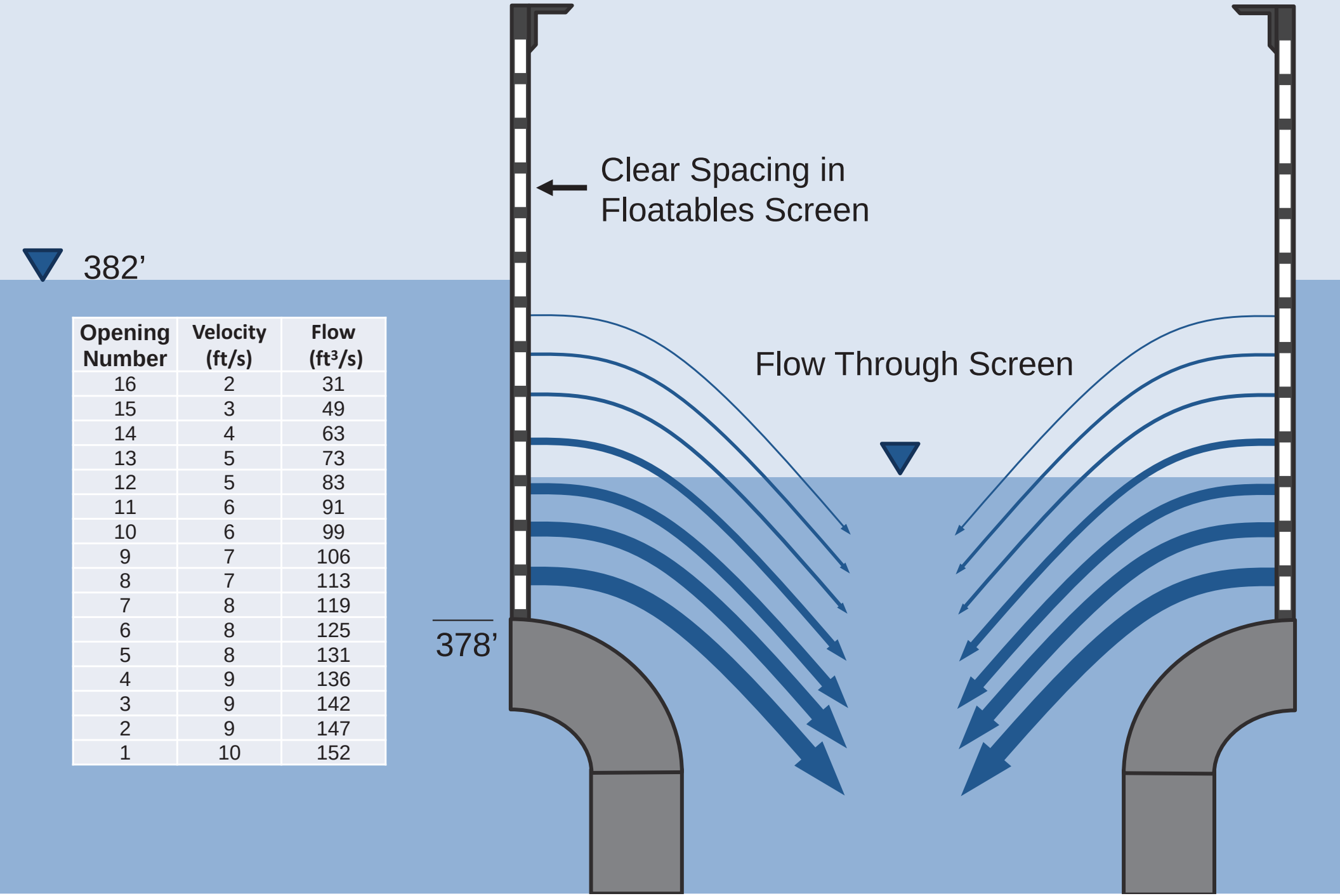


Cross Section Thru Service Spillway

Fish Screen Flow Schematic

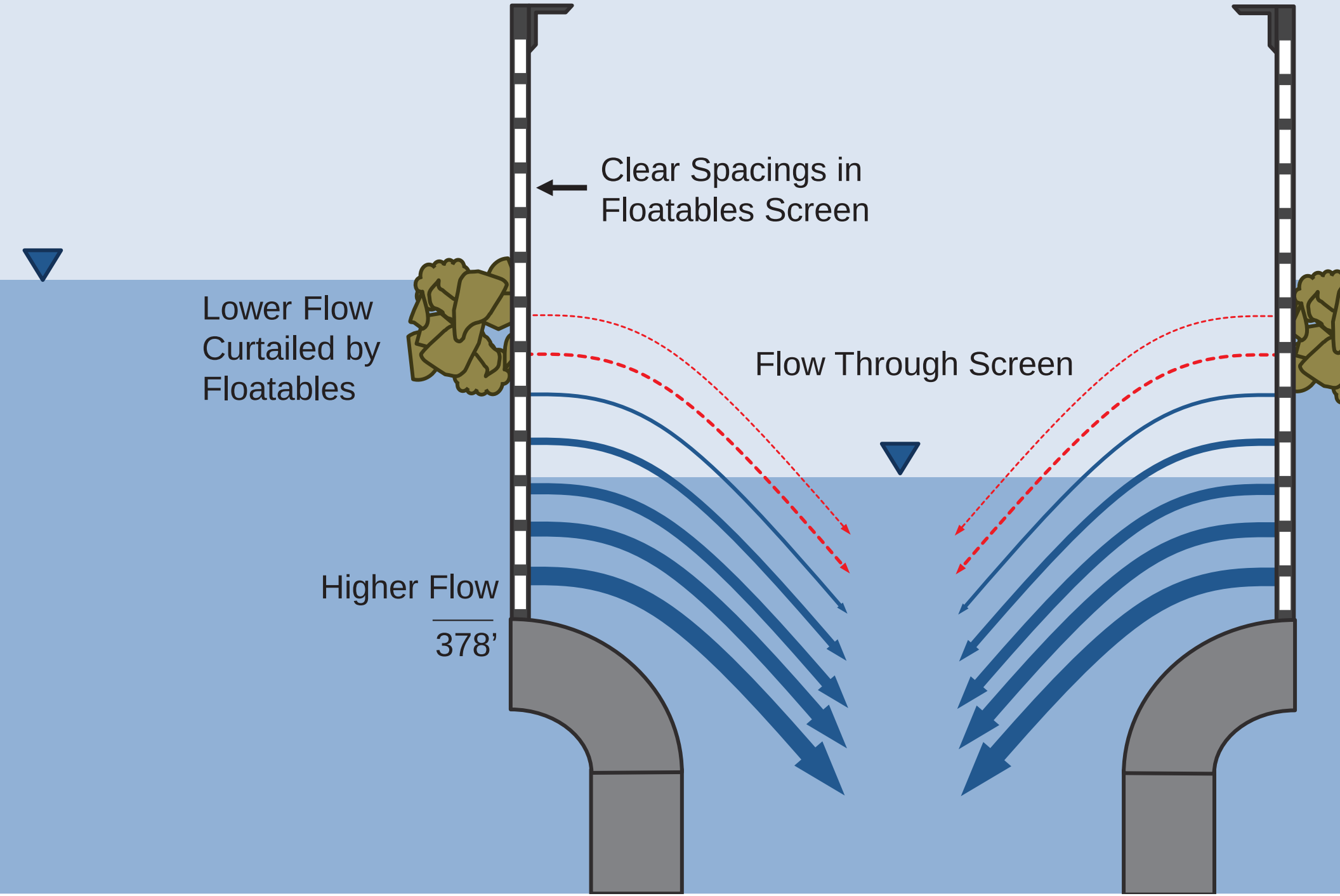


Example at Lake Level 382’

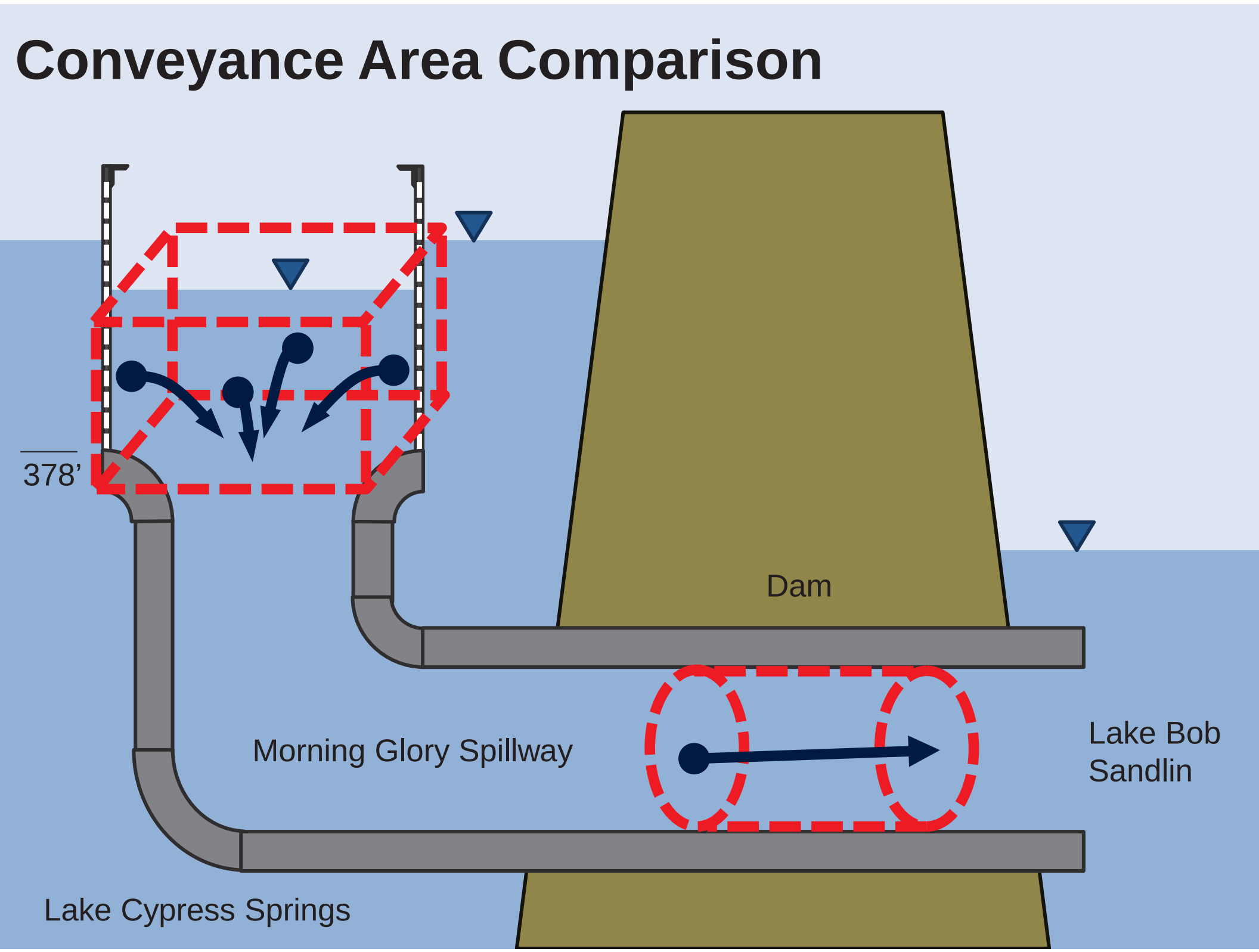


Opening Number	Velocity (ft/s)	Flow (ft^3/s)
16	2	31
15	3	49
14	4	63
13	5	73
12	5	83
11	6	91
10	6	99
9	7	106
8	7	113
7	8	119
6	8	125
5	8	131
4	9	136
3	9	142
2	9	147
1	10	152

Example: Floatables Clogging Fish Screen

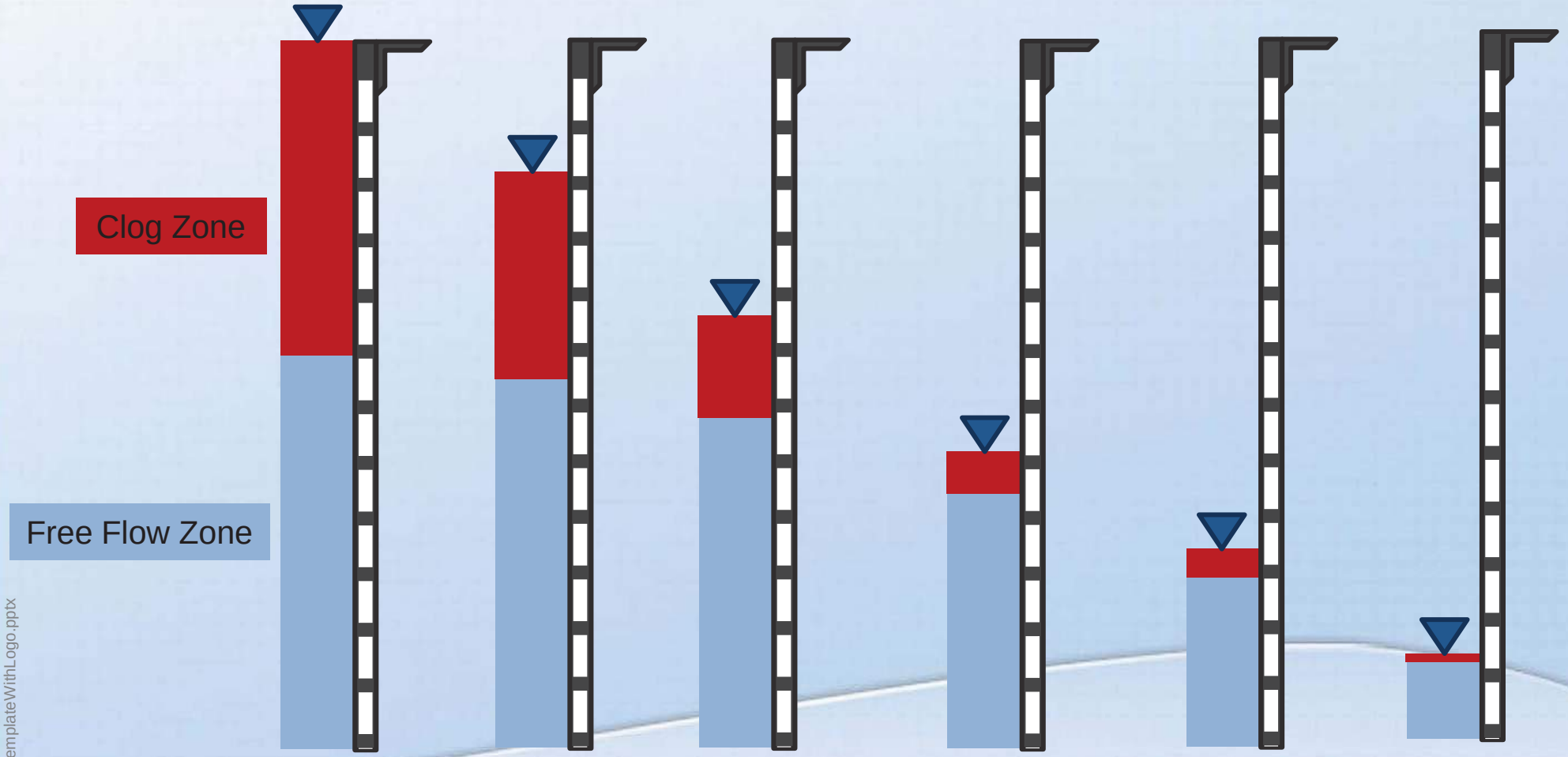


Conveyance Area Comparison

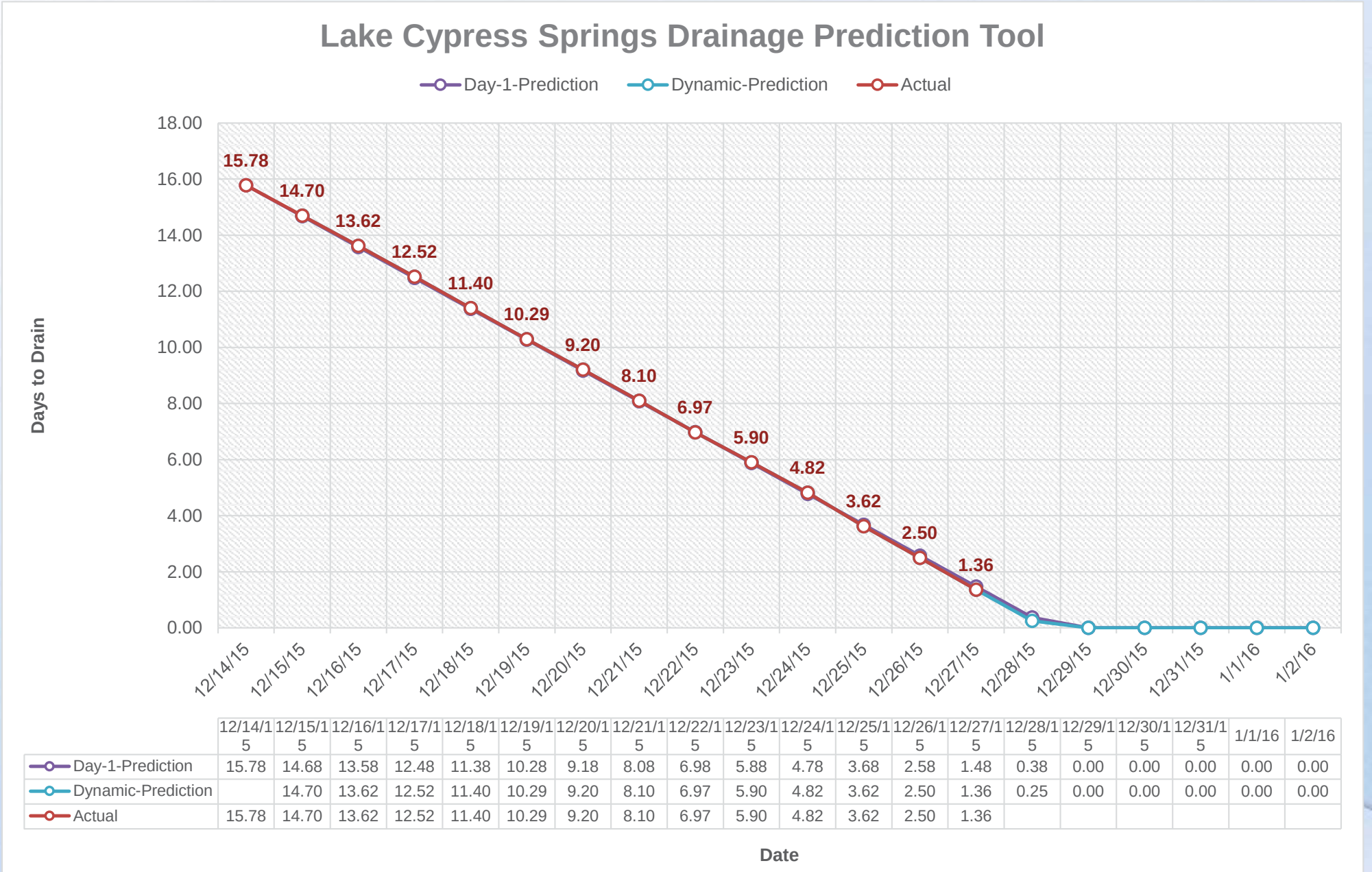


Clogging Calculations

WSE	384’	383’	382’	381’	380’	379’
Area Clog	46%	33%	21%	13%	8%	4%
Meas.-Down	2.75’	1.67’	0.83’	0.38’	0.17’	0.04

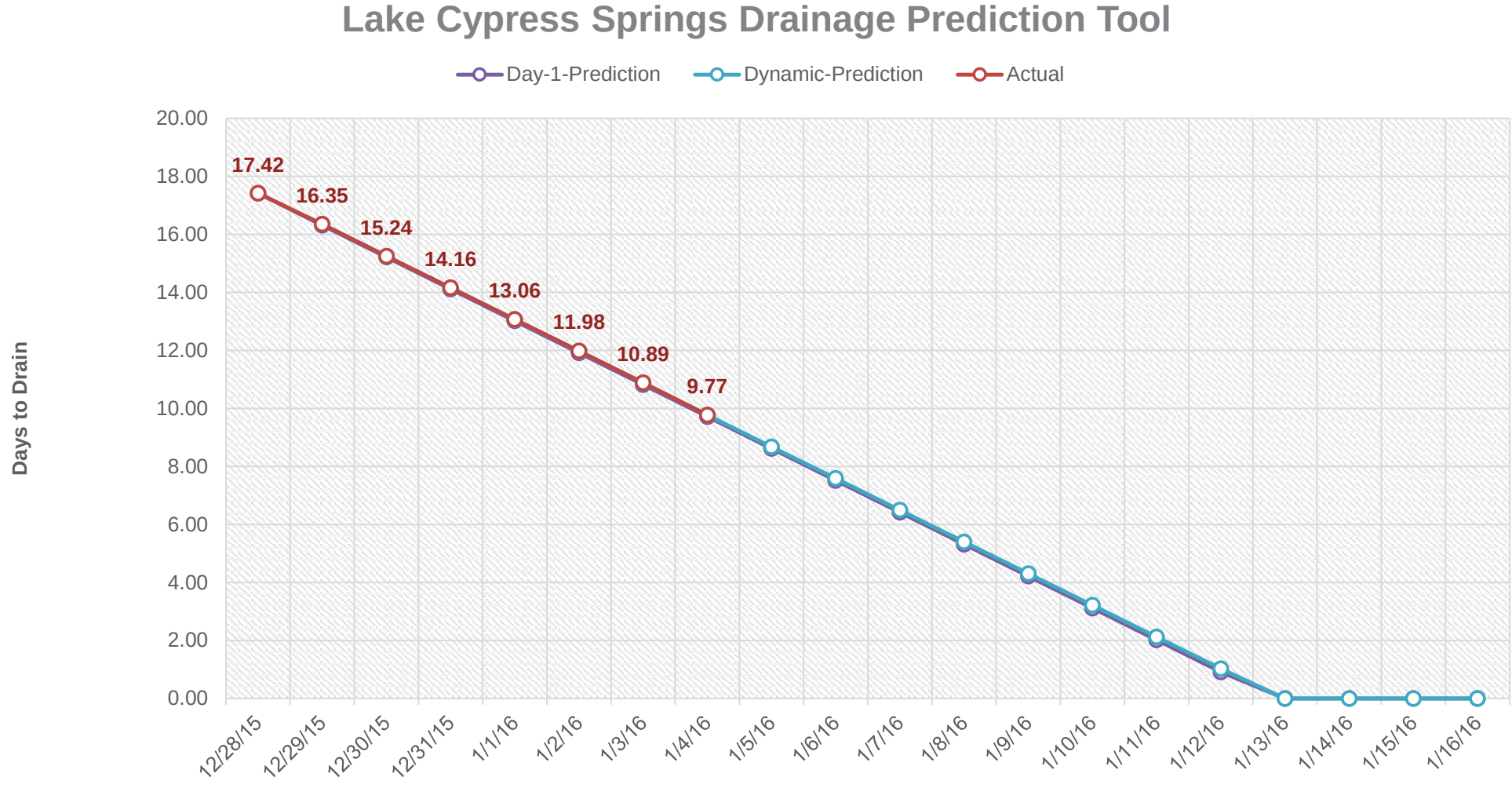


Time to Drain the Reservoir



	12/14/15	12/15/15	12/16/15	12/17/15	12/18/15	12/19/15	12/20/15	12/21/15	12/22/15	12/23/15	12/24/15	12/25/15	12/26/15	12/27/15	12/28/15	12/29/15	12/30/15	12/31/15	1/1/16	1/2/16
Day-1-Prediction	15.78	14.68	13.58	12.48	11.38	10.28	9.18	8.08	6.98	5.88	4.78	3.68	2.58	1.48	0.38	0.00	0.00	0.00	0.00	0.00
Dynamic-Prediction		14.70	13.62	12.52	11.40	10.29	9.20	8.10	6.97	5.90	4.82	3.62	2.50	1.36	0.25	0.00	0.00	0.00	0.00	0.00
Actual	15.78	14.70	13.62	12.52	11.40	10.29	9.20	8.10	6.97	5.90	4.82	3.62	2.50	1.36						

Time to Drain the Reservoir

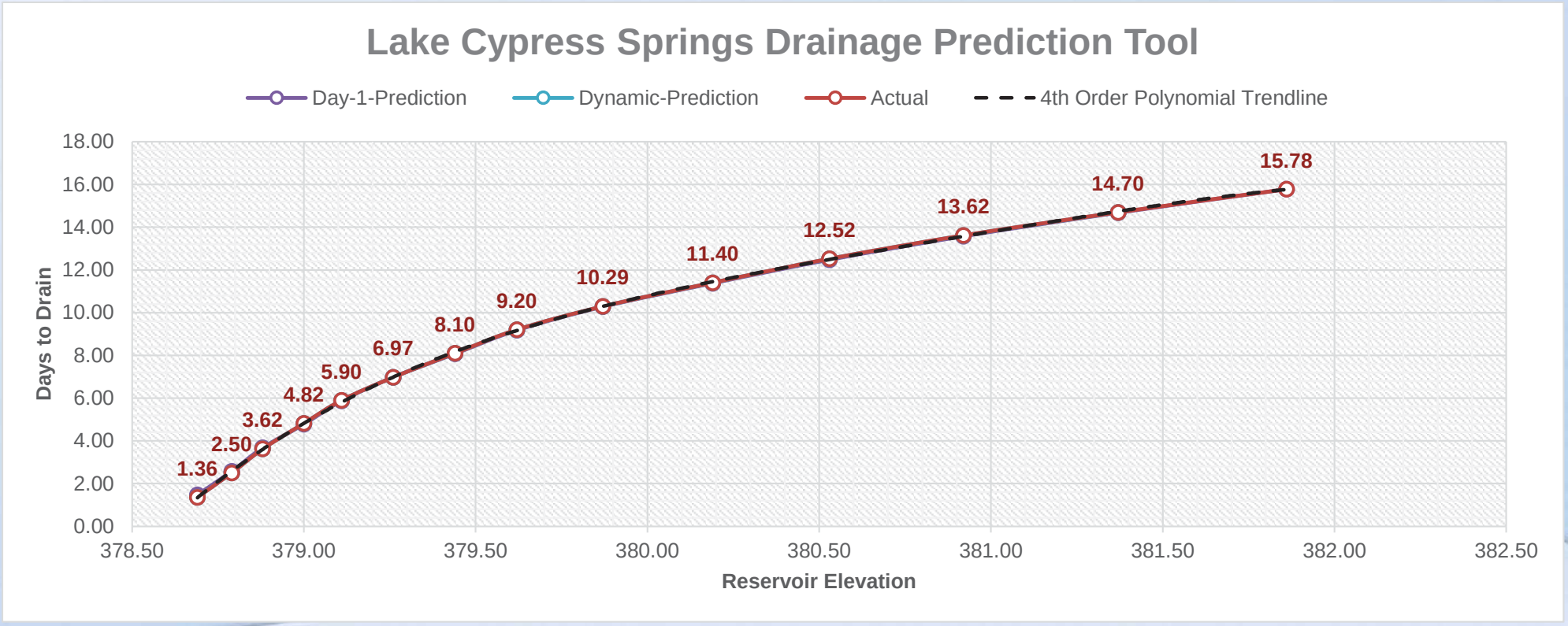


	12/28/15	12/29/15	12/30/15	12/31/15	1/1/16	1/2/16	1/3/16	1/4/16	1/5/16	1/6/16	1/7/16	1/8/16	1/9/16	1/10/16	1/11/16	1/12/16	1/13/16	1/14/16	1/15/16	1/16/16
Day-1-Prediction	17.42	16.32	15.22	14.12	13.02	11.92	10.82	9.72	8.62	7.52	6.42	5.32	4.22	3.12	2.02	0.92	0.00	0.00	0.00	0.00
Dynamic-Prediction		16.35	15.24	14.16	13.06	11.98	10.89	9.77	8.68	7.59	6.49	5.40	4.31	3.22	2.12	1.03	0.00	0.00	0.00	0.00
Actual	17.42	16.35	15.24	14.16	13.06	11.98	10.89	9.77												

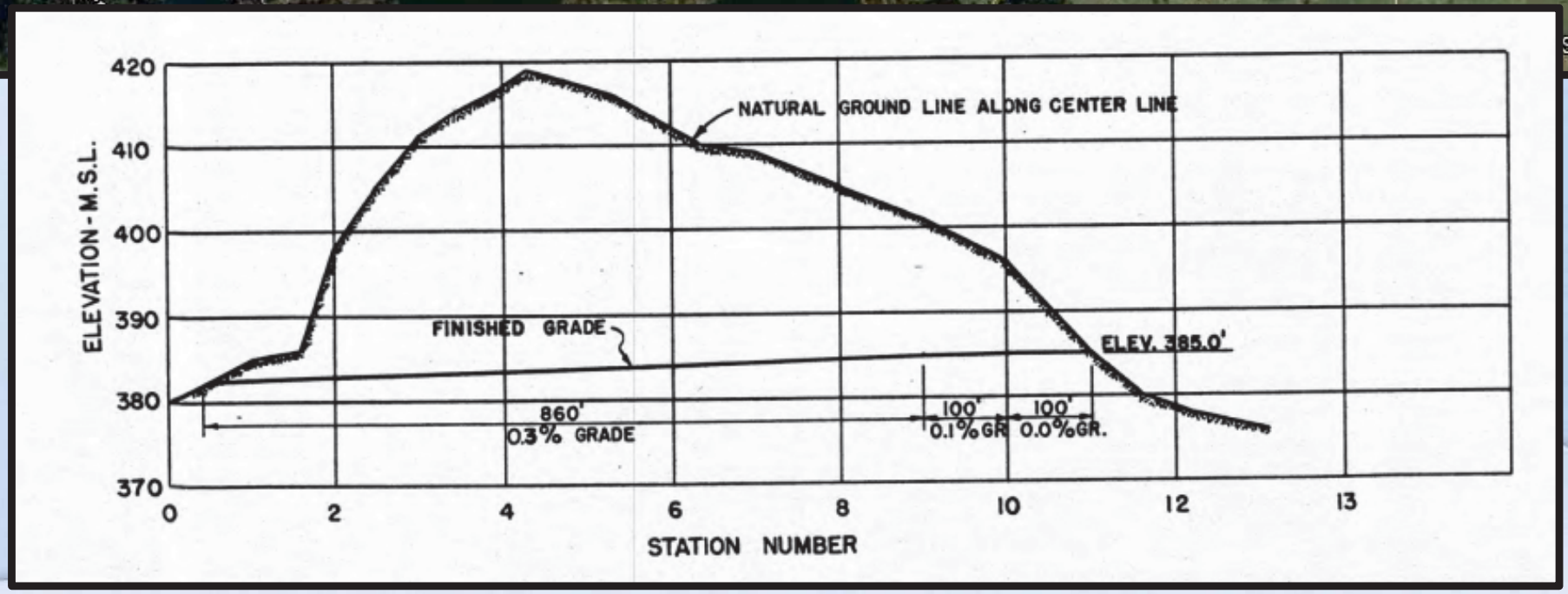
Establishing the Drainage Prediction Formula

$$y = -0.223532182847975x^4 + 340.575147612204x^3 - 194,588.651968243x^2 + 49,412,856.9770127x - 4,705,373,779.88359$$

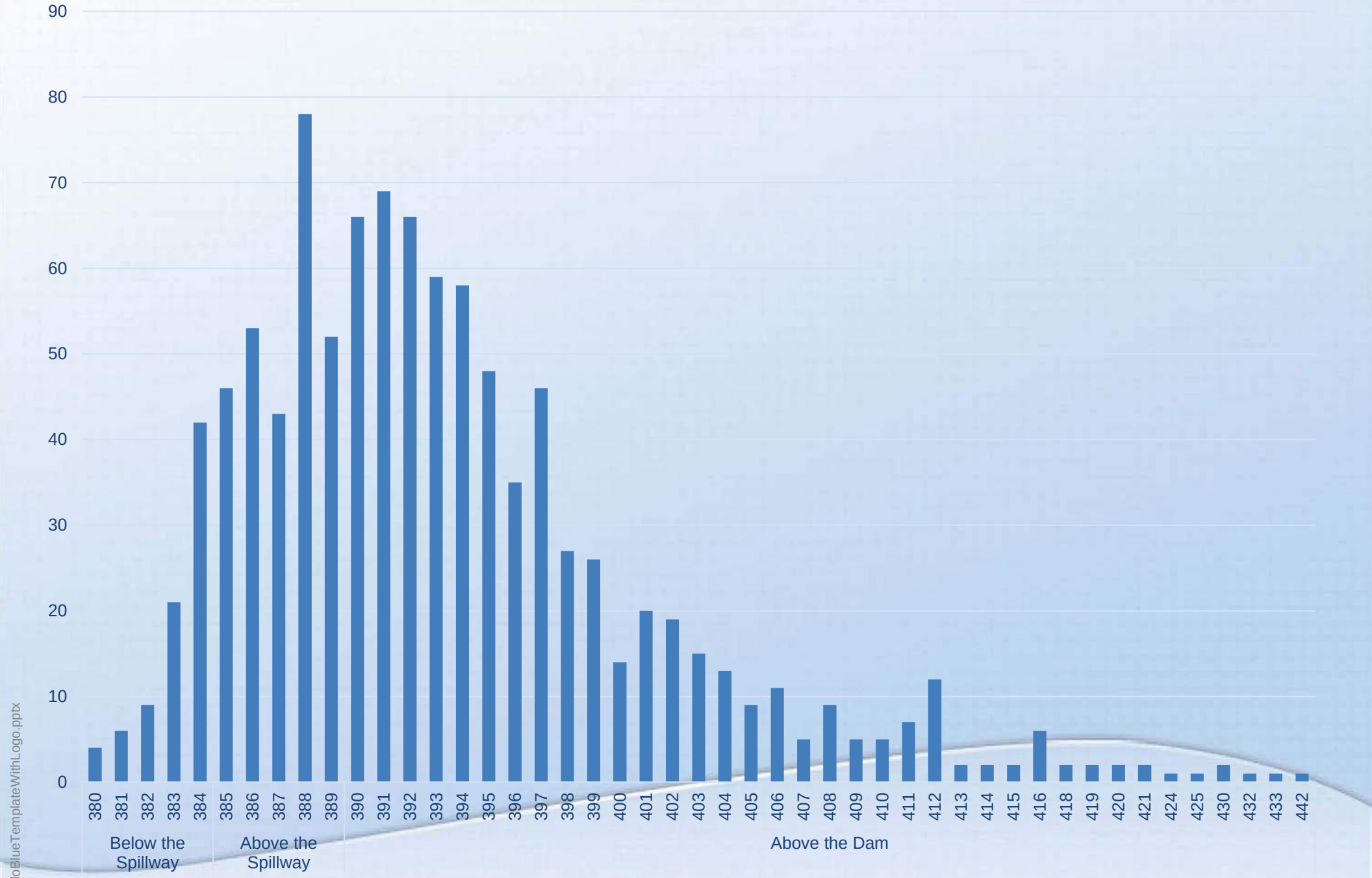
- **Complex formula but essentially says, if the reservoir elevation is X, then the days to drain is Y.**
- **For example, if the reservoir elevation is 380.5, it will take approximately 12.5 days to drain**



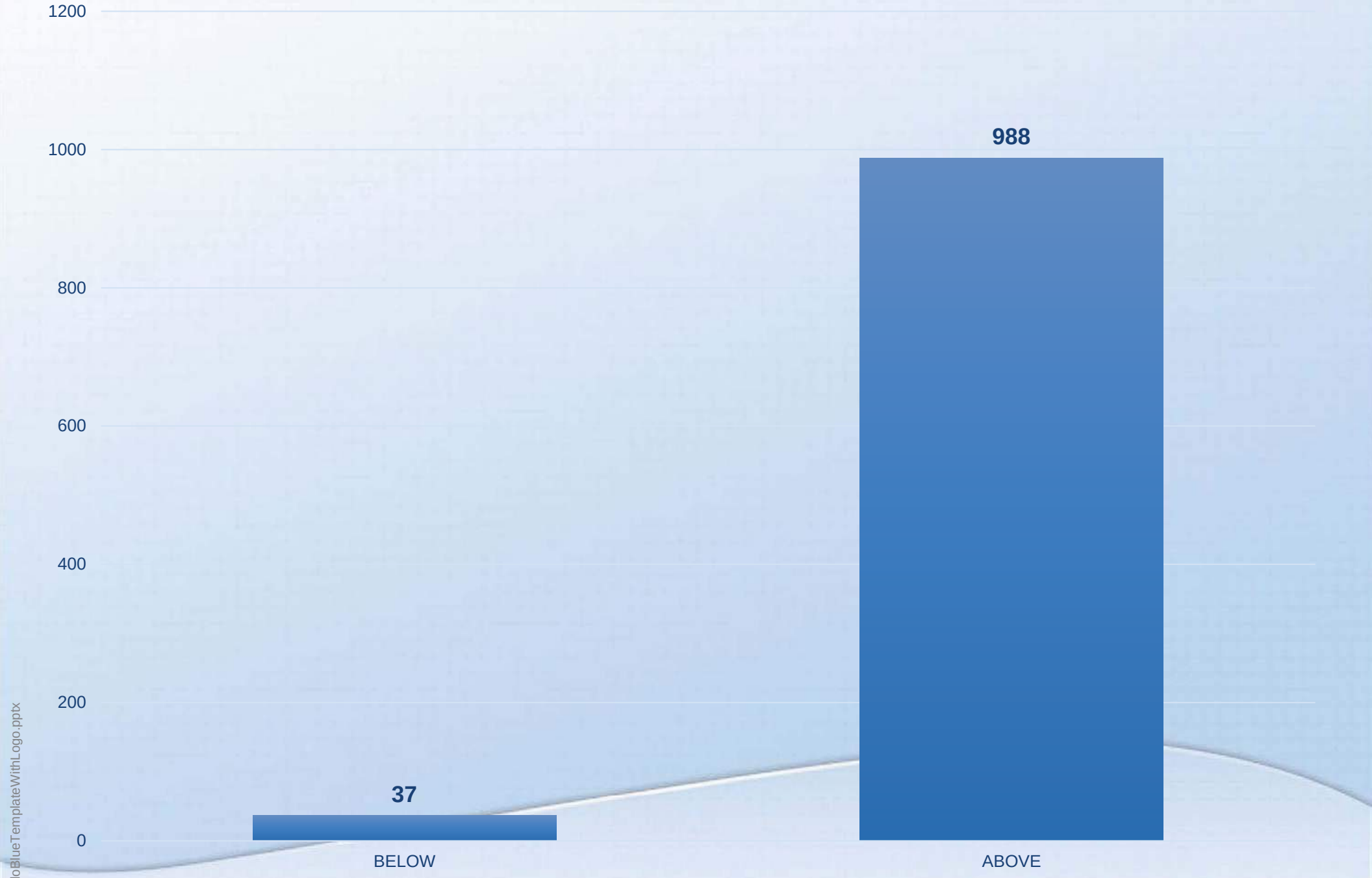
Emergency Spillway



Lake Cypress Springs Home Elevation Survey Results



Count of Homes for December 2015 Event (383.92')

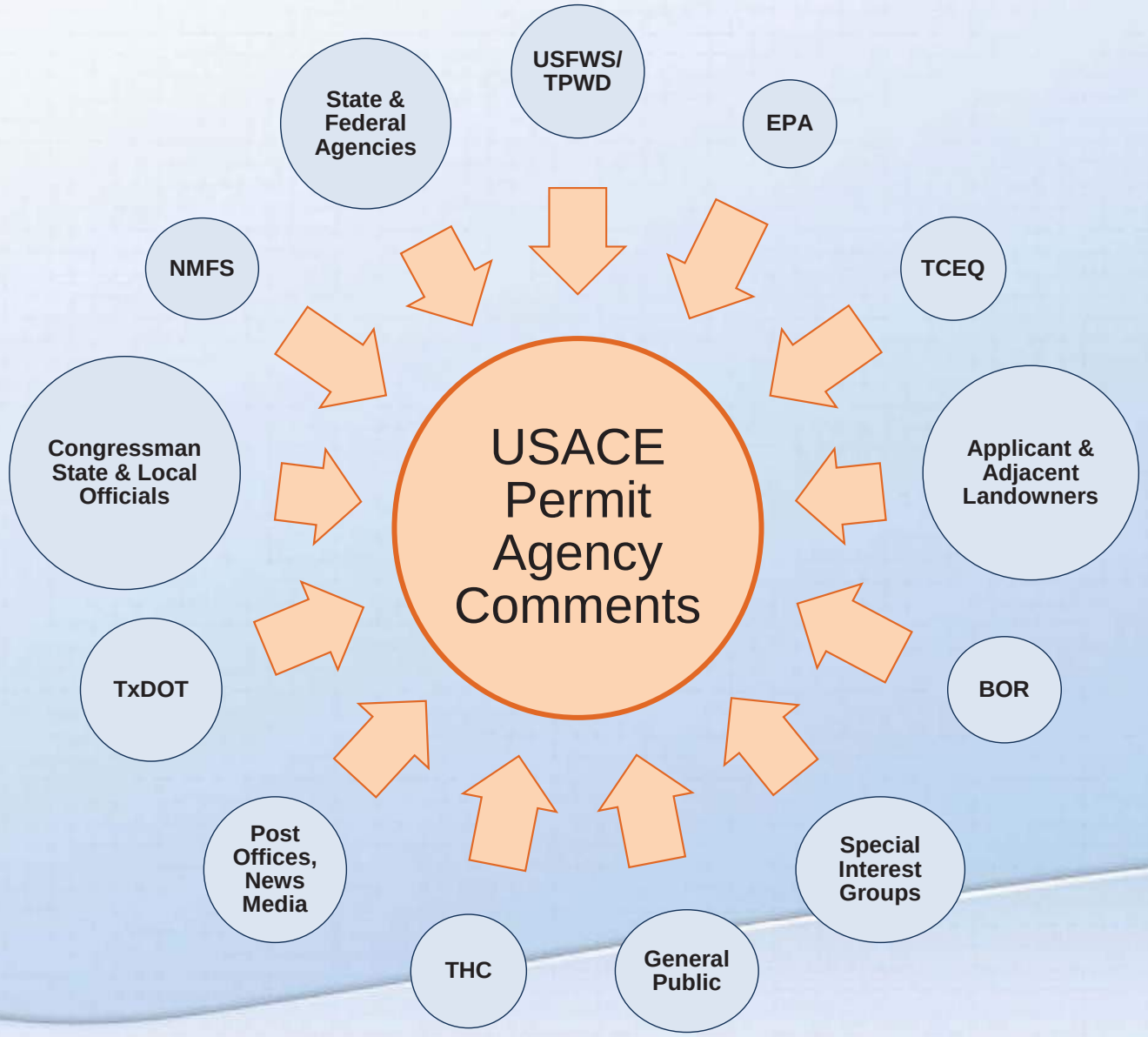


Potential Areas of Consideration

- Stakeholder Assessment Metrics
  - Input from the Stakeholders on alternatives
- Jurisdictional Assessment and Identification of Possible Permitting Requirements
  - US Army Corp of Engineers (USACE)
  - US Environmental Protection Agency (EPA)
  - Texas Commission on Environmental Quality (TCEQ)
  - Texas Department of Transportation (TxDOT)
  - Texas Parks and Wildlife Department (TPWD)
  - Others
- Impacts to Hydraulics
- Cost

USACE Permit Process
State and Federal Regulation

US Army Corps of Engineers®



- **EPA** – U.S. Environmental Protection Agency
- **USFWS** – U.S. Fish and Wildlife Service
- **TPWD** – Texas Parks and Wildlife Department
- **NMFS** – National Marine Fisheries Services
- **TxDOT** – Texas Department of Transportation
- **HUD** – U.S. Department of Housing and Urban Development
- **BOR** – Bureau of Reclamation
- **SHPO** – State Historic Preservation Office
- **TCEQ** – Texas Commission on Environmental Quality
- **TCH** – Texas Historical Commission

Jurisdictional Hurdles with USACE

US Army Corps of Engineers®

- Modifications to the spillway may result in adverse impacts to Lake Cypress and downstream of the spillway including:
  - water quality,
  - aquatic biological communities,
  - State/federal listed threatened and endangered species,
  - jurisdictional wetland areas and waters of the US

- Modifications to the existing spillway could result in long-term ecological changes to both the lake and downstream riverine communities.

Jurisdictional Hurdles with EPA

- Under the Clean Water Act (CWA), EPA is charged with protecting and restoring the nation's waterways:
  - Water Quality
  - Water Quality Monitoring and Assessment
  - Wetlands
  - Environmental Impact Studies for Major Projects Impacting the Watershed

- EPA is directly responsible for Clean Water Act enforcement, and shares responsibility for administering the CWA Section 404 Permitting with the USACE.

Jurisdictional Hurdles with TCEQ

- TCEQ Dam Safety
  - USACE/TCEQ have strict guidelines restricting the design of dam-related components
- TCEQ Water Quality
  - Surge water through a proposed secondary spillway will cause water quality impacts downstream.
- TCEQ Sedimentation
  - Additional flow at higher velocities at a second location on the lake could cause additional sedimentation to discharge downstream

Jurisdictional Hurdles with TxDOT

- Modifications to the spillway could cross FM-3122 or FM-3007:
  - Bridge-Class Culverts
  - Gates, Bulkheads, or Stop Logs

Jurisdictional Hurdles with TPWD & USFWS

- Both organizations will require coordination and approval to proceed

Jurisdictional Hurdles with Special Interest Groups and Private Organizations

- Region D Planning Group
- Texas Water Development Board
- The Nature Conservancy of Texas
- Sierra Club
- National Wildlife Federation
- Center for Biological Diversity

Texas Water Development Board

The Nature Conservancy
Protecting nature. Preserving life.™

Sierra Club
Founded 1892

National Wildlife Federation

Center for Biological Diversity
Because life is good.

Public Stakeholder Questions

Structural Alternatives
and Stakeholder Meeting for the
FCWD Preliminary Engineering Report

for Franklin County Water District

David Harkins, P.E., PhD.

Phil Bullock, P.E.

Engineers...Working Wonders With Water®

July 27, 2016

Carollo delivers national expertise specializing ONLY in water and wastewater

WATER

OUR FOCUS

OUR BUSINESS

OUR PASSION

Lake Cypress Springs

urley

2723

3122

900

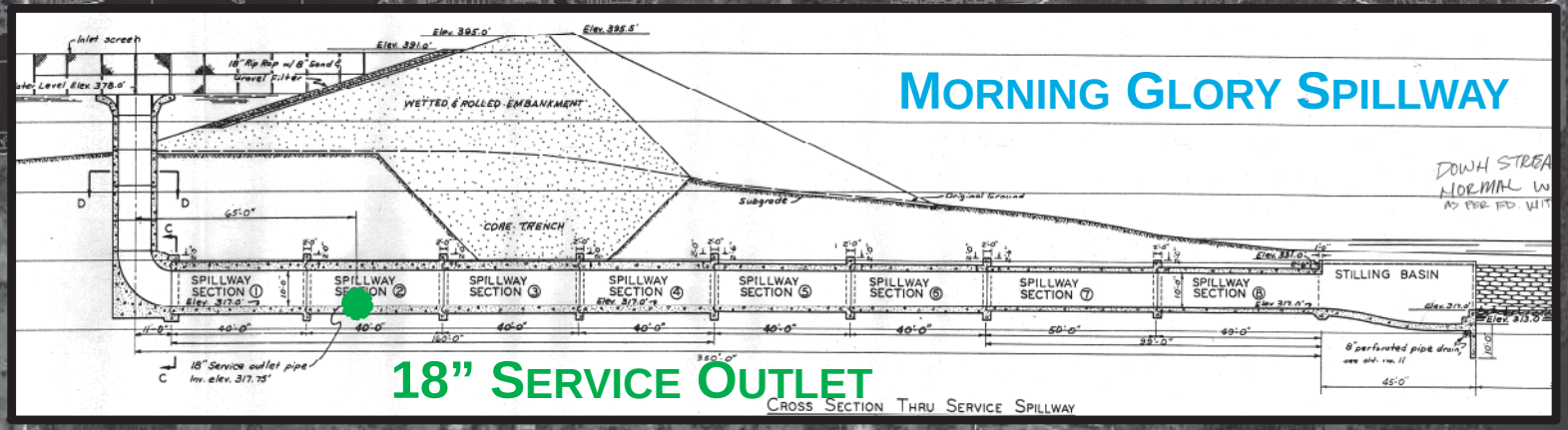
EMERGENCY SPILLWAY

Co Rd SE 3122

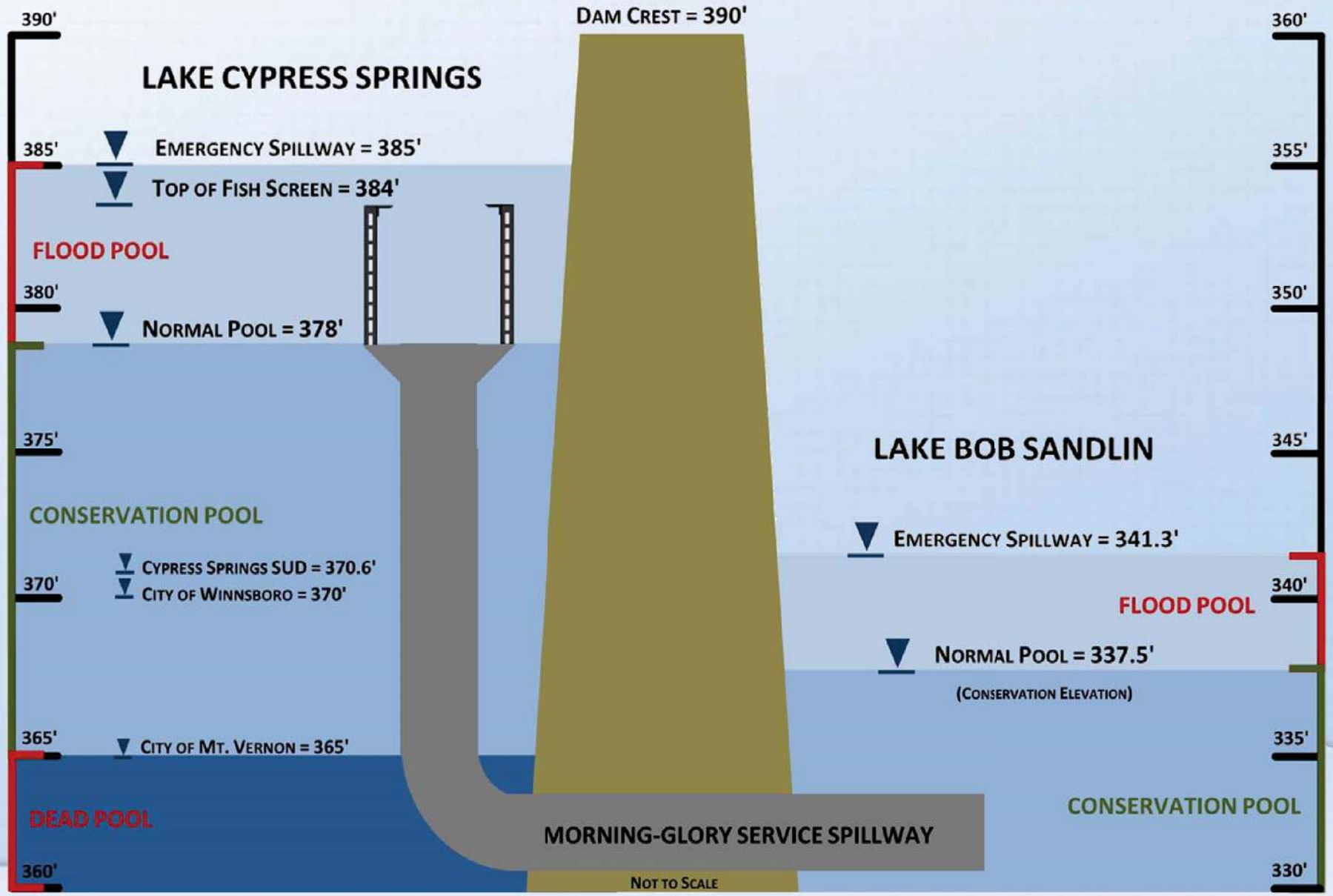
Lake Cypress Springs

LCS DAM

LAKE BOB SANDLIN



Lake Cypress Springs Spillway

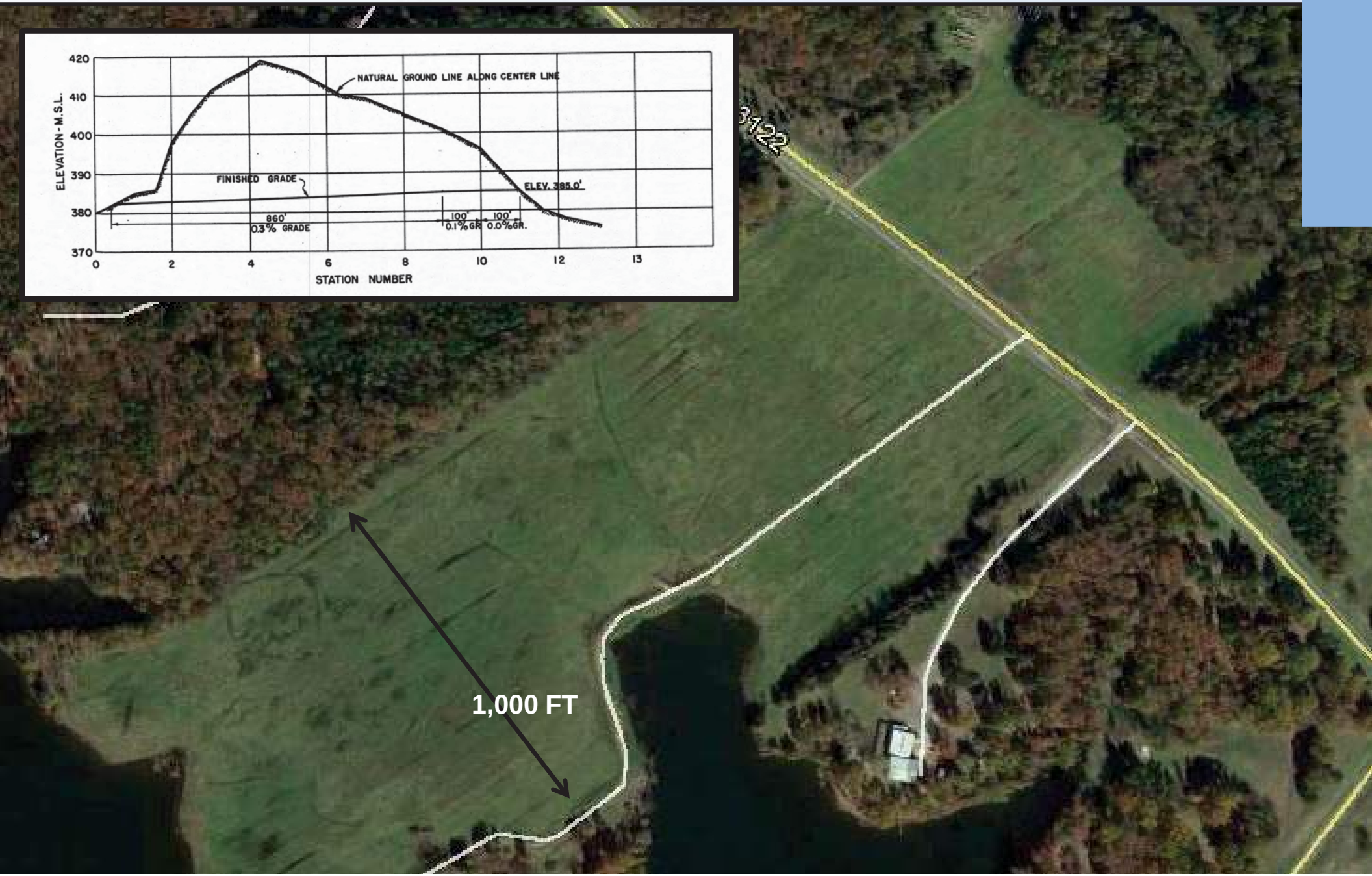


Structural Alternatives

1. Addition of canal on emergency spillway
2. Addition of box culverts on north end of Lake Cypress Springs Dam (LCS)
3. Add tainter gates to LCS dam (comparable to Lake Bob Sandlin (LBS))
4. Add pump station at north end of LCS Dam
5. Additional morning glory spillway

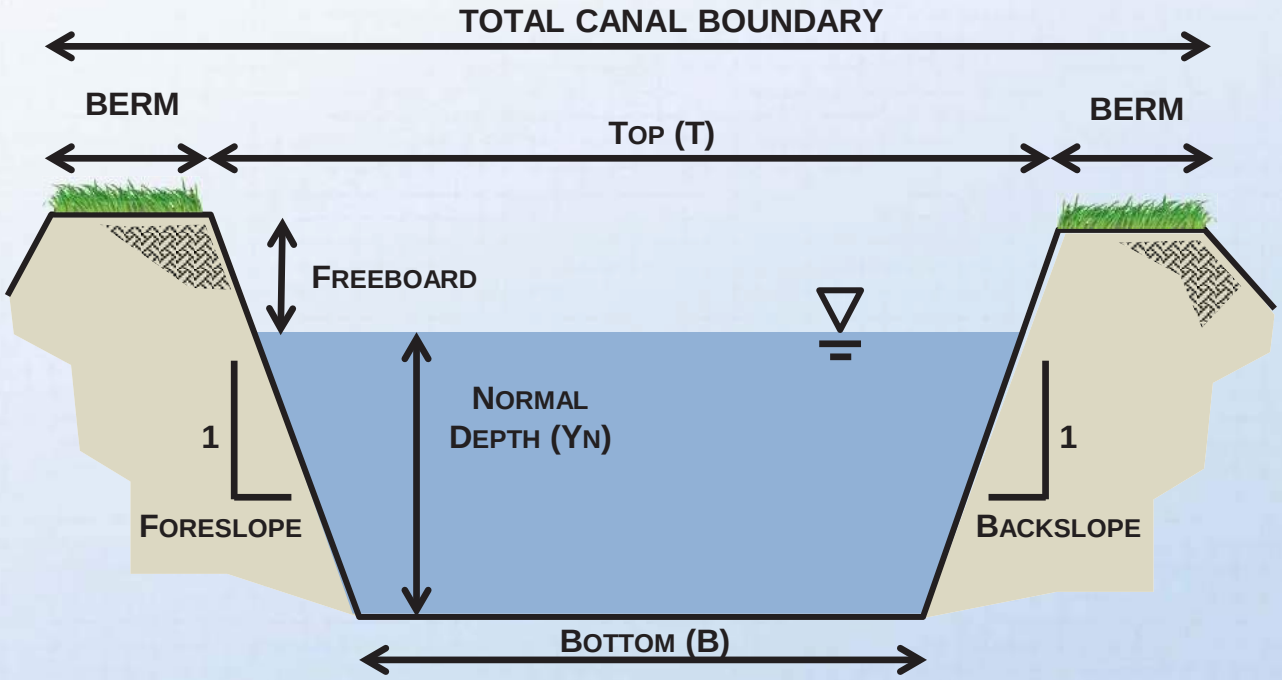
Operational Alternative

Additional Canal

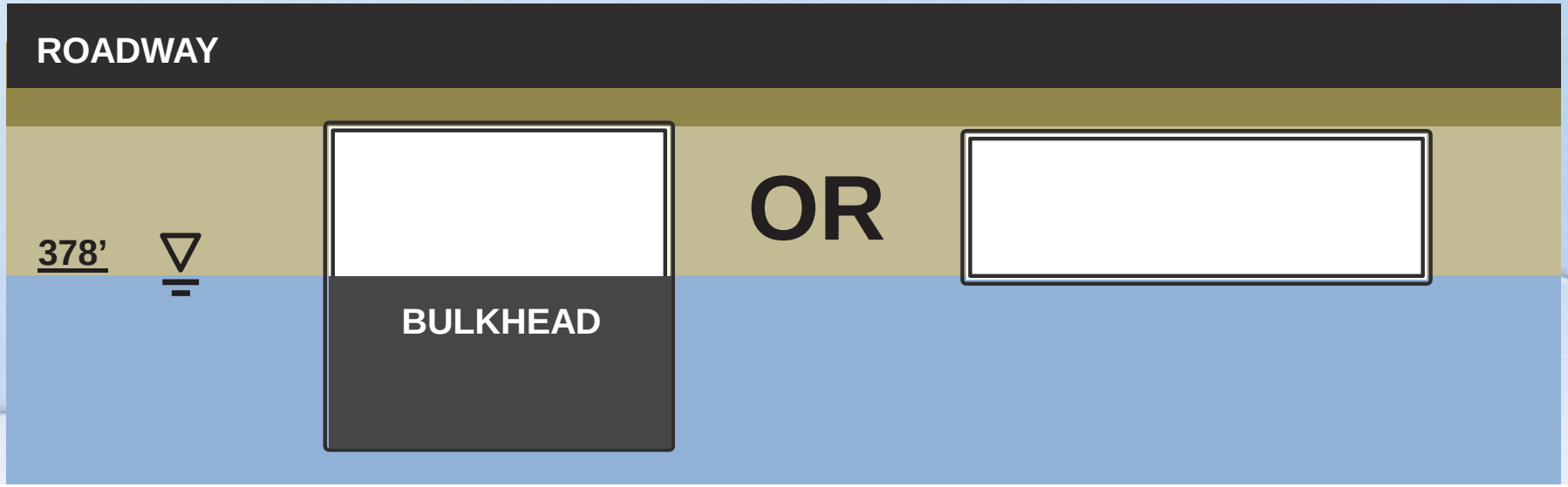


Additional Canal

Canal Section



Crossing Section



Canal Section

NATURAL CANALS

OVERBANK CANALS

CONCRETE LINED CANALS

Canal Section

Crossing Section

CAST-IN PLACE CULVERTS

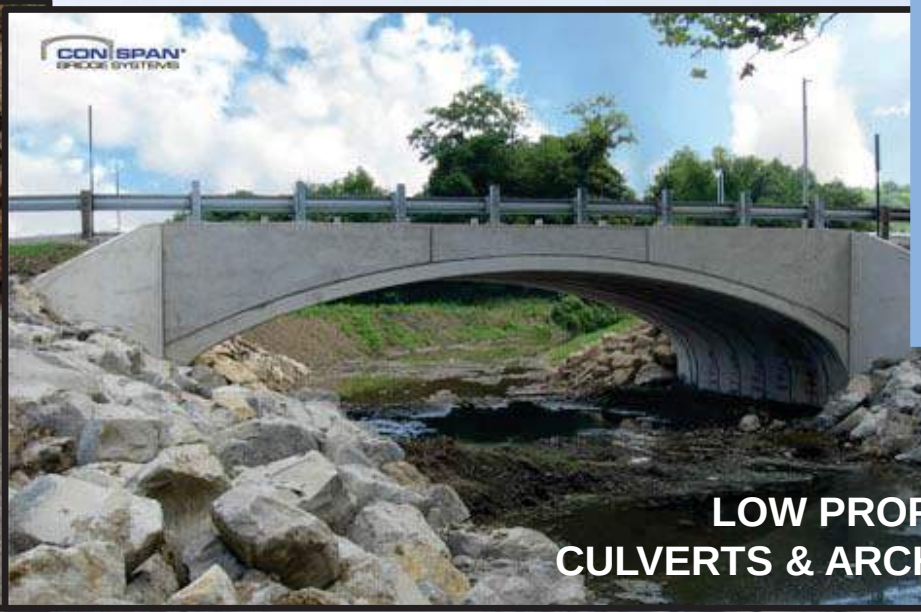
LOW PROFILE CULVERTS

BRIDGES

LOW WATER CROSSINGS

Crossing Section

PRE-CAST BOX
CULVERTS

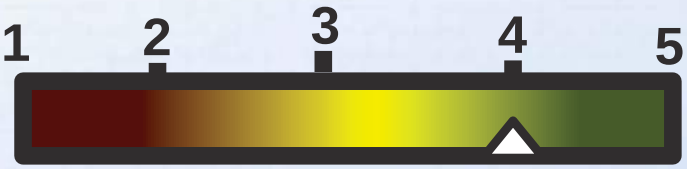


LOW PROFILE
CULVERTS & ARCHES

CORRUGATED
ROUND STEEL

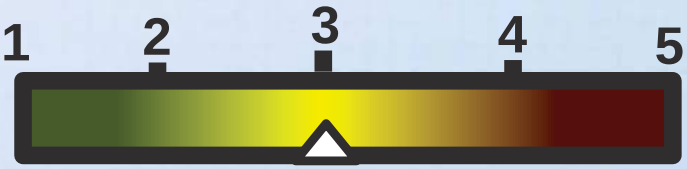
Carollo Conceptual Analysis

- **Feasibility – 4 (HIGH)**

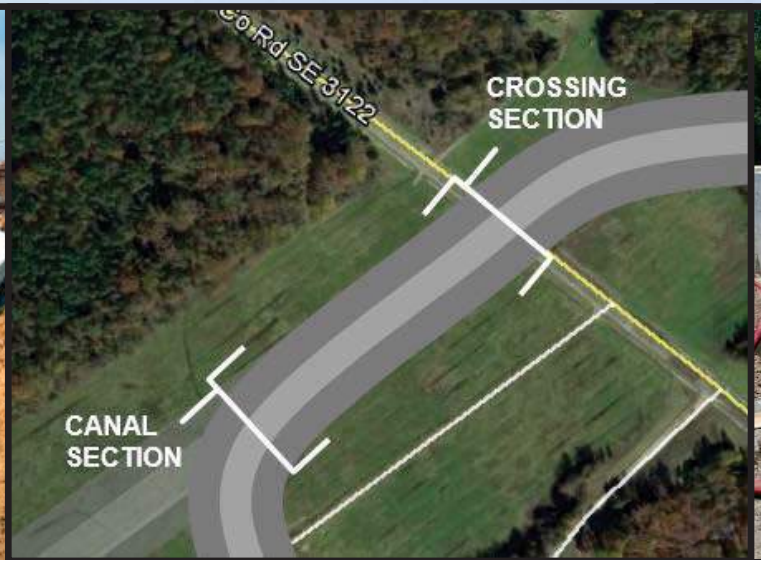


  - Possibly simpler permitting (because off the Dam)
  - Unknown if downstream canal can convey water

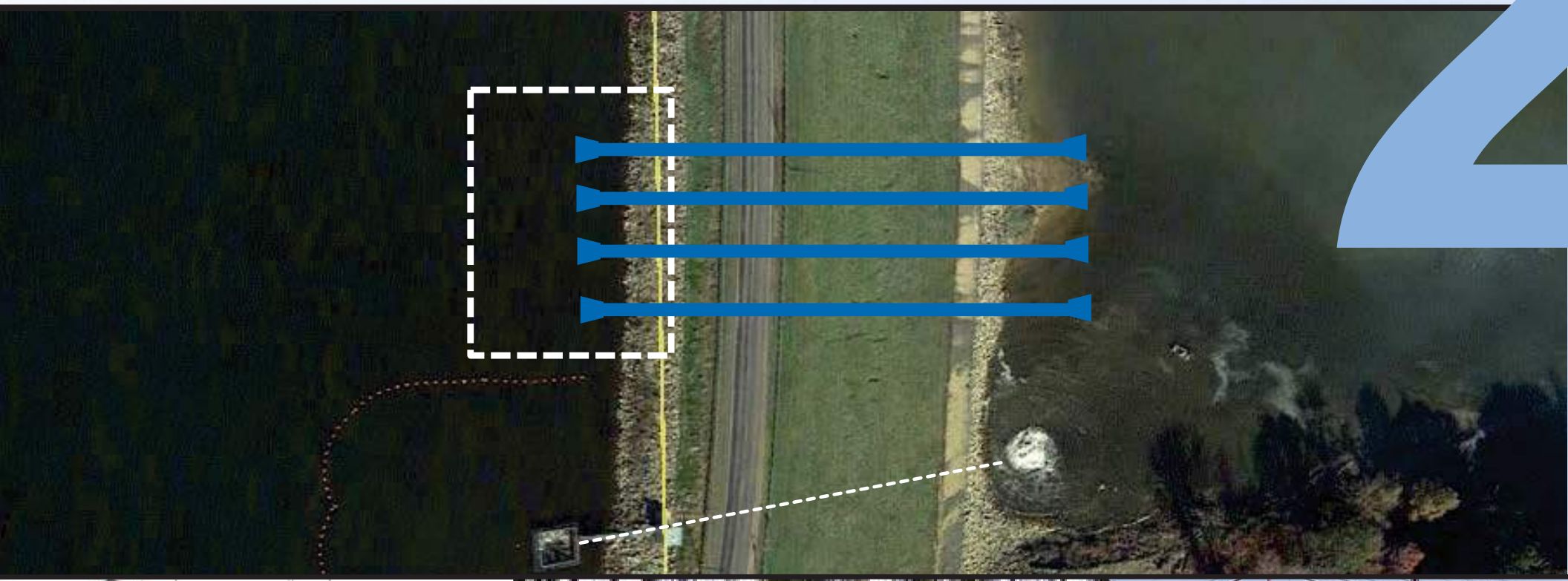
- **Cost – 3 (MED)**



  - Road improvements required WITH lengthy canal
  - Shortened culverts or bulkheads must be used decreasing conveyance ability and increasing count

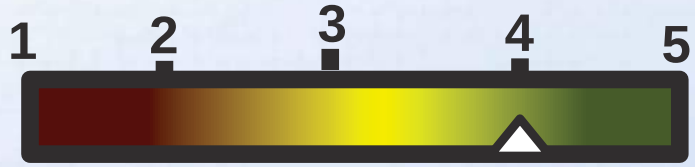


Box Culverts



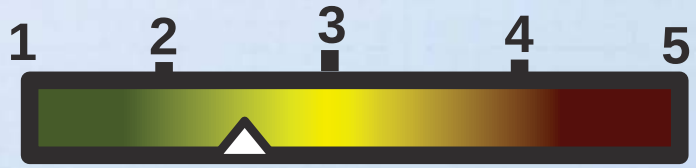
Carollo Conceptual Analysis

- **Feasibility – 4 (HIGH)**



  - **Count of Box Culverts is an unknown**
  - **Stringent Permitting Requirements**

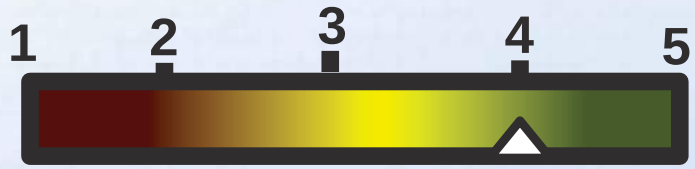
- **Cost – 2.5 (MED)**



  - **Road improvements required**
  - **Shortened culverts or bulkheads must be used decreasing conveyance ability and increasing count**

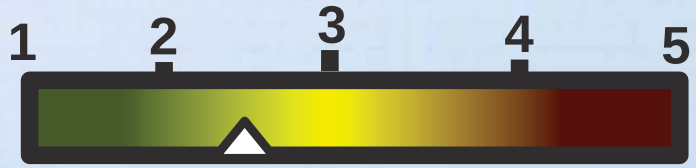
Carollo Conceptual Analysis

- **Feasibility – 4 (HIGH)**

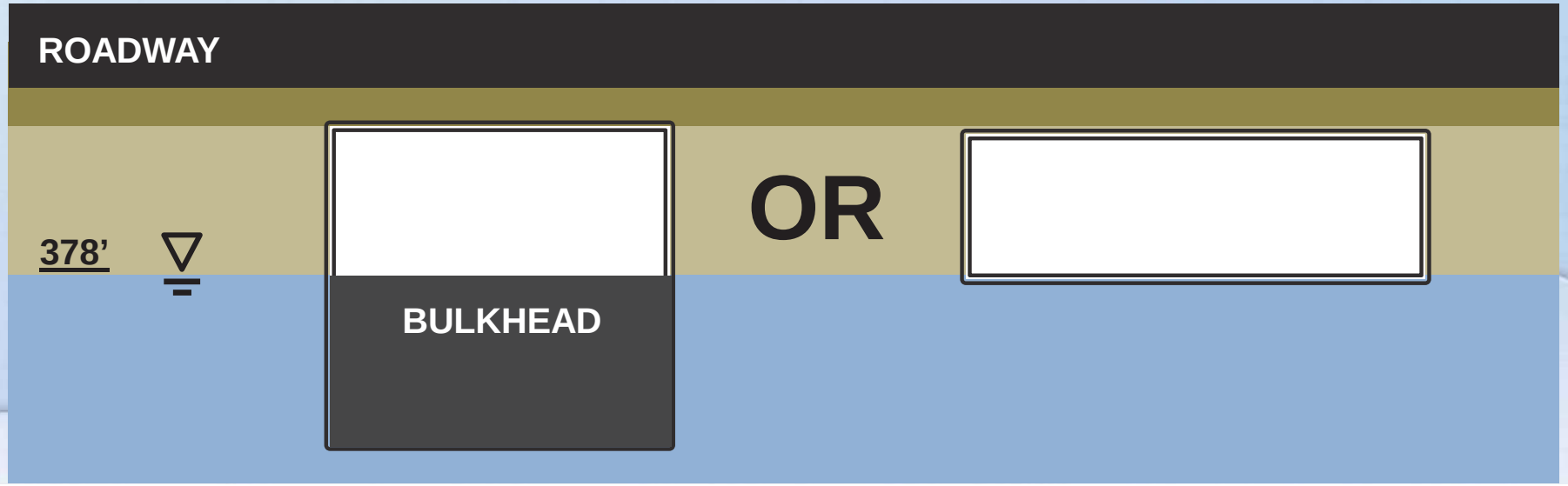


  - Count of Box Culverts is an unknown
  - Stringent Permitting Requirements

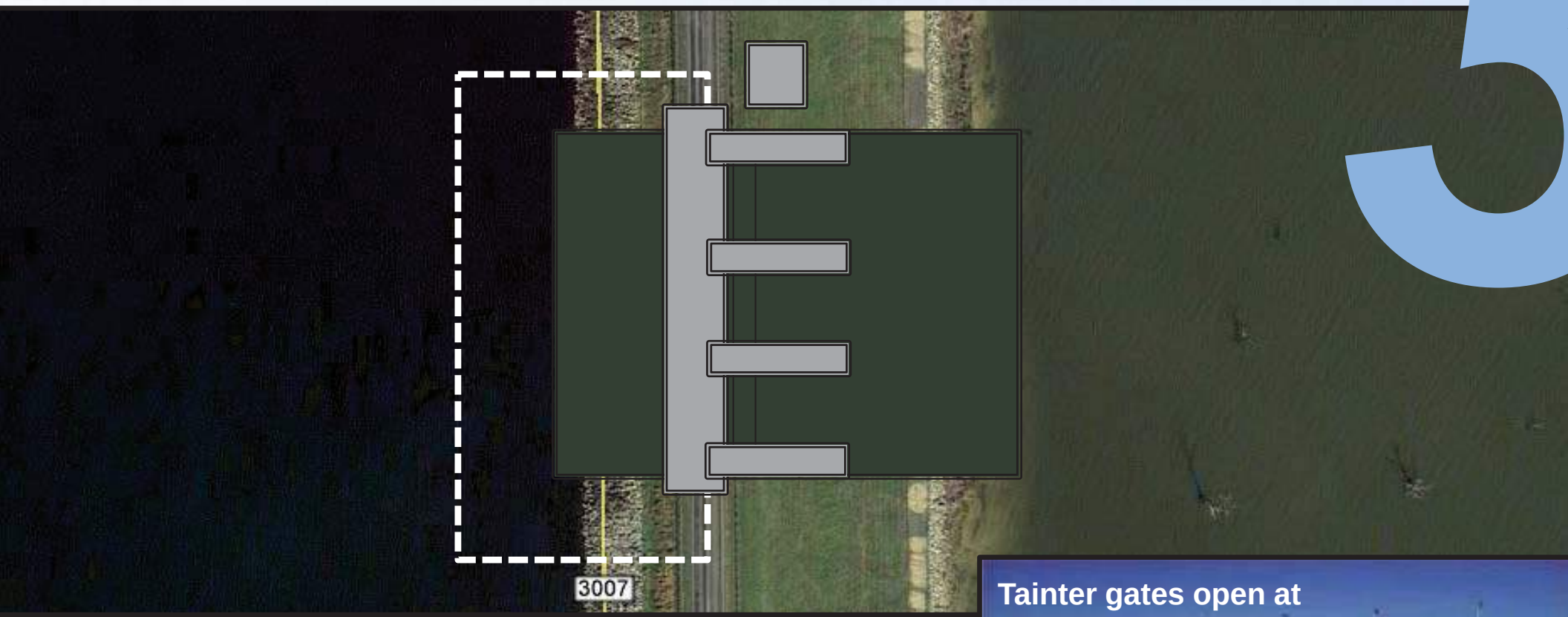
- **Cost – 2.5 (MED)**



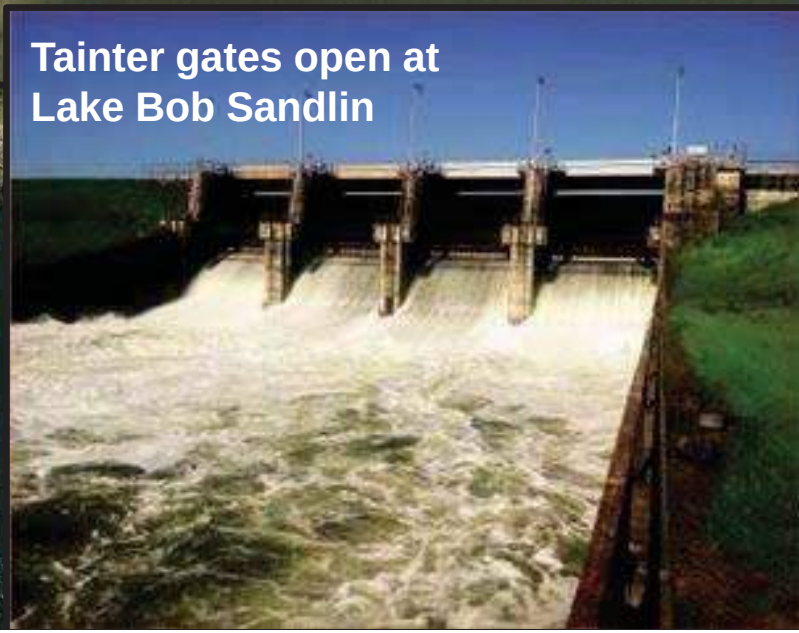
  - Road improvements required
  - Shortened culverts or bulkheads must be used decreasing conveyance ability and increasing count



Building a Tainter Gate System



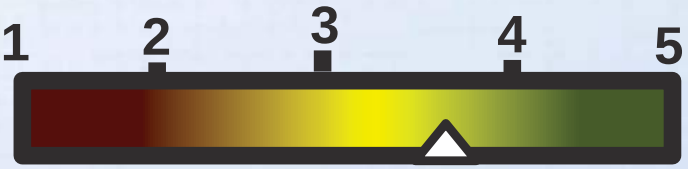
Tainter gates at
Lake Bob Sandlin



Tainter gates open at
Lake Bob Sandlin

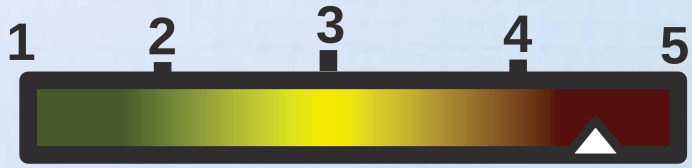
Carollo Conceptual Analysis

- **Feasibility – 3.5 (MED)**

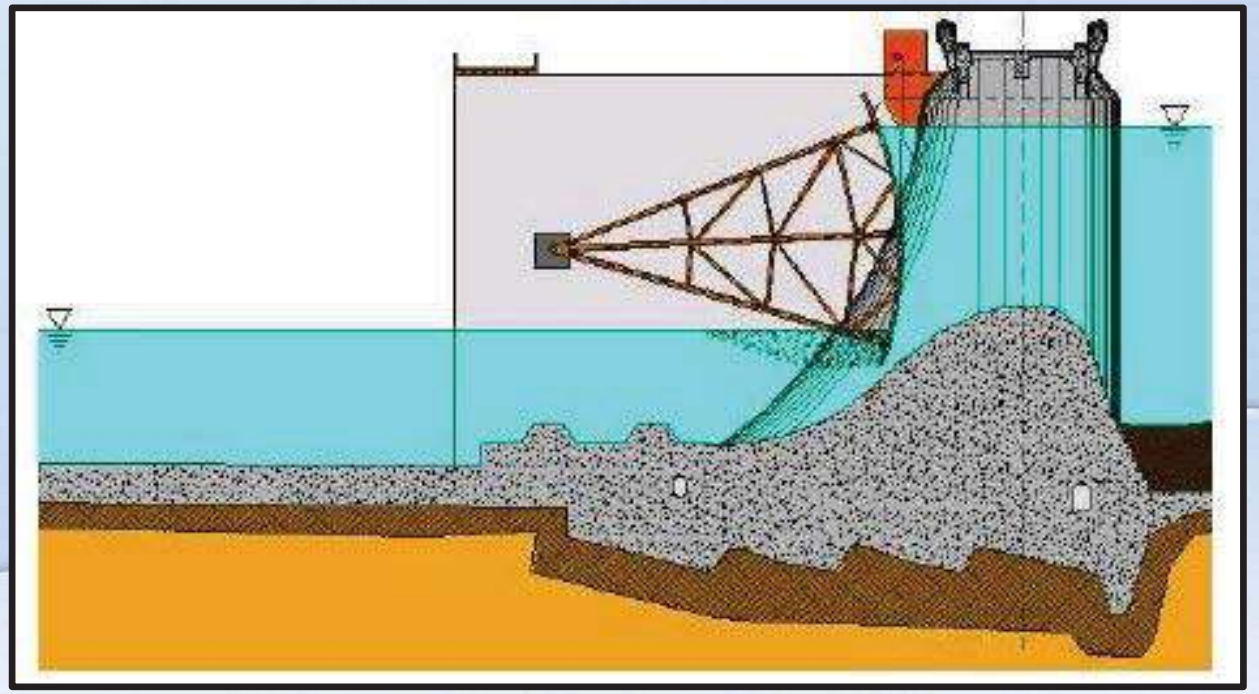


  - **Permitting of the structure is a challenge**

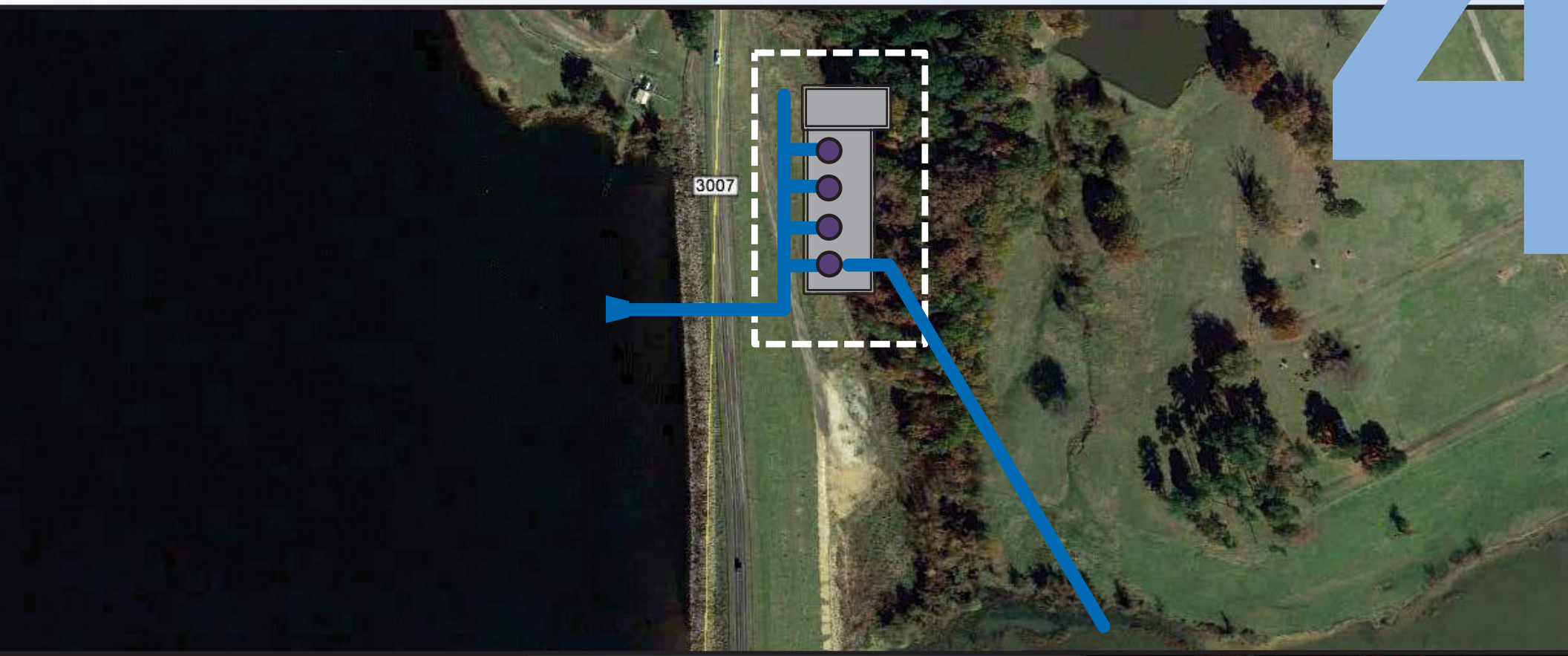
- **Cost – 4.5 (HIGH)**



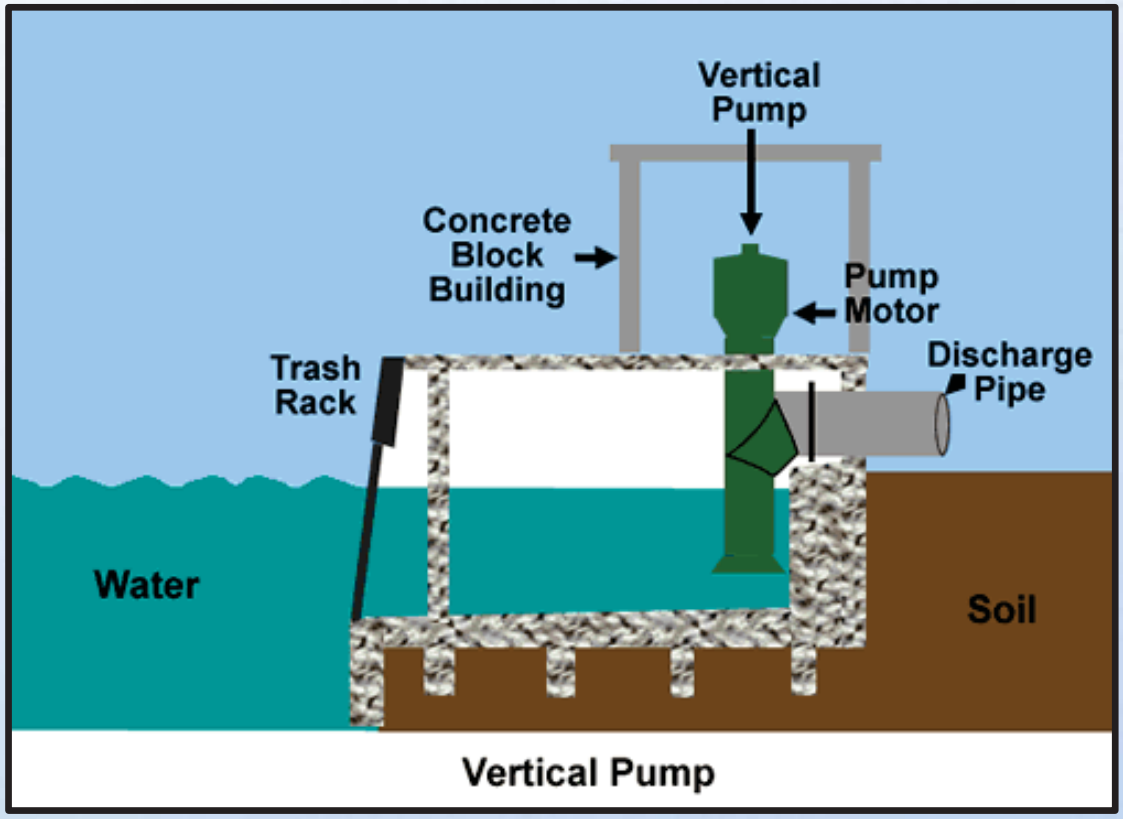
  - **Tainter gates are extremely expensive.**



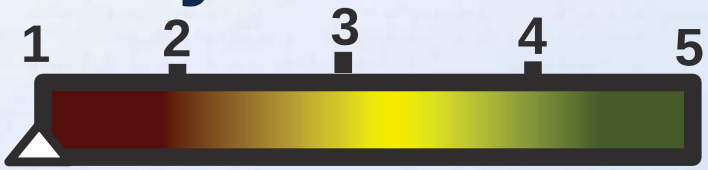
Building a Pump Station



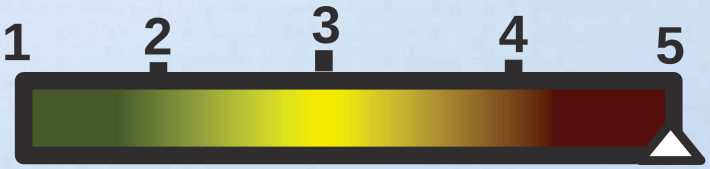
Building a Pump Station



Carollo Conceptual Analysis

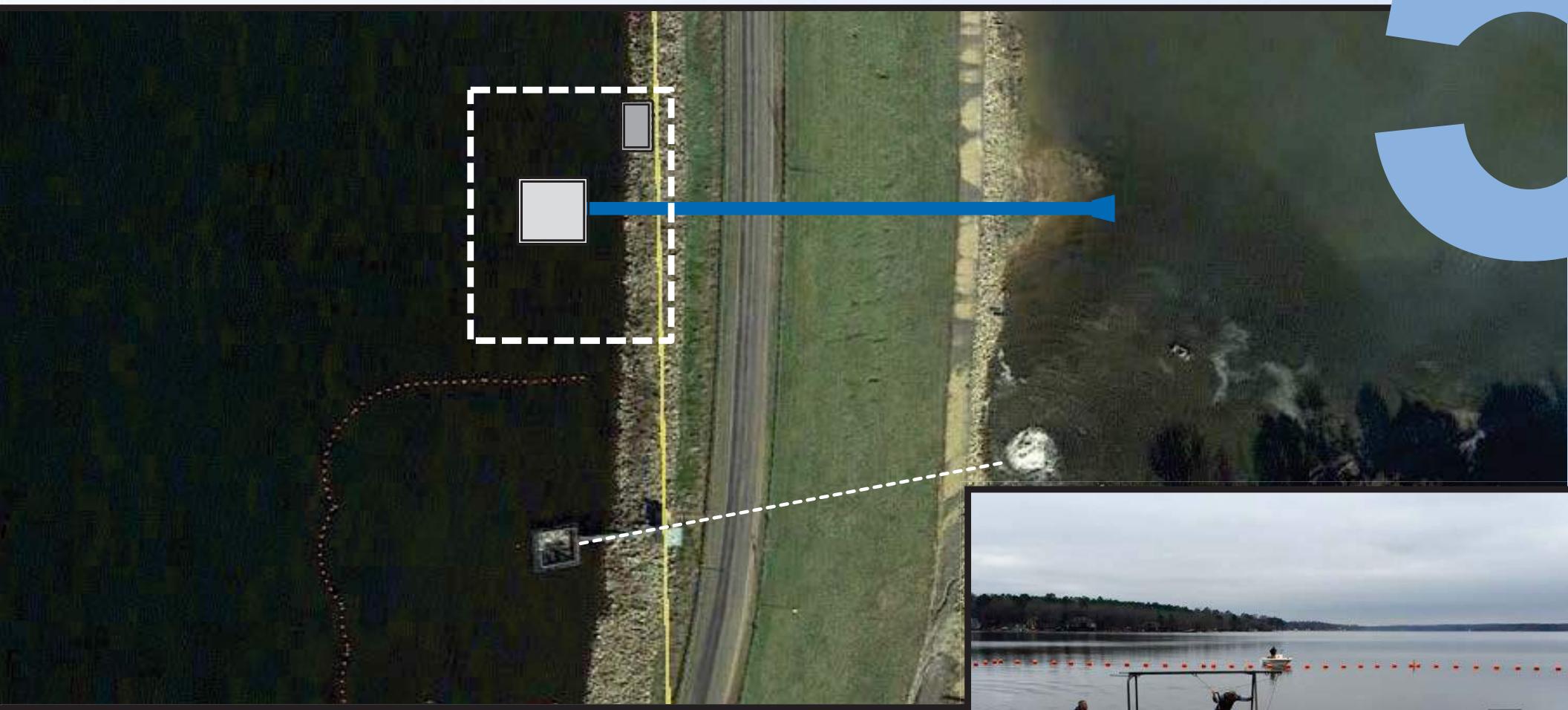


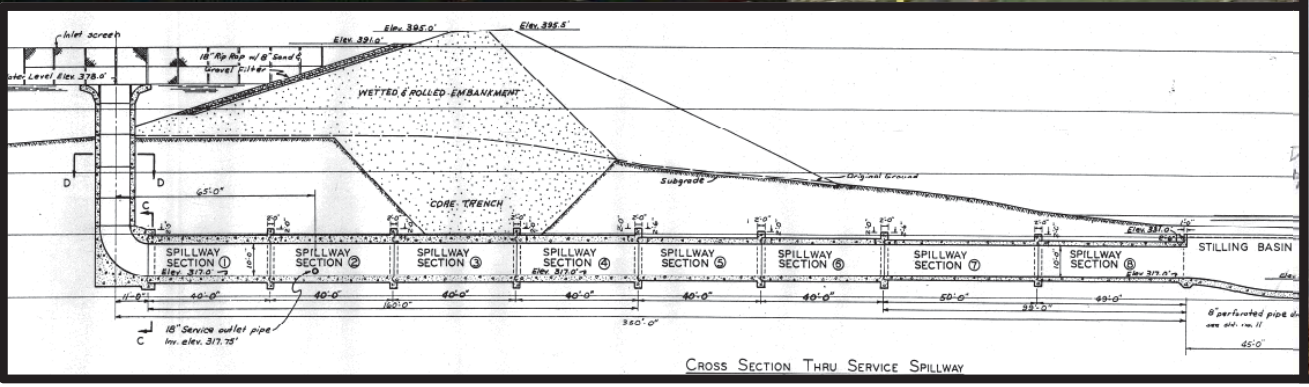
- **Feasibility – 1 (LOW)**
  - **Pumping the volume of water required to minimize rise in the water surface elevation of the lake is likely unfeasible**



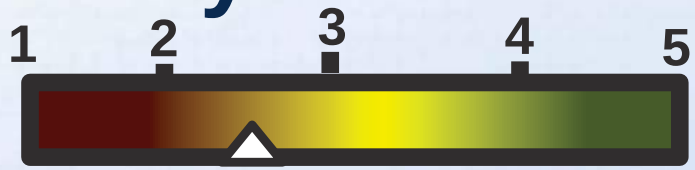
- **Cost – 5 (HIGH)**
  - **Pump stations are expensive and require continual maintenance.**

Building a Secondary Morning Glory

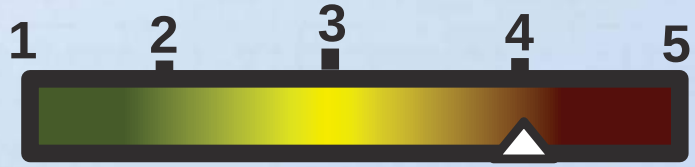




Carollo Conceptual Analysis



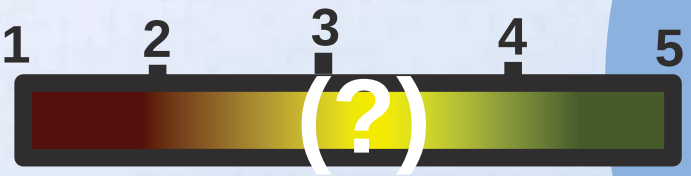
- **Feasibility – 2.5 (MED)**
  - In-the-wet construction and dam boring are significant foreseeable challenges
  - No perceived benefit over box culverts option



- **Cost – 4 (HIGH)**
  - Cofferdams, water control, and bore-pits required for the construction of a secondary spillway drive the cost up.

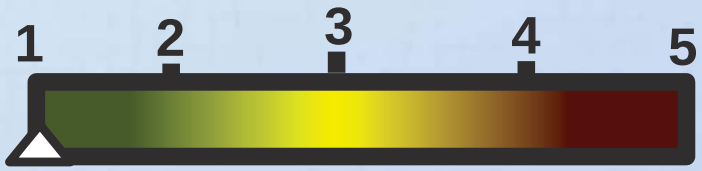
Operational Alternative

- **Feasibility – UNKNOWN**

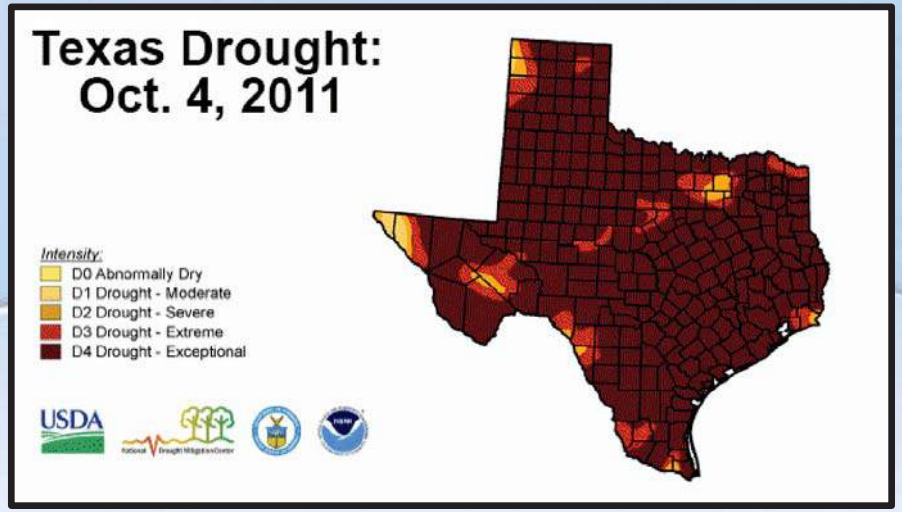


  - **Prediction: lowering the reservoir to a new pool will have long-term water supply effects**
  - **Reservoir will experience lower summer levels than past**

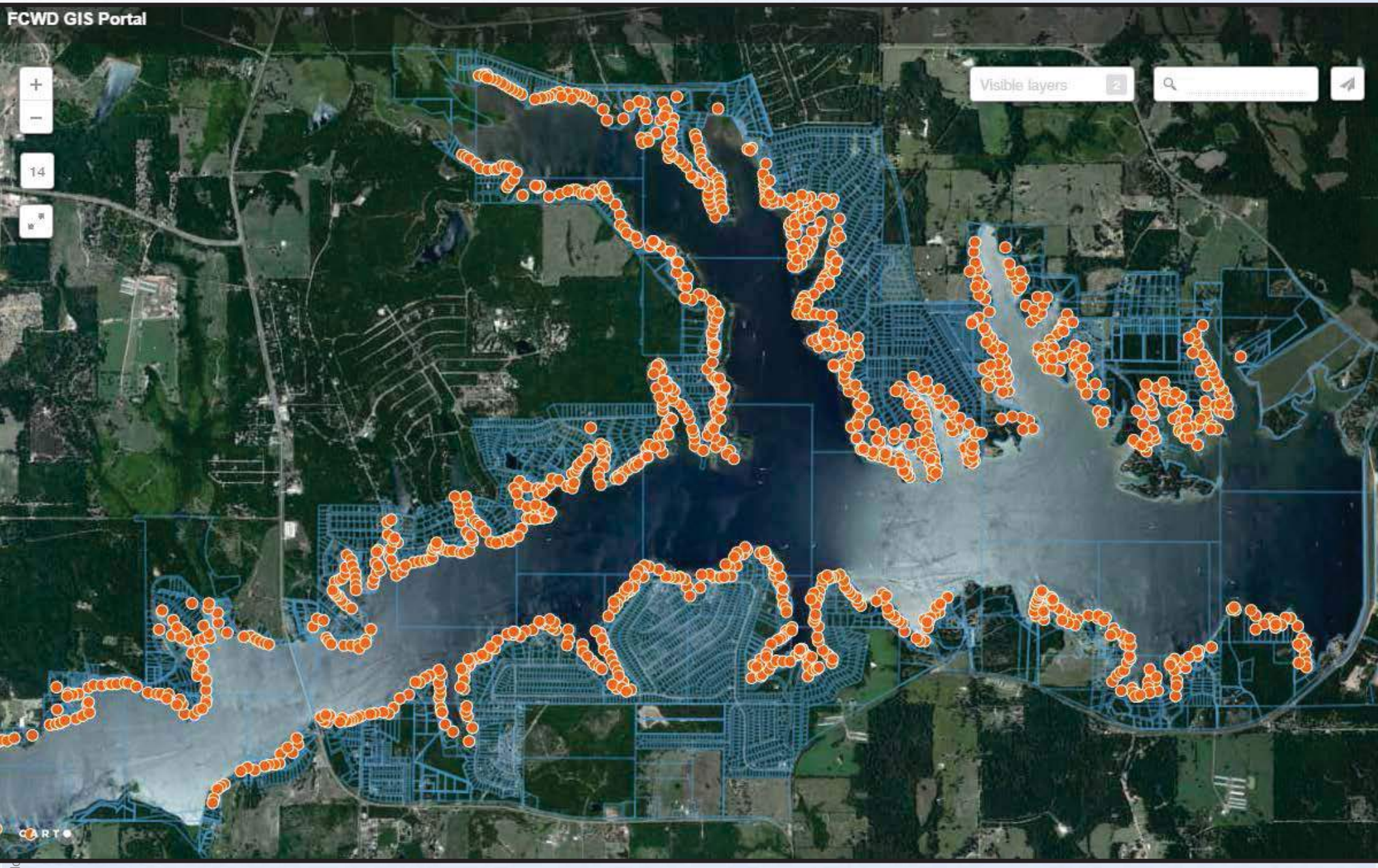
- **Cost – 1 (LOW)**



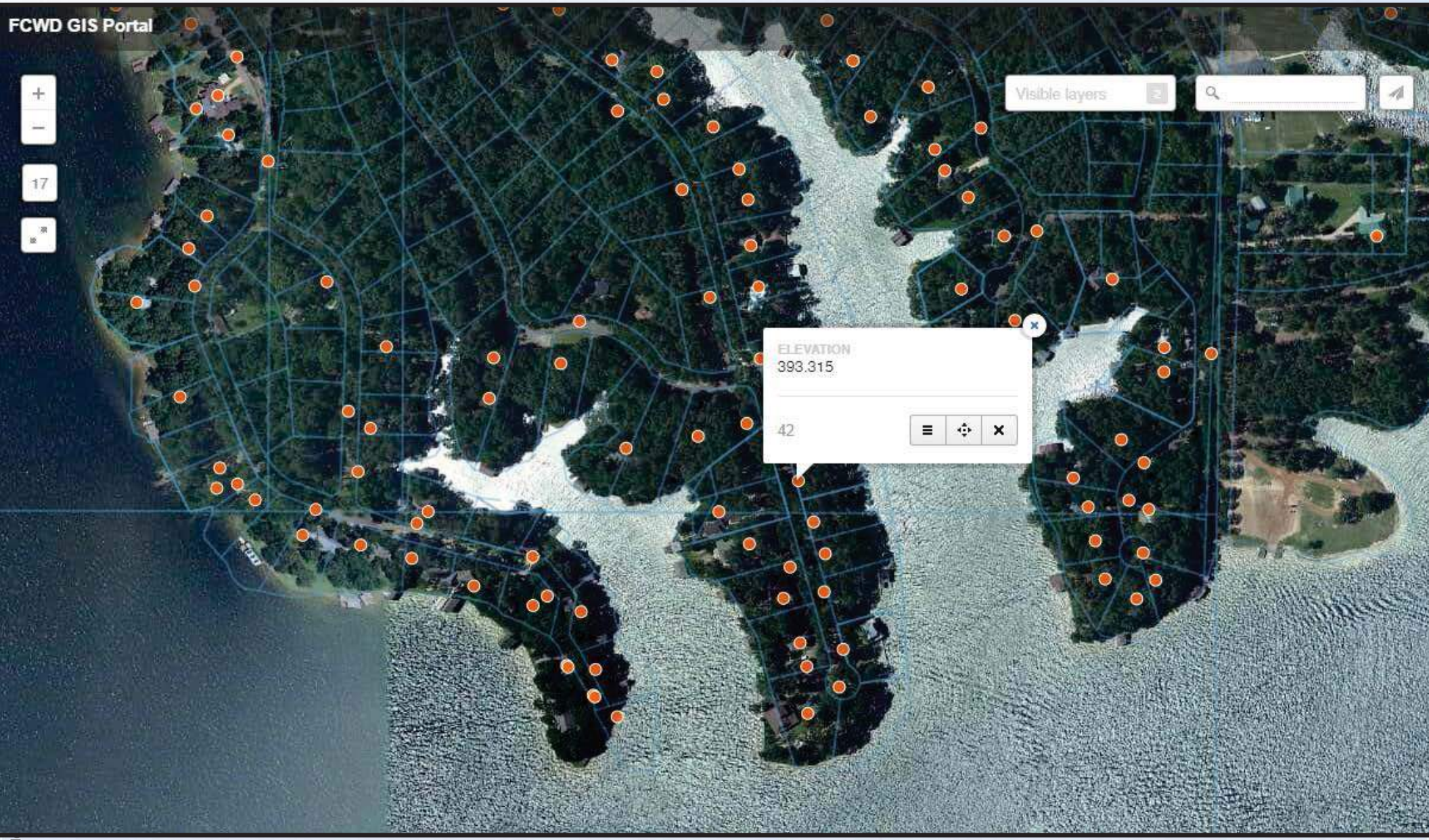
  - **Possible permitting expense (?)**



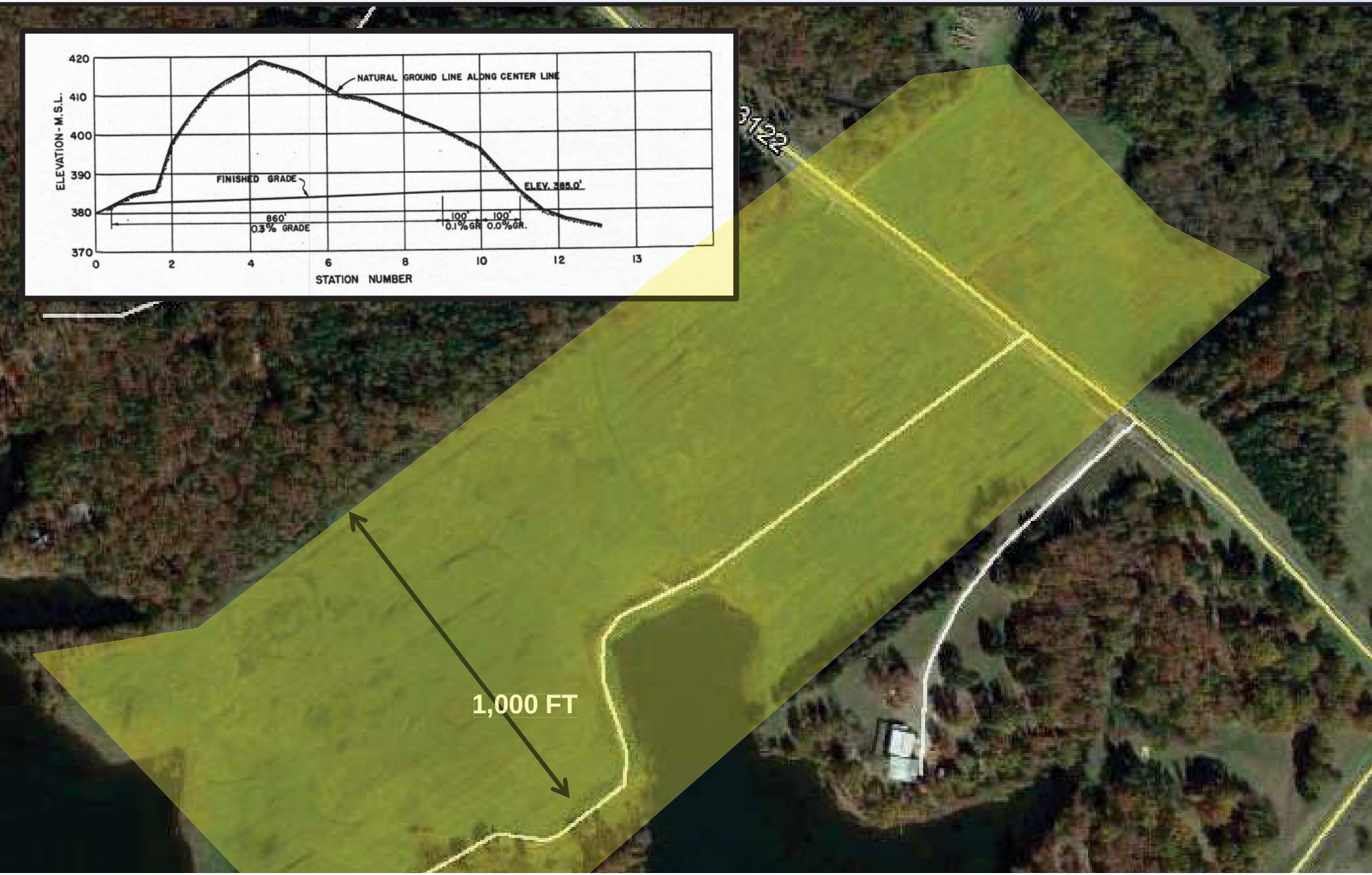
Lake Cypress Springs Elevation Survey



Lake Cypress Springs Elevation Survey



Add Emergency Spillway Analysis and Costs to PER



Public Stakeholder Questions

Proposed FCWD

Rules and Regulations Modifications

Franklin County Water District

David Harkins, P.E., PhD.

Stefanie Albright

Phil Bullock, P.E.

November 15, 2016

Lake Cypress Springs

urley

2723

3122

900

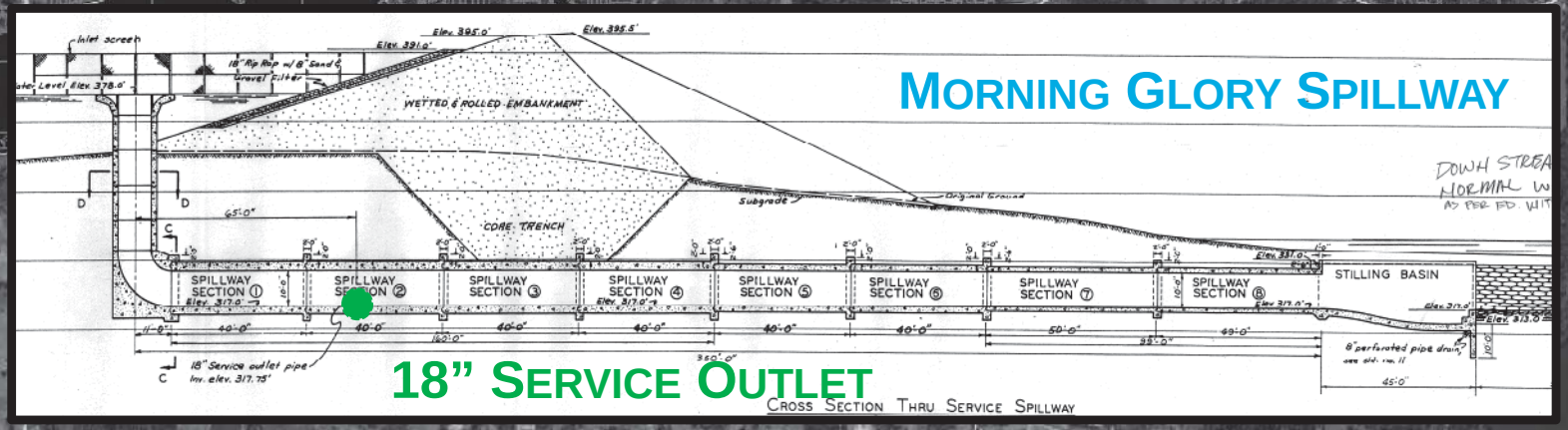
EMERGENCY SPILLWAY

Co Rd SE 3122

Lake Cypress Springs

LCS DAM

LAKE BOB SANDLIN

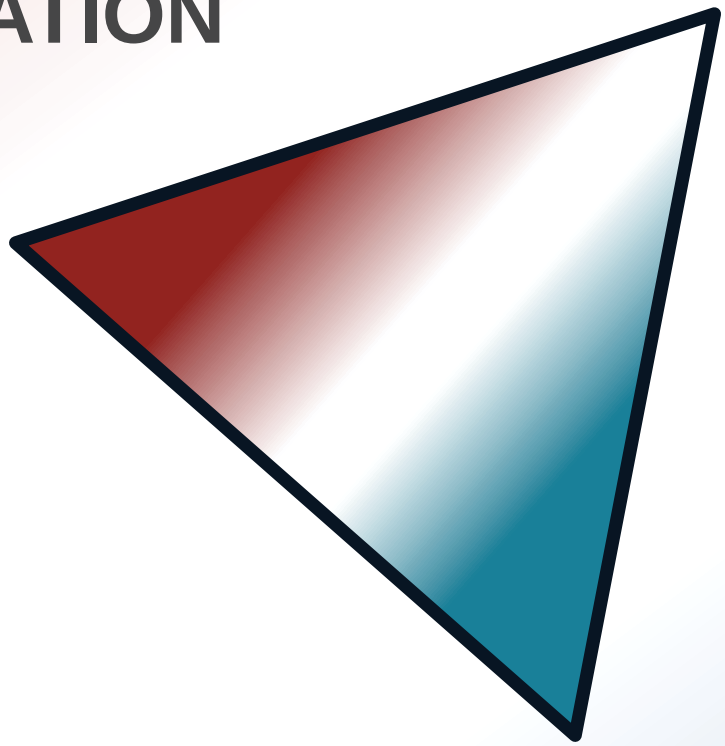


Lloyd Gosselink
ATTORNEYS AT LAW

FRANKLIN COUNTY WATER DISTRICT

LEGAL DETERMINATION

ACTIONS



ENGINEERING RECOMMENDATIONS

carollo
Engineers...Working Wonders With Water™

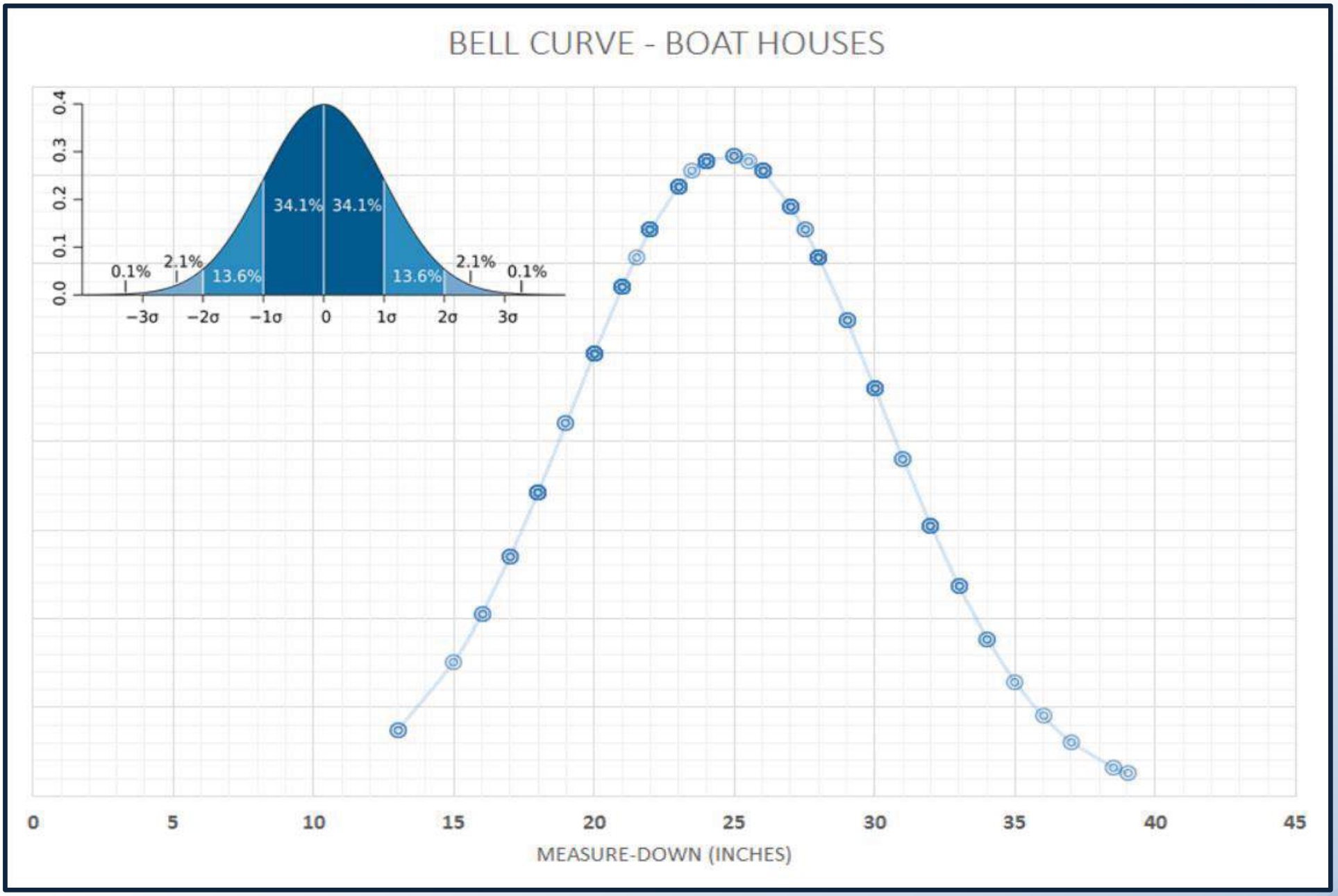
Engineering Technical Memorandums (TMs)

- TM#1 –Retaining Walls, Dredge, and Fill
- TM#2 –Boat Houses
- TM#3 –Lake Closure
- TM#4 –FEMA Mapping (To Be Completed in the PER)
- TM#5 –Residential Structures

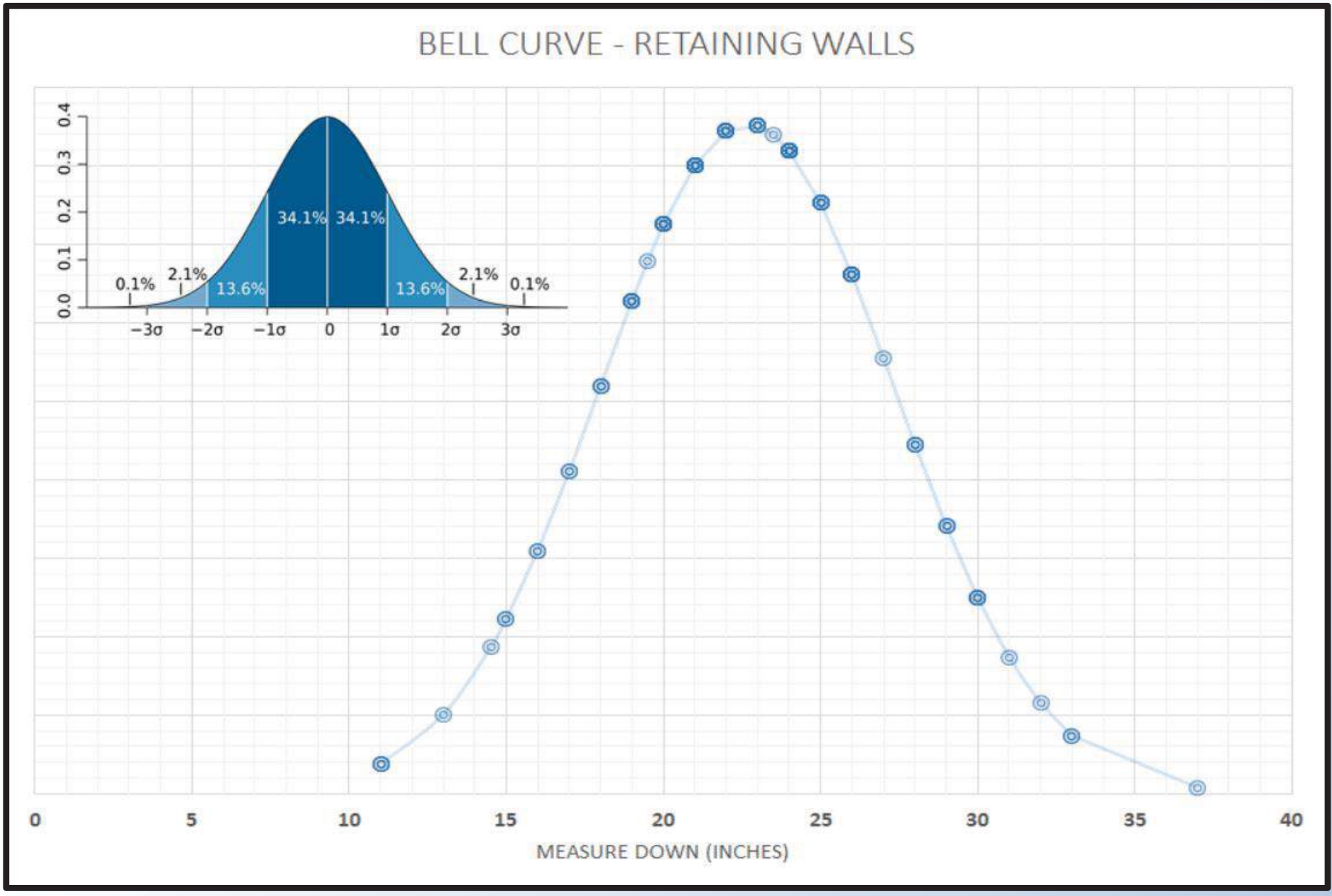
TM#1 –Retaining Walls, Dredge, and Fill

- Backfill material used in construction activities below the elevation of 385.0 feet msl **must be reclaimed from the reservoir unless specialized backfill is specified by a registered Texas professional engineer (P.E.). Backfill materials must be obtained from the reservoir by adhering to applicable dredging regulations**.
- **In addition to the terms and conditions of the permit, dredging, filling or retaining wall activities shall be performed in accordance with all applicable regulations and permits of the U.S. Army Corps of Engineers.**

Lakeside Sample – Deck Height



Lakeside Sample – Retaining Walls



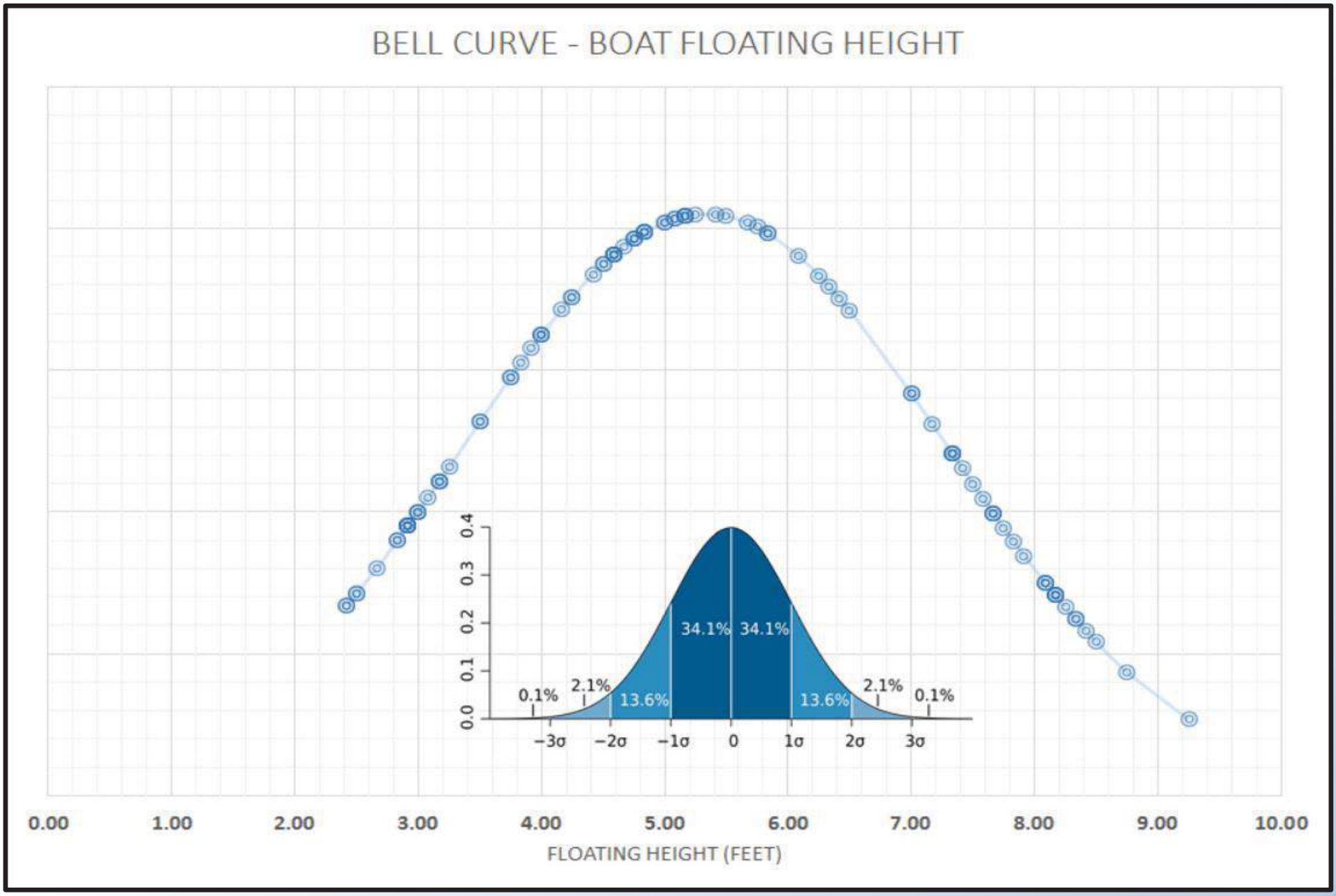
TM#2 –Boat Houses NEW

- **Boat and jet ski lifts are required to maintain a minimum 16.00 ft. and 12.00 ft. Internal Range (IR),** respectively, as measured by the distance from the lowest lift obstruction to the normal pool water surface elevation inside the Cradle Area. Structures permitted as a jet ski lift with shortened Internal Range requirements cannot be converted to a boat lift without permitted structural modifications to meet the heightened Internal Range.
- **Alternative jet ski lifts, including deck-mounted or drive-on (floating dock) lifts shall not be located under the boathouse roof area**. Drive-on (floating dock) jet ski lifts shall maintain tethered functional floatation at a water surface elevation of 385.50 feet above mean sea level or greater.
- **The floor deck of any boat house structure shall be no less than 24 inches above elevation 378.00 feet msl.**
- **Only a single (1) fixed on-water facility is allowed per lot.**

TM#2 –Boat Houses NEW

- **All materials, fixtures, and assets shall be able to withstand periodic temporary flooding inundation**.
- **Boathouses will not contain finished areas**, as defined by square-footage with enclosed walls, floors, or ceilings of material generally accepted for interior residential construction (e.g., windows, drywall/sheet rock, insulated walls, carpet, etc.). Screened-in porches and sun-rooms with exterior-grade ceiling fans and/or heaters are allowed.
- **A single fully enclosed storage area per boathouse structure is allowed, not to exceed 144 square feet.**
- **All boats lifted and stored in boathouses shall be restricted**, by tie (rope, chain, chord, etc.), or by obstruction (bar, pole, post, etc.), **from floating outside of the boathouse perimeter**. All smaller watercraft (jet skis, paddle boats, kayaks, canoes, etc.) shall be similarly secured from floating untethered

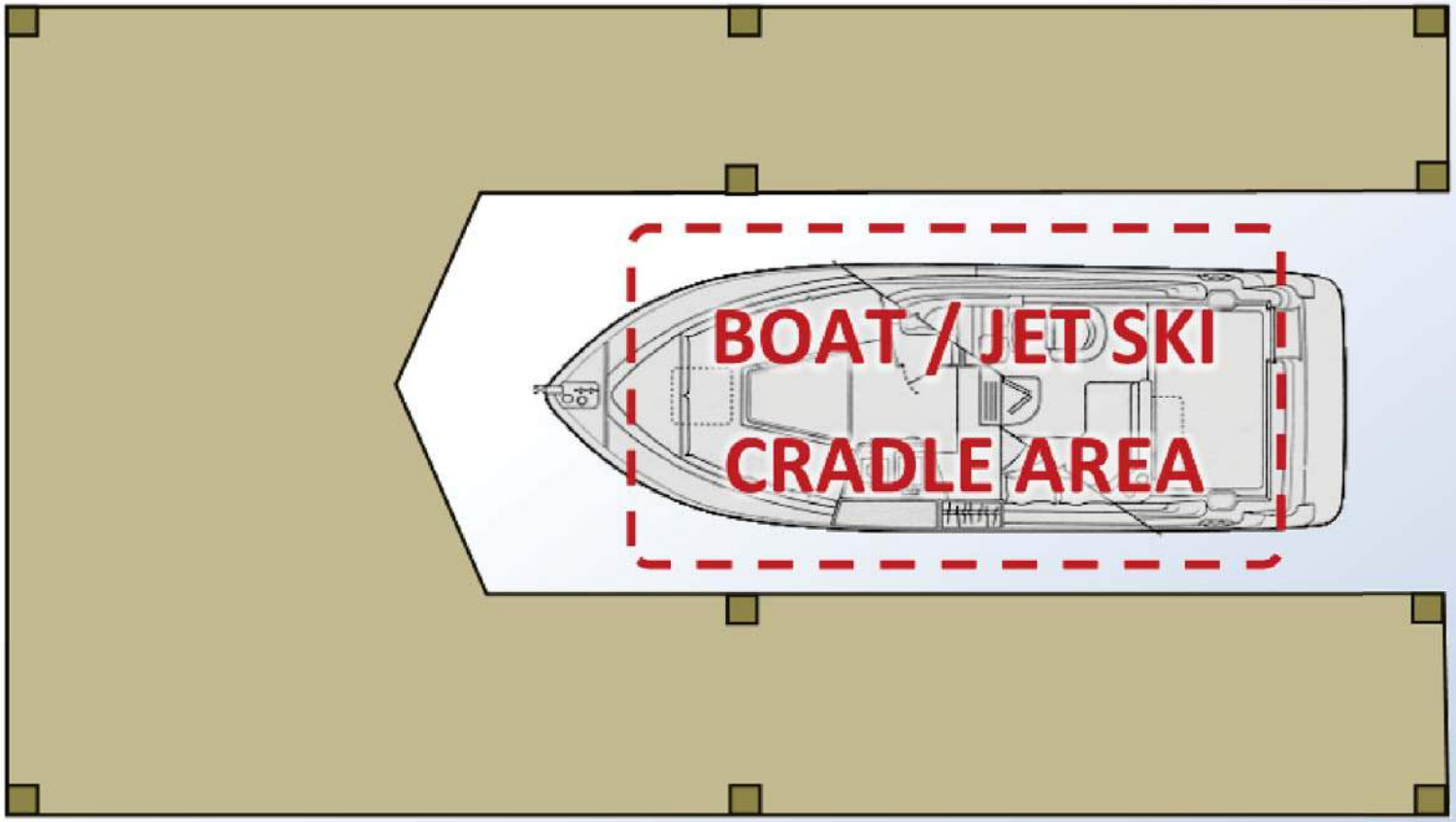
Lakeside Sample – Boat Height



New Internal Range

DETERMINING INTERNAL RANGE (IR)

Boat and jet ski lifts are required to maintain a minimum **16.00** ft. and **12.00** ft. Internal Range (IR), respectively, as measured by the distance from the lowest lift obstruction 1 to the normal pool water surface elevation 2 inside the **CRADLE AREA**.

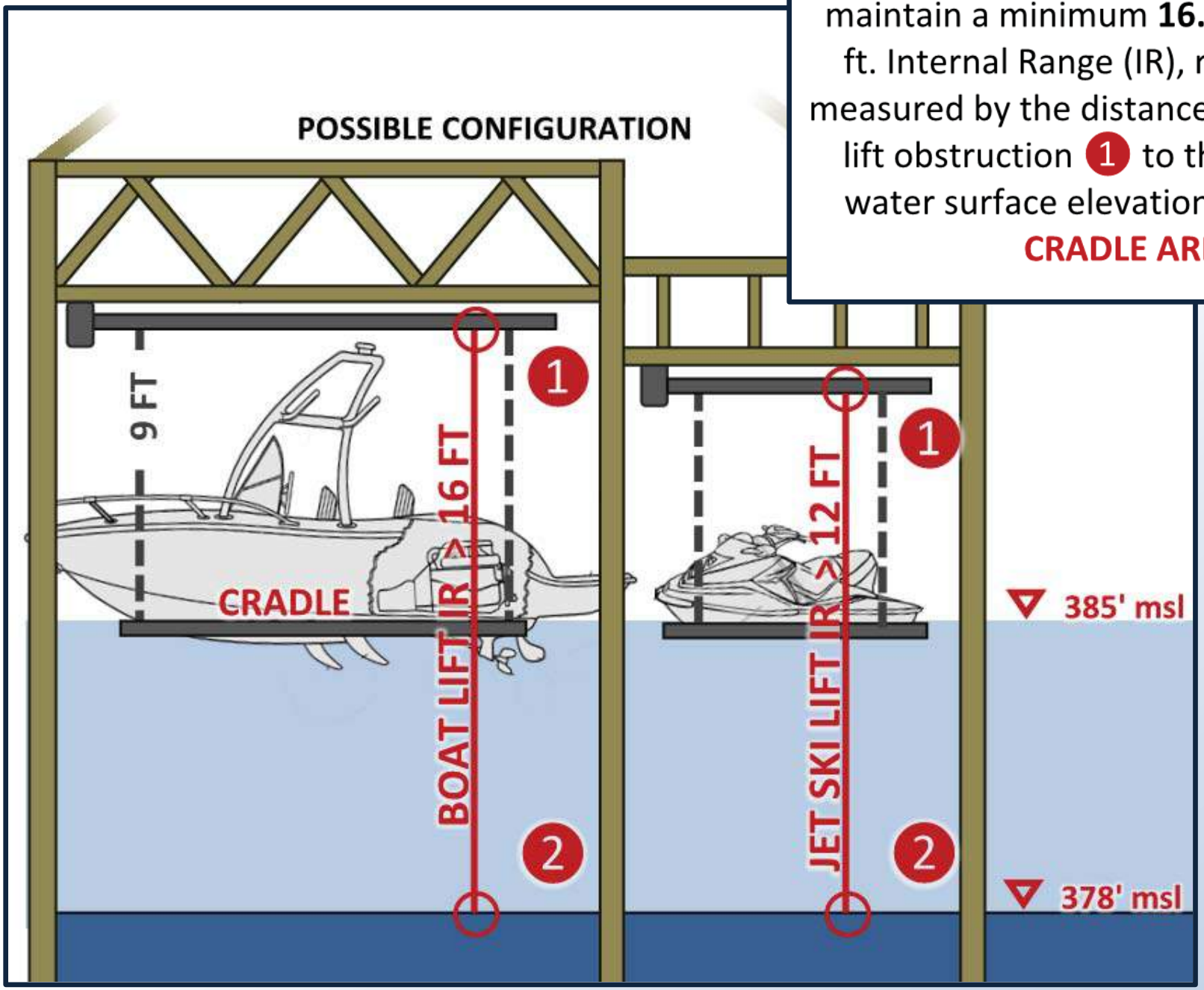


DRAWINGS ARE MEANT TO BE SCHEMATIC, AND DO NOT REPRESENT ANY DESIGN METHODOLOGY.

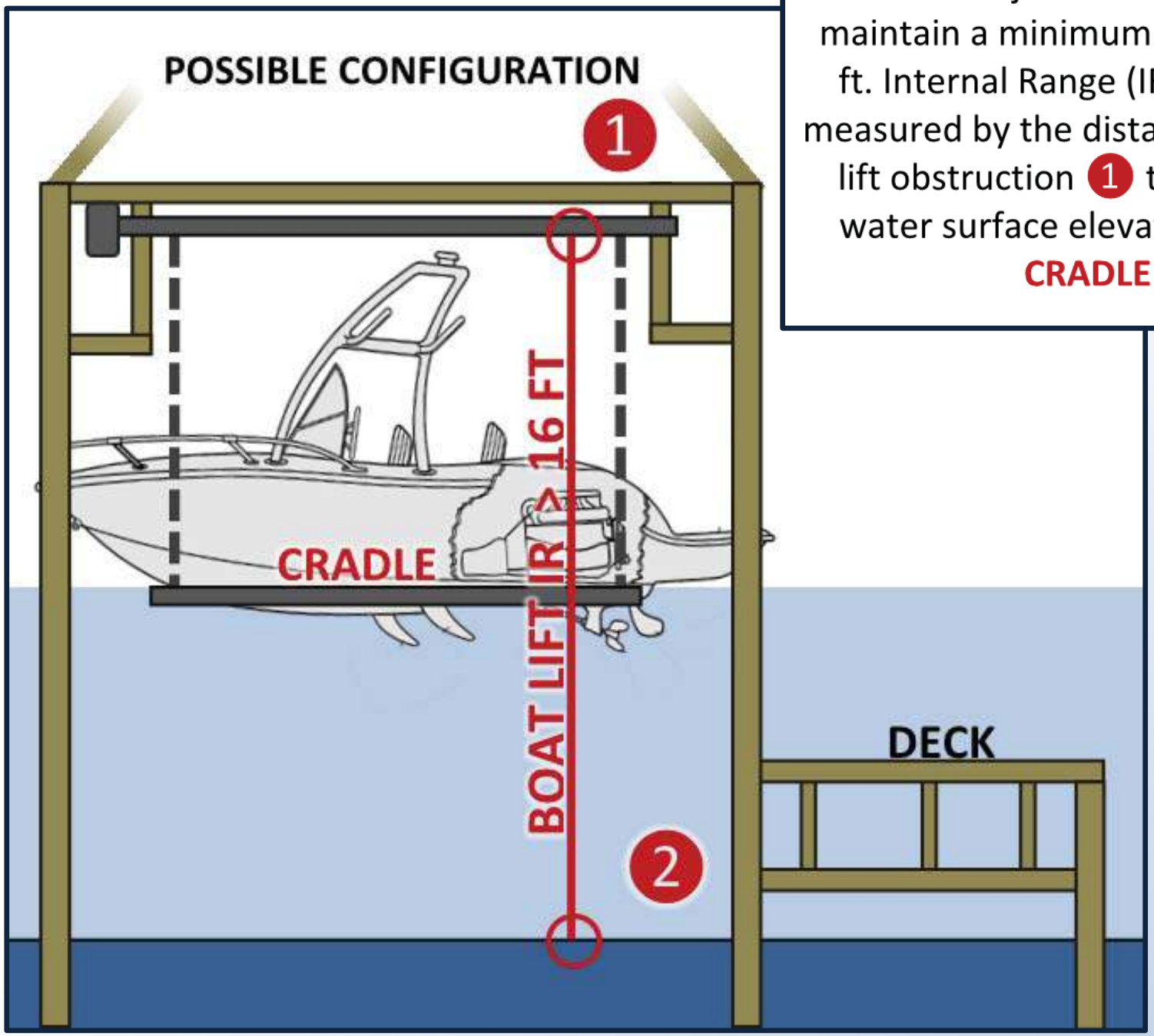
New Internal Range

DETERMINING INTERNAL RANGE (IR)

Boat and jet ski lifts are required to maintain a minimum **16.00** ft. and **12.00** ft. Internal Range (IR), respectively, as measured by the distance from the lowest lift obstruction 1 to the normal pool water surface elevation 2 inside the **CRADLE AREA**.



New Internal Range



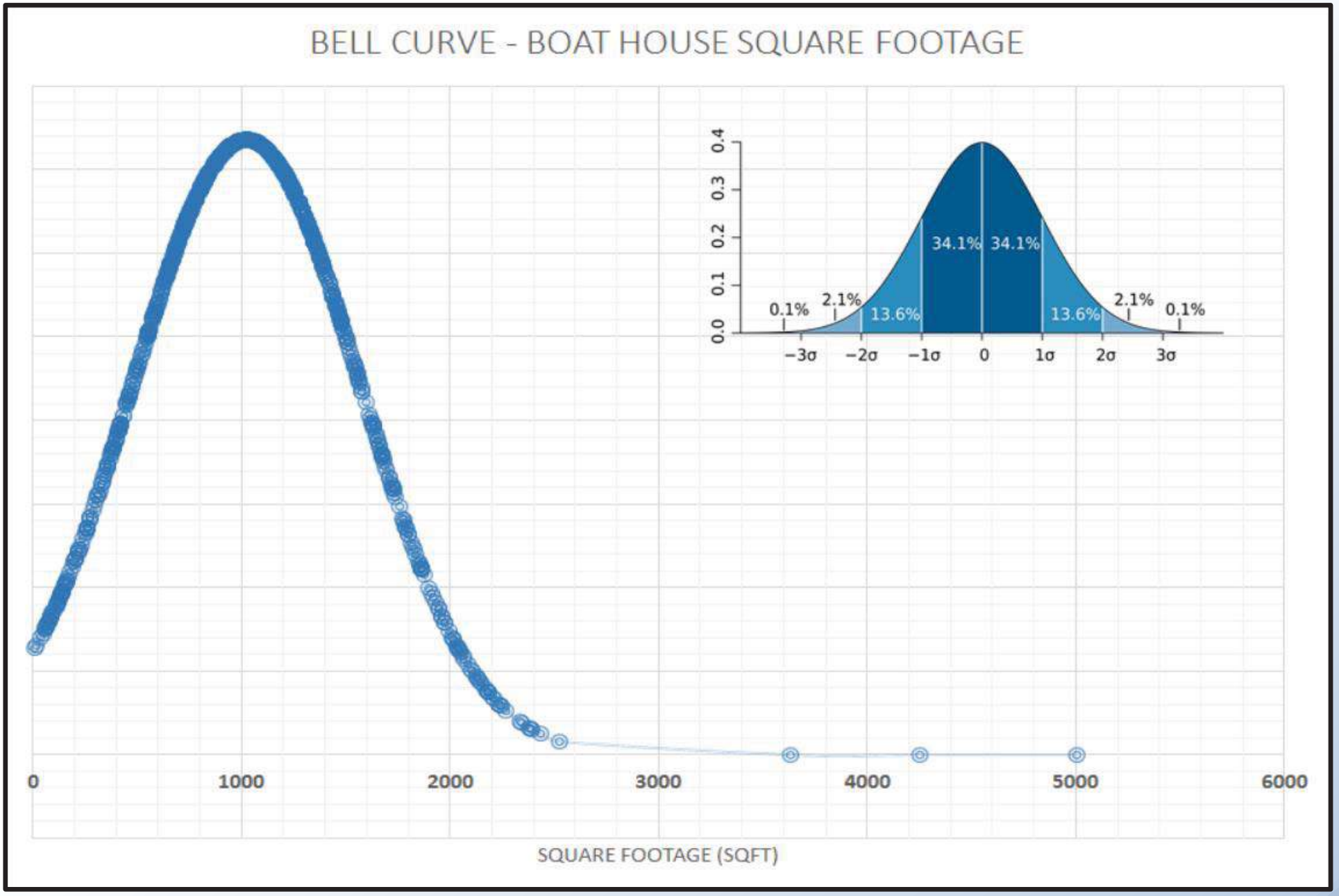
DETERMINING INTERNAL RANGE (IR)

Boat and jet ski lifts are required to maintain a minimum **16.00** ft. and **12.00** ft. Internal Range (IR), respectively, as measured by the distance from the lowest lift obstruction 1 to the normal pool water surface elevation 2 inside the **CRADLE AREA**.

TM#2 –Boat Houses MODIFIED

- **No single pier or boathouse constructed on District Property shall exceed a total of** ~~twenty-four hundred (2,400)~~ **two thousand (2,000) square feet <u>of covered area</u>**, with the total area of all single piers and/or boathouses not exceeding ~~thirty-five hundred (3,500)~~ three thousand (3,000) square feet~~; provided, however, that if a lot contains more than one boathouse and/or pier, each boathouse and/or pier must be located at least five feet (5') away from every other boathouse and/or pier (measured between the closest points on both structures).~~ <u>Floating on-water facilities conforming to the rules and regulations herein are excluded from the total allowable area.</u>

Lakeside Sample – Boat House Size



TM#2 –Boat Houses MODIFIED

- No boathouse constructed on District Property shall exceed one (1) story. Notwithstanding the foregoing, a flat deck area may be permitted on the roof; provided, however, that the total height of all structures, including parapets, handrails, or any other architectural features, shall **not exceed ~~twenty feet (20')~~ twenty-five feet (25') above 318 feet MSL.**
- ~~**Boathouses shall be designed and constructed so as to minimize any obstruction of the view of the Lake by other Lessees.**~~

Boat House Max Height

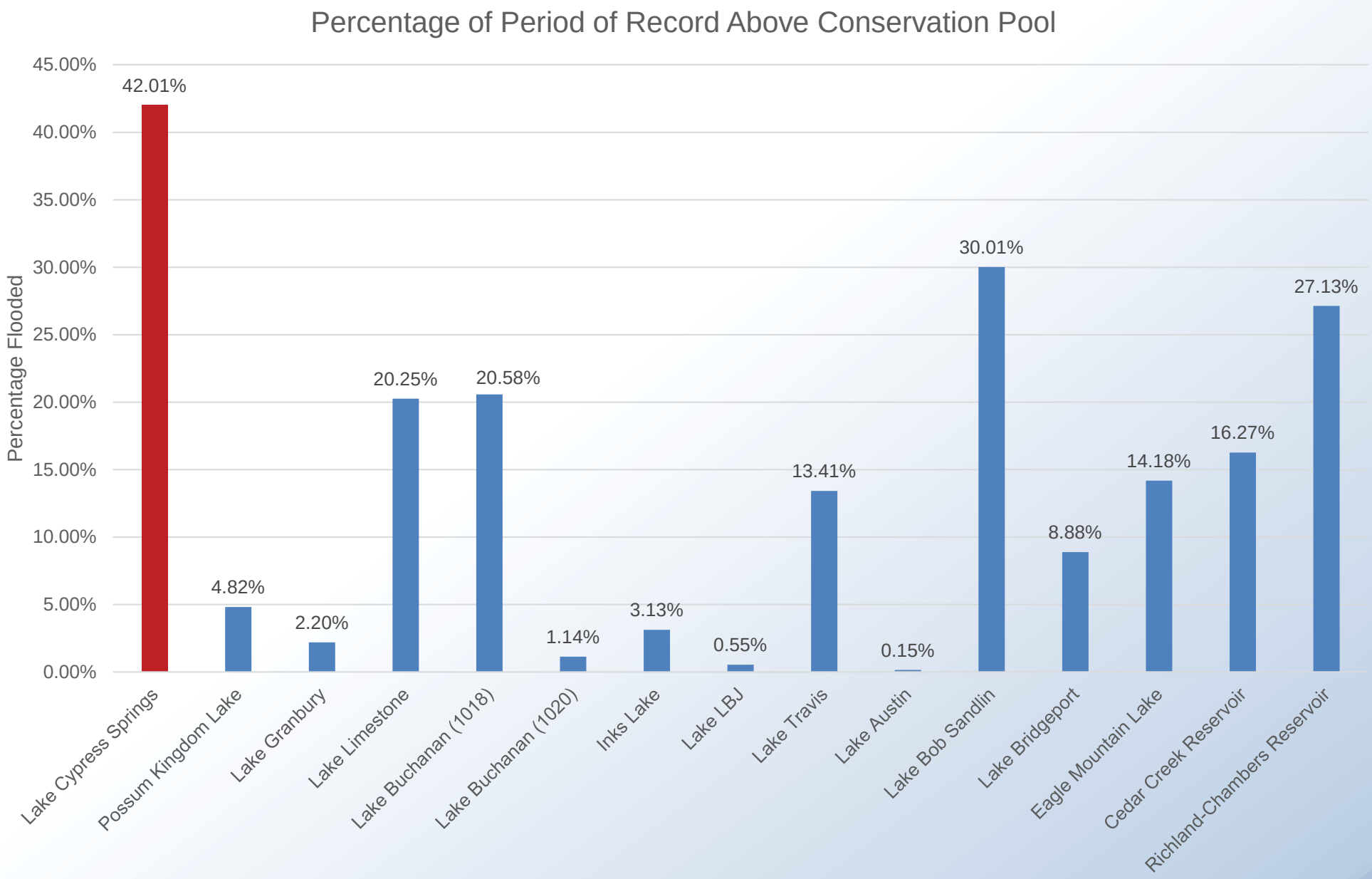
PARAMETERS			
Boat House Width	**W**	50	FT
Boat House Length	**L**	50	FT
Accptable Roof Slope (Min 6:1)	**R**	3	:1 FT/FT
Gable on W or L	**G**	L	---
Effective Roof Height	**ERH**	**8.33**	**FT**
Operational Range	**OR**	7	FT
Boat Height	**B**	9	FT
Internal Range	**IR**	**16.00**	**FT**
TOTAL Boat House Height	**HT**	**24.33**	**FT**

TOTAL Boat House Height	HT	24.33	FT

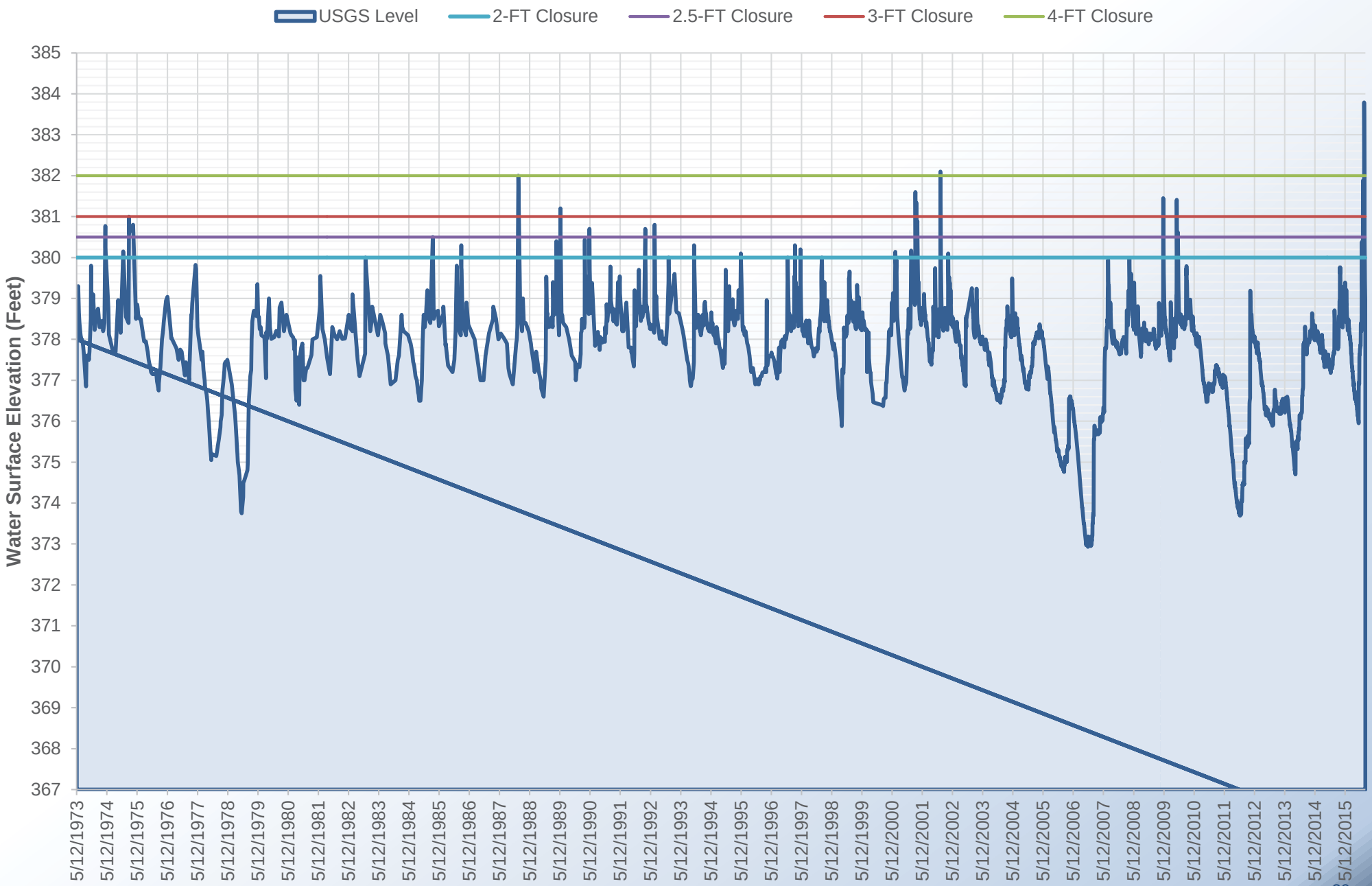
TM#3 –Lake Closers

- Lake Cypress Spring is a reservoir that remains above conservation pool more than any other lakes analyzed.
- Additionally, the lake is determined to be, in comparison with the other reservoirs studied, to be moderately volatile above conservation pool.
- When coupled with anecdotally evidence of other lake closures in Texas, **Carollo recommends a lake closure elevation of 2.50 ft. m.s.l. above conservation pool of 378.00 ft.** m.s.l. (or an elevation of 380.5 ft. m.s.l.

TM#3 –Lake Closers



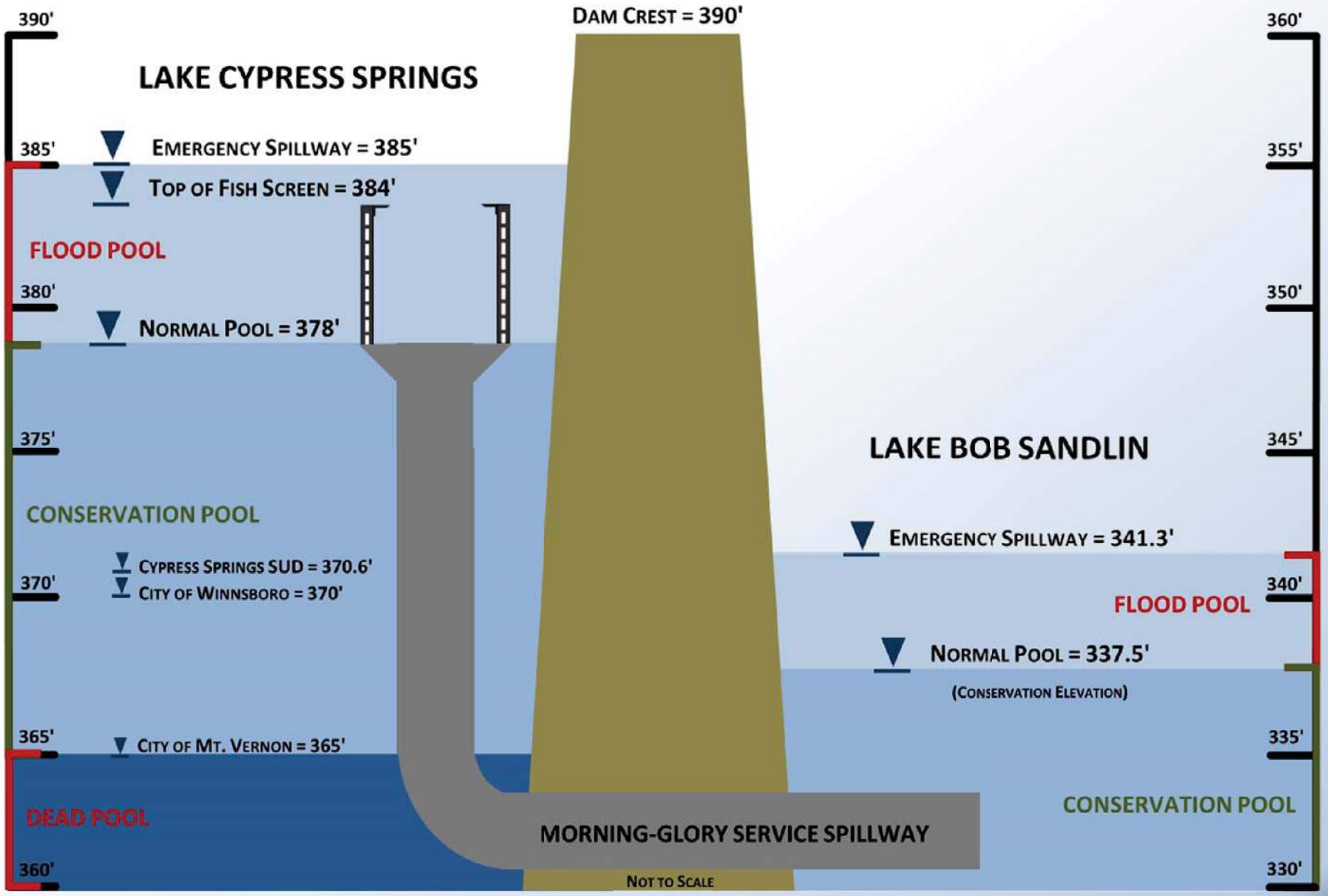
TM#3 –Lake Closers



TM#5 –Residential Structures

- New residential structures and added finished area **must be designed and constructed to be elevated so that (i) the finished floor elevation at the lowest location is elevated to or above 385.50 ft. m.s.l.;** and (ii) the pier or column foundation and the structure attached thereto is anchored to resist flotation, collapse, and lateral movement due to the combined effects of wind and water loads acting simultaneously on all building components. A registered professional engineer or architect shall develop or review the structural design, specifications, and plans for the construction and shall certify that the design and methods of construction to be used are in accordance with accepted standards of practice.

LCS Morning Glory Spillway



TM#5 –Residential Structures

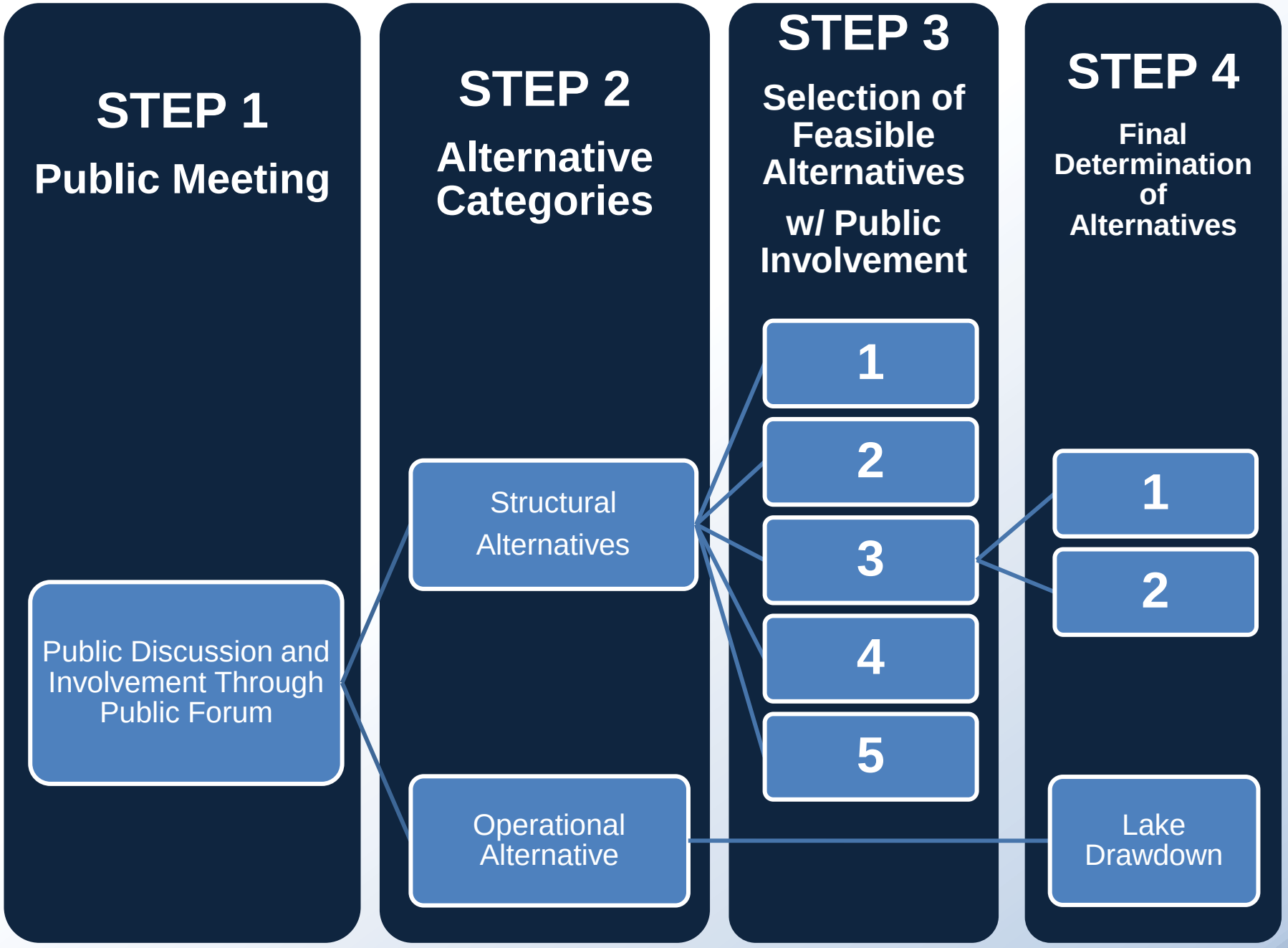
- Detached garages, gazebos, storage buildings, decks, and patios (or similar structures) are permitted to be constructed in whole or in part at any elevation. **However, all materials, fixtures, and assets positioned at or below 585.50 ft. m.s.l. shall be able to withstand periodic temporary inundation of flood waters.** Elevated decks and patios must be designed and constructed to remain intact, in place, and must be supported to resist flood loads. Attached decks must be supported on piles, posts, or columns embedded into the ground and capable of surviving anticipated erosion and scour.

TM#5 –Residential Structures

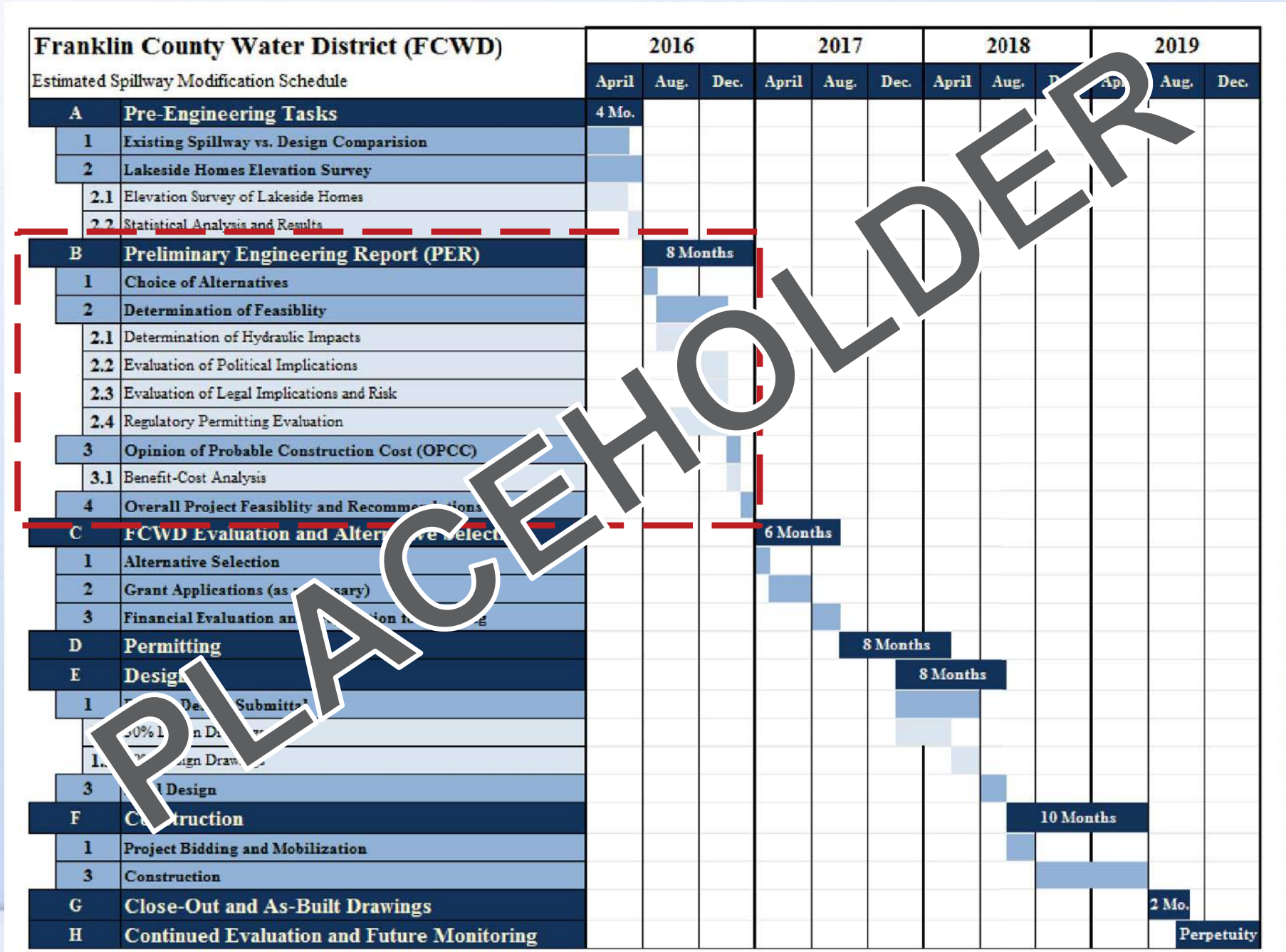
- Residential structures not conforming to the minimum floor slab elevation requirement of 385.50 ft. m.s.l. **can be repaired and improved,** so long as there is no increase of finished areas. Any addition of finished area must conform to all rules herein.

- Boathouses not conforming to the requirements of internal range **can be repaired but shall not be improved, per the definitions herein.** Variances to this rule will be granted for these listed improvements to boathouses, but limited to the addition of:
    - Handrails or other safety improvements
    - Stairs, overhead walkways, walkways, and ramps for boathouse access
    - Uncovered decking areas
    - Swimming ladders, dock cleats, tie downs, bumpers, slides, diving boards, or other recreational amenities requiring installation
    - Storage areas
    - Sinks, fixtures, cabinets, and countertops
    - Cupola/weather vanes or flags
    - Ceiling fans and overhead lighting
    - Screened in areas

Brief PER Update



PER Schedule Update



PLACEHOLDER

Lloyd Gosselink
ATTORNEYS AT LAW

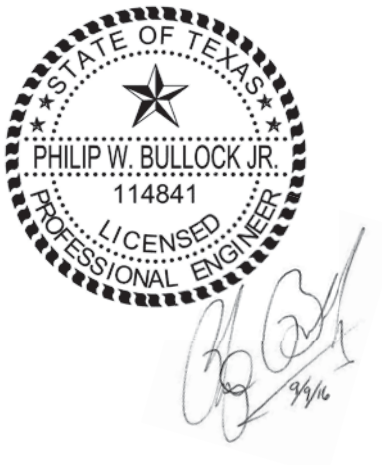
Questions?

carollo
Engineers...Working Wonders With Water™

APPENDIX C

RULES AND REGULATION TECHNICAL MEMORANDUMS (TM's)

TBPE No. F-882



LLOYD GOSSELINK

ENGINEERING RECOMMENDATIONS FOR LAKEFRONT STRUCTURES

TECHNICAL MEMORANDUM NO. 1
RETAINING WALLS, DREDGING, AND FILL WORKS

FINAL
May, 2016

10375 RICHMOND AVENUE, SUITE 1625 • HOUSTON, TEXAS 77042 • P. 281.872.4512 • F. 281.872.4505

LLOYD GOSSELINK

ENGINEERING RECOMMENDATIONS FOR LAKEFRONT STRUCTURES

TECHNICAL MEMORANDUM NO. 1
RETAINING WALLS, DREDGING, AND FILL WORKS

TABLE OF CONTENTS

Page No.

LIST OF TABLES AND FIGURES

LIST OF APPENDICES

RETAINING WALLS, DREDGING, AND FILL WORKS

1.0 BACKGROUND INFORMATION

FCWD is a water conservation and reclamation district that owns and operates Lake Cypress Springs in Franklin County in Northeast Texas. FCWD maintains water rights for the beneficial use and impoundment of surface water supplies. Stored water supplies in Lake Cypress Springs are used to provide firm supplies to customers of the District.

Carollo Engineers, Inc. (Carollo) was engaged by LG on behalf of the District to perform a technical evaluation of the District's permitting practices as they relate to lakefront structures, and to submit engineering recommendations relating to this evaluation. The information presented herein summarizes the evaluations performed, and provides engineering recommendations for the permitting of lakefront structures, particularly relating to retaining walls, dredging, and fill work.

1.1 Dam and Spillway Functionality

Lake Cypress Springs operates with a morning-glory spillway elevation set at 378.0 feet above mean sea level (msl). This conservation elevation is not constant and varies depending upon a suite of factors including: the magnitude, frequency, and distribution of precipitation, hydraulic and geomorphological characteristics of the watershed, contractual and legal obligations affecting operations, the water use of customers, localized reservoir evaporation, and other factors. Because of this existing morning-glory spillway, the FCWD has limited ability to control releases of water from the dam. The only controlled releases of water occur with a low-flow 18-inch service spillway used to meet obligations to a downstream water-right owner, Mount Pleasant. The dam elevation is set at 390.0 feet above msl and the emergency spillway to divert water around the dam and into Lake Bob Sandlin is set at 385.0 feet above msl.

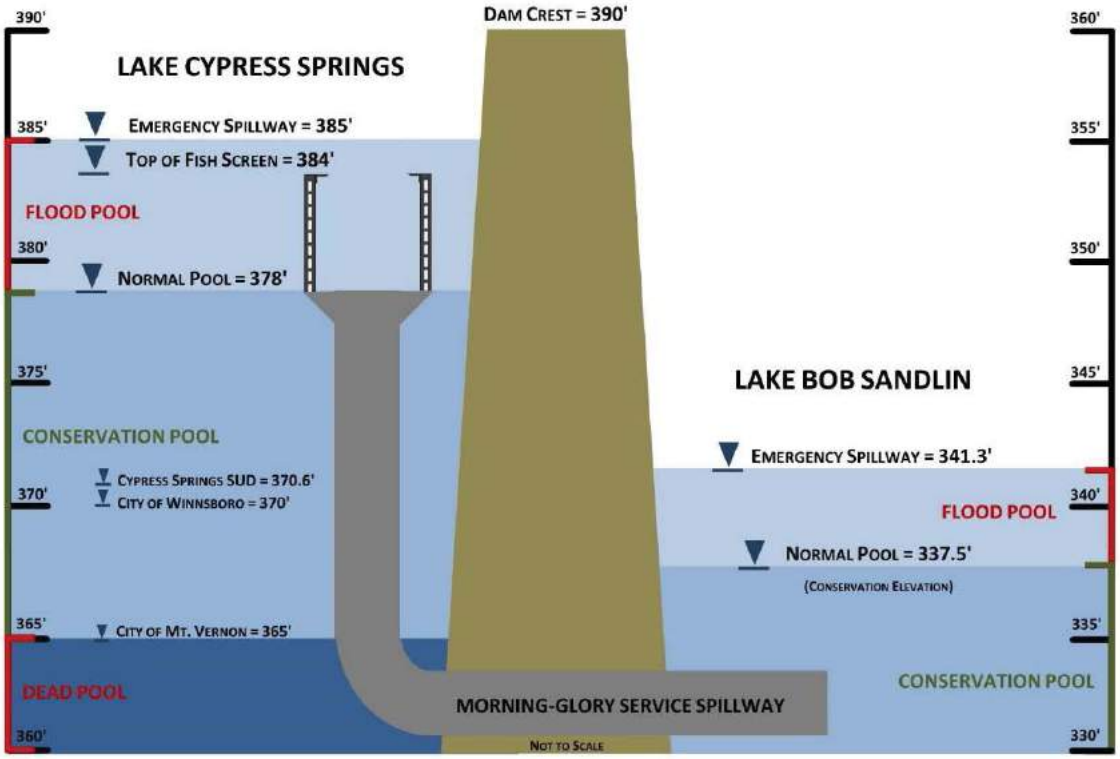


Figure 1.1 Important Lake Elevations

A September 22, 2009 frequency analysis completed by Freese Nichols Inc. (FNI) calculated predicted lake elevations for a given storm event, as presented in Table 1.1 below.

Table 1.2 Summary Lake Elevations
Engineering Recommendations for Lakefront Structures
Lloyd Gosselink

Event	Elevation
2-year	379.20
5-year	379.57
10-year	379.98
25-year	380.62
50-year	381.40
100-year	382.35
500-year	384.77

As shown in the table above, a 2-year storm event would cause a rise in the surface-water by 1.2 feet when the reservoir is at conservation at the start of an event. Per FCWD, many

retaining wall elevations on property surrounding the lake were built to be 1 to 2 feet above the conservation pool elevation. This indicates that fluctuations in the reservoir can be caused by smaller and more-frequent rain events.

1.2 Existing Permitting Requirements

At present, current policy is that a permit is required from FCWD for any activities involving the construction or placement of a structure (as defined below) on Lake Cypress Springs lakefront properties. This includes the improvement or replacement of any building or structure on FCWD property. The applicable permitting requirements (exert from Appendix 7: Rules and Regulations of Franklin County Water District) already pertaining to retaining walls, dredging, and fill work are as follows:

14.1 Except as otherwise specifically provided in this Article, a permit shall be required for the construction, improvement or replacement of any building, structure or improvement on District Property. No construction activity associated with such construction, improvement or replacement may commence until the District has approved the permit and issued an authorization to construct.

14.19 Retaining Walls. Retaining walls shall be constructed in compliance with the terms of the applicable permit and the applicable standards promulgated by the District, if any.

14.20 Dredging.

a) *No dredging, filling, or otherwise altering or reconfiguring the beds of the Lake shall be conducted on District Property without a dredging permit from the District.*

b) *Upon requesting a dredging permit, the requesting Lessee must advise the District whether dredged soil is to be spread on the Lessee's lot or hauled off site. No dredged soil or fill material shall be deposited in the Lake.*

c) *The holder of a dredging permit shall notify the District to schedule an inspection before the dredging actually occurs. No dredging shall commence prior to such inspection.*

d) *The holder of a dredging permit shall notify the District to schedule an inspection upon completion of all permitted dredging.*

e) *No dredging is permitted on District Property within six feet (6') of a retaining wall or bulkhead.*

2.0 PERMITTING REVIEW

A review has been performed to characterize the permitting processes and policies presently in place for a selection of Texas water suppliers in relation to their reservoirs, with particular attention to processes pertaining to the construction of retaining walls, dredging,

and fill activities. The entities selected for this review were chosen for their qualitative similarity to FCWD's use of Lake Cypress Springs based on their availability of data and similarity it function to the FCWD. Entities selected own and operate recreational lakes in Texas, use their lakes for water supply as well as recreation, and mandate specific limitations on retaining walls, dredging and filling in their lakes. In addition to the qualitative analysis that was performed, an effort was made to discover quantitative (studied and scientific) information supporting the language pertaining to retaining wall and dredge/fill regulations. No relevant quantitative information was discovered but qualitative comparisons to other entities could be made. This information is presented below.

2.1 Brazos River Authority (BRA)

The BRA's permitting processes and regulations were evaluated for Lake Granbury, Lake Possum Kingdom, and Lake Limestone. Other BRA reservoirs in the Brazos River Basin (Lake Proctor, Whitney, Aquilla, Belton, Stillhouse Hollow, Georgetown, Granger, and Somerville) are federal reservoirs and therefore considered in Section 2.6.

Information discovered pertaining to the permitting of construction activities through BRA can be found in Appendix 1: BRA. BRA requires that a permittee complete a "Permit and Agreement for On-Water Facility" (Attached in Appendix 1: BRA) as defined by facilities, whether floating or affixed to the lakebed, including but not limited to docks, piers, platforms, and stationary inflatable devices which are 10 feet or more in length/width. This permit is similarly required for dredging, removing or placement of fill on BRA lands or altering the lakebed; and retaining walls/bulkheads constructed on BRA lands or lakebed. The permit requirements for each of the three (3) lakes vary slightly, but contain the following language pertaining to retaining walls, dredging, and fill:

- *Dredging, filling or otherwise altering or reconfiguring the bed of the Lake, or excavating, filling or reshaping of Authority lands without written permission from the Area Project Manager is prohibited.*
- *If more than fifty (50) cubic yards of nontoxic dredged or fill material (native soil, concrete, sand, gravel or rock) are to be discharged below elevation six hundred ninety three (693) feet in the construction of the requested Facility, Permittee must obtain a Department of the Army permit for such Facility from the U.S. Army Corps of Engineers.*

2.2 Lower Colorado River Authority (LCRA)

LCRA's regulations on land and water use for the Highlands System of Lakes (Lake Buchanan, Inks Lake, Lake LBJ, Lake Marble Falls, Lake Travis, Lake Austin, and Lady Bird Lake) have been investigated for the potential utility.

Information discovered pertaining to the permitting of construction activities through LCRA can be found in Appendix 2: LCRA. The LCRA no longer requires that property owners obtain an LCRA permit for dredge and fill projectsA different approach to the regulation of these activities appears to be employed, instead providing property owners informative diagrams and useful information on how dredge/fill and bulkhead activities should be performed. These diagrams should be reviewed and could be similarly altered and implemented for Lake Cypress Springs to assist owners with understanding why dredge/fill requirements are important.

Although no permit is required by the LCRA, the Authority does stipulate in their regulations some requirements, as indicated below:

Dredge and fill activities are most common among property owners constructing stabilization projects on a single-family waterfront lot. Although construction of retaining walls and removal of sediment from the lakebed are the most typical activities that fall under LCRA's Dredge and Fill Standards, the standards also address:

- *Bulkhead, rock riprap or revetment construction and repair that include backfilling behind the wall and installing toe protection or tiebacks. Retaining walls must follow the existing shoreline.*
- *Use of a bulldozer, front-end loader or backhoe to move sediment from areas normally below the lake elevation listed in this booklet to an area above the lake elevation listed in this booklet.*
- *Construction or maintenance of shoreline protection systems.*
- *Construction or maintenance of recessed boat slips.*
- *Construction or maintenance of boat ramps.*
- *Contact LCRA to obtain checklist, if the length of shoreline work exceeds 500 feet or the volume of dredged material exceeds 500 cubic yards (see example calculation Figure F-4, Page 12).*
- *Contact LCRA prior to all dredging activities on LCRA property*

Compliance with the Dredge and Fill Standards on the Highland Lakes does not ensure compliance with requirements or regulations from other entities. Entities with jurisdiction may include cities, counties, property owners associations and homeowners associations. Compliance may be required with other sections of LCRA's Highland Lakes Watershed Ordinance, LCRA's Safety Standards for residential docks, land and water use regulations and on-site sewage facilities program. In cases where LCRA and another entity have different regulations or requirements, the most stringent regulations apply

In addition to these regulation, land reclamation is strictly NOT allowed by LCRA:

- *Property owners are not permitted to reclaim lost property resulting from the natural erosion process or a flood event. All shoreline stabilization projects and fill work must be conducted on or above the lake elevations listed in [the regulations].*

2.3 San Jacinto River Authority (SJRA)

Information discovered pertaining to the permitting of construction activities through SJRA can be found in Appendix 3: SJRA. SJRA's regulations on Lake Conroe have been evaluated for their potential utility. The SJRA requires that lakefront property owners obtain a permit for bulkhead applications and dredge/fill operations. Similarly to the LCRA, SJRA also provides owners with helpful information about dredge/fill and bulkhead construction. Regulations pertaining to these activities and requiring a permit for construction included:

Section 6.06: Dredging and Filling; Bulkheading. (a) It is a violation of these Rules for any Person to dredge, excavate, deposit, or fill material from, in or to the Reservoir or Authority Land at any time except in strict compliance with a valid Permit authorizing same.

- *(b) It is a violation of these Rules for any Person to install, re-install, replace or modify bulkheads in the Reservoir or on Authority Land at any time except in strict compliance with a valid Permit authorizing same.*

- *(c) To obtain a Permit, a Person must submit an application on forms provided by the Authority and timely pay all fees required by the Authority. The Authority exercises the right to grant, deny, condition or renew such Permit as deemed appropriate in the sole discretion of the Authority.*

- *(d) In addition to the terms and conditions of any Permit issued pursuant to this Section, any dredging, filling or bulkheading work shall be performed in accordance with all applicable regulations and permits of the U.S. Army Corps of Engineers (Galveston District).*

2.4 Titus Count Fresh Water Supply District No. 1 (TCFWSD)

Information discovered pertaining to the permitting of construction activities through TCFWSD No. 1 can be found in Appendix 4: TCFWSD. The TCFWSD rules and regulations on Lake Bob Sandlin have been investigated for their potential utility. The TCFWSD requires that a permit be granted for dredge/fill activities and bulkhead construction. The rules and regulations pertaining to these activities include:

- *All dredging in Lake Bob Sandlin (including that associated with retaining walls, shoreline leveling and/or contouring, and boat ramp construction) shall be performed in accordance with rules and guidelines established by the U.S. Army Corps of Engineers. All dredging requires a dredging permit from the District (including those projects where no permit or notice is required by the Corps of Engineers). If a dredging permit is issued from the District, dredging will be allowed only under the footprint of the structure or for backfill of retaining wall.*

- *Acceptable erosion control measures must be utilized throughout the construction period (i.e. containment, silt screens, other physical structures to minimize the amount of sediment entering the reservoir).*

- *Retaining walls may be constructed along your property line. If an eroded area along the shoreline is approved by the District to be reclaimed, a portion of the backfill material may also be reclaimed from the reservoir, dependent upon the amount needed. Any material used to backfill must be pre-approved by the District. Soil testing may be required at property owner's expense.*

- *If more than 50 cubic yards of nontoxic dredged or fill material (native soil, concrete, sand, gravel or rock) are to be discharged below elevation of 337.50' MSL in the construction of the requested structure, Permittee must obtain a Department of the Army permit for such structure from the U.S. Army Corps of Engineers.*

2.5 Tarrant Regional Water District (TRWD)

Information discovered pertaining to the permitting of construction activities through TRWD can be found in Appendix 5: TRWD. TRWD's rules and regulations for retaining walls, dredging, and fill work on their four (4) lakes (Lake Bridgeport, Cedar Creek Reservoir, Eagle Mountain Lake, and Richland Chambers Reservoir) were evaluated for their potential utility. TRWD requires a permit for retaining walls and dredge/fill activities. Regulations pertaining to these activities are rather brief, and include:

- *Retaining walls shall be constructed in a manner that improves the shoreline alignment. If an eroded area along the shoreline is approved by the District to be reclaimed then the backfill material must also be reclaimed from the reservoir.*

- *Approved materials for seawalls include concrete, soil cement, minimum 8 gauge steel sheet piling, PVC sheet piling, pressure treated lumber, and rip rap. Other materials with a long life expectancy will be considered. Creosote materials will not be approved.*

- *All dredging activity must be performed in such a manner that will maintain a gently sloping lake bottom and prevent the formation of holes or sudden drop-offs.*

- *All construction activities disturbing the soil at or below the flood flowage boundary of the reservoir must employ erosion control practices to minimize the amount of sediment entering the reservoir.*

- *All dredged materials shall be placed in such a manner as to prevent any sediment runoff back into the reservoir. Containment and/or silt screens may be required.*

- *The District recommends that before any dredging contractor begins work that he/she first call 1-800-DIGTESS (1-800-344-8377) to determine if underground utilities are located in the area.*

2.6 United States Army Corp (USACE) Lakes

Information discovered pertaining to the permitting of construction activities on a USACE reservoir can be found in Appendix 6: USACE The USACE rules and regulations for federally owned and operated lakes in Texas have been reviewed for their potential utility. This exercise was confirmed that federally owned lakes do not typically allow the construction of structures on project lands. Each lake has slightly different mandated rules, so Sam Rayburn Reservoir was used as an example (exert shown below):

- *Adjacent Landowners Cannot: Place personal property of any kind, including but not limited to boats, buildings, stairways, bird houses, tables, etc., on government property for more than 24 hours. Such actions may result in summary removal and impoundment of the property or other action. Portable (roll-away) docks are prohibited at all times.*

- This includes the *Construct[ion] or place[ment of] any house, trailer, RV or other structure for human habitation, permanent or temporary, on flowage easement.*

An example of a flowage easement for Sam Rayburn Reservoir is shown below:

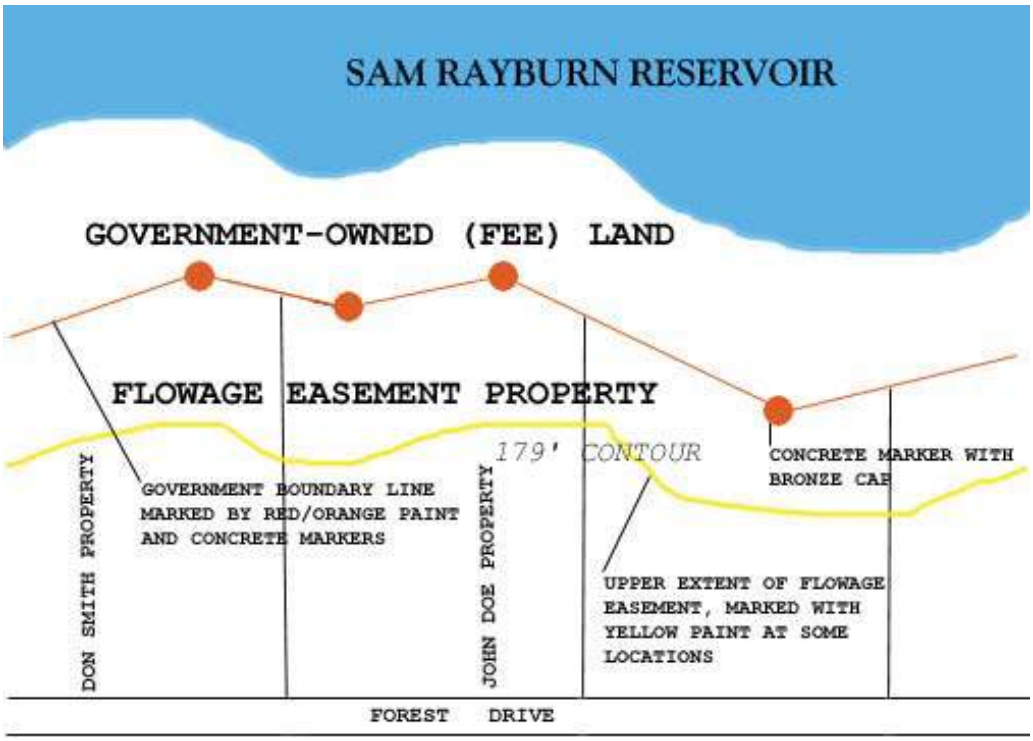


Figure 1.3 Flowage Esement Example

3.0 EVALUATION OF PERMITTING PROCESSES

A matrix of permitting language was compiled to aggregate major elements into a table for comparison.

Table 1.4 Matrix of Permitting Language
Engineering Recommendations for Lakefront Structures
Lloyd Gosselink

	BRA	LCRA	SJRA	TRWD	TCFWSD	FCWD
Altering or reconfiguring the bed of the lake, dredging, excavating, or filling or reshaping lands require a permit	✓		✓	✓	✓	✓
Construction of bulkhead or retaining wall requires a permit	✓		✓	✓		✓
USACE permit for such Facility from the U.S. Army Corps of Engineers is required	✓	✓	✓		✓	
Owner must employ erosion control practices (silt protection fencing, rock gabions, etc.) to minimize sedimentation reentering the reservoir		✓		✓	✓	
Backfill material must/should be reclaimed from the reservoir				✓	✓	
Regulation of materials used for construction of retaining walls and bulkheads				✓		
Before dredging, 1-800-DIGTESS should be called to determine if underground utilities are located in the area.				✓		
Construction must improve the shoreline alignment, functionality, and enhance the aesthetics of the lake		✓		✓		
Dredging activity must be completed in a way that maintains a mildly sloping lake bottom				✓		
Entity reserves the right to establish case-specific regulations and limitations where appropriate.	✓	✓	✓	✓	✓	

4.0 RECOMMENDED MODIFICATIONS

FCWD's existing permitting processes and regulations as they relate to retaining wall, dredging, and fill work have been considered in the context of the broader water community's similar permitting processes. Based upon this evaluation, it is recommended that the following (or similar) language in **bold text** be added and ~~stricken text~~ be removed from the FCWD's rules and regulations relating to retaining wall, dredging, and fill work.

14.19 Retaining Walls. ~~*Retaining walls shall be constructed in compliance with the terms of the applicable permit and the applicable standards promulgated by the District, if any.*~~

a) ***Retaining walls shall be constructed in a manner that improves the shoreline alignment, functionality, and enhances the aesthetics of the lake. Retaining walls must be constructed in a structurally sound manner which does not create an environmental or safety concern.***

b) ***In addition to the terms and conditions of the permit, dredging, filling or retaining wall activities shall be performed in accordance with all applicable regulations and permits of the U.S. Army Corps of Engineers.***

c) ***Backfill material used in construction activities below the elevation of 385.0 feet msl must be reclaimed from the reservoir unless specialized backfill is specified by a registered Texas professional engineer (P.E.). Backfill materials must be obtained from the reservoir by adhering to applicable dredging regulations below.***

d) ***Construction activities that disturb soil below conservation pool elevation of the reservoir must employ erosion control practices (silt protection fencing, rock gabions, etc.) to minimize sedimentation reentering the reservoir.***

e) ***Due to the unique nature of lakeside retaining systems, such facilities will be evaluated on a case-by-case basis and FCWD reserves the right to establish case-specific regulations and limitations where appropriate.***

14.20 Dredging.

a) *No dredging, filling, or otherwise altering or reconfiguring the beds of the Lake shall be conducted on District Property without a dredging permit from the District.*

b) *Upon requesting a dredging permit, the requesting Lessee must advise the District whether dredged soil is to be spread on the Lessee's lot or hauled off site. No dredged soil or fill material shall be deposited in the Lake.*

c) *The holder of a dredging permit shall notify the District to schedule an inspection before the dredging actually occurs. No dredging shall commence prior to such inspection.*

d) *The holder of a dredging permit shall notify the District to schedule an inspection upon completion of all permitted dredging.*

e) *No dredging is permitted on District Property within six feet (6') of a retaining wall or bulkhead.*

f) Dredging activity must be completed in a way that maintains a mildly sloping lake bottom to prevent the formation of sudden drop-offs.

It is further recommended that FCWD develop exhibits similar to the ones developed by the LCRA to effectively communicate ideal concepts for improvements to shoreline alignment, functionality, and aesthetics.

APPENDIX 1 – BRA

REGULATIONS OF
BRAZOS RIVER AUTHORITY
LAKES AND ASSOCIATED LANDS

1. APPLICABILITY

These regulations apply to all Lakes and associated lands under the jurisdiction of the Brazos River Authority (BRA).

2. AUTHORITY

These regulations are adopted and promulgated under authority vested in the Board of Directors of the BRA by the laws of Texas, including, but not limited to, Chapter 8502 of the Special District Laws Code; Chapters 49 and 51 of the Texas Water Code; Chapters 25 and 31 of the Texas Parks and Wildlife Code; and Chapter 542 of the Texas Transportation Code.

3. PRIOR REGULATIONS SUPERSEDED

The Regulations for the Governance of Brazos River Authority Lakes and Associated Lands adopted by the Brazos River Authority Board of Directors on July 31, 2006, is hereby repealed and replaced in its entirety as of the effective date herein.

4. DEFINITIONS

a. Commercial On-Water Facility: an On-water Facility serving more than one single-family residence or serving the public at-large (exception: a multi-slip On-Water Facility permitted to a condominium association or home-owner's association for use at no additional charge by the entity's members and guests).

b. Residential On-Water Facility: an On-Water Facility serving a single-family residence.

c. Lakes: Possum Kingdom Lake located in Young, Palo Pinto, Stephens, and Jack Counties with the boundary of the Lake defined by the 1,000 foot Mean Sea Level (msl) contour line. Lake Granbury located in Parker and Hood Counties with the boundary of the Lake defined by the 693 foot msl contour line. Lake Limestone located in Limestone, Leon, and Robertson Counties with the boundary of the Lake defined by the 363 foot msl contour line. Each Lakes contour line may meander and change over time with natural forces, including erosion and accretion.

d. Watercraft: the term "Watercraft", for the purposes of these Rules and Regulations, shall have the same meaning as the term "Vessel" in the Texas Water Safety Act.

e. On-Water Facility: Residential On-Water Facilities and Commercial On-Water Facilities, whether floating or affixed to the lakebed, including but not limited to: docks, piers, platforms, and stationary inflatable devices which are 10 feet or more in length/width.

f. **Dead Load:** the weight of all structural framing and other structure components fixed to and permanently integrated into an On-Water Facility, including, but not limited to: float or pier framing, decking, railing, flotation units, hardware, utilities, power posts, transformers, dock boxes, pile guides, cleats, fire protection equipment (if permanently affixed to the structure) and any other fixed materials or equipment

g. **Live Load:** the active and changing loads that may be imposed on an On-Water Facility.

5. GENERAL INFORMATION

a. Lake Levels

The water level in the Lakes will not be constant. BRA Lakes are water supply and conservation projects. While it is the desire of the BRA to keep the Lakes as full as possible, the level of the water will vary, depending on the amount of water diverted locally, evaporation rates, amounts of rainfall and runoff in the Brazos Basin upstream, required releases, and other factors. The level in any lake may drop substantially below the full lake level.

b. Swimming

Swimming in all areas of the Lakes, including designated swimming areas, is solely at the risk of the swimmer.

c. Emergencies

In the case of extreme flooding, water contamination, or other emergency or natural disaster, the General Manager/CEO is authorized to declare restrictions on the use of all or any portion of BRA Lakes as deemed necessary and convenient for purpose of public health, safety and welfare. No person shall engage in any activity that violates such restrictions.

d. Building and Construction Compliance

Pursuant to the authority granted by §51.127 of the Texas Water Code, the BRA may, from time to time, adopt standards and regulate activities as provided therein on any stream or body of water, or any body of land, or any easement owned or controlled by the BRA.

6. VARIANCE

Variances to these regulations for governance, where not otherwise mandated by federal, state or local laws, may be granted by the General Manager/CEO or his designee in cases of imminent public necessity/calamity; or to protect public health, safety or welfare.

7. WATERCRAFT

Watercraft may be maintained and operated on the Lakes under the following conditions:

a. Applicable Laws

Watercraft on the Lakes shall be equipped, operated and maintained in accordance with the provisions of all applicable federal, state, or local laws, including but not limited to:

(1) United States Coast Guard Inland Rules (33 USC 34);
(2) Texas Water Safety Act (§31, TPWD Code); and
(3) Boat Sewage Disposal Act, 30 Texas Administrative Code §§321.1 – 321.18.

b. BRA Operating Regulations

In addition to the applicable laws stated above and pursuant to the authority granted by §31.092 of the Texas Parks and Wildlife Code and §51.127 of the Texas Water Code, the following regulations shall be effective on the Lakes:

(1) The BRA's General Manager/CEO is authorized to designate areas or zones in which the operation of watercraft shall be prohibited or in which the speed of watercraft shall be restricted. These zones shall be marked by buoys or signs stating the prohibition or restriction. No watercraft shall be operated within a prohibited zone. Watercraft operating in any restricted zone shall be operated in a manner that fully complies with the posted restriction.
(2) Watercraft operating within 50 feet of the shoreline or 50 feet of any boathouse, dock, on-water facility, occupied watercraft, or area in which people are swimming or diving shall be operated at a slow, no wake speed (a headway speed that does not create a swell or wake).
(3) No person or watercraft shall be in the water within 100 feet of any public fishing pier that is operated or maintained by the BRA, and which is designated for fishing only.
(4) The operator of a watercraft involved in a collision, accident, or other casualty that results in death or injury to a person or damage to property in excess of $2,000 shall report the incident to a BRA Lake Ranger as soon as possible, but not later than 30 days from the date of the collision or accident.

c. Mooring, Anchoring or Berthing on the Lakes

Watercrafts may be anchored, moored or berthed on the Lakes only as follows:

(1) Watercrafts may be moored or beached for a period of time not to exceed two (2) days in locations on the Lakes which will not interfere unduly with recreational use of the shoreline or lake by others.
(2) Except as provided in subsection (1) above, Watercraft shall be anchored, moored or berthed at private or commercial facilities or areas of the Lakes maintained in accordance with permits or contracts issued by the BRA.
(3) No watercraft shall be moored longer than 15 minutes at a BRA owned courtesy dock.
(4) In an emergency, any watercraft left unattended shall, to the extent possible, be securely moored or anchored and suitably flagged and lighted. The watercraft shall be removed to an approved mooring or berthing area as soon as possible.

d. Watercraft Sanitation

If applicable, watercraft must display the appropriate clean water sticker pursuant to 26.044 of the Texas Water Code.

8. ON-WATER FACILITIES

Pursuant to the authority granted in §51.127 of the Texas Water Code, the following provisions apply to On-Water Facilities, including but not limited to: docks, piers, platforms, and stationary inflatable devices which are 10 feet or more in length/width.

a. Installation of On-Water Facilities and Permit Application Process

The privilege of installing an On-Water Facility is not an inherent right with the control or ownership of waterfront property. No facility shall be situated in, on, or over the waters of the lakes or on BRA land without the appropriate BRA permit. Any such facility without the appropriate BRA permit shall be subject to immediate removal at the owner's expense. A permit or contractual relationship shall be obtained from the appropriate Area Project Manager prior to construction, modification, or transfer of any on-water facility in, on, or over the Lakes. Applications for permits shall be made on forms provided by the BRA. The BRA exercises the right to grant or deny On-Water Facility Permits as deemed appropriate in the sole discretion of the BRA.

b. Requirements for On-Water Facilities

The On-Water Facility owner is responsible for the safety and structural soundness of any On-Water Facility placed on or over the Lakes. BRA approvals and/or inspections relating to On-Water Facilities shall not constitute a warrant of the functionality, structural integrity, safety, workmanship, materials, or water worthiness of any On-Water Facility. All On-Water Facilities must meet the following requirements:

(1) All On-Water Facilities must be constructed and maintained in a structurally sound manner which does not create a safety hazard or environmental concern.
(2) On-Water Facilities may not be situated in a manner that unreasonably interferes or obstructs access to other permitted facilities or neighboring properties.
(3) There shall be no more than one On-Water Facility on any one shoreline lot.
(4) On-Water Facilities shall not extend more than one-third of the distance between opposite shorelines of any area of the Lakes where the distance between the shorelines is less than 300 feet.
(5) Lake level fluctuation shall not constitute a basis for extending On-water facilities further into the Lakes.
(6) In narrow sections of the Lakes where the distance between opposite shorelines is 120 feet or less, a clear channel, at least 40 feet in width, shall be maintained between the facilities on opposite shorelines, with the location of such channel being as nearly as practicable over the deepest portion of that section of the Lake.
(7) A scaled drawing showing the location and dimensions of the proposed facility must be included in the application. In addition, if property boundaries are uncertain, a property survey may be required.
(8) Applicant must own or lease the land adjoining the Lake at the location of the proposed facility and provide to the BRA, at the time of permit application, documentation establishing the ownership or leasehold interest in the property.
(9) The On-Water Facility identification number, furnished by the BRA, must be posted conspicuously on all On-Water Facilities.
(10) Buoyancy for all floating facilities shall be provided by polystyrene, multiple air filled internal compartments, or a similar flotation material that is encapsulated in an approved rustproof, non-corrosive, UV resistant shell that is a minimum of 0.15 inches in thickness (such as, high impact polyethylene).
(11) Barrels, pontoons, drums or other improvised equipment shall not be used for flotation.
(12) Amber reflectors must be installed on all sides of facilities at no greater than

20-foot intervals. Those portions of on-water facilities extending farther than 100 feet into the Lakes shall be illuminated during hours of darkness in such a manner as to make such facilities visible to boat traffic on the Lakes without the lights themselves impairing the vision of boaters.

(13) On-Water Facilities may not be more than one story; however, On-Water Facilities may include a gabled or flat roof that can be used as a sun deck. Sun Decks located on the roof of an On-Water Facility may include a covering for shade; however, coverings may not be used as a third-story.

(14) On-Water Facilities may be built with side and back walls; however, there must be a Lake-side entrance into the On-Water Facility that is fully open and subject to visible inspection by BRA personnel from a Watercraft at all times.

(15) A storage closet, no larger than 40 square feet, will be allowed for an On-Water Facility, provided that the storage closet is included in the approved design. (One storage closet per Commercial/condominium/home-owners association On-Water Facility slip or Residential On-Water Facility.)

(16) Living quarters, kitchens (any space adapted to cook or prepare food), plumbing, sinks, bathing facilities or toilet facilities are not allowed in or on facilities permitted on the Lakes.

c. The BRA reserves the right, in its sole discretion, to further restrict On-Water Facilities on BRA Lakes if placement of the On-Water Facility: creates a hazard to navigation; results in a nuisance; impairs the BRA's ability to operate and maintain the Lake; or interferes with or restricts access to adjacent properties or On-Water Facilities.

d. Additional Residential On-Water Facility Requirements

(1) All Residential On-Water Facilities will generally be located as close to the center-most part of the water frontage as possible.

(2) The area for all Residential On-Water Facilities (including areas for Watercraft slips or storage) shall not exceed 2,000 square feet in total. Walkways to the On-Water Facilities, 6 feet or less in width, may be constructed and shall not be included in the calculation of the total area for Residential On-Water Facilities.

(3) Residential On-Water Facilities, previously permitted to exceed 2,000 square feet, may re-build or replace the facility with a structure of the same square footage. All other facility specifications apply.

(4) Personal water craft may be stored on the sides of a permitted Residential On-Water Facility; however, Watercraft storage shall be managed in a manner that does not create an unreasonable hazard or overcrowding.

(5) Residential On-water facilities shall not extend further than 100 feet into the Lake from the shoreline.

(6) BRA may, in its sole discretion, permit a Residential On-Water Facility to extend beyond 100 feet into the Lake from the shoreline, utilizing the following criteria:

a. Sufficient water depth based on water available at historical average lake elevation;
b. Distance into lake of adjacent docks on either side;
c. Clear channel requirements (40 feet minimum) and/or hazards to boater navigation;

d. Location of walkway on lot; and,
e. Dock size and configuration.

However, in no event shall a residential On-Water Facility extend further than 200 feet from the shoreline of any Lake.

(7) Privately operated fuel/oil dispensing systems are prohibited. Automatic shut- off valves are required for pre-existing systems.

e. Additional Requirements for Commercial On-Water Facilities

(1) Due to the unique nature of Commercial On-Water Facilities, such facilities shall be evaluated on a case by case and BRA reserves the right to establish appropriate restrictions, limitations and requirements.
(2) Commercial On-Water Facilities with slips greater than 26 feet in length must provide, at a minimum, one sewage pump-out facility.
(3) The design of a Commercial On-Water Facility must be signed and sealed by a professional engineer/architect licensed to do business in the State of Texas.

f. Other On-Water Facilities or Structures
Other structures such as duck blinds, casting targets, slalom courses, shall not be erected on the Lakes except by written permission of the BRA.

g. All facilities must comply with any and all additional requirements of federal, state, and local laws.

h. Floating habitable structures are prohibited on BRA owned, operated, or managed lakes. Houseboats or other watercraft with overnight accommodations that are designed for navigation are excluded from this prohibition.

i. Pre-Existing On-Water Facilities
Except as provided in Subsection 8d.(3), On-Water Facilities in place prior to October 27, 2014, shall be allowed to remain in their present location and configuration until such time as substantive repairs on the On-Water Facility become necessary. A substantive repair is any repair which:

(1) Requires removal of the On-Water Facility from the Lake (vertically or horizontally);
(2) Is due to deterioration to the point of becoming a safety hazard;
(3) Is due to an environmental hazard;
(4) Results in the replacement or rebuilding of sidewalls; or
(5) Results in the addition, replacement, or upgrading of the electrical wiring system.

Voluntary replacement of non-encapsulated flotation that does not involve or require the repair, replacement or upgrading of existing structures (other than the substructure supporting the encapsulated flotation) shall not be considered a substantive repair and shall not require additional upgrade of the On-Water Facility.

9. ON-WATER FACILITIES VIOLATIONS

The BRA may revoke the permit of any On-Water Facility that is in violation of the provisions of these Rules and Regulations. In the event an On-Water Facility is in violation of these provisions, the BRA may exercise the right to grant or deny continuation of the On-Water Facility Permit as deemed appropriate in the sole discretion of the BRA. The BRA reserves the right to revoke permits and require removal of On-water Facilities at the expense of the owner/permittee in the following circumstances: if the Facility creates a public health, safety, or welfare concern; the permittee has failed to timely tender any applicable associated fees; or the facility has an adverse environmental impact to BRA Lakes or property. Additionally, pursuant to §51.128 of the Texas Water Code, any violation of this section may result in criminal penalties.

10. FEES FOR ON-WATER FACILITIES

The BRA shall, from time to time, establish fees for Commercial On-Water Facilities on BRA Lakes.

11. DESIGNATED RESTRICTED/PROHIBITED AREAS

Pursuant to the authority granted in §51.127 of the Texas Water Code and §31.092 of the Texas Parks and Wildlife Code, the General Manager/CEO is authorized to identify designated areas in which specific activities are restricted or prohibited for purposes of public safety or security. These designated areas shall be marked with signs or buoys that clearly indicate that specific activities are restricted or prohibited in that area. Signs or buoys marking restricted or prohibited areas shall be complied with at all times.

12. RECREATIONAL SCUBA DIVING

Pursuant to the authority granted by §51.127 of the Texas Water Code, the following additional rules shall apply to scuba diving in BRA waters:

a. Scuba diving is allowed in the Lakes only in areas within 150 feet of a shoreline, except for emergency rescue or salvage operations or for special events for which exceptions may be granted by the BRA. Scuba diving in other areas is prohibited.

b. Divers shall display a warning flag or sign indicating "diver down" on a buoy or boat in the immediate area where scuba diving is in progress. The sign must be visible from a distance of 100 feet. Warning flags and signs shall be removed as soon as all divers return to the boat or shore.

c. A "diver down" flag shall be red with a diagonal white stripe and shall be at least 15 inches square or, if larger, may be rectangular shaped.

d. Scuba diving shall not be conducted in areas that will block or interfere with normal boat traffic.

13. FIREARMS AND HUNTING

Pursuant to the authority granted by §51.127 of the Texas Water Code, the following rules apply to all hunting on any BRA lands or water.

a. Hunting is prohibited on BRA lands, including leased properties. However, the BRA reserves the right to lease specific tracts for bow hunting, as deemed appropriate by the BRA.

b. Hunting on BRA Lakes is limited to hunting of waterfowl in season from a stationary blind at a fixed location in or on the Lakes, as specifically permitted by the BRA. Any other hunting on BRA Lakes is strictly prohibited.

c. All hunting of waterfowl on the Lakes shall be conducted in full compliance with the following requirements:

(1) The hunting of waterfowl on the Lakes shall be conducted in accordance with all applicable provisions and requirements of Federal, State and local laws.
(2) Written permits for waterfowl hunting sites shall be issued by the BRA and must be presented at the permitted site upon request by law enforcement officials.
(3) The fee for a waterfowl hunting site permit shall be established by the BRA's Board of Directors, and such fee may be adjusted at the sole discretion of the Board.

d. Bowfishing is legal for taking non-game fish such as gar and buffalo in accordance with Texas Parks and Wildlife Regulations.

(1) Fish may be taken with longbow, recurve bow, compound bow, or crossbow.
(2) Taking or attempting to take fish with bow and arrow may not be performed within 100 ft. of any marked or designated swim area or public boat ramp or within 50 feet any On-Water Facility or restricted area.
(3) Boaters participating in bowfishing should be courteous to lakefront property owners with respect to noise and light setups.

e. Other than as specifically authorized in this section, no firearms shall be discharged along or across BRA lands or waters of the Lakes, except at target ranges approved by the BRA.

f. Penalties
Persons who violate the above terms are subject to revocation of their waterfowl hunting site permit, termination of their hunting lease, and/or any and all additional civil and criminal remedies.

14. PROHIBITED ACTIVITIES

Pursuant to the authority granted by §51.127 and §221.076 of the Texas Water Code, and §25.004 of the Texas Parks and Wildlife Code, the following activities are prohibited on BRA Lakes or BRA lands:

a. Camping in areas not designated for such activity by the BRA;

b. Camping in designated BRA RV sites or designated BRA camping sites for periods of more than ten consecutive days without written permission from the BRA;

c. Littering, illegal dumping, improper disposal of waste, and/or vandalism;

d. Operating generators in BRA public use areas in a manner that disturbs others;

e. Campfires in areas not designated for such activity by the BRA;

f. Possessing or using glass containers of any kind in BRA public use areas, to include 200 feet from the shoreline of that public use area;

g. Bringing pets or domesticated animals into any public use area and BRA trail systems unrestrained or on a leash longer than 10 feet (other than official service and assistance animals trained to provide aide), persons responsible for the pet or domesticated animal shall be responsible for removing any waste produced, the waste shall be deposited into an approved trash/waste container;

h. Allowing pets or domesticated animals into a designated swimming area;

i. Bringing livestock, including horses, into BRA public use areas, except on designated equestrian trails;

j. Discharging fireworks or detonating explosives, unless written permission is granted by the BRA;

k. Using any device constructed and operated to launch projectiles on or over the Lakes or on BRA lands;

l. Swimming within 100 feet of all public loading docks, boat ramps or fishing piers;

m. Fishing from all public boat ramps and courtesy docks, unless otherwise designated;

n. Diving or jumping into the Lakes from a height of 20 feet or more, and climbing or rappelling on BRA lands;

o. Diving or jumping into the Lakes from a public highway, roadway bridge, railroad bridge, water intake structure, or utility tower;

p. Operating vehicles off-road on BRA lands or lakebeds, except as specifically authorized by the BRA;

q. Using all-terrain vehicles, dirt bikes, golf carts, UTV's or other vehicles not licensable by the State of Texas for use on public roadways, in BRA public use areas and on BRA lands or lakebeds;

r. Locating or constructing improvements or structures on BRA lands or waters to include placement of privately owned buoys without written permission from the BRA;

s. Cutting, burning, removing or destroying any tree or vegetation on BRA lands without written permission from the BRA;

t. Removing rock, sand or soil from BRA lands without written permission from the BRA;

u. Dredging, filling or otherwise altering or reconfiguring the beds of the Lakes, or excavating, filling or reshaping of BRA lands without written permission from the BRA; and

v. Aviation activities, to include landing and take-off, are allowed at BRA approved airfields and airstrips only. (Exception: emergency medical services) This provision does not restrict landings and take-offs on the waters of the Lakes.

15. ABANDONED PROPERTY

The BRA may seize any personal property located on the Lakes or adjacent BRA lands which is unauthorized, or which is abandoned, or which is left unattended without conforming with BRA regulations for mooring or anchoring, or with respect to which any fee or charge imposed by the BRA is not paid when due, in accordance with applicable federal, state, and local laws.

16. MOTOR VEHICLE SPEED LIMITS

Pursuant to the authority granted in §542.202 of the Texas Transportation Code and §51.127 of the Texas Water Code, the General Manager/CEO is authorized to designate areas on BRA lands adjacent to the Lakes wherein the speed of motor vehicles operated in such areas shall be restricted for purposes of safety. Such areas shall be marked with signs on which the maximum speeds at which motor vehicles may be operated shall be posted. No motor vehicle shall be operated in any such area at a speed in excess of the speed thus posted.

17. ADVERTISING, COMMERCIAL ACTIVITIES AND EXHIBITIONS

Pursuant to the authority granted in §51.127 of the Texas Water Code, the BRA shall regulate the following at their sole discretion.

a. Private notices, advertisements and signs are prohibited on any portion of the Lakes, facilities on the Lake, or BRA lands, except by specific written permission of the BRA. This provision shall not apply to signs, banners or private notices placed on BRA leased property by the lessee.

b. No person, firm or corporation shall engage in any business or commercial operation on any portion of the Lakes or BRA lands, except by specific written permission of the BRA.

c. Exhibitions, water shows, boat races or any other public event may be performed on the Lakes or on BRA lands only by prior specific written permission of the BRA.

d. Concessions are only authorized in conjunction with BRA approved special events.

18. ALCOHOLIC BEVERAGES

Pursuant to the authority granted in §51.127 of the Texas Water Code, the General Manager/CEO is authorized to designate specific BRA parks or public use areas in which the possession or consumption of alcoholic beverages is strictly prohibited. All such areas in which alcoholic beverages are not allowed shall be clearly posted.

19. PUBLIC USE AREA ACCESS

The BRA may establish and post a schedule for closing or restricting admittance to a designated public use area, or portion thereof. Entry into public use areas without complying with the posted schedule is strictly prohibited.

20. WATER DIVERSION

Water shall not be pumped or diverted from the Lakes except as specifically permitted in

writing by the BRA.

21. ON-SITE SEWAGE FACILITY (OSSF) REGULATED AREAS

Pursuant to the authority granted in Title 30, Chapter 285 of the Texas Administrative Code (TAC), the BRA shall administer and enforce the OSSF program as the authorized agent of the TCEQ in its area of jurisdiction and shall enforce Chapter 366 of the Texas Health and Safety Code.

It is the responsibility of individuals installing, constructing, repairing, replacing or modifying on-site sewage facilities to coordinate with the local lake offices at Possum Kingdom Lake and Lake Limestone to determine when and if a permit is required.

22. OTHER PERMITS REQUIRED

Permits and associated fees, if applicable, are required for the following activities:

a. Dredging, removing or placement of fill on BRA lands or altering the lakebed;

b. Retaining walls/bulkheads constructed on BRA lands or lakebed;

c. Modifications or alterations to previously approved private boat ramps. New privately owned boat ramps and rail systems are no longer authorized for installation;

d. Marina Pump-out Systems and Clean Water Sticker programs;

e. Mooring buoy (applicable to Possum Kingdom only);

f. Workbarges (a workbarge is any platform that assists a commercial contractor in construction, demolition, maintenance or salvage);

g. Private Swimming Areas (Lake Granbury only);

h. Overnight Camping or Day-use Fees, where applicable;

i. Long-term (greater than 14 consecutive days) parking at Possum Kingdom Airport; and

j. Hangar leases at Possum Kingdom Airport.

23. PENALTY

Pursuant to §31.127 of the Texas Parks and Wildlife Code and/or §51.128 of the Texas Water Code, a person who violates or fails to comply with any provision of these regulations is guilty of a Class C misdemeanor.

24. NOTICE TO APPEAR

An enforcement officer who issues a citation to or arrests a person for a violation of these regulations may deliver to the alleged violator a written notice to appear before the Justice of the Peace or county court having jurisdiction in the area where the alleged offense was committed. The BRA does not collect or receive any funding from fines that may be assessed by a Justice of the Peace or county court having jurisdiction in the area where the alleged offense was committed.

25. LEGAL PROOF

In any prosecution for violation of these regulations, it shall not be necessary for the State to prove that the installation of any sign, buoy or marker was authorized. Any person charged with a violation of these regulations may prove, as a defense, that installation of any sign, buoy or marker was not authorized.

26. DEED RESTRICTIONS AND COVENANTS

The BRA recognizes the existence of deed restrictions and covenants, but generally defers to property owners and home owner associations for enforcement. The BRA is not required to issue permits for On-water Facilities on lots where On-Water Facilities were prohibited in previously approved and executed development agreements.

27. VALIDITY

If any part of these regulations should be found invalid or unconstitutional, the validity of the remainder hereof shall not be impaired.

28. EFFECTIVE DATE

These regulations are hereby adopted by the Board of Directors of the Brazos River Authority on October 27, 2014, at its regular board meeting.

APPLICATION FOR CONSTRUCTION PERMIT
BRAZOS RIVER AUTHORITY
COTTAGE SITE LEASE

Mail to:
BRAZOS RIVER AUTHORITY
301 OBSERVATION POINT ROAD
GRAFORD, TEXAS 76449

Name

Mailing Address

City, State,Zip

Home Phone

Lake Phone

LOT DESCRIPTION:
Lot
Tract
Area

Camp Name

Lake Address (911)

Business Phone

PLEASE PROVIDE A DETAILED SITE PLAN SHOWING LOCATIONS AND DIMENSIONS OF PROPOSED IMPROVEMENTS. (Buildings, sprinkler system, landscape, retaining walls, fencing, etc.)

DESCRIPTION OF CONSTRUCTION REQUESTED:

Date of Construction:

Date of Completion:

Contractor:

Contractor Phone Number

Applicant Signature

Date

Allow 10-15 days for processing application.
Do not begin any construction until authorized.
$50.00 non-refundable fee is due at time of request.
If there is a locked gate please provide a key or combination.

****

FOR AUTHORITY USE ONLY

APPROVAL: Date

(If construction is not started within one year of approval date a new application and fee is required.)

Comments:

Payment Received: Date Cash Check # Cust. # Lawson:

DRAWING OF PROPOSED CONSTRUCTION

Permit and Agreement for On-Water Facility

This Permit and Agreement for On-Water Facility ("Agreement") is entered into by and between the Brazos River Authority ("Authority") and _____ ("Permittee").

I. **Facility.** Permittee may maintain and use a private facility ("Facility") in or on Lake Granbury ("Lake"), as such Facility is further described in Exhibit A, attached hereto and incorporated by reference herein. Permittee agrees to observe all applicable rules and regulations or other requirements of the Authority with regard to the construction, maintenance and use of the requested Facility, including specifically the conditions set forth in this Agreement.

II. **Adjoining Land Rights.** Permittee must own or lease the land adjoining the Lake at the site of the requested Facility. Permittee hereby represents that Permittee possesses all necessary land rights on the adjoining Lakeshore land at the site of the requested Facility.

III. **Term.** This Agreement shall commence upon the Effective Date, and terminate upon the transfer of the necessary land rights on the adjoining Lakeshore land at the site of the requested Facility to a third party ("Transferee"), unless sooner terminated in accordance with this Agreement. Permittee must complete any construction or modification of a Facility permitted by this Agreement within one (1) year of the Effective Date, or this Agreement shall automatically terminate. Upon the termination of this Agreement, in order for Permittee or Transferee to continue to maintain and use the private Facility authorized herein, Permittee or Transferee must enter into a new Agreement for On-Water Facility, as such agreement may be modified or succeeded from time to time; provided, however, Authority shall be under no obligation to approve any such agreement.

IV. **Fees.** Permittee shall be subject to the following fees:

1. **Application Fee.** A one-time, non-refundable Application Fee of seventy-five dollars ($75.00) upon submission of this Agreement for consideration and upon any subsequent request for modification to the Facility. The Application Fee may be adjusted in the future by the Authority, at its sole discretion.

2. **Annual Permit Fee.** The Annual Permit Fee for the privilege of constructing and maintaining the requested Facility in or on the Lake is zero (0) cents per square foot of Lake area required for the Facility, with the minimum fee being zero dollars ($0.00) per calendar year. The minimum Annual Permit Fee and rate cited herein may be adjusted in the future by the Authority, at its sole discretion. This Annual Permit Fee shall not be subject to proration.

3. **Late Fees.** In the event that Permittee shall fail to pay the Annual Permit Fee on or before the day which is thirty (30) days after the day on which payment is due, there shall be finance charges added to such unpaid amount beginning with the date the invoice was due at an annual percentage rate of the lesser of ten (10%) or the highest rate allowed by applicable law until paid. In addition to the finance charges, there will be a twenty-five dollar ($25.00) late fee added to the unpaid amount thirty (30) days after the date the installment was due. The late fee and finance charges will be added in order to compensate Authority for the extra administrative expenses incurred in collecting delinquent accounts. The late fee and finance charges may be adjusted periodically by the Authority, at its sole discretion.

4. **Payment**. **Payment of the Application Fee and the Annual Permit Fee must accompany this Agreement**. Subsequent fees, as adjusted, must be paid by the first day of February of each succeeding year in order to avoid cancellation of this permit and termination of this Agreement. Permittee must reconcile past due fees before the Authority shall approve this Agreement or modification to the Facility.

V. **Lien Holders**. In the event this Agreement or the facilities approved hereunder are at any time encumbered by a lien, before Authority shall provide the lien holder with notices and opportunity to cure, Permittee must provide the holder of any such lien with a copy of this Agreement, and such lien holder must provide the Authority a signed acknowledgement that the lien holder is aware of

and accepts the terms of this Agreement. It shall be the Permittee's or lien holder's responsibility to provide the Authority with information regarding the lien holder including any change of the lien holder's contact information. Failure to provide the Authority with such information, including the lien holder's signed acknowledgement, may result in exclusion of the lien holder from notices and opportunity to cure.

In the event the Authority receives a lien holder's signed acknowledgement, and the Permittee or lien holder furnishes the Authority with the address to which such lien holder desires copies of notices of default to be mailed, the Authority will thereafter mail to such lien holder at the address so given, by certified mail, postage prepaid, return receipt requested, duplicate copies of any and all notices of default required to be sent to Permittee in accordance with Section VI. below, at the same time that such notice is placed in the mail or otherwise delivered to Permittee.

Any such lien holder may pay any fees, make any repairs and improvements, or may perform any other act required of Permittee under the terms of this Agreement which may be necessary and proper to be done in the observance of the conditions herein, or to prevent the forfeiture of this Agreement, and all payments so made and things so done and performed by such lien holder shall, if made or done in the time period required under this Agreement, including cure periods, be effective to prevent a forfeiture of the rights of Permittee hereunder as the same would have been if timely done and performed by Permittee.

VI. **Default, Cure, and Cancellation**. Permittee shall be considered in default of this Agreement if for any reason 1) Permittee ceases to be the owner of the necessary land rights on the adjoining Lakeshore land, 2) Permittee violates any provisions of any applicable rules, regulations and/or guidelines of the Authority, or 3) Permittee violates the terms of this permit, including, but not limited to, the failure to pay permit fees when due and any violations regarding the construction, maintenance and use of the requested Facility. In the event of default, the Authority shall provide Permittee with written notice of such default and Permittee shall have thirty (30) days to cure such default. Subject to Section V. of this Agreement, if Permittee fails to cure such default in such thirty (30) days, the Authority may, in its sole discretion, cancel this permit and terminate this Agreement.

VII. **Removal of Facilities.** Subject to Section IV of this Agreement, In the event the Authority cancels this permit and terminates this agreement, the Authority may, in its sole discretion, require the facility to be removed. If Permittee or the lien holder fails to remove the facility after such a request by the Authority, the Authority may remove the facility and Permittee shall be liable for any and all costs incurred by the Authority related to the removal of the facility.

VIII. **Water Level.** THE WATER LEVEL IN THE LAKES WILL NOT BE CONSTANT. AUTHORITY LAKES ARE WATER SUPPLY AND CONSERVATION PROJECTS. WHILE IT IS THE DESIRE OF THE AUTHORITY TO KEEP THE LAKES AS FULL AS POSSIBLE, THE LEVEL OF THE WATER WILL VARY, DEPENDING ON THE AMOUNT OF WATER USED FROM THE LAKES, EVAPORATION RATES, GENERATION OF HYDROELECTRIC POWER, AMOUNTS OF RAINFALL AND RUNOFF IN THE BRAZOS BASIN UPSTREAM, AND OTHER FACTORS. THE LEVEL IN ANY LAKE WILL DROP AS MUCH AS 33 FEET BELOW THE FULL LAKE LEVEL. THE AUTHORITY WILL NOT CREDIT, PRO-RATE, REFUND, OR PROVIDE ANY FORM OF COMPENSATION FOR THE INABILITY OF PERMITTEE TO UTILZE ON-WATER PERMITTED FACILITIES.

IX. **Assignment.** This Agreement may not be assigned by Permittee, and any such assignment shall be void.

X. **Modifications.** No modifications shall be made to the permitted Facility without the express written approval of the Authority. Any request for modification to the Facility must be accompanied by an application form describing and depicting the proposed modifications and the one-time, nonrefundable Application Fee of seventy-five dollars ($75.00) provided for in Section IV. above.

XI. Additional Requirements Regarding Facilities

1. The privilege of installing an On-Water Facility is not an inherent right with the control or ownership of waterfront property.

2. The Authority exercises the right to grant or deny On-Water Facility Permits and any modifications to Facilities as deemed appropriate in the sole discretion of the Authority.

3. The Authority may permit no more than one On-Water Facility on any one shoreline lot, and, the Area Project Manager at each of its lakes may establish a minimum shoreline footage requirement for placement of any On-Water Facility.

4. This Agreement must be approved and signed by the Authority before construction of the requested Facility is initiated.

5. Identification furnished by the Authority must be posted conspicuously on all permitted facilities.

6. The requested Facility shall be installed and maintained only in the location specifically authorized by the Authority.

7. The requested Facility must be generally located as close to the center most portion of the water frontage as possible.

8. No Facility may be situated in a manner that interferes or obstructs access to other permitted facilities or neighboring properties.

9. The requested Facility may not extend further than 100 feet into the Lake from the shoreline nor more than one-third of the distance between opposite shorelines of the Lake, unless otherwise agreed to in writing by the Authority because of circumstances which make conformance with such limits impossible or impracticable. In narrow sections of the Lake where the distance between opposite shorelines is 120 feet or less, a clear channel at least 40 feet in width shall be maintained between the proposed Facility and facilities on the opposite shoreline.

10. Amber reflectors must be installed on all sides of the requested Facility at no greater than 20-foot intervals. Any portion of the Facility which is permitted to extend further than 100 feet into the Lake shall be illuminated during all hours of darkness.

11. Buoyancy for any floating Facility shall be provided by Styrofoam, polystyrene or a similar flotation material that is encapsulated in an approved rustproof, noncorrosive shell (such as, high impact polyethylene). Barrels, drums or other improvised flotation equipment shall not be used in constructing the Facility.

12. Living quarters, kitchens, sinks, bathing facilities or toilet facilities are not allowed in or on facilities permitted on the Lake.

13. Dredging, filling or otherwise altering or reconfiguring the bed of the Lake, or excavating, filling or reshaping of Authority lands without written permission from the Area Project Manager is prohibited.

14. If more than fifty (50) cubic yards of nontoxic dredged or fill material (native soil, concrete, sand, gravel or rock) are to be discharged below elevation six hundred ninety three (693) feet in the construction of the requested Facility, Permittee must obtain a Department of the Army permit for such Facility from the U.S. Army Corps of Engineers.

15. All facilities must be structurally sound and in a condition that does not threaten public health, safety, welfare, or constitute a hazard to anyone occupying or utilizing the Lakes or Facility. Responsibility for the safety and structural soundness of the Facility shall reside entirely with the Permittee.

16. The Authority may conduct spot inspections of the Facility and require Permittee, at Permittee's sole cost and expense, to bring the Facility into compliance with current on-water facility standards as may be adopted by the Authority in its sole discretion from time to time.

17. Facilities may be required to be removed or modified if, in the opinion of the Area Project Manager, they constitute a hazard to navigation, public health, safety, welfare, or a hazard to anyone occupying or utilizing the Lakes or Facility.

18. Permittee agrees that the Authority may enter onto Permittee's property, at reasonable times, for the purposes of inspecting the Facility.

19. Permittee shall, at Permittee's sole cost and expense, comply with any and all additional requirements of federal, state, county, municipal and Brazos River Authority laws, ordinances, orders, rules and regulations, as such may be adopted and amended from time to time, including, but not limited to: (i) obtaining any additional permits, licenses, or applications or paying any other fees as required by any other entity; (ii) Authority's Regulations of Brazos River Authority Lakes and Associated Lands; (iii) and any other rules and regulations adopted by Authority.

20. Additional information and forms may be obtained from the Brazos River Authority at the following address and telephone number:

Brazos River Authority Lake Granbury Office 4552 Mambrino Highway Granbury, TX 76048 817-573-3212	Brazos River Authority Lake Limestone Office 20226 Sterling Robertson Dam Rd. Thornton, TX 76687 903-529-2141	Brazos River Authority Possum Kingdom Office 301 Observation Pt. Rd. Graford, TX 76449 940-779-2321

Agreed to this ____ day of _____, 20___.

BRAZOS RIVER AUTHORITY	**PERMITTEE**
By: _____	By: _____
Title: Area Project Manager	Title: _____
Date: _____	Date: _____

EXHIBIT A
Application Form For On-Water Facility

Permitee Information

Permit to be issued in the name of: _____

The requesting party's name and address (as it will be stated on the permit)

Mailing Address: _____ Telephone (home) _____

_____ (office or cell) _____ (fax) _____

_____ Email: _____

If the permit is to be issued in a business name, please enter the name and job title of the person authorized to sign the contract and responsible for the permit:

Name: _____ Title: _____

Lien Holder Information *(if applicable)*

Lien Holder: _____ Contact Name: _____

Mailing Address: _____ Telephone _____ (fax) _____

_____ Email: _____

Facility Information

Applying for:

- ☐ New Construction of facility
- ☐ Modification of the current facility
- ☐ Transfer of existing facility *(if checking this box, please provide the name of the previous owner below)*

Name of previous permittee: _____

Location of structure or facility:

Subdivision: _____ Lot: _____ Tract: _____ Area: _____ Section: _____

Acreage: _____ Survey: _____ Block: _____ Phase: _____

County: _____ Abstract: _____

Physical Address of property where facility will be located: _____

(physical address required) _____

Type of facility for which a permit is requested (dock, pier, ramp, boathouse, etc.):

_____

Dimensions of facility:	**Width**	**by Length**	**GPS Coordinates**	
			Latitude	Longitude
Walkway:	____ ft.	____ ft.		
Main:	____ ft.	____ ft.	____	____
Other:	____ ft.	____ ft.		
____	____ ft.	____ ft.		

For new construction or modification: Attach a sketch drawn to scale of the proposed facility, showing all dimensions to include side view, top view, and end view; including minimum distances from the facility to property boundaries as such boundaries are extended into the Lake.

_____ _____

Signature of Applicant Date

Payment Enclosed:

Application Fee:	$ 75.00
Annual Permit Fee:	$ 0.00
Total:	**$ 75.00**

Do Not Write Below This Line

Approval recommended by: _____ Date: _____

Permit Approved not to exceed _____ square feet of Lake area, as shown on the attached sketch. **Permit No.** _____

BRAZOS RIVER AUTHORITY

Approved by: _____ Date: _____

Printed Name: Connie Tucker; Area Project Manager

Permit and Agreement for On-Water Facility

This Permit and Agreement for On-Water Facility ("Agreement") is entered into by and between the Brazos River Authority ("Authority") and _____ ("Permittee").

I. **Facility.** Permittee may maintain and use a private facility ("Facility") in or on Lake Limestone ("Lake"), as such Facility is further described in Exhibit A, attached hereto and incorporated by reference herein. Permittee agrees to observe all applicable rules and regulations or other requirements of the Authority with regard to the construction, maintenance and use of the requested Facility, including specifically the conditions set forth in this Agreement.

II. **Adjoining Land Rights.** Permittee must own or lease the land adjoining the Lake at the site of the requested Facility. Permittee hereby represents that Permittee possesses all necessary land rights on the adjoining Lakeshore land at the site of the requested Facility.

III. **Term.** This Agreement shall commence upon the Effective Date, and terminate upon the transfer of the necessary land rights on the adjoining Lakeshore land at the site of the requested Facility to a third party ("Transferee"), unless sooner terminated in accordance with this Agreement. Permittee must complete any construction or modification of a Facility permitted by this Agreement within one (1) year of the Effective Date, or this Agreement shall automatically terminate. Upon the termination of this Agreement, in order for Permittee or Transferee to continue to maintain and use the private Facility authorized herein, Permittee or Transferee must enter into a new Agreement for On-Water Facility, as such agreement may be modified or succeeded from time to time; provided, however, Authority shall be under no obligation to approve any such agreement.

IV. **Fees.** Permittee shall be subject to the following fees:

1. **Application Fee.** A one-time, non-refundable Application Fee of seventy-five dollars ($75.00) upon submission of this Agreement for consideration and upon any subsequent request for modification to the Facility. The Application Fee may be adjusted in the future by the Authority, at its sole discretion.

2. **Annual Permit Fee.** The Annual Permit Fee for the privilege of constructing and maintaining the requested Facility in or on the Lake is zero (0) cents per square foot of Lake area required for the Facility, with the minimum fee being zero dollars ($0.00) per calendar year. The minimum Annual Permit Fee and rate cited herein may be adjusted in the future by the Authority, at its sole discretion. This Annual Permit Fee shall not be subject to proration.

3. **Late Fees.** In the event that Permittee shall fail to pay the Annual Permit Fee on or before the day which is thirty (30) days after the day on which payment is due, there shall be finance charges added to such unpaid amount beginning with the date the invoice was due at an annual percentage rate of the lesser of ten (10%) or the highest rate allowed by applicable law until paid. In addition to the finance charges, there will be a twenty-five dollar ($25.00) late fee added to the unpaid amount thirty (30) days after the date the installment was due. The late fee and finance charges will be added in order to compensate Authority for the extra administrative expenses incurred in collecting delinquent accounts. The late fee and finance charges may be adjusted periodically by the Authority, at its sole discretion.

4. **Payment**. **Payment of the Application Fee and the Annual Permit Fee must accompany this Agreement**. Subsequent fees, as adjusted, must be paid by the first day of February of each succeeding year in order to avoid cancellation of this permit and termination of this Agreement. Permittee must reconcile past due fees before the Authority shall approve this Agreement or modification to the Facility.

V. **Lien Holders**. In the event this Agreement or the facilities approved hereunder are at any time encumbered by a lien, before Authority shall provide the lien holder with notices and opportunity to cure, Permittee must provide the holder of any such lien with a copy of this Agreement, and such lien holder must provide the Authority a signed acknowledgement that the lien holder is aware of and

accepts the terms of this Agreement. It shall be the Permittee's or lien holder's responsibility to provide the Authority with information regarding the lien holder including any change of the lien holder's contact information. Failure to provide the Authority with such information, including the lien holder's signed acknowledgement, may result in exclusion of the lien holder from notices and opportunity to cure.

In the event the Authority receives a lien holder's signed acknowledgement, and the Permittee or lien holder furnishes the Authority with the address to which such lien holder desires copies of notices of default to be mailed, the Authority will thereafter mail to such lien holder at the address so given, by certified mail, postage prepaid, return receipt requested, duplicate copies of any and all notices of default required to be sent to Permittee in accordance with Section VI. below, at the same time that such notice is placed in the mail or otherwise delivered to Permittee.

Any such lien holder may pay any fees, make any repairs and improvements, or may perform any other act required of Permittee under the terms of this Agreement which may be necessary and proper to be done in the observance of the conditions herein, or to prevent the forfeiture of this Agreement, and all payments so made and things so done and performed by such lien holder shall, if made or done in the time period required under this Agreement, including cure periods, be effective to prevent a forfeiture of the rights of Permittee hereunder as the same would have been if timely done and performed by Permittee.

VI. **Default, Cure, and Cancellation**. Permittee shall be considered in default of this Agreement if for any reason 1) Permittee ceases to be the owner of the necessary land rights on the adjoining Lakeshore land, 2) Permittee violates any provisions of any applicable rules, regulations and/or guidelines of the Authority, or 3) Permittee violates the terms of this permit, including, but not limited to, the failure to pay permit fees when due and any violations regarding the construction, maintenance and use of the requested Facility. In the event of default, the Authority shall provide Permittee with written notice of such default and Permittee shall have thirty (30) days to cure such default. Subject to Section V. of this Agreement, if Permittee fails to cure such default in such thirty (30) days, the Authority may, in its sole discretion, cancel this permit and terminate this Agreement.

VII. **Removal of Facilities.** Subject to Section IV of this Agreement, In the event the Authority cancels this permit and terminates this agreement, the Authority may, in its sole discretion, require the facility to be removed. If Permittee or the lien holder fails to remove the facility after such a request by the Authority, the Authority may remove the facility and Permittee shall be liable for any and all costs incurred by the Authority related to the removal of the facility.

VIII. **Water Level.** THE WATER LEVEL IN THE LAKES WILL NOT BE CONSTANT. AUTHORITY LAKES ARE WATER SUPPLY AND CONSERVATION PROJECTS. WHILE IT IS THE DESIRE OF THE AUTHORITY TO KEEP THE LAKES AS FULL AS POSSIBLE, THE LEVEL OF THE WATER WILL VARY, DEPENDING ON THE AMOUNT OF WATER USED FROM THE LAKES, EVAPORATION RATES, GENERATION OF HYDROELECTRIC POWER, AMOUNTS OF RAINFALL AND RUNOFF IN THE BRAZOS BASIN UPSTREAM, AND OTHER FACTORS. THE LEVEL IN ANY LAKE WILL DROP AS MUCH AS 33 FEET BELOW THE FULL LAKE LEVEL. THE AUTHORITY WILL NOT CREDIT, PRO-RATE, REFUND, OR PROVIDE ANY FORM OF COMPENSATION FOR THE INABILITY OF PERMITTEE TO UTILZE ON-WATER PERMITTED FACILITIES.

IX. **Assignment.** This Agreement may not be assigned by Permittee, and any such assignment shall be void.

X. **Modifications.** No modifications shall be made to the permitted Facility without the express written approval of the Authority. Any request for modification to the Facility must be accompanied by an application form describing and depicting the proposed modifications and the one-time, nonrefundable Application Fee of seventy-five dollars ($75.00) provided for in Section IV. above.

XI. Additional Requirements Regarding Facilities

1. The privilege of installing an On-Water Facility is not an inherent right with the control or ownership of waterfront property.

2. The Authority exercises the right to grant or deny On-Water Facility Permits and any modifications to Facilities as deemed appropriate in the sole discretion of the Authority.

3. The Authority may permit no more than one On-Water Facility on any one shoreline lot, and, the Area Project Manager at each of its lakes may establish a minimum shoreline footage requirement for placement of any On-Water Facility.

4. This Agreement must be approved and signed by the Authority before construction of the requested Facility is initiated.

5. Identification furnished by the Authority must be posted conspicuously on all permitted facilities.

6. The requested Facility shall be installed and maintained only in the location specifically authorized by the Authority.

7. The requested Facility must be generally located as close to the center most portion of the water frontage as possible.

8. No Facility may be situated in a manner that interferes or obstructs access to other permitted facilities or neighboring properties.

9. The requested Facility may not extend further than 100 feet into the Lake from the shoreline nor more than one-third of the distance between opposite shorelines of the Lake, unless otherwise agreed to in writing by the Authority because of circumstances which make conformance with such limits impossible or impracticable. In narrow sections of the Lake where the distance between opposite shorelines is 120 feet or less, a clear channel at least 40 feet in width shall be maintained between the proposed Facility and facilities on the opposite shoreline.

10. Amber reflectors must be installed on all sides of the requested Facility at no greater than 20-foot intervals. Any portion of the Facility which is permitted to extend further than 100 feet into the Lake shall be illuminated during all hours of darkness.

11. Buoyancy for any floating Facility shall be provided by Styrofoam, polystyrene or a similar flotation material that is encapsulated in an approved rustproof, noncorrosive shell (such as, high impact polyethylene). Barrels, drums or other improvised flotation equipment shall not be used in constructing the Facility.

12. Living quarters, kitchens, sinks, bathing facilities or toilet facilities are not allowed in or on facilities permitted on the Lake.

13. Dredging, filling or otherwise altering or reconfiguring the bed of the Lake, or excavating, filling or reshaping of Authority lands without written permission from the Area Project Manager is prohibited.

14. If more than fifty (50) cubic yards of nontoxic dredged or fill material (native soil, concrete, sand, gravel or rock) are to be discharged below elevation three hundred sixty three (363) feet in the construction of the requested Facility, Permittee must obtain a Department of the Army permit for such Facility from the U.S. Army Corps of Engineers.

15. All facilities must be structurally sound and in a condition that does not threaten public health, safety, welfare, or constitute a hazard to anyone occupying or utilizing the Lakes or Facility.

Responsibility for the safety and structural soundness of the Facility shall reside entirely with the Permittee.

16. The Authority may conduct spot inspections of the Facility and require Permittee, at Permittee's sole cost and expense, to bring the Facility into compliance with current on-water facility standards as may be adopted by the Authority in its sole discretion from time to time.

17. Facilities may be required to be removed or modified if, in the opinion of the Area Project Manager, they constitute a hazard to navigation, public health, safety, welfare, or a hazard to anyone occupying or utilizing the Lakes or Facility.

18. Permittee agrees that the Authority may enter onto Permittee's property, at reasonable times, for the purposes of inspecting the Facility.

19. Permittee shall, at Permittee's sole cost and expense, comply with any and all additional requirements of federal, state, county, municipal and Brazos River Authority laws, ordinances, orders, rules and regulations, as such may be adopted and amended from time to time, including, but not limited to: (i) obtaining any additional permits, licenses, or applications or paying any other fees as required by any other entity; (ii) Authority's Shoreline Management Plan and Customer Guide (if applicable); (iii) Regulations for Governance for Brazos River Authority Lakes and Associated Lands; (iv) and any other rules and regulations adopted by Authority.

20. Additional information and forms may be obtained from the Brazos River Authority at the following address and telephone number:

Brazos River Authority Lake Granbury Office 4552 Mambrino Highway Granbury, TX 76048 817-573-3212	Brazos River Authority Lake Limestone Office 20226 Sterling Robertson Dam Rd. Thornton, TX 76687 903-529-2141	Brazos River Authority Possum Kingdom Office 301 Observation Pt. Rd. Graford, TX 76449 940-779-2321

Agreed to this ____ day of _____, 20___.

BRAZOS RIVER AUTHORITY	**PERMITTEE**
By: _____	By: _____
Title: Area Project Manager	Title: _____
Date: _____	Date: _____

EXHIBIT A
Application Form For On-Water Facility

Permitee Information

Permit to be issued in the name of: _____

The requesting party's name and address (as it will be stated on the permit)

Mailing Address: _____ Telephone (home) _____

_____ (office or cell) _____ (fax) _____

_____ Email: _____

If the permit is to be issued in a business name, please enter the name and job title of the person authorized to sign the contract and responsible for the permit:

Name: _____ Title: _____

Lien Holder Information *(if applicable)*

Lien Holder: _____ Contact Name: _____

Mailing Address: _____ Telephone _____ (fax) _____

_____ Email: _____

Facility Information

Applying for:

- ☐ New Construction of facility
- ☐ Modification of the current facility
- ☐ Transfer of existing facility *(if checking this box, please provide the name of the previous owner below)*

Name of previous permittee: _____

Location of structure or facility:

Subdivision: _____ Lot: _____ Tract: _____ Area: _____ Section: _____

Acreage: _____ Survey: _____ Block: _____ Phase: _____

County: _____ Abstract: _____

Physical Address of property where facility will be located: _____

(physical address required) _____

Type of facility for which a permit is requested (dock, pier, ramp, boathouse, etc.):

_____

Dimensions of facility:	**Width**	**by**	**Length**	**GPS Coordinates**	
				Latitude	Longitude
Walkway:	____ ft.		____ ft.		
Main:	____ ft.		____ ft.	____	____
Other:	____ ft.		____ ft.		
____	____ ft.		____ ft.		

For new construction or modification: Attach a sketch drawn to scale of the proposed facility, showing all dimensions to include side view, top view, and end view; including minimum distances from the facility to property boundaries as such boundaries are extended into the Lake.

_____ _____

Signature of Applicant Date

Payment Enclosed:

Application Fee:	$ 75.00
Annual Permit Fee:	$ 0.00
Total:	**$ 75.00**

Do Not Write Below This Line

Approval recommended by: _____ Date: _____

Permit Approved not to exceed _____ square feet of Lake area, as shown on the attached sketch. **Permit No.** _____

BRAZOS RIVER AUTHORITY

Approved by: _____ Date: _____

Printed Name: Davy Moore; Area Project Manager

Permit and Agreement for On-Water Facility

This Permit and Agreement for On-Water Facility ("Agreement") is entered into by and between the Brazos River Authority ("Authority") and _____ ("Permittee").

I. **Facility.** Permittee may maintain and use a private facility ("Facility") in or on Possum Kingdom Lake ("Lake"), as such Facility is further described in Exhibit A, attached hereto and incorporated by reference herein. Permittee agrees to observe all applicable rules and regulations or other requirements of the Authority with regard to the construction, maintenance and use of the requested Facility, including specifically the conditions set forth in this Agreement.

II. **Adjoining Land Rights.** Permittee must own or lease the land adjoining the Lake at the site of the requested Facility. Permittee hereby represents that Permittee possesses all necessary land rights on the adjoining Lakeshore land at the site of the requested Facility.

III. **Term.** This Agreement shall commence upon the Effective Date, and terminate upon the transfer of the necessary land rights on the adjoining Lakeshore land at the site of the requested Facility to a third party ("Transferee"), unless sooner terminated in accordance with this Agreement. Permittee must complete any construction or modification of a Facility permitted by this Agreement within one (1) year of the Effective Date, or this Agreement shall automatically terminate. Upon the termination of this Agreement, in order for Permittee or Transferee to continue to maintain and use the private Facility authorized herein, Permittee or Transferee must enter into a new Agreement for On-Water Facility, as such agreement may be modified or succeeded from time to time; provided, however, Authority shall be under no obligation to approve any such agreement.

IV. **Fees.** Permittee shall be subject to the following fees:

1. **Application Fee.** A one-time, non-refundable Application Fee of seventy-five dollars ($75.00) upon submission of this Agreement for consideration and upon any subsequent request for modification to the Facility. The Application Fee may be adjusted in the future by the Authority, at its sole discretion.

2. **Annual Permit Fee.** The Annual Permit Fee for the privilege of constructing and maintaining the requested Facility in or on the Lake is zero (0) cents per square foot of Lake area required for the Facility, with the minimum fee being zero dollars ($0.00) per calendar year. The minimum Annual Permit Fee and rate cited herein may be adjusted in the future by the Authority, at its sole discretion. This Annual Permit Fee shall not be subject to proration.

3. **Late Fees.** In the event that Permittee shall fail to pay the Annual Permit Fee on or before the day which is thirty (30) days after the day on which payment is due, there shall be finance charges added to such unpaid amount beginning with the date the invoice was due at an annual percentage rate of the lesser of ten (10%) or the highest rate allowed by applicable law until paid. In addition to the finance charges, there will be a twenty-five dollar ($25.00) late fee added to the unpaid amount thirty (30) days after the date the installment was due. The late fee and finance charges will be added in order to compensate Authority for the extra administrative expenses incurred in collecting delinquent accounts. The late fee and finance charges may be adjusted periodically by the Authority, at its sole discretion.

4. **Payment**. **Payment of the Application Fee and the Annual Permit Fee must accompany this Agreement**. Subsequent fees, as adjusted, must be paid by the first day of February of each succeeding year in order to avoid cancellation of this permit and termination of this Agreement. Permittee must reconcile past due fees before the Authority shall approve this Agreement or modification to the Facility.

V. **Lien Holders**. In the event this Agreement or the facilities approved hereunder are at any time encumbered by a lien, before Authority shall provide the lien holder with notices and opportunity to cure, Permittee must provide the holder of any such lien with a copy of this Agreement, and such lien holder must provide the Authority a signed acknowledgement that the lien holder is aware of and

accepts the terms of this Agreement. It shall be the Permittee's or lien holder's responsibility to provide the Authority with information regarding the lien holder including any change of the lien holder's contact information. Failure to provide the Authority with such information, including the lien holder's signed acknowledgement, may result in exclusion of the lien holder from notices and opportunity to cure.

In the event the Authority receives a lien holder's signed acknowledgement, and the Permittee or lien holder furnishes the Authority with the address to which such lien holder desires copies of notices of default to be mailed, the Authority will thereafter mail to such lien holder at the address so given, by certified mail, postage prepaid, return receipt requested, duplicate copies of any and all notices of default required to be sent to Permittee in accordance with Section VI. below, at the same time that such notice is placed in the mail or otherwise delivered to Permittee.

Any such lien holder may pay any fees, make any repairs and improvements, or may perform any other act required of Permittee under the terms of this Agreement which may be necessary and proper to be done in the observance of the conditions herein, or to prevent the forfeiture of this Agreement, and all payments so made and things so done and performed by such lien holder shall, if made or done in the time period required under this Agreement, including cure periods, be effective to prevent a forfeiture of the rights of Permittee hereunder as the same would have been if timely done and performed by Permittee.

VI. **Default, Cure, and Cancellation**. Permittee shall be considered in default of this Agreement if for any reason 1) Permittee ceases to be the owner of the necessary land rights on the adjoining Lakeshore land, 2) Permittee violates any provisions of any applicable rules, regulations and/or guidelines of the Authority, or 3) Permittee violates the terms of this permit, including, but not limited to, the failure to pay permit fees when due and any violations regarding the construction, maintenance and use of the requested Facility. In the event of default, the Authority shall provide Permittee with written notice of such default and Permittee shall have thirty (30) days to cure such default. Subject to Section V. of this Agreement, if Permittee fails to cure such default in such thirty (30) days, the Authority may, in its sole discretion, cancel this permit and terminate this Agreement.

VII. **Removal of Facilities.** Subject to Section IV of this Agreement, In the event the Authority cancels this permit and terminates this agreement, the Authority may, in its sole discretion, require the facility to be removed. If Permittee or the lien holder fails to remove the facility after such a request by the Authority, the Authority may remove the facility and Permittee shall be liable for any and all costs incurred by the Authority related to the removal of the facility.

VIII. **Water Level.** THE WATER LEVEL IN THE LAKES WILL NOT BE CONSTANT. AUTHORITY LAKES ARE WATER SUPPLY AND CONSERVATION PROJECTS. WHILE IT IS THE DESIRE OF THE AUTHORITY TO KEEP THE LAKES AS FULL AS POSSIBLE, THE LEVEL OF THE WATER WILL VARY, DEPENDING ON THE AMOUNT OF WATER USED FROM THE LAKES, EVAPORATION RATES, GENERATION OF HYDROELECTRIC POWER, AMOUNTS OF RAINFALL AND RUNOFF IN THE BRAZOS BASIN UPSTREAM, AND OTHER FACTORS. THE LEVEL IN ANY LAKE WILL DROP AS MUCH AS 33 FEET BELOW THE FULL LAKE LEVEL. THE AUTHORITY WILL NOT CREDIT, PRO-RATE, REFUND, OR PROVIDE ANY FORM OF COMPENSATION FOR THE INABILITY OF PERMITTEE TO UTILZE ON-WATER PERMITTED FACILITIES.

IX. **Assignment.** This Agreement may not be assigned by Permittee, and any such assignment shall be void.

X. **Modifications.** No modifications shall be made to the permitted Facility without the express written approval of the Authority. Any request for modification to the Facility must be accompanied by an application form describing and depicting the proposed modifications and the one-time, nonrefundable Application Fee of seventy-five dollars ($75.00) provided for in Section IV. above.

XI. Additional Requirements Regarding Facilities

1. The privilege of installing an On-Water Facility is not an inherent right with the control or ownership of waterfront property.

2. The Authority exercises the right to grant or deny On-Water Facility Permits and any modifications to Facilities as deemed appropriate in the sole discretion of the Authority.

3. The Authority may permit no more than one On-Water Facility on any one shoreline lot, and, the Area Project Manager at each of its lakes may establish a minimum shoreline footage requirement for placement of any On-Water Facility.

4. This Agreement must be approved and signed by the Authority before construction of the requested Facility is initiated.

5. Identification furnished by the Authority must be posted conspicuously on all permitted facilities.

6. The requested Facility shall be installed and maintained only in the location specifically authorized by the Authority.

7. The requested Facility must be generally located as close to the center most portion of the water frontage as possible.

8. No Facility may be situated in a manner that interferes or obstructs access to other permitted facilities or neighboring properties.

9. The requested Facility may not extend further than 100 feet into the Lake from the shoreline nor more than one-third of the distance between opposite shorelines of the Lake, unless otherwise agreed to in writing by the Authority because of circumstances which make conformance with such limits impossible or impracticable. In narrow sections of the Lake where the distance between opposite shorelines is 120 feet or less, a clear channel at least 40 feet in width shall be maintained between the proposed Facility and facilities on the opposite shoreline.

10. Amber reflectors must be installed on all sides of the requested Facility at no greater than 20-foot intervals. Any portion of the Facility which is permitted to extend further than 100 feet into the Lake shall be illuminated during all hours of darkness.

11. Buoyancy for any floating Facility shall be provided by Styrofoam, polystyrene or a similar flotation material that is encapsulated in an approved rustproof, noncorrosive shell (such as, high impact polyethylene). Barrels, drums or other improvised flotation equipment shall not be used in constructing the Facility.

12. Living quarters, kitchens, sinks, bathing facilities or toilet facilities are not allowed in or on facilities permitted on the Lake.

13. Dredging, filling or otherwise altering or reconfiguring the bed of the Lake, or excavating, filling or reshaping of Authority lands without written permission from the Area Project Manager is prohibited.

14. If more than fifty (50) cubic yards of nontoxic dredged or fill material (native soil, concrete, sand, gravel or rock) are to be discharged below elevation one thousand (1,000) feet in the construction of the requested Facility, Permittee must obtain a Department of the Army permit for such Facility from the U.S. Army Corps of Engineers.

15. All facilities must be structurally sound and in a condition that does not threaten public health, safety, welfare, or constitute a hazard to anyone occupying or utilizing the Lakes or Facility.

Responsibility for the safety and structural soundness of the Facility shall reside entirely with the Permittee.

16. The Authority may conduct spot inspections of the Facility and require Permittee, at Permittee's sole cost and expense, to bring the Facility into compliance with current on-water facility standards as may be adopted by the Authority in its sole discretion from time to time.

17. Facilities may be required to be removed or modified if, in the opinion of the Area Project Manager, they constitute a hazard to navigation, public health, safety, welfare, or a hazard to anyone occupying or utilizing the Lakes or Facility.

18. Permittee agrees that the Authority may enter onto Permittee's property, at reasonable times, for the purpose of inspecting the Facility.

19. Permittee shall, at Permittee's sole cost and expense, comply with any and all additional requirements of federal, state, county, municipal and Brazos River Authority laws, ordinances, orders, rules and regulations, as such may be adopted and amended from time to time, including, but not limited to: (i) obtaining any additional permits, licenses, or applications or paying any other fees as required by any other entity; (ii) Authority's Regulations of Brazos River Authority Lakes and Associated Lands; (iii) and any other rules and regulations adopted by Authority.

20. Additional information and forms may be obtained from the Brazos River Authority at the following address and telephone number:

Brazos River Authority Lake Granbury Office 4552 Mambrino Highway Granbury, TX 76048 817-573-3212	Brazos River Authority Lake Limestone Office 20226 Sterling Robertson Dam Rd. Thornton, TX 76687 903-529-2141	Brazos River Authority Possum Kingdom Office 301 Observation Pt. Rd. Graford, TX 76449 940-779-2321

Agreed to this ____ day of _____, 20___.

BRAZOS RIVER AUTHORITY	**PERMITTEE**
By: _____	By: _____
Title: Area Project Manager	Title: _____
Date: _____	Date: _____

EXHIBIT A
Application Form For On-Water Facility

Permitee Information

Permit to be issued in the name of: _____

The requesting party's name and address (as it will be stated on the permit)

Mailing Address: _____ Telephone (home) _____

_____ (office or cell) _____ (fax) _____

_____ Email: _____

If the permit is to be issued in a business name, please enter the name and job title of the person authorized to sign the contract and responsible for the permit:

Name: _____ Title: _____

Lien Holder Information *(if applicable)*

Lien Holder: _____ Contact Name: _____

Mailing Address: _____ Telephone _____ (fax) _____

_____ Email: _____

Facility Information

Applying for:

- ☐ New Construction of facility
- ☐ Modification of the current facility
- ☐ Transfer of existing facility *(if checking this box, please provide the name of the previous owner below)*

Name of previous permittee: _____

Location of structure or facility:

Subdivision: _____ Lot: _____ Tract: _____ Area: _____ Section: _____

Acreage: _____ Survey: _____ Block: _____ Phase: _____

County: _____ Abstract: _____

Physical Address of property where facility will be located: _____

(physical address required) _____

Type of facility for which a permit is requested (dock, pier, ramp, boathouse, etc.):

_____

Dimensions of facility:	**Width**	**by**	**Length**	**GPS Coordinates**	
				Latitude	Longitude
Walkway:	____ ft.		____ ft.		
Main:	____ ft.		____ ft.	____	____
Other:	____ ft.		____ ft.		
____	____ ft.		____ ft.		

For new construction or modification: Attach a sketch drawn to scale of the proposed facility, showing all dimensions to include side view, top view, and end view; including minimum distances from the facility to property boundaries as such boundaries are extended into the Lake.

_____ _____

Signature of Applicant Date

Payment Enclosed:

Application Fee:	$ 75.00
Annual Permit Fee:	$ 0.00
Total:	**$ 75.00**

Do Not Write Below This Line

Approval recommended by: _____ Date: _____

Permit Approved not to exceed _____ square feet of Lake area, as shown on the attached sketch. **Permit No.** _____

BRAZOS RIVER AUTHORITY

Approved by: _____ Date: _____

Printed Name: Mike Iltis; Area Project Manager

APPENDIX 2 – LCRA

LCRA LAND AND WATER USE REGULATIONS

· Effective Oct. 1, 2015 ·

APPLICABILITY

These regulations apply to all water under the jurisdiction of the Lower Colorado River Authority ("LCRA Water") and to all land owned or leased by LCRA ("LCRA Land"). Unless specified, conduct prohibited by these Regulations applies to both LCRA Water and LCRA Land.

1. AUTHORITY

These regulations are adopted and promulgated under authority vested in the LCRA Board of Directors and laws of the State of Texas, including, but not limited to, the LCRA Act, Chapter 51 of the Texas Water Code, and Chapter 31 of the Texas Parks and Wildlife Code.

2. DEFINITION OF TERMS

The following terms in these regulations have these meanings:

a. "General manager" means the general manager or the acting general manager of LCRA or his or her designee.

b. "Watercraft" means any boat, vessel, personal watercraft, barge or similar floating craft used or capable of being used for transportation on water.

c. "Motorboat" means any vessel propelled or designed to be propelled by machinery, whether or not the machinery is permanently or temporarily affixed or is the principal source of propulsion.

d. "Floating habitable structure" means a floating structure intended to be used or actually used as a temporary or permanent domicile by one or more persons and containing all or part of the following: cooking, eating, sleeping or sanitary facilities. A floating habitable structure includes a structure that may be capable of navigation but is not designed primarily for that purpose. The attachment of an outboard motor and registration as a vessel does not exclude the structure from this definition. This definition expressly excludes houseboats or other watercraft with overnight accommodations that are designed primarily for navigation.

e. "Grandfathered Floating Habitable Structure" means a floating habitable structure that existed on one of the Highland Lakes prior to Oct. 20, 2010.

f. "LCRA Land" shall include any real property owned or leased by LCRA.

g. "LCRA Water" shall include the Highland Lakes along the Colorado River from Mansfield Dam to the 1,020 foot above mean sea level line above Lake Buchanan and any other lakes under LCRA's control.

h. "Highland Lakes" for purposes of these regulations means Lake Travis, Lake Marble Falls, Lake LBJ, Inks Lake and Lake Buchanan collectively.

3. ABANDONED PROPERTY

Abandonment of personal property on or in LCRA Land or LCRA Water, including but not limited to docks, watercraft and vehicles, is prohibited. Personal property left unattended on LCRA Land or in LCRA Water for more than 24 hours shall be considered abandoned property. Abandoned property may be removed and disposed of in any manner deemed appropriate by the general manager. LCRA is not responsible for personal property left on LCRA Land or in LCRA Water.

4. ADVERTISEMENTS

No commercial notices, signs or advertisements shall be placed on LCRA Land. Private messages may be posted only in areas designated by the general manager for such messages.

5. BUOYS

No persons other than LCRA employees performing their duties shall place any buoy or marker on LCRA Water.

6. DREDGING AND FILLING

Any excavation, discharge or fill of materials in LCRA Water shall be performed in accordance with all applicable regulations and permits of the U.S. Army Corps of Engineers (Fort Worth or Galveston District) and LCRA's Highland Lakes Watershed Ordinance.

7. EMERGENCY RESTRICTIONS

In the case of extreme flooding, water contamination, or other emergency or natural disaster, the general manager is authorized to declare restrictions on the use of all or any portion of LCRA Water as deemed necessary and convenient for purposes of public health, safety and welfare. No person shall engage in any activity that violates such restrictions.

8. FIREARMS, HUNTING, TRAPPING AND BOW FISHING

a. Hunting and the possession or use of a firearm, bow, crossbow, slingshot or any other type of weapon on LCRA Land are illegal under Chapter 62 of the Texas Parks and Wildlife Code, with certain exceptions. No person shall hunt or shoot a firearm, bow or crossbow on or over LCRA Water except bow fishing as noted below. No person shall place poisons, salt blocks, feed, or mechanical devices such as traps and snares on LCRA Land.

b. Bow fishing is allowed on the Highland Lakes with these restrictions:

I. Bow fishing must take place from a boat.

II. Bow fishing is not allowed from the bank, within 75 feet of any marked designated swimming area, within 50 feet of any boat dock, pier, restricted or residential areas, or while wading.

III. Crossbows, draw-locking mechanisms and arrows designed for flight through the air are prohibited; only hand-pulled and hand-released equipment is allowed.

IV. Archery equipment is prohibited on LCRA Land.

9. FIREWORKS AND EXPLOSIVES

Possession or discharge of fireworks or explosives on LCRA Land or LCRA Water is prohibited.

10. FLOATING HABITABLE STRUCTURES

a. Floating habitable structures are prohibited within the floodplain of the Highland Lakes.

b. A Grandfathered Floating Habitable Structure is excluded from the prohibition in this Section if it complies with all of the following conditions:

I. A Grandfathered Floating Habitable Structure must be registered with LCRA within six months after notification by LCRA staff;

II. A Grandfathered Floating Habitable Structure may not be relocated, replaced, expanded or modified, other than as required for necessary maintenance; and

III. A Grandfathered Floating Habitable Structure shall comply with all applicable federal, state or local rules and regulations, including any applicable LCRA rules and regulations.

11. GROUPS

Prior written permission shall be obtained from LCRA for any organized group activity involving 20 or more individuals on LCRA Land. At the sole discretion of the general manager, LCRA may designate a particular site reserved for any group activity.

12. MOTOR VEHICLES

Except in special-use areas designated by the general manager, all motor vehicle operation on LCRA Land shall be confined to designated roads and parking areas. All motor vehicles operated on LCRA Land shall be licensed for street use and shall be operated only by persons with valid driver licenses in a reasonable and prudent manner. No motor vehicle may be operated in excess of a posted speed limit.

13. OBSTRUCTION OF NAVIGATION AND WATER FLOW

a. No person shall anchor any watercraft or construct or maintain any floating or fixed structure on or in LCRA Water that unreasonably prevents, impedes or interferes with safe navigation or access to the water by the public. No person shall construct or maintain in LCRA Water any fence, pump, pipe or similar device for the purpose of diverting water and/or wind currents or interfere with the normal movement of water and floating debris.

b. All floating or fixed structures of any type on LCRA Water shall be adequately marked or lighted so as not to create a safety hazard for the public. This paragraph does not apply to breakwater structures permitted under the Highland Lakes Marina Ordinance.

14. PARK USE

a. Picnicking and camping are allowed on LCRA Land only in those public areas so designated.

b. No person shall camp on any LCRA Land for more than five consecutive days or on multiple LCRA Lands for more than 10 days within any calendar month without reservations.

c. No person shall litter or contaminate any camping, picnic, or other areas of LCRA Land or LCRA Water. Park visitors may dispose of garbage and waste only in trash barrels or dumpsters provided by LCRA. In areas in which there are no trash receptacles provided, campers and picnickers shall collect and remove their garbage and waste from LCRA Land for lawful disposal.

d. Campfires are allowed only in established fire rings or in contained camp stoves. During times of extreme fire hazard conditions, the general manager may declare a ban on all ground fires on all or any part of LCRA Land. No person shall build or maintain a fire on LCRA Land at any time when a burn ban declaration is in effect. No person shall at any time burn garbage, brush or other refuse on LCRA Land.

e. All pets must be kept on leash at all times while in designated camping and picnicking areas; outside the designated camping and picnicking areas, pets must be kept under their owners' direct control. In no case shall a pet be allowed to constitute a nuisance.

f. No horses shall be allowed in designated camping or picnicking areas unless equine facilities are established at the park.

g. No person shall place, construct, erect or occupy any temporary or permanent structure for human habitation or other purposes on LCRA Land. This provision does not apply to the use of normal camping equipment. No person shall install or construct an electric, water, wastewater or other utility line or service upon, over or under LCRA Land.

h. No person shall bring or use any glass containers on LCRA Land.

i. No person shall cause, create or contribute to excessive noise, including generators and amplified music on LCRA Land, between the hours of 10 p.m. and 6 a.m. Noise that unreasonably disturbs other visitors is considered excessive.

j. Public consumption or display of alcoholic beverages is prohibited on LCRA Land. Intoxicated persons are not allowed on LCRA Land.

15. PARK REGULATIONS

In addition to these regulations, LCRA may enact regulations specifically for certain LCRA Lands and adjacent LCRA Water, and may approve park regulations enacted by other political subdivisions for LCRA Land leased to them for public parks. In case of conflict between specific park regulations and these general use regulations, the specific park regulations shall govern.

16. PROTECTION OF LCRA PROPERTY AND NATURAL AND CULTURAL RESOURCES

a. Archaeological and historical features of every character located in, on or under LCRA Land or LCRA Water are protected by state law and may not be disturbed or removed without a permit from the Texas Historical Commission, or successor agency, and without having obtained prior written permission from LCRA.

b. No person shall destroy, alter, excavate or remove from LCRA Land any timber, shrubs, other vegetation, rock, sand, gravel, caliche, or any other substance, or material or any archaeological, historic or geologic feature.

c. No person shall use or operate a metal detector on LCRA Land.

d. No person shall damage, deface or destroy any LCRA property, including equipment and facilities provided for outdoor recreational purposes.

e. No person shall, in any manner, alter or remove any LCRA sign, survey marker, boundary fence, cross fence, gate, cattle guard or wire gap. No person shall construct any road, trail, path or other avenue on, over or across LCRA Land or cross LCRA Land to reach adjacent property.

17. RESTRICTED AREAS

a. To ensure the safety and health of the public and to provide for the security, safeguarding, and preservation of property and improvements, the general manager is authorized to designate areas of LCRA Land that the public is prohibited from entering or in which certain activities are prohibited. Such areas will be clearly marked by signs indicating the prohibition.

b. The general manager is authorized to designate certain areas of LCRA Water as fishing, swimming or otherwise restricted areas. Such areas will be marked by buoys or signs.

c. No person shall enter into such prohibited areas or engage in any activity that violates a posted prohibition or restriction, sign or buoy.

d. The use of drones or other types of surveillance equipment is strictly prohibited near LCRA's core infrastructure such as dams, power plants, substations, natural gas facilities, power lines and other designated areas.

e. This section shall not apply to authorized maintenance, patrol or rescue activities.

18. SANITATION

No person shall dump or otherwise dispose of garbage, polystyrene foam, construction materials, hazardous materials or other solid waste on LCRA Land or into LCRA Water. No person shall discharge wastewater, sewage or effluent from holding tanks, sinks, toilets or other

plumbing fixtures on LCRA Land or in LCRA Water.

19. SOLICITATION OF BUSINESS

No person shall engage in or solicit any business on LCRA Land or LCRA Water.

20. SWIMMING

Swimming is prohibited within 50 feet of any public boat ramp.

21. VIOLATIONS

Any person who knowingly or intentionally violates or fails to comply with any provision of these regulations is guilty of a Class C misdemeanor. Upon conviction, a violator is subject to punishment by a fine not to exceed $500. In addition, a violator may be barred from use of LCRA Land and facilities. It is a defense to prosecution for a violation of these regulations that the person had a current valid permit issued by the general manager and that the person was in compliance with any special conditions of the permit.

22. WAIVER AND PERMITS

Except when prohibited by state law, any provision of these regulations may be waived in whole or in part as deemed necessary and appropriate at the sole discretion of the general manager. A waiver shall be evidenced by a permit or other prior written permission issued by the general manager.

23. WATERCRAFT

a. A motorboat operating on LCRA Water must have an exhaust water manifold or a factory-type muffler installed on the engine.

b. Watercraft on LCRA Water shall be equipped and operated in accordance with all provisions of the Water Safety Act and all water safety rules and regulations adopted by the Texas Parks and Wildlife Department.

c. The operator of any watercraft involved in an accident shall immediately report the accident to an LCRA Ranger or other law enforcement official.

d. Any watercraft operated on the Highland Lakes that is equipped with an optional exhaust noise-suppression device shall be operated with the device engaged when in a "No Wake" area.

e. No person may operate a motorized watercraft on the Highland Lakes at a speed greater than the minimum speed necessary to maintain steerageway and headway within 50 feet of the shoreline, structures, swimmers or restricted areas.

f. No person may operate a watercraft on the Highland Lakes at a noise level greater than 92 decibels, measured using the Society of Automotive Engineers' standard J-2005 (stationary test).

g. It is unsafe to operate watercraft faster than 20 miles per hour or the minimum planing speed at night on the Highland Lakes.

24. WILD AND FERAL ANIMALS; LIVESTOCK

No person shall feed any feral or wild animal on LCRA Land. No person shall place, dump, abandon or leave any animal on LCRA Land. Livestock are not allowed to range or graze on LCRA Land.

25. VALIDITY

If any part of these regulations should be held by a court of competent jurisdiction to be invalid or unconstitutional, the validity of the remainder hereof shall not be affected.

FOR BOATING ACCIDENTS OR EMERGENCIES, CALL 911.

To report violations of these regulations, call 866-527-2267.

LCRA
ENERGY • WATER • COMMUNITY SERVICES

www.lcra.org

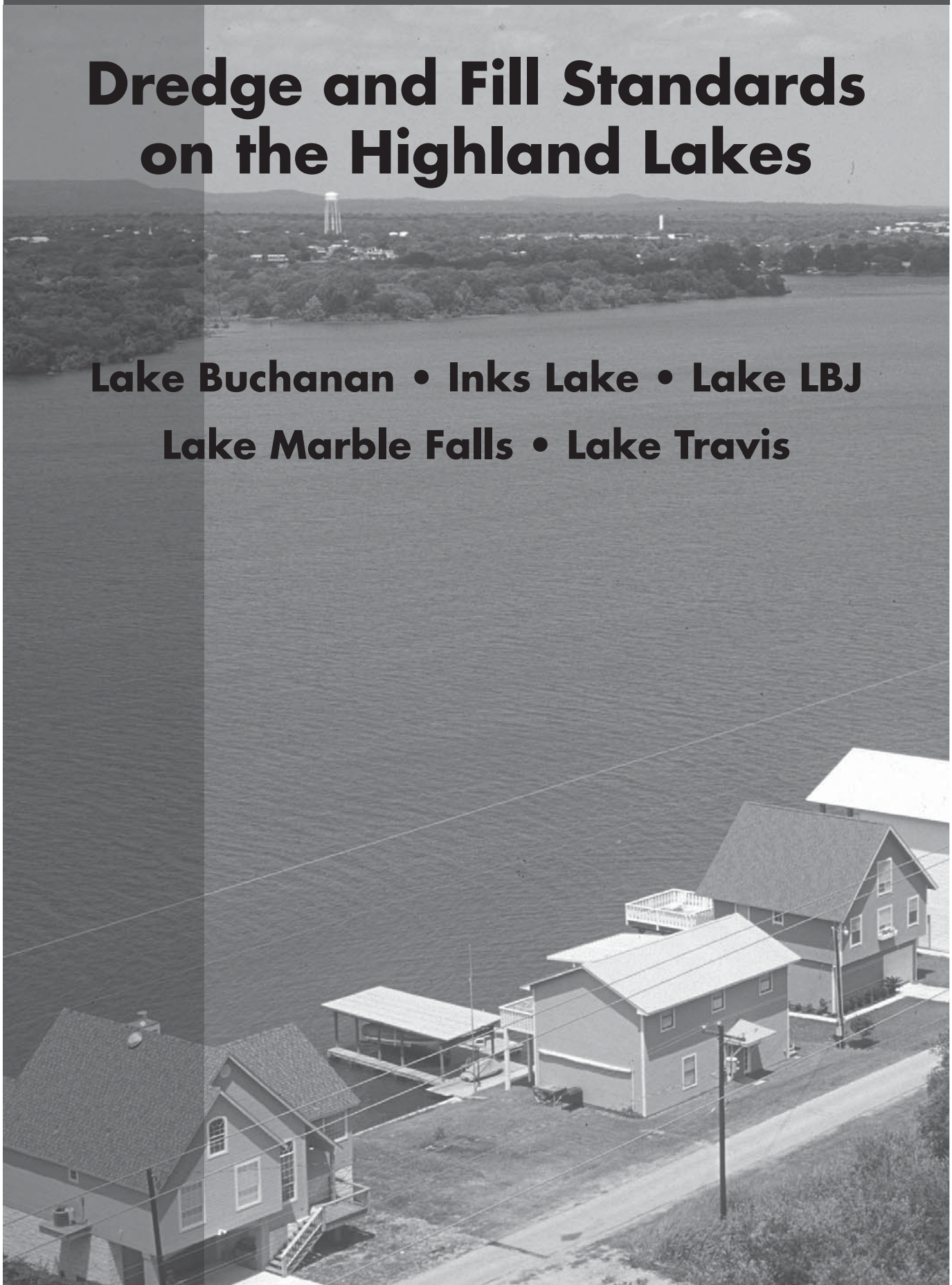
Oct. 1, 2015

LCRA
ENERGY • WATER • COMMUNITY SERVICES

www.lcra.org

Dredge and Fill Standards on the Highland Lakes

Lake Buchanan • Inks Lake • Lake LBJ
Lake Marble Falls • Lake Travis



Introduction

The Lower Colorado River Authority (LCRA) no longer requires that property owners obtain an LCRA permit for dredge and fill projects. However, LCRA has the authority to enforce these standards, and will evaluate violations of the standards on a case-by-case basis. **Property owners are still required to comply with requirements of Section 404 of the Clean Water Act and notify the U.S. Army Corps of Engineers (USACE) prior to beginning a project.**

LCRA developed these Dredge and Fill Standards as a companion to the USACE requirements. LCRA designed the standards to help shoreline property owners and contractors avoid problems and situations associated with dredge and fill practices in the Highland Lakes.

By complying with the USACE requirements and LCRA's Dredge and Fill Standards, shoreline owners can help protect their property from erosion, maintain navigability and ensure the protection of the Highland Lakes.

LCRA does not assess fees as part of implementing these standards.

Lower Colorado River Authority
P.O. Box 220
Austin, Texas 78767-0220
1-800-776-5272, (512) 473-3200
www.lcra.org

Printed on recycled paper.

The summary below highlights key components found in the Dredge and Fill Standards.

- All fill and shoreline stabilization work must follow the existing shoreline, unless otherwise authorized by LCRA. Reclamation of lost property due to erosion is not allowed.
- LCRA does not allow encroachments or unauthorized fill on LCRA property. Approval from LCRA is required before dredging on LCRA land.
- All dredged material needs to be removed from lakebed and placed above lake elevations listed on page 5.
- Contact LCRA to obtain work checklist if the length of shoreline work exceeds 500 feet or if the volume of dredged material exceeds 500 cubic yards (see example calculation Figure F-4, Page 12).
- Shoreline activity above lake elevations listed on page 5 may require a development permit.

For additional copies of these standards, or to address questions or concerns, please contact LCRA Water Resource Protection at 1-800-776-5272, Ext. 2324.

For information on U.S. Army Corps of Engineers (USACE) requirements, please see contact information listed below.

U.S. Army Corps of Engineers, Ft. Worth District
P.O. Box 17300, Ft. Worth, Texas 76102
Phone: 1-817-886-1731
www. swf.usace.army.mil (click on "Permits")

Contents

Definitions

Words used in these standards but not defined in this section will have their ordinarily accepted meaning. For the purpose of these standards, the following words and phrases are defined.

Contractor: Any person, other than the owner, engaging in land development and construction activities.

Dredge: The removal or disturbance of material from below the stated normal conservation pool elevations of the lakes.

Erosion: The detachment and movement of soil, sediment or rock fragments by wind, water, ice or gravity.

Erosion Control: Devices such as silt fence, rock berm and soil protection blankets that prevent soil migration from the site. See LCRA's Erosion Control Guide for more information, available by calling 1-800-776-5272, Ext. 2324.

Fill: Any material, structure, wall, riprap or revetment below the stated normal conservation pool elevations of the lakes.

Highland Lakes: Include Lake Buchanan, Inks Lake, Lake LBJ, Lake Marble Falls and Lake Travis on the Colorado River within the LCRA district.

Lakewide Permit: A permit issued by LCRA that allows for expedited permitting of certain activities under certain conditions when work is performed on Highland Lakes property during lake drawdowns. Because lakewide permits are reissued from time to time, the actual permit number may change.

Shoreline: The line at which the water surface of each Highland Lake intersects the land at any given time. The shoreline will move as the surface elevation of a lake changes.

Dredge and Fill Activities

Dredge and fill activities are most common among property owners constructing stabilization projects on a single-family waterfront lot. Although construction of retaining walls and removal of sediment from the lakebed are the most typical activities that fall under LCRA's Dredge and Fill Standards, the standards also address:

- Bulkhead, rock riprap or revetment construction and repair that include backfilling behind the wall and installing toe protection or tiebacks. **Retaining walls must follow the existing shoreline.**
- Use of a bulldozer, front-end loader or backhoe to move sediment from areas normally below the lake elevation listed in this booklet to an area above the lake elevation listed in this booklet.
- Construction or maintenance of shoreline protection systems.
- Construction or maintenance of recessed boat slips.
- Construction or maintenance of boat ramps.
- Contact LCRA to obtain checklist, if the length of shoreline work exceeds 500 feet or the volume of dredged material exceeds 500 cubic yards (**see example calculation Figure F-4, Page 12**).
- Contact LCRA prior to all dredging activities on LCRA property.

Other Regulations

Compliance with the Dredge and Fill Standards on the Highland Lakes does not ensure compliance with requirements or regulations from other entities. Entities with jurisdiction may include cities, counties, property owners associations and homeowners associations. Compliance may be required with other sections of LCRA's Highland Lakes Watershed Ordinance, LCRA's Safety Standards for residential docks, land and water use regulations and on-site sewage facilities program. In cases where LCRA and another entity have different regulations or requirements, the most stringent regulations apply.

Highland Lakes Elevation Levels

LCRA's Dredge and Fill Standards apply to work below the following stated lake elevations on the Highland Lakes:
Lakes Travis (681' mean sea level)
Lake Marble Falls (738' mean sea level)
Lake LBJ (825' mean sea level)
Inks Lake (888' mean sea level)
Lake Buchanan (1,020' mean sea level)

Property Ownership

The water surface is public domain. LCRA is responsible for protecting water quality, enforcing safety and regulating use of the Highland Lakes. The right to do work along the shoreline or dredge in the lakebed depends on who owns the land where the work will take place.

Privately Owned Land

LCRA requires that the property owner, who will be performing the dredge and fill activities, own the land where all such activities will take place.

It is the property owner's responsibility to determine land ownership and the boundaries of that ownership. Information on the boundaries of ownership can be obtained from a variety of sources, such as county deed records, title companies and appraisal districts.

If there is a dispute over the placement of fill or construction of shoreline stabilization structures over land not controlled by the property owner doing the work, the dispute must be settled in a court of competent jurisdiction. LCRA has no jurisdiction regarding the litigation of these matters.

Publicly Owned Land

Some land under the Highland Lakes could be owned by a city or county, the state or another public entity such as LCRA. Each of these entities may have its own requirements for dredge and fill activities over land they own.

Property owners must determine which public entity owns the land and what type of permission is needed before conducting work. Property owners are responsible for complying with any requirements imposed by an entity that has jurisdiction over the property. You may determine ownership through the county courthouse or tax appraisal offices. When researching ownership, use the most recent existing survey or plat.

If you are located on Lake Travis or Lake Buchanan, you will need to take particular notice of ownership below the lake elevations as listed in this booklet and avoid encroaching on LCRA property.

LCRA does not allow encroachment on LCRA land; all activities must be conducted on the property owner's land. Dredging on LCRA property requires approval from LCRA before beginning work. Any unauthorized fill placed on LCRA land will be subject to removal at land owner's expense. For help determining LCRA ownership of shoreline land, please contact LCRA's Real Estate Services at 1-800-776-5272, Ext. 7986.

Land Reclamation — Not Allowed

Property owners are not permitted to reclaim lost property resulting from the natural erosion process or a flood event. All shoreline stabilization projects and fill work must be conducted on or above the lake elevations listed in this booklet.

Water Quality Protection

Dredging material from a lakebed, installing retaining walls or other bank stabilization structures, and conducting other site disturbances can temporarily impact Highland Lakes water quality. Such projects may require removing a substantial amount of material. To reduce erosion and sediment in the lakes or tributaries during construction projects or other land-disturbing activities, take the following steps:

- Place dredged material above the lake elevations listed in this booklet in a manner that will prevent material from re-entering the lake through runoff.
- Perform work in a manner that prevents runoff of fill material, dredged material and pollutants into the waters of the High-

land Lakes. Minimize removal of natural vegetation, revegetate the disturbed area as soon as possible, and provide temporary erosion and sedimentation controls during the project. For more information on the use of erosion and sedimentation controls contact LCRA Water Resource Protection at 1-800-776-5272, Ext. 2324.

- Dredging in submerged conditions may require special techniques such as coffer dams or turbidity curtains. Contact LCRA for more information. Dredging should be performed in dry conditions during a scheduled lake lowering or other low water level conditions.
- Keep erosion controls in place and maintain them until vegetation in the fill area is at least 70 percent established.
- Gradually slope dredged areas to blend the newly dredged area into the existing channel bottom contour. Smooth dredged areas to prevent any irregular surfaces or cuts that might collapse (**see example calculation Figure F-5, Page 13**).
- Limit fill material to native soils obtained at the work site, concrete, sand, gravel, rock or other coarse aggregate material. Fill material must be free of waste, scrap metal products, organic materials and unsightly debris.
- Dredging in a cove that is fed by a creek may increase erosion, especially on flood control lakes. Contact LCRA to discuss if this condition is present.

Ensuring Navigability of Waters

All work must not interfere with others' reasonable access to, or use of, navigable waters. Retaining walls must be designed and built to adequately control erosion and not present a hazard to navigation.

To ensure navigability, the fill for the retaining wall must follow the existing shoreline and be limited to the minimum required to stabilize the shoreline. The wall must not exceed the length of the

Table 1: Riprap Size for Wave Protection

(Source: HEC-11 Chart 7. Hudson Relationship for Riprap Size Required to Resist Wave Erosion)

D50 = 0.57H/ cot 1/3 q
D50 = Median Riprap Size (in)
H = Wave Height (ft)
q = Bank Angle with Horizontal

	bank side slope (horizontal:vertical)					
D50, in	2:1	2.5:1	3:1	4:1	5:1	6:1
H, ft						
1	5	5	5	4	4	4
2	11	10	9	9	8	8
3	16	15	14	13	12	11
4	22	20	19	17	16	15
5	27	25	24	22	20	19
6	33	30	28	26	24	23

example: H = 3 feet, side slope = 2 horizontal to 1 vertical
result - use rock with D50 of 16 inches

Table 2: Wave Run-Up Height for Angular Rock Riprap

(Source: HEC-11 Chart 8. Wave Run-up on Smooth, Impermeable Slopes and Table 9. Correction for Wave Run-up)

R = Wave Run-up Height (ft)
H = Wave Height (ft)
q = Bank Angle with Horizontal
Cf = Correction Factor (0.6 for angular rock riprap)

	bank side slope (horizontal:vertical)					
R, ft	2:1	2.5:1	3:1	4:1	5:1	6:1
H, ft						
1	1.7	1.9	2.0	2.2	2.2	2.2
2	3.4	3.7	4.0	4.3	4.3	4.3
3	5.0	5.6	5.9	6.5	6.5	6.5
4	6.7	7.4	7.9	8.6	8.6	8.6
5	8.4	9.3	9.9	10.8	10.8	10.8
6	10.1	11.2	11.9	13.0	13.0	13.0

example: H = 3 feet, side slope = 2 horizontal to 1 vertical
result - wave run-up extends 5 feet above water level

property owner's waterfront property line.

Shoreline Protection Techniques

Managing the effects of wave heights and run up should be incorporated into the design of shoreline protection. The design should minimize the effects when shoreline protection fails and overtopping occurs. For guidance on shoreline protection parameters, see Tables 1 and 2, page 8.

Research has shown that a ski boat traveling at 20 miles per hour (mph), 100 feet from shore can generate a 3-foot wave. Likewise, a 50 mph wind across a lake from shore to shore measuring a distance of 10,000 feet generates a 3-foot wave. These are typical examples of wave height that could overtop your shoreline protection (see Figures 1 and 2, page 10).

Use of retaining walls and riprap to stabilize eroded shorelines

- Walls and riprap must be placed along the existing shoreline. Reclamation of land is not allowed.
- Walls may match existing retaining walls to minimize debris collection and maintain a consistent shoreline. However, walls should be angled back to match the existing shoreline to avoid reclamation.
- Construct the wall using stone, concrete blocks, poured concrete, rock, gabions (rock wrapped with wire mesh that is commercially manufactured for erosion control) or other course aggregate material.
- Place rock riprap at the base of the retaining wall (see Figure 2, page 10) to protect the wall from being undermined, which can lead to wall collapse, and to ensure maintenance of aquatic habitat.
- Use riprap material that is natural or quarry-run stone.

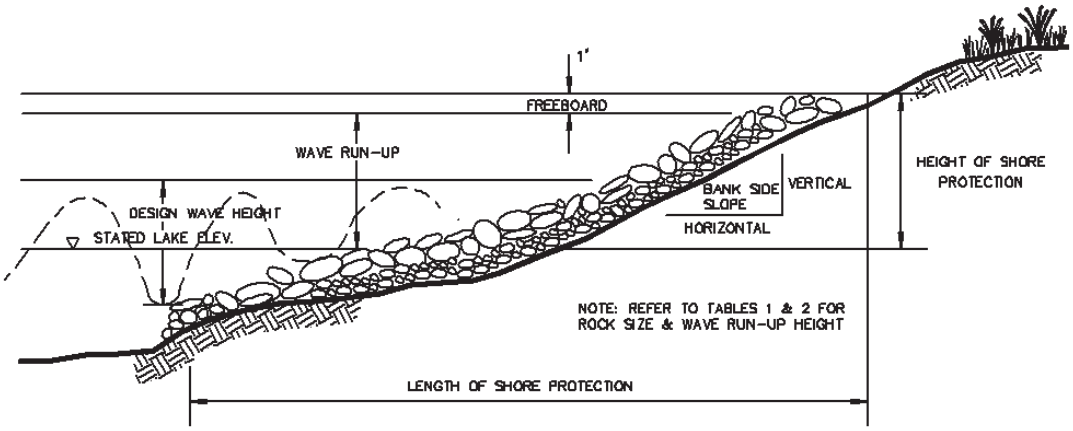


Figure F–1
SLOPE PROTECTION
USING ROCK RIPRAP

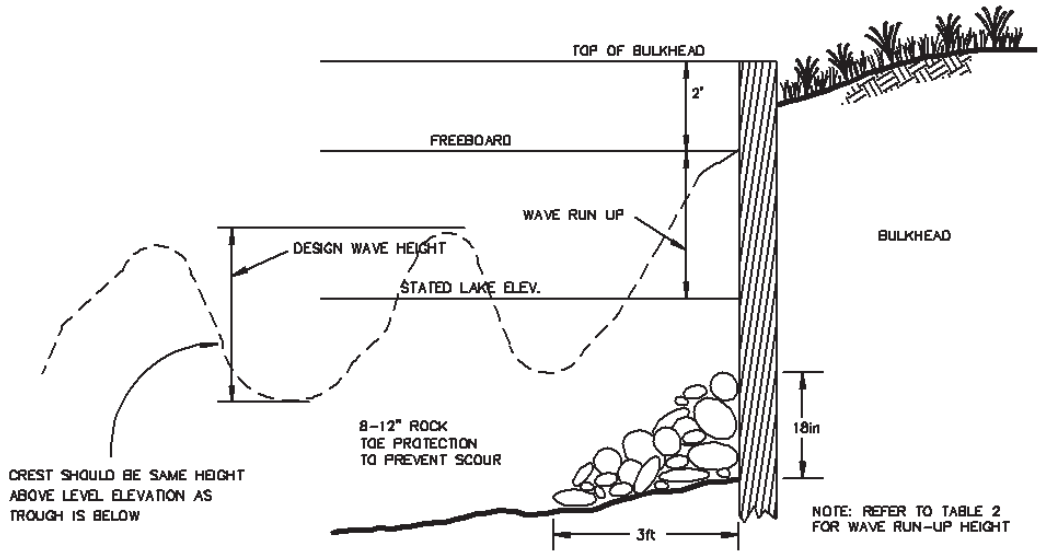


Figure F–2
VERTICAL PROTECTION
USING RETAINING WALL

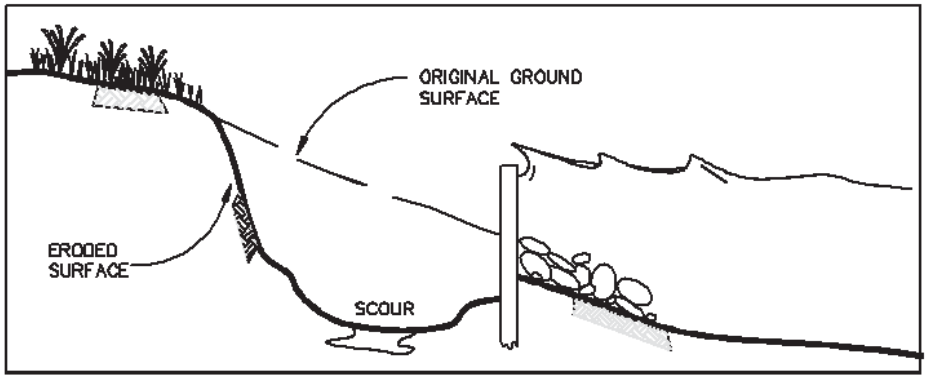
Design Example for Vertical Retaining Wall

Top of Wall = Stated Lake Elevation (pg. 4) +.5 (anticipated wave height) +2 ft. of Freeboard

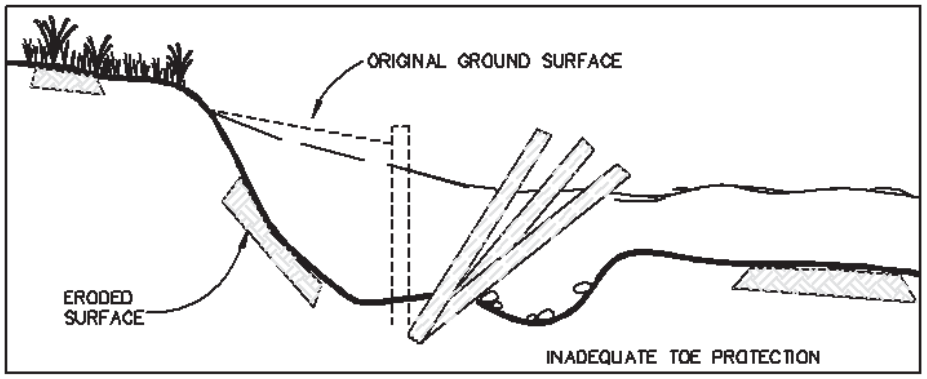
example: 825' msl (Lake LBJ) +.5 (3 ft. wave height) +2 ft.

Top of Wall = 828.5' msl

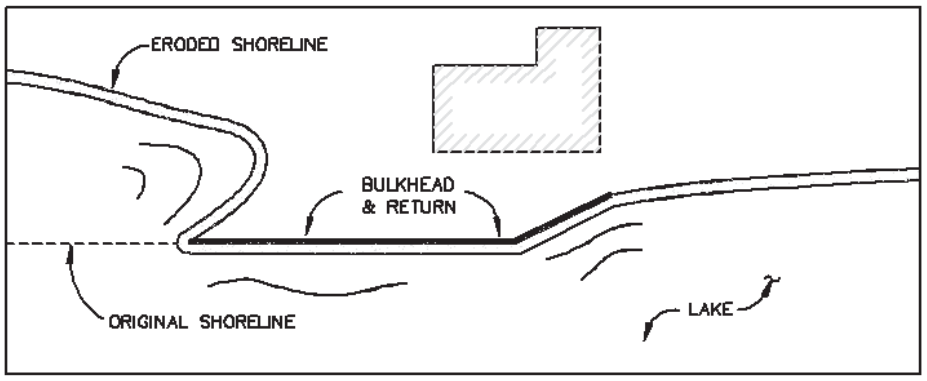
Figure F–3
FAILED SHORELINE PROTECTION SYSTEMS



EROSION BEHIND STRUCTURE – WAVES LAP OVER TOP
SIDE VIEW

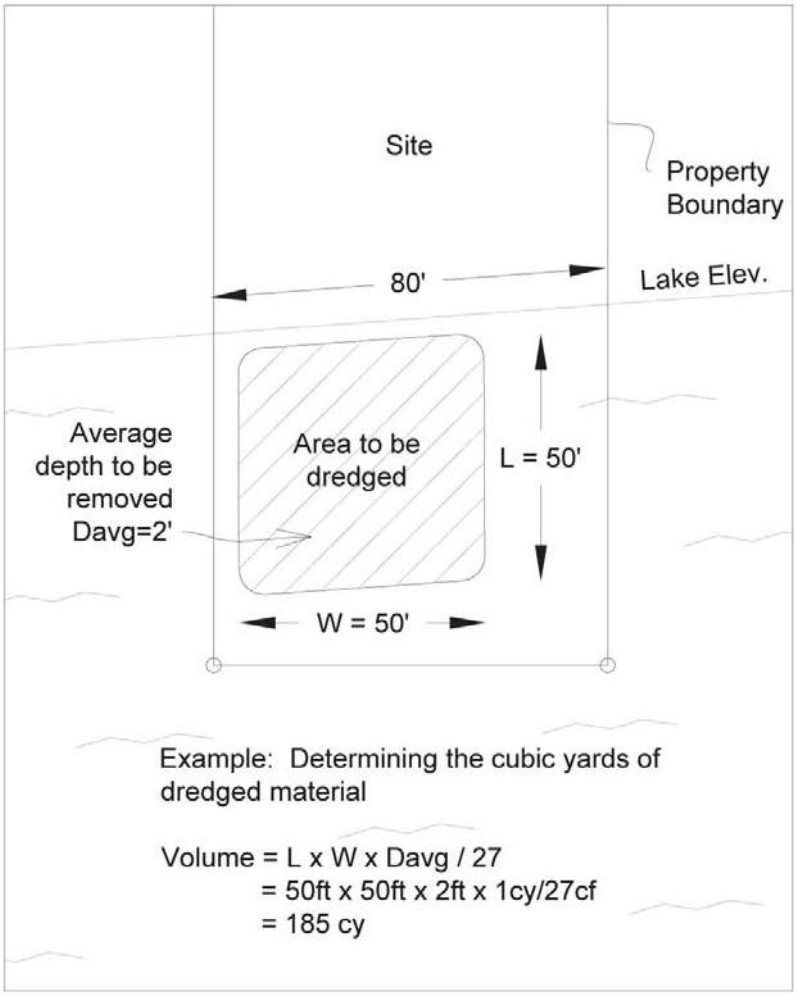


SLUMPING DUE TO TOE SCOUR
SIDE VIEW



PLAN VIEW -- FLANK EROSION

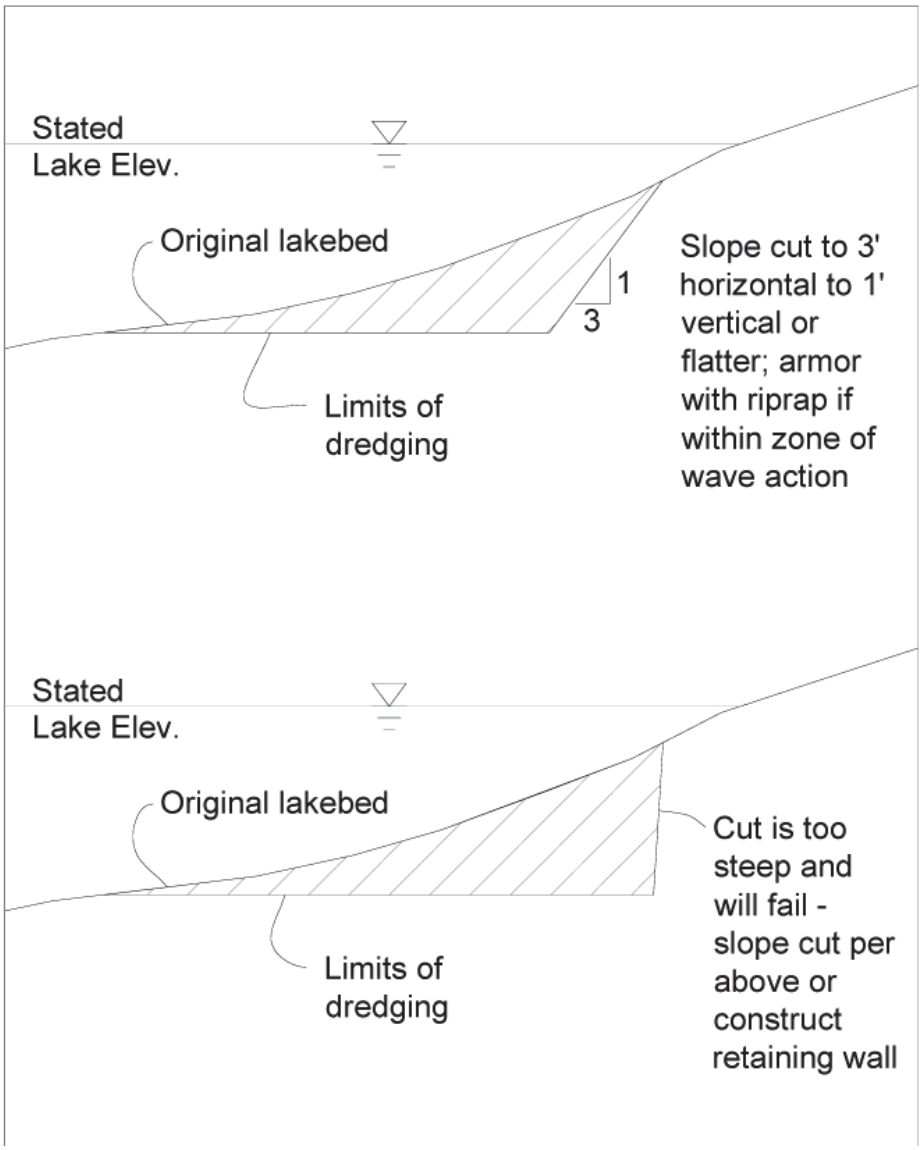
FIGURE F-4
DETERMINING THE CUBIC YARDS
OF DREDGED MATERIAL



Example: Determining the cubic yards of dredged material

Volume = L x W x Davg / 27
= 50ft x 50ft x 2ft x 1cy/27cf
= 185 cy

FIGURE F-5
CUT SLOPE FOR DREDGED AREA



- Do not use concrete rubble or other debris salvaged from construction sites to stabilize shorelines.
- Limit site preparation to the work necessary to obtain adequate slope and stability of the riprap material.
- Perform site preparation to follow the existing contour of the land.

For examples of inadequately designed shoreline protection systems, see Figure 3, page 11.

The three pictures show erosion behind the structure (scouring), slumping that results from the scouring, and flank erosion.

Enforcement of Dredge and Fill Standards

An agent or employee of LCRA may inspect dredge and fill activities in response to a complaint of possible violation of LCRA's Dredge and Fill Standards. LCRA will try to provide advance notification for inspections. The owner or owners representative is encouraged to be present during an inspection. LCRA typically conducts inspections during normal LCRA business hours unless other arrangements are made.

When a violation of LCRA's Dredge and Fill Standards occurs, an authorized agent or employee of LCRA will issue a Notice of Violation stating the nature of the violation or violations. The notice will be provided by:

1. Posting in a prominent location on the site and
2. Sending a copy of the notice to the property owner, if known, by certified mail.

The property owner will have 30 business days from the date that the notice of violation is posted to comply with the standards. The property owner may submit to LCRA a written request for an extension of that time frame. In the written request, the property owner must explain in detail the need for additional time and what measures are being taken to correct the violation. LCRA staff has discretion to grant an extension of time; the approval will be in writing.

Nothing in LCRA's Dredge and Fill Standards prevents LCRA from seeking injunctive relief or another remedy in law or equity at any time against any person allegedly violating the standards.

When more than one entity imposes standards for dredge and fill activities, the rules that are more restrictive or impose higher standards or requirements are the ones that must be observed.

U.S. Army Corps of Engineers Requirements

In addition to complying with LCRA's Dredge and Fill Standards, you are required to comply with any other federal, state and local requirements, including Section 404 of the Clean Water Act. Under Section 404, you must have a permit from the U.S. Army Corps of Engineers (USACE) for any discharge of dredged or fill material into waters of the United States. The Highland Lakes, all streams that flow into the Highland Lakes, and wetlands that are adjacent to the above areas are examples of waters of the United States under Section 404. In some cases, you may be authorized to do work under a general permit without notifying the USACE. However, in many cases you must notify the USACE and receive either a verification of authorization under a general permit or an individual permit before beginning work.

For more information on USACE requirements, please see the USACE Web site listed below. You may also call or write the USACE Fort Worth District office.

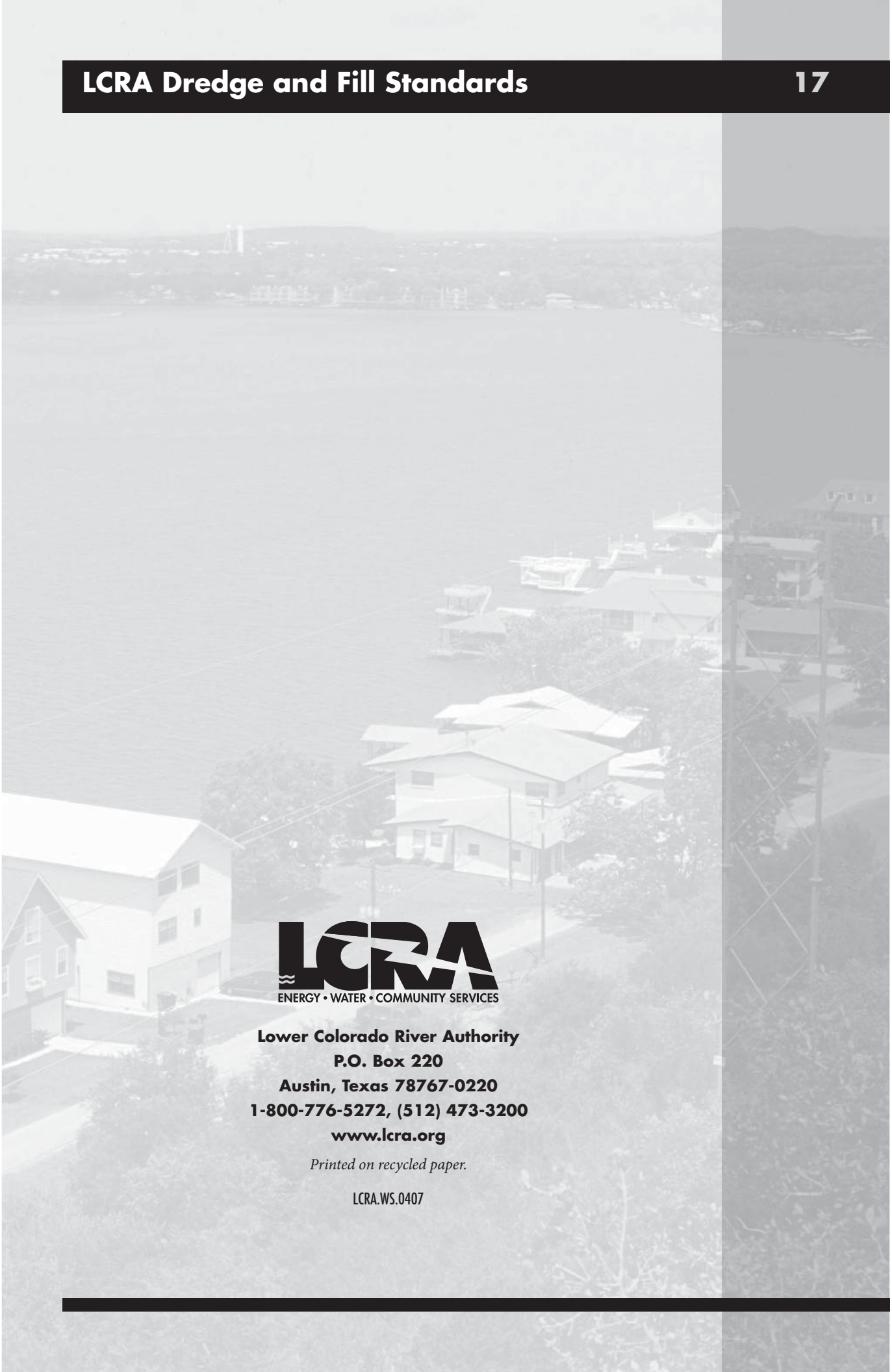
U.S. Army Corps of Engineers, Fort Worth District
P.O. Box 17300, Fort Worth, Texas 76102
Phone: 817-886-1731
www.swf.usace.army.mil (click on "Permits")

Please keep in mind that it is necessary to obtain permission from other government agencies (local, state, federal) before beginning any work involving dredge and fill activities.

Lakewide Permit

In 1998 the USACE gave approval for LCRA to provide a Lakewide Permit that applies to repair work or minor dredging during a lake lowering on the Highland Lakes.

The Lakewide Permit remains in effect under the conditions of LCRA Dredge and Fill Standards. LCRA manages the Lakewide Permit process for the USACE. LCRA prepares packets with criteria specific to the Lakewide Permit, makes inspections of shoreline protection work, and files reports with the USACE in accordance with the permit.



ENERGY • WATER • COMMUNITY SERVICES

Lower Colorado River Authority
P.O. Box 220
Austin, Texas 78767-0220
1-800-776-5272, (512) 473-3200
www.lcra.org

Printed on recycled paper.

LCRA.WS.0407

P.O. Box 220
Austin, Texas 78767-0220

APPENDIX 3 – SJRA

SAN JACINTO RIVER AUTHORITY
LAKE CONROE RULES FOR THE FOLLOWING

Structure on Lake Conroe (dock/pier/cut in) the following must be followed:

1. 40' out from bulkhead
2. If on a canal must keep 30' center channel for navigational purpose
3. May have upper deck but, no enclosures (no walls, may have small storage closet)
4. Must use licensed contractor
5. Must have POA/HOA approval if required by POA/HOA
6. Wooden structures

Bulkhead repair/new: See attached. No charge for this
Dredging: See attached. No charge for this.

Lawn Irrigation: Residential customers who wish to pull water from the lake to water their personal lawn.

This is an annual fee of $150.00 and the contract runs thru May 1st. to April 31st.
The resident must purchase and maintain their own system.
If for some reason they wish to no longer continue with this service then they must remove either the entire system or cut the pipe that protrudes in the water. (Depending on when they discontinue service if there is a refund of partial or all of funds.

Encroachments: This is for a resident who want to do any of the following:

1. Pool
2. Fence
3. Portable building(no permanent structure)
4. Some cases bulkhead work if they need to push out the bulkhead for structural reasons
5. Deck

No fees for encroachments
Must complete application
Have a survey
The resident may also purchase the property that SJRA owns

Events are also done with an approval process. These events may include swim races, boat parades, etc. They must complete application and have a General Liability policy with SJRA listed as additionally insured for 1 million dollars.

Licensed contractors: must complete application, 1 million dollar general liability policy w/SJRA listed as additionally insured. The annual fee is 375.00 and if they have a barge its $250 per barge additionally a year.

Fishing Guides: must complete application, $300,000 general liability w/SJRA listed as additionally insured. The annual fee is $375 and If they have more than one fishing guide boat then it is an additionally $100 per boat after the first boat.

Lake Conroe Reservoir Rules and Regulations

Effective June 1, 2015

San Jacinto River Authority
Lake Conroe Division
P.O. BOX 329
Conroe, Texas 77305
936-588-1111
lakeconroe@sjra.net

www.SJRA.net/lakeconroe

TABLE OF CONTENTS

LAKE CONROE RESERVOIR RULES AND REGULATIONS

*** * ***

CHAPTER I
GENERAL PROVISIONS

Section 1.01: Authority. These rules and regulations are adopted and promulgated under the authority vested in the Board of Directors of the San Jacinto River Authority by the laws of the State of Texas, including Article 8280-121 V.T.C.S., as amended, Section 49.004, Texas Water Code, as amended, the Texas Water Safety Act, Chapter 31, Texas Parks and Wildlife Code, as amended, and Sections 51.127-51.131 Texas Parks and Wildlife Code, as amended.

Section 1.02: Definitions. (a) When used herein, the following terms shall have the following meanings unless indicated otherwise:

(1) ***Authority.*** The term "Authority" shall mean the San Jacinto River Authority, a conservation and reclamation district, a governmental agency and a political subdivision of the State of Texas created by special act of the Texas Legislature codified at Article 8280-121 V.T.C.S., as amended, under authority of Article XVI, Section 59, of the Texas Constitution.

(2) ***Authority Land.*** The term "Authority Land" shall mean any real property owned or controlled by the Authority in connection with the operation of the Lake Conroe Dam and Reservoir. This term generally includes easement rights, rights of way, any type of real property interest, and/or any land which is, may be or has been inundated by water of the Reservoir, and the lands adjacent thereto, up to a contour line 201 feet above mean sea level. This term generally does not include flowage easements and other similar rights to temporarily inundate land adjacent to the Reservoir above 201 feet above mean sea level, or interests in real property over which the Authority has no rights with respect to land use control or regulation.

(3) ***Commercial Operation.*** The term "Commercial Operation" shall mean any activity on the Reservoir or on Authority Land which involves buying or selling goods or services, or the exchange or attempt or offer to exchange goods or services for money, barter, or for anything of value including, but not limited to, exhibitions, water shows, boat races, fishing tournaments, or any similar activity.

(4) ***Encroachment.*** The term "Encroachment" shall mean any structure, building, appurtenance or other fixture permanently placed upon Authority Land, that cannot be immediately removed from Authority Land, or that otherwise infringes upon the rights of the Authority in and to Authority Land.

(5) ***Marina.*** The term "Marina" shall mean a basin, pier, wharf, floating structure, boat dock, or any other structure providing for anchorage or storage of Vessels, that is operated by or associated with a Commercial Operation.

(6) ***Party Boat.*** The term "Party Boat" shall mean a Vessel operated by the owner of the Vessel or an employee of the owner of the Vessel that is rented or leased by the owner for a recreational event for more than six passengers and with a length exceeding 30 feet.

(7) ***Permit.*** The term "Permit" shall mean a written permit issued by the Authority to a Person, or a written agreement between the Authority and a Person, regarding use of the Reservoir, Authority Land and/or Raw Water.

(8) ***Person.*** The term "Person" shall mean individuals, firms, partnerships, corporations and governmental entities, or any combination thereof.

(9) ***Personal Watercraft.*** The term "Personal Watercraft" shall mean a Vessel designed to be operated by a person or persons *sitting*, *standing* or *kneeling* on the Vessel rather than the conventional manner of sitting or standing inside the Vessel and includes jet skis, wet bikes, and aqua planes.

(10) ***Private Structure.*** The term "Private Structure" shall mean a basin, pier, wharf, floating structure, boat dock, or any other structure providing for anchorage or storage of Vessels, that is privately owned or operated by a Person and not associated with a Commercial Operation.

(11) ***Raw Water.*** The term "Raw Water" shall mean the water of the Reservoir.

(12) ***Refuse.*** The term "Refuse" shall mean gasoline and other motor fuels, cleaning solvents, oils or greases, glass, aluminum plastic or metal cans, bottles, packaging materials or containers, natural fiber, monofilament, nylon or similar lines, ropes, or nets, ashes, cinders, sand, gravel, tar, asphalt, plastic and plastic products, nails, wire or building

materials; metal or metal products; paper or paper products; glass or glass products; wood or wood products; grass clippings, sawdust, trash, garbage, pesticides, insecticides, fungicides or other household or lawn or garden chemicals or agents; human, animal, domestic or industrial wastes or wastewater; contents of toilet facilities; or any other refuse matter of any kind or description whatever.

(13) ***Reservoir.*** The term "Reservoir" shall mean Lake Conroe Reservoir, which is the body of water impounded by the Lake Conroe Dam, located in Montgomery and Walker Counties, Texas.

(14) ***Rules.*** The term "Rules" shall mean these rules and regulations.

(15) ***Texas Water Safety Act.*** The term "Texas Water Safety Act" shall mean Chapter 31 of the Texas Parks and Wildlife Code, as the same may be amended from time to time.

(16) ***Vessel.*** The term "Vessel" shall mean any watercraft, other than a seaplane on water, used or capable of being used as a means of transportation on water, including, for example, boats, barges, and Personal Watercraft.

(17) ***Vessel Livery.*** The term "Vessel Livery" shall mean a Commercial Operation engaged in renting or hiring out Vessels for profit.

(b) These definitions shall apply to these Rules only and have no effect on any other rules, regulations, resolution, orders or other acts or instruments of the Authority unless specifically referenced and incorporated therein.

Section 1.03: Applicability. These Rules apply to the Reservoir, Authority Land and Raw Water.

Section 1.04: Other Laws and Regulations; Conflicts. (a) These Rules shall be in addition to any applicable rules, regulations, laws or requirements of any other Federal, State or local regulatory authority.

(b) In the event of a direct conflict between these Rules and any Federal or State rules, regulations, laws or requirements, such Federal or State rules, regulations, laws or requirements shall prevail and control over these Rules.

CHAPTER II
BOATING AND VESSELS ON THE RESERVOIR

Section 2.01: Operation of Vessels. The Reservoir is hereby found and declared to impound public waters of the State of Texas. Accordingly, the operation of Vessels on the Reservoir is permitted by the Texas Water Safety Act.

Section 2.02: Applicable Laws and Regulations. (a) The operation of Vessels on the Reservoir shall be subject to any applicable Federal, State, or local rules, regulations, laws or requirements.

(b) Without limiting the generality of Subsection (a), the following laws and regulations may be applicable, in whole or in part, to the operation of Vessels on the Reservoir:

(1) Texas Water Safety Act -- relating to the identification and numbering of vessels; certificates of title for Vessels and outboard motors; required equipment for Vessels, including lights, horns, life preservers, fire extinguishers, manifolds and mufflers, rearview mirrors, and related exemptions; boating regulations, including applicability of the United States Coast Guard Inland Rules, prohibiting reckless or negligent operation, excessive speed, prohibiting interference with markers and ramps, obstructions, operation in restricted areas, setting time and manner of operation while engaging in certain watersports, requiring accident reporting, boater education, and insurance coverage for a Vessel Livery; enforcement, penalties and inspections; boat ramps and buoys and markers; party boats; and rulemaking of the Texas Parks and Wildlife Department;

(2) Chapters 51, 53 and 55, Title 31, Texas Administrative Code, as amended -- relating to the rules of the Texas Parks and Wildlife Department promulgated under the Texas Water Safety Act, including boater education, fees, boat speed limits and buoy standards, and marine safety enforcement;

(3) Subchapter E, Chapter 12, Texas Parks and Wildlife Code, as amended -- relating to punishments for violation of Texas Parks and Wildlife Code, including Texas Water Safety Act and regulations promulgated thereunder;

(4) Chapter 49, Texas Penal Code, as amended -- related to public intoxication, boating while intoxicated, intoxication assault, and intoxication manslaughter;

(5) Chapter 38, Texas Penal Code, as amended -- related to evading of arrest or detention;

(6) Chapter 66, Texas Parks and Wildlife Code, as amended -- related to fishing, aquatic plans, and exotic or potentially harmful aquatic fish, shellfish or aquatic plants.

(7) Chapter 34, Title 33, United States Code, as amended -- relating to inland navigation rules;

(8) Part 175, Title 33, Code of Federal Regulations, as amended -- relating to personal flotation devices, distress signals, and ventilation; and

(9) Part 25, Title 46, Code of Federal Regulations, as amended -- relating to fire extinguishers; and

(10) Chapter 321, Title 30, Texas Administrative Code, as amended -- relating to boat sewage disposal.

Section 2.03: Adoption of Local Rules. As authorized by the Texas Water Safety Act, Sections 2.04, 2.05, and 2.08 of these Rules are hereby adopted as local rules of the Authority. Such local rules shall supplement any applicable Federal, State or local laws or regulations.

Section 2.04: Control of Speed. It is a violation of these Rules for any Person to:

(1) operate a Vessel on the Reservoir at a speed in excess of a "No Wake" speed within one hundred feet (100') of any Private Structure, Marina or other lakeshore facility or bridge, any moored, anchored or occupied Vessel, or in an inlet in which people are swimming;

(2) operate a Vessel on the Reservoir at a speed in excess of a "No Wake" speed within fifty feet (50') of another Vessel, Personal Watercraft or water skier (other than a water skier towed by such Vessel); or

(3) operate any Vessel on the Reservoir at a speed in excess of minimum planing speed (the minimum speed at which a Vessel will achieve and maintain a level plane) during the period from one half-hour after sunset to one half-hour before sunrise.

Section 2.05: Mooring, Anchoring and Docking; Unattended Vessels. It is a violation of these Rules for any Person to:

(1) anchor, moor or dock any Vessel for a period exceeding thirty-six (36) hours anywhere on the Reservoir or on any Authority Land, except at a Private Structure or Marina; provided, however, that for purposes of this Subdivision a Marina does not include a facility permitted as a courtesy dock by the Authority; or

(2) leave any Vessel unattended for any period of time, except:

(A) where such Vessel is securely moored, or anchored and flagged and lighted, so as not to create a hazard to navigation; or

(B) in the event of an emergency.

Section 2.06: Noise. (a) It is a violation of these Rules for any Person to:

(1) operate any motor-powered Vessel on the Reservoir in a manner that unreasonably disturbs the public due to engine or exhaust noise; or

(2) operate any motor-powered Vessel on the Reservoir without the use of a subsurface exhaust water manifold or a factory-type muffler, except as approved in writing by the Authority in accordance with Section 31.072 of the Texas Water Safety Act (relating to racing craft engaged in a sanctioned race).

(b) It is a violation of these Rules for any Person to operate any Vessel on the Reservoir in a manner that contributes to excessive noise or disturbs the public between the hours of 10:00 p.m. and 6:00 a.m. Noise that unreasonably disturbs other members of the public is considered excessive. Amplified music shall be turned off between the hours of 10:00 p.m. and 6:00 a.m. Amplified music containing explicit lyrics shall not be audible to the general public at any time. Any Person that violates this Subsection is subject to penalties under these Rules and is further subject to removal and/or ban from Authority Land.

Section 2.07: No Parasail Launching from Authority Land. It is a violation of these Rules for any Person to launch a parasail or any other aerial device designed to lift and carry a person or persons aloft from Authority Land, including, without limitation, any portion of the Lake Conroe Dam, the beach area at the east end of the Dam, or anywhere on Ayer's Island. It is permissible to launch a parasail or any other aerial

device designed to lift and carry a person or persons aloft from a Vessel on the Reservoir or from private property.

Section 2.08: Buoys and Other Markers and Signage. (a) All Persons shall observe and comply with any duly authorized buoy, beacon, marker, stake, flag, navigation aid or sign on the Reservoir. Failure to do so is a violation of these Rules.

(b) It is a violation of these Rules for any Person to install or maintain a buoy, beacon, marker, stake, flag, navigation aid or sign on the Reservoir without the prior written approval of the Authority.

(c) It is a violation of these Rules for any Person to move, remove, displace, tamper with, damage or destroy a buoy, beacon, marker, stake, flag, navigation aid or sign on the Reservoir without the prior written approval of the Authority.

(d) Subsections (a) through (c) shall not apply to a buoy, beacon, marker, stake, flag, navigation aid or sign on the Reservoir installed or maintained by Authority employees, Montgomery County law enforcement officers, Texas Parks and Wildlife Department employees, or employees of an agency of the United States Government, in the performance of official duties.

Section 2.09: Inspections. All Vessels on or off the Reservoir shall be subject to inspection by authorized representatives of the Authority at all times. It is a violation of these Rules for a Person to fail or refuse to allow authorized representatives of the Authority access to Vessels for purposes of conducting an inspection, or to interfere with an inspection in progress.

Section 2.10: Accident Reporting. Any accident required to be reported to the Texas Parks and Wildlife under the Texas Water Safety Act, shall also be reported to the Office of the Montgomery County Constable, Precinct 1. Failure to so report an accident is a violation of these Rules.

CHAPTER III
PUBLIC ACCESS; DESIGNATED USE AREAS

Section 3.01: Public Access to Authority Land. (a) The public shall have the right to access and go upon, over and across the surface of Authority Land except where such access is designated by the General Manager as being restricted or prohibited, or where these Rules otherwise limit or prohibit such access.

(b) No Person shall exclude the public from Authority Land without the prior written consent of the Authority.

(c) Any Person that violates this Section is subject to penalties under these Rules.

Section 3.02: Designation by General Manager. (a) The General Manager of the Authority may designate:

(1) areas of Authority Land designated as public parks, boat launch, picnicking or camping areas;

(2) areas of the Reservoir or Authority Land where certain activities are deemed unusually hazardous or dangerous to public safety or unreasonably interfere with the proper and efficient operation of the Lake Conroe Dam and Reservoir;

(3) areas of the Reservoir exclusively for swimming, fishing, water skiing, operation of Vessels or Personal Watercraft, or a combination of such activities; or

(4) areas of the Reservoir in which the operation of all or any certain Vessels (including Personal Watercraft) shall be prohibited or restricted, or in which speed shall be limited.

(b) Areas designated under Subsection (a) shall be clearly marked by buoys or signs indicating the boundaries, restriction(s) and purpose(s) of such designation, all as required by applicable Federal and State laws and regulations.

Section 3.03: Designated Uses. (a) It is a violation of these Rules for any Person to engage in any activity in violation of a designation made, marked and identified under Section 3.02.

(b) Subsection (a) shall not apply to activities by Authority employees, Montgomery County law enforcement officers, Texas Parks and Wildlife Department employees, or employees of an agency of the United States Government, in the performance of official duties.

CHAPTER IV
PICNICKING, CAMPING AND OTHER RECREATIONAL USES OF AUTHORITY LAND AND THE RESERVOIR

Section 4.01: Picnicking and Camping. (a) Picnicking and camping are allowed on Authority Land subject to strict compliance with the provisions of this Section.

(b) No Person may:

(1) camp or picnic on Authority Land expect in those public areas so designated; or

(2) camp on any Authority Land for more than five (5) consecutive days or camp on Authority Land for more than ten (10) days within any calendar month.

(c) Any Person that violates this Section is subject to penalties under these Rules and is further subject to removal and/or ban from Authority Land.

Section 4.02: Littering; Glass. (a) No Person may litter or contaminate any picnic, camping or other areas of the Authority Land or the Reservoir, or otherwise abandon or dispose of Refuse in the Reservoir or on Authority Land expect in designated public trash receptacles.

(b) No Person may bring or use any glass container on Authority Land.

(c) Any Person that violates this Section is subject to penalties under these Rules and is further subject to removal and/or ban from Authority Land.

Section 4.03: Noise. No Person may cause, create or contribute to excessive noise or disturb the public on the Reservoir or Authority Land. Noise that unreasonably disturbs other members of the public is considered excessive. Amplified music shall be turned off between the hours of 10:00 p.m. and 6:00 a.m. Any Person that violates this Section is subject to penalties under these Rules and is further subject to removal and/or ban from Authority Land.

Section 4.04: Consumption of Alcohol. Conspicuous public consumption or display of alcoholic beverages that unreasonably disturbs other members of the public is prohibited on the Reservoir or Authority Land. It is a violation of these Rules for any intoxicated individual to

enter upon Authority Land. It is a violation of these Rules for any individuals to become intoxicated while on Authority Land. Any Person that violates this Section is subject to penalties under these Rules and is further subject to removal and/or ban from Authority Land.

Section 4.05: Pets; Livestock; Abandonment of Animals. (a) All Persons must keep their pets on leashes at all times while in designated camping and picnicking areas on Authority Land; outside such designated camping and picnicking areas, pets must be kept under their owners' direct control while on Authority Land. No Person's pet may cause, create or contribute to excessive noise or disturb the public on Authority Land between the hours of 10:00 p.m. and 6:00 a.m. In no case shall a Person bring a dangerous animal or a dangerous dog on Authority Land. For purposes of the foregoing, a "dangerous animal" means any animal that is (1) defined as a "dangerous wild animal" by Section 822.101, Texas Health and Safety Code, or (2) an animal of any other species of wild or feral mammal or reptile that by its nature or breeding is capable of inflicting serious bodily injury to a human, and a "dangerous dog" has the meaning given by Section 822.041, Texas Health and Safety Code, and also includes any dog running at large that makes an unprovoked attack on a domestic animal that causes serious bodily injury or death, and the attack occurs on property other than that of the dog's owner.

(b) Livestock shall not be allowed to range or graze on Authority Land. No horses shall be allowed in designated camping or picnicking areas. This Subsection shall not apply to Authority employees at any time, or to Montgomery County law enforcement officers, Texas Parks and Wildlife Department employees, or employees of an agency of the United States Government, in the performance of official duties.

(c) No Person may place, dump, abandon or leave any animal on Authority Land, and any such animals may be removed immediately from Authority Land notwithstanding the provisions of Chapter VIII.

(d) Any Person that violates this Section is subject to penalties under these Rules and is further subject to removal and/or ban from Authority Land.

Section 4.06: Fires. (a) Fires may be burned on Authority Land only in established fire rings or in a contained grill, stove or fire pit.

(b) During times of drought or other fire hazard conditions, the General Manager may declare a ban on all ground fires on all or any part of Authority land, as necessary for purposes of public health, safety and welfare. No Person may light, build or maintain a ground fire on

Authority Land while such a ban is in effect.

(c) No person shall at any time burn Refuse on Authority Land.

(d) Any Person that violates this Section is subject to penalties under these Rules and is further subject to removal and/or ban from Authority Land.

Section 4.07: Removal of Natural Resources. No Person shall destroy or remove from Authority Land any timber, shrubs, other vegetation, rock, sand, gravel, caliche, or any other substance, material or geologic feature without the prior written approval of the Authority. This Section does not prohibit the dredging of the Reservoir and/or Authority Land if authorized by the Authority under Chapter VI. Any Person that violates this Section is subject to penalties under these Rules and is further subject to removal and/or ban from Authority Land.

CHAPTER V
FISHING AND HUNTING; FIREARMS; GUIDE PERMITTING; FERAL ANIMALS

Section 5.01: Fishing Permitted. (a) Fishing is permitted on the Reservoir or from any Authority Land:

(1) in areas where fishing is not designated as restricted or prohibited;

(2) during the applicable fishing season; and

(3) in accordance with the provisions of the Texas Parks and Wildlife Code and any rules and regulations established by the Texas Parks and Wildlife Department thereunder.

(b) Any Person that violates this Section is subject to penalties under these Rules and is further subject to removal and/or ban from fishing on the Reservoir or from Authority Land.

Section 5.02: Hunting and Trapping Generally Prohibited. (a) Except as authorized under Section 5.03, hunting on the Reservoir or any Authority Land is prohibited.

(b) Except for legal minnow or bait traps, no Person shall place poisons, traps or snares in the Reservoir or on Authority Land.

(c) Any Person that violates this Section is subject to penalties under these Rules and is further subject to removal and/or ban from Authority Land.

Section 5.03: Limited Waterfowl Hunting Permitted. (a) The hunting of waterfowl is permitted on the Reservoir and on Authority Land:

(1) with a shotgun;

(2) in the areas bounded by the Sam Houston National Forest;

(3) during the applicable hunting season; and

(4) in accordance with the applicable federal and state laws, rules and regulations, including applicable provisions of the Texas Parks and Wildlife Code and any rules and regulations established by the Texas Parks and Wildlife Department thereunder.

(b) No fixed or stationary hunting blinds may be placed or constructed on the Reservoir or on Authority Land.

(c) Any Person that violates this Section is subject to penalties under these Rules and is further subject to removal and/or ban from hunting on the Reservoir or on Authority Land.

Section 5.04: Discharge of Firearms. (a) Except as provided by Section 5.03, it is a violation of these Rules for any Person to discharge a shotgun, rifle, pistol or other firearm into, along, across or from the Reservoir or Authority Land.

(b) Subsection (a) shall not apply to the discharge of any firearms by the Authority employees, Montgomery County law enforcement officers, the Texas Parks and Wildlife Department employees, or employees of any agency of the United States Government in the performance of official duties.

Section 5.05: Guide Permitting. Fishing and/or hunting guide services that constitute Commercial Operations shall be subject to permitting under Chapter XI.

Section 5.06: Feral Animals; Exotic or Potentially Harmful Species. (a) Except for native fish, birds and waterfowl, no Person may feed any feral or wild animal on Authority Land.

(b) No Person shall possess or introduce exotic or potentially harmful fish, shellfish or exotic plants or other species on Authority Land or into the Reservoir in violation of Chapter 66, Texas Parks and Wildlife Code, as amended, or any rules and regulations established by the Texas Parks and Wildlife Department thereunder.

(c) Any Person that violates this Section is subject to penalties under these Rules and is further subject to removal and/or ban from Authority Land.

CHAPTER VI
PRIVATE STRUCTURES, MARINAS, AND OTHER ENCROACHMENTS ON THE RESERVOIR OR AUTHORITY LAND

Section 6.01: General Statement. The right to engage in construction, placement, operation and maintenance of Private Structures, Marinas, bulkheads, buildings, and other facilities or Encroachments on the Reservoir or Authority Land is not an inherent right that comes with the control or ownership of waterfront property.

Section 6.02: Permit Required at All Times. (a) Except as provided under Section 6.03, it is a violation of these Rules for any Person to construct, operate or maintain an Encroachment on the Reservoir or any Authority Land at any time except in strict compliance with a valid Permit authorizing same.

(b) A request for a Permit for an Encroachment shall be directed to the Authority and processed in accordance with procedures approved by the General Manager from time to time. The Authority exercises the right to grant, deny, condition or renew such Permit as deemed appropriate in the sole discretion of the Authority.

Section 6.03: Compliance with Permit. (a) Any construction, operation or maintenance of an Encroachment under a Permit shall be subject at all times to the terms and conditions set forth therein.

(b) Unless expressly prohibited by the terms of a Permit for an Encroachment, the Authority may revoke or suspend a Permit at any time due to the violation of the terms of such Permit or any violation of these Rules by the holder of the Permit.

(c) Unless expressly prohibited by the terms of a Permit for an Encroachment, the violation of a Permit is considered a violation of these Rules.

Section 6.04: Encroachments Not Requiring a Permit. Notwithstanding Section 6.02, the following Encroachments shall not require a Permit:

(1) Personal property that is immediately removable from Authority Land; or

(2) Landscaping and related irrigation systems installed on Authority Land by the Person owning or leasing an adjoining land.

Section 6.05: Removal of Encroachments. (a) The Authority by written notice may compel any Person that owns, operates or maintains an Encroachment in violation of these Rules to immediately remove same at no cost or expense to the Authority. If such Person fails to fully and timely remove the Encroachment in accordance with such notice, the Authority, with or without any further notice to the owner, operator or licensee of the Encroachment, and with or without revocation or suspension of any related Permit(s), may remove the Encroachment at the sole cost and expense of the owners, operator or licensee.

(b) Notwithstanding Subsection (a), the Authority reserves the right to remove an Encroachment under Section 11.02.

(c) The removal of an Encroachment under Subsection (a) is in addition to any penalties under Section 11.01.

Section 6.06: Dredging and Filling; Bulkheading. (a) It is a violation of these Rules for any Person to dredge, excavate, deposit, or fill material from, in or to the Reservoir or Authority Land at any time except in strict compliance with a valid Permit authorizing same.

(b) It is a violation of these Rules for any Person to install, re-install, replace or modify bulkheads in the Reservoir or on Authority Land at any time except in strict compliance with a valid Permit authorizing same.

(c) To obtain a Permit, a Person must submit an application on forms provided by the Authority and timely pay all fees required by the Authority. The Authority exercises the right to grant, deny, condition or renew such Permit as deemed appropriate in the sole discretion of the Authority.

(d) In addition to the terms and conditions of any Permit issued pursuant to this Section, any dredging, filling or bulkheading work shall be performed in accordance with all applicable regulations and permits of the U.S. Army Corps of Engineers (Galveston District).

Section 6.07: Inspections. All Encroachments (regardless of whether a Permit is required under these Rules) and any dredging, filling or bulkheading work described under Section 6.06(a) shall be subject to inspection by authorized representatives of the Authority at all times. It is a violation of these Rules for a Person to fail or refuse to allow authorized representatives of the Authority access to an Encroachment or such work for purposes of conducting an inspection, or to interfere with an inspection in progress.

Section 6.08: Change in Reservoir Levels. The Authority is under no obligation to maintain a specific level of the Reservoir in order to facilitate the construction or use of Encroachments, including Private Structures or Marinas.

(b) The General Manager may limit or restrict the construction, operation and maintenance of Encroachments by Permit in response to changes in Reservoir levels, for public health and safety, in times of emergency, or when, in his or her judgment, circumstances so require. No Person may construct, operate or maintain an Encroachment in violation of such limitations or restrictions. Any Person that violates this Subsection is subject to penalties under these Rules. The Authority may additionally revoke or suspend the Permit for a subject Encroachment.

CHAPTER VII
SANITARY CONDITIONS; SEPTIC SYSTEMS

Section 7.01: General Rule. Sanitation conditions and facilities on the Reservoir and on Authority Land shall be maintained in compliance with standards set by applicable laws, rules, regulations and orders of Federal, State and local governmental agencies. Any violation of such laws, rules, regulations and orders of Federal, State or local governmental agencies shall be a violation of these Rules without regard to the issuance of a notice of violation or other enforcement of such laws, rules, regulations and orders by Federal, State or local governmental agencies.

Section 7.02: On-Site Sanitary Sewage Facilities. On-Site Sanitary Sewage Facilities (i.e., septic systems) located within 2,075 feet of the Reservoir are subject to regulation and permitting by the Authority under that certain "Order Adopting Rules for On-Site Sewage Facilities Within 2075 Feet of Lake Conroe, Texas" passed and adopted by the Board of Directors of the Authority on February 26, 2004, as same may be amended from time to time hereafter.

Section 7.03: Sewage Collection Lines and Facilities. The construction, operation and maintenance of sewage collection lines and related facilities and appurtenances in or over the Reservoir or on Authority Land is subject to Chapter VI.

CHAPTER VIII
ABANDONMENT OF PERSONAL PROPERTY

Section 8.01: General Rule. (a) It is a violation of these Rules for any Person to abandon personal property on the Reservoir or on Authority Land. If personal property is left unattended for a period of more than thirty-six (36) hours, it shall be deemed to have been abandoned.

(b) Abandoned personal property may be impounded by the Authority and held in custody. Such abandoned personal property may be reclaimed by payment of one dollar per day storage fees plus additional cost to the Authority which was incurred in recovering the property and moving it to the site for storage. Abandoned personal property which has been impounded and which has not been reclaimed within ninety (90) days from the date of impoundment by the payment of the above specified charge, may be sold, destroyed or otherwise disposed of by the Authority, as the Authority, in its sole discretion, deems appropriate with or without notice by the Authority. The Authority shall neither have nor assume any responsibility whatsoever, as fiduciary custodian, agent or otherwise for any abandoned personal property or the impoundment or disposition of same by the Authority pursuant to these rules.

(c) The Authority shall neither have nor assume any responsibility whatsoever, as fiduciary custodian, agent or otherwise for any abandoned personal property, to attempt to identify the owner of the abandoned personal property. If the Authority identifies the owner of the abandoned personal property, such owner shall be responsible for any costs incurred by the Authority under Subsection (b) in addition to any penalties under Section 11.01.

Section 8.02: Exception. Section 8.01 does not apply to Encroachments permitted under Chapter VI, to Commercial Operations permitted under Chapter IX, or to Vessels securely moored in or at a permitted Private Structure, Vessel Livery or Marina; provided, however, that for purposes of this Section, a Marina does not include a facility permitted as a courtesy dock by the Authority.

CHAPTER IX
COMMERCIAL OPERATIONS

Section 9.01: General Statement. The right to engage in the operation of business ventures, barges, excursion and rental Vessels and other Commercial Operations on the Reservoir or Authority Land is not an inherent right.

Section 9.02: Permit Required at All Times. It is a violation of these Rules for any Person to conduct a Commercial Operation on the Reservoir or any Authority Land at any time except in strict compliance with a valid Permit authorizing same.

(b) A request for a Permit for a Commercial Operation shall be directed to the Authority and processed in accordance with procedures approved by the General Manager from time to time. The Authority exercises the right to grant, deny, condition or renew such Permit as deemed appropriate in the sole discretion of the Authority.

Section 9.03: Compliance with Permit. (a) Any Commercial Operation engaged in or operated under a Permit shall be subject all times to the terms and conditions set forth therein.

(b) Unless expressly prohibited by the terms of a Permit for a Commercial Activity, the Authority may revoke or suspend a Permit at any time due to the violation of the terms of such Permit or any violation of these Rules by the holder of the Permit.

(c) Unless expressly prohibited by the terms of a Permit for a Commercial Activity, the violation of a Permit is considered a violation of these Rules.

Section 9.04: Inspections. All Commercial Operations shall be subject to inspection by authorized representatives of the Authority at all times. It is a violation of these Rules for a Person to fail or refuse to allow authorized representatives of the Authority access to a Commercial Operation for purposes of conducting an inspection, or to interfere with an inspection in progress.

Section 9.05: Reservoir Levels. (a) The level of the Reservoir is subject to change due to evaporation rates, rainfall, runoff within the watershed boundary, the amount of water used by current water right holders, and other factors. The Authority is under no obligation to maintain a specific level of the Reservoir in order to facilitate Commercial Operations.

(b) The General Manager may limit or restrict certain Commercial Operations in response to changes in Reservoir levels, for public health and safety, in times of emergency, or when, in his or her judgment, circumstances so require. No Person may engage in Commercial Operations in violation of such limitations or restrictions. Any Person that violates this Subsection is subject to penalties under these Rules. If the Commercial Operation is operating under a Permit, the Authority may additionally revoke or suspend the Permit and enjoin the subject Commercial Operations.

CHAPTER X
RAW WATER USE

Section 10.01: General Statement. The right to divert Raw Water from the Reservoir is not an inherent right that comes with the control or ownership of water front property.

Section 10.02: Permit Required at All Times. (a) It is a violation of these Rules for any Person to divert Raw Water from the Reservoir at any time except in strict compliance with:

(1) a water right issued by the Texas Commission on Environmental Quality authorizing such diversion; or

(2) a valid Permit authorizing such diversion.

(b) A request for a Permit to divert Raw Water from the Reservoir shall be directed to the Authority and processed in accordance with procedures approved by the General Manager from time to time. The Authority exercises the right to grant, deny, condition or renew such Permit as deemed appropriate in the sole discretion of the Authority.

Section 10.03: Compliance with Permit. (a) Any diversion of Raw Water under a Permit shall be subject all times to the terms and conditions set forth therein.

(b) Unless expressly prohibited by the terms of a Permit to divert Raw Water, the Authority may revoke or suspend a Permit at any time due to the

violation of the terms of such Permit or any violation of these Rules by the holder of the Permit.

(c) Unless expressly prohibited by the terms of a Permit to divert Raw Water, the violation of a Permit is considered a violation of these Rules.

Section 10.03: Raw Water Intake. The diversion of Raw Water from the Reservoir, any associated Raw Water intake, pumping, diversion, metering, or other equipment located in the Reservoir or on Authority Land constituting an Encroachment shall require a Permit under Chapter VI. The Authority may, but shall not be obligated to, include a Permit for such Encroachment in a Permit to divert Raw Water from the Reservoir.

Section 10.04: Reservoir Levels. (a) The level of the Reservoir is subject to change due to evaporation rates, rainfall, runoff within the watershed boundary, the amount of water used by water right holders, and other factors. The Authority is under no obligation to maintain a specific level of the Reservoir in order to facilitate the diversion of Raw Water from the Reservoir.

(b) The General Manager may limit or restrict the diversion of Raw Water from the Reservoir by Permit in response to changes in Reservoir levels, for public health and safety, in times of emergency, or when, in his or her judgment, circumstances so require. No Person may divert Raw Water from the Reservoir in violation of such limitations or restrictions. Any Person that violates this Subsection is subject to penalties under these Rules. The Authority may additionally revoke or suspend the Permit and enjoin the subject Raw Water diversion.

CHAPTER XI
PENALTIES AND OTHER REMEDIES; ENFORCEMENT; SEVERABILITY

Section 11.01: Penalty for Violation. A violation of any part of these Rules shall constitute a Class C misdemeanor, which shall be punishable by a fine of not less than $25.00 or more than $500 per day per violation.

Section 11.02: Removal, Remediation and Repair. In addition to the penalties authorized in Section 11.01, any Vessel, Private Structure, Marina, Commercial Operation, Encroachment, or other structure, facility or item which, in the judgment of the Authority, poses a public nuisance or an imminent danger of collapsing, sinking, capsizing, releasing pollutants or creating a navigational hazard on the Reservoir or Authority Land may be immediately removed by the Authority, and any related pollution or

damages may be remediated or repaired by the Authority, with or without notice to the owner, operator or licensee, and with or without revocation or suspension of any related permit(s), at the sole cost and expense of the owners, operator or licensee.

Section 11.03. Enforcement of Rules Authorized. These Rules, including any penalties hereunder, may be enforced by complaints filed in the appropriate court of jurisdiction. The General Manager is delegated authority to enforce these Rules, including the authority to cause such complaints to be prepared, filed and prosecuted on behalf of the Authority.

Section 11.04: Recovery of Fees and Costs. If the Authority prevails in any suit to enforce these Rules, including but not limited to a suit for the recovery of penalties under Section 11.01 or the recovery of costs and expenses under Section 11.02, it may, in the same action, recover fees for attorneys, expert witnesses and other costs incurred by the Authority to the fullest extent allowed by law.

Section 11.05: Remedies Cumulative. The penalties, other remedies and enforcement provisions provided under these Rules are cumulative and not exclusive of any other any other penalties provided under applicable law, any other right of recovery that the Authority may have for damages or otherwise under applicable law, or any other remedies available to the Authority at law or in equity.

Section 11.06: Severability. The provisions of these Rules are severable, and if any provision or part of these Rules or the application hereof to any Person or circumstances shall ever be held by any court of competent jurisdiction to be invalid or unconstitutional for any reason, the remainder of these Rules and application of the same shall not be affected thereby.

CHAPTER XII
EFFECTIVE DATE; IMPLEMENTATION; REPEAL OF PRIOR RULES

Section 12.01: Publication of Statement of Rules. The General Manager is authorized and directed to publish once a week for two consecutive weeks a substantive statement of these Rules and the penalties for violation of these Rules in a newspaper with general circulation in Montgomery County and Walker County. The statement must intelligently explain the purpose to be accomplished by or the acts prohibited by these Rules. The statement must advise the public that violation of these Rules will subject the violator to a penalty. The statement must advise the public that the full text of these Rule is on file in

the principal offices of the Authority and that any interested person is entitled to read the full text.

Section 12.02: Rules Effective. (a) These Rules shall be effective as of June 1, 2015 (the "Effective Date"); provided however, a violation of these Rules is not punishable as an offense unless the violation occurs after the 30th day on which the notice requirements under Subsection (a) have been met.

(b) These Rules shall continue remain effective until repealed, revoked, rescinded, or amended by official action of the Board of Directors of the Authority.

Section 12.03: Implementation. Except where expressly reserved to the Board of Directors of the Authority herein, the implementation of these Rules shall be delegated to the General Manager and his or her designees.

Section 12.04: Repeal of Prior Rules. All regulations for the governance of the Reservoir and Authority Land adopted by the Board of Directors of the Authority prior to the adoption of these Rules are repealed as of the Effective Date.

367176.9


www.SJRA.net/lakeconroe

San Jacinto River Authority

Lake Conroe Office
P.O. Box 329 · Conroe, Texas 77305
(T) 936.588.1111 · (F) 936.588.1114

BULKHEAD APPLICATION

☐ New Bulkhead ☐ Modification/Repair in Existing Location

☐ Modification/Repair in New Location

Date: _____

Name of Applicant: _____

Land/Subdivision: _____

Checklist:
☐ Application ☐ Sub-division Approval
☐ Property Survey
☐ Construction Plans

Lot: _____ Block: _____ Section: _____

Site Address: _____

City: _____ State: _____ Zip: _____

Applicant's Phone Number: _____

Contractor Business Name: _____

Contractor Phone Number: _____

Email Address: _____

**** I CERTIFY THAT THE ABOVE INFORMATION IS TRUE AND CORRECT AND AGREE TO THE TERMS AND CONDITIONS ON THE REVERS SIDE OF THIS AGREEMENT.**

Printed Name: _____ Signature: _____

For Office Use Only:

☐ Owner Fee Title ☐ Purchase Title ☐ Encroachment Agreement ☐ Other

License #: _____ Parcel #: _____ Dock Compliant: _____

Contractor Compliance Verified: _____ Area: _____

Notes:

☐ Approved ☐ Denied
Date: _____
Signature: _____
Name: _____

TERMS AND CONDITIONS

When accepted by the San Jacinto River Authority ("SJRA") in writing, this document shall constitute an agreement that is a permit with legal and binding consequences. The Company or individual applicant, who shall be referred to as the Permittee, hereby represents, covenants, and agrees, on behalf of Permittee and Permittee's heirs, assigns, and any other person claiming by, under, or through Permittee, as follows:

Permittee represents and warrants that the proposed/existing structure or permitted activity described in this Permit Agreement is not in violation of or contrary to any deed restriction or covenant running with the land, if any, in which the herein described lot, tract or parcel of land is situated, and agrees that, should such construction or use be in violation of any deed restrictions or covenants running with the land, this permit shall automatically become void and of no effect without the necessity of any action on the part of the San Jacinto River Authority.

Permittee agrees to conduct the permitted activities in the manner and in accordance with the rules and regulations of the San Jacinto River Authority pertaining to such activities which are available for inspection at the SJRA headquarters or upon request. Any breach of any rules and regulations shall automatically void this permit and Permittee shall be subject to penalties as provided under SJRA Rules and Regulations.

Permittee agrees to observe and abide by all applicable federal, state and local laws, ordinances and regulations pertaining to the permitted activity and nothing contained herein shall be construed as alleviating the Permittee of any responsibility to obtain any permit, license or any other approval required by any agency in connection with the activities herein permitted.

PERMITTEE HEREBY AGREES TO INDEMNIFY, DEFEND AND HOLD HARMLESS SJRA AND ITS EMPLOYEES AND AGENTS FROM ALL CLAIMS, LOSSES, LIABILITIES, DAMAGES, COSTS OR EXPENSES, INCLUDING CLAIMS FOR ATTORNEYS' FEES, INCURRED BY SJRA, ITS EMPLOYEES OR AGENTS AS A RESULT OF ANY CLAIMS OR SUITS THAT ANYONE, INCLUDING PERMITTEE, OR ANYONE CLAIMING BY, UNDER, OR THROUGH PERMITTEE, MAY BRING AGAINST SJRA, ITS EMPLOYEES OR AGENTS TO RECOVER ANY ALLEGED LOSSES, LIABILITIES, COSTS OR EXPENSES, WHICH ARISE DURING OR RESULT FROM PERMITTEE'S OPERATIONS, OR FROM ANY PERMITTED STRUCTURE OR FACILITY, REGARDLESS OF WHETHER CAUSED IN WHOLE OR IN PART BY ANY ACT, ACTION, OR FAILURE TO ACT, INCLUDING BUT NOT LIMITED TO ALLEGED NEGLIGENCE, GROSS NEGLIGENCE, OR OTHER FAULT OF SJRA AND/OR EMPLOYEES AND AGENTS.

Permittee accepts and voluntarily incurs all risk of, and intentionally waives all claims against SJRA and/or its employees and agents for, death and/or any injuries, claims, losses, liabilities, damages, costs or expenses, whether known or unknown, which arise during or result from Permittee's operations or from any permitted structure or facility, regardless of whether caused in whole or in part by any act, action, or failure to act, **INCLUDING BUT NOT LIMITED TO ALLEGED NEGLIGENCE, GROSS NEGLIGENCE, OR OTHER FAULT OF SJRA AND/OR EMPLOYEES AND AGENTS.**

Permittee has been informed and understands that SJRA has secured flowage or flood easements, and in some cases waiver and release of damages agreements, for properties around the perimeter of the Lake Conroe reservoir above 201.0 mean sea level elevation up to 207.0 mean sea level elevation as defined by metes and bounds surveys and recorded with Montgomery County Tax Appraisal District. Permittee agrees and shall at all times comply with and be subject to the provisions, requirements, limitations, restrictions and relinquishments of rights as contained in such flowage or flood easements and waiver and release of damage agreements.

Permittee agrees, for permittee, its agents, employees and/or affiliates that these representations are contractually binding, and are not mere recitals, and that Permittee shall reimburse SJRA for all costs and expenses, including but not limited to attorney's fees and other costs and expenses, incurred by SJRA in enforcing any provision(s) of this Agreement.

Every term and provision of this permit is intended to be severable. If any one or more of them is found to be unenforceable or invalid, that shall not affect the other terms and provisions which shall remain binding and enforceable.

This Permit, and any amendments thereto, will remain in force and effect as long as Permittee complies with these terms and conditions and the Regulations set forth by the SJRA.

San Jacinto River Authority

Lake Conroe Office
P.O. Box 329 · Conroe, Texas 77305
(T) 936.588.1111 · (F) 936.588.1114

DREDGING APPLICATION

Date: _____

POA/Individual Name: _____

Land/Subdivision: _____

Checklist:
☐ Application
☐ Map (including longitude and latitude)
☐ Estimated Volume

Longitude: _____ Latitude: _____

Area (sq. ft.): _____ Depth (feet): _____ Volume (cu. ft.): _____

Contractor Business Name: _____

Contractor Phone Number: _____

Email Address: _____

**** I CERTIFY THAT THE ABOVE INFORMATION IS TRUE AND CORRECT AND AGREE TO THE TERMS AND CONDITIONS ON THE REVERS SIDE OF THIS AGREEMENT.**

Printed Name: _____ Signature: _____

For Office Use Only:

Contractor Compliance Verified: _____

Notes:

☐ Approved ☐ Denied
Date: _____
Signature: _____
Name: _____

TERMS AND CONDITIONS

When accepted by the San Jacinto River Authority ("SJRA") in writing, this document shall constitute an agreement that is a permit with legal and binding consequences. The Company or individual applicant, who shall be referred to as the Permittee, hereby represents, covenants, and agrees, on behalf of Permittee and Permittee's heirs, assigns, and any other person claiming by, under, or through Permittee, as follows:

Permittee represents and warrants that the proposed/existing structure or permitted activity described in this Permit Agreement is not in violation of or contrary to any deed restriction or covenant running with the land, if any, in which the herein described lot, tract or parcel of land is situated, and agrees that, should such construction or use be in violation of any deed restrictions or covenants running with the land, this permit shall automatically become void and of no effect without the necessity of any action on the part of the San Jacinto River Authority.

Permittee agrees to conduct the permitted activities in the manner and in accordance with the rules and regulations of the San Jacinto River Authority pertaining to such activities which are available for inspection at the SJRA headquarters or upon request. Any breach of any rules and regulations shall automatically void this permit and Permittee shall be subject to penalties as provided under SJRA Rules and Regulations.

Permittee agrees to observe and abide by all applicable federal, state and local laws, ordinances and regulations pertaining to the permitted activity and nothing contained herein shall be construed as alleviating the Permittee of any responsibility to obtain any permit, license or any other approval required by any agency in connection with the activities herein permitted.

PERMITTEE HEREBY AGREES TO INDEMNIFY, DEFEND AND HOLD HARMLESS SJRA AND ITS EMPLOYEES AND AGENTS FROM ALL CLAIMS, LOSSES, LIABILITIES, DAMAGES, COSTS OR EXPENSES, INCLUDING CLAIMS FOR ATTORNEYS' FEES, INCURRED BY SJRA, ITS EMPLOYEES OR AGENTS AS A RESULT OF ANY CLAIMS OR SUITS THAT ANYONE, INCLUDING PERMITTEE, OR ANYONE CLAIMING BY, UNDER, OR THROUGH PERMITTEE, MAY BRING AGAINST SJRA, ITS EMPLOYEES OR AGENTS TO RECOVER ANY ALLEGED LOSSES, LIABILITIES, COSTS OR EXPENSES, WHICH ARISE DURING OR RESULT FROM PERMITTEE'S OPERATIONS, OR FROM ANY PERMITTED STRUCTURE OR FACILITY, REGARDLESS OF WHETHER CAUSED IN WHOLE OR IN PART BY ANY ACT, ACTION, OR FAILURE TO ACT, INCLUDING BUT NOT LIMITED TO ALLEGED NEGLIGENCE, GROSS NEGLIGENCE, OR OTHER FAULT OF SJRA AND/OR EMPLOYEES AND AGENTS.

Permittee accepts and voluntarily incurs all risk of, and intentionally waives all claims against SJRA and/or its employees and agents for, death and/or any injuries, claims, losses, liabilities, damages, costs or expenses, whether known or unknown, which arise during or result from Permittee's operations or from any permitted structure or facility, regardless of whether caused in whole or in part by any act, action, or failure to act, **INCLUDING BUT NOT LIMITED TO ALLEGED NEGLIGENCE, GROSS NEGLIGENCE, OR OTHER FAULT OF SJRA AND/OR EMPLOYEES AND AGENTS.**

Permittee has been informed and understands that SJRA has secured flowage or flood easements, and in some cases waiver and release of damages agreements, for properties around the perimeter of the Lake Conroe reservoir above 201.0 mean sea level elevation up to 207.0 mean sea level elevation as defined by metes and bounds surveys and recorded with Montgomery County Tax Appraisal District. Permittee agrees and shall at all times comply with and be subject to the provisions, requirements, limitations, restrictions and relinquishments of rights as contained in such flowage or flood easements and waiver and release of damage agreements.

Permittee agrees, for permittee, its agents, employees and/or affiliates that these representations are contractually binding, and are not mere recitals, and that Permittee shall reimburse SJRA for all costs and expenses, including but not limited to attorney's fees and other costs and expenses, incurred by SJRA in enforcing any provision(s) of this Agreement.

Every term and provision of this permit is intended to be severable. If any one or more of them is found to be unenforceable or invalid, that shall not affect the other terms and provisions which shall remain binding and enforceable.

This Permit, and any amendments thereto, will remain in force and effect as long as Permittee complies with these terms and conditions and the Regulations set forth by the SJRA.

Permit My Bulkhead Construction

Description

Property owners adjacent to Lake Conroe occasionally desire to repair or install bulkheads along the shoreline. In order to prevent or minimize encroachment into the public reservoir or onto public land, the property owner must submit appropriate documents and obtain a construction permit from SJRA before construction is initiated. SJRA's approval does not constitute approval of the architectural or engineering design of a bulkhead or any other facility, and SJRA, by issuance of a permit, assumes no liability or responsibility for the architectural or engineering design or for any defect of the facilities.

Process

Step 1: Property owner submits the following items to Lake Conroe Division:

1. Completed application for bulkhead construction.
2. Existing property survey drawing (preferably including a metes and bounds description of the property) by a Registered Professional Land Surveyor. The location of the proposed structure should be marked on the survey. If any part of the proposed bulkhead will be located in an area that is subject to a perpetual or special easement, property owner must provide a copy of the easement.
3. Construction plans for the proposed bulkhead (including proposed construction materials and placement of bulkhead relevant to property lines).
4. Approval from the Subdivision or Homeowners Association (if applicable).

Step 2: Lake Conroe Division staff review for compliance with rules related to bulkhead construction and placement:

1. SJRA's general policy is that there be no taking of public property or reduction of reservoir volume via the placement of a bulkhead.
2. Repairs to existing bulkheads will generally be approved provided that the repaired bulkhead remains in the same location as the existing bulkhead.
3. Proposals for new bulkhead construction or bulkhead repair projects that are proposed to be placed outside the existing bulkhead location will be reviewed on an individual basis to ensure minimal encroachment into the reservoir or onto public land.

4. If a new bulkhead or a repaired bulkhead that is placed outside of the existing bulkhead is proposed to be located on public land owned by SJRA, the property owner must either enter into SJRA's standard Encroachment Agreement (to be filed with the County Deed records) or purchase the property by following the process for a sliver sale (see separate procedure for Surplus Property Sales).
5. If the proposed construction of a new or repaired bulkhead would result in any additional encroachment into the reservoir, whether located on public or private property, the construction plans must include compensating excavated volume adequate to prevent any loss of water storage capacity in the lake.
6. All bulkhead construction must be in compliance with the U.S. Army Corps of Engineers permits for fill within waters of the U.S. and any additional necessary permits from the County and/or City of jurisdiction, as appropriate.

Step 3: When compliant with SJRA rules and the submittals and procedures described above, SJRA will issue a permit for construction to the property owner within 30 days of such determination. If any issues are identified that require resolution before approval, SJRA will promptly advise the property owner.

Related Documents

1. Application for Bulkhead Construction Permit
2. Standard Encroachment Agreement
3. Procedure for Surplus Property Sales
4. Procedure for Dredging Permit

Permit My Dredging Project

Description:

Property owners adjacent to Lake Conroe occasionally desire to dredge the area around their existing boat slip or an area that would improve their boat slip's access to the main body of the lake. In order to dredge on Lake Conroe, the property owner or contractor must contact SJRA with the appropriate documents to obtain approval before the dredging begins. This process is designed to make sure that all contractors are licensed while operating on Lake Conroe, but also to make SJRA aware of any construction on the reservoir and to help ensure compliance with all local, state, and federal rules and regulations for activity on the lake.

Process:

Step 1: Contractor or property owner to submit the following items to Lake Conroe Division:

1. Completed application for dredging.
2. A map of the area proposed to be dredged (identifying the dredged location(s), including the longitude and latitude).
3. Estimated total volume of material to be removed and target depth proposed for dredge location.

Step 2: Lake Conroe Division staff will review the application for dredging. The contractor must be licensed to do work on the reservoir and compliant with all SJRA rules and regulations. The general rules for dredging are as follows:

1. SJRA will generally allow dredging within the reservoir for valid purposes and within reasonable limits.
2. All dredged material must be removed from the reservoir. It cannot be stored on the lake bottom. It must be placed in a storage container or on approved adjacent property.
3. All dredging operations must be compliant with the U.S. Army Corps of Engineers rules and regulations for dredging and obtain any necessary permits from the appropriate regulatory agencies.

Step 3: If there are no issues discovered during review and all the necessary documentation is received, SJRA staff will issue an approval to the contractor or entity responsible for the dredging operation. The contractor must display the permit at all times during construction. All construction is subject to inspection during and after completion.

Permits for Bulkhead Construction

Description

Property owners adjacent to Lake Conroe occasionally desire to repair or install bulkheads along the shoreline. In order to prevent or minimize encroachment into the public reservoir or onto public land, the property owner must submit appropriate documents and obtain a construction permit from SJRA before construction is initiated. SJRA's approval does not constitute approval of the architectural or engineering design of a bulkhead or any other facility, and SJRA, by issuance of a permit, assumes no liability or responsibility for the architectural or engineering design or for any defect of the facilities.

Process

Step 1: Property owner submits the following items to Lake Conroe Division:

1. Completed application for bulkhead construction.
2. Existing property survey drawing (preferably including a metes and bounds description of the property) by a Registered Professional Land Surveyor. The location of the proposed structure should be marked on the survey. If any part of the proposed bulkhead will be located in an area that is subject to a perpetual or special easement, property owner must provide a copy of the easement.
3. Construction plans for the proposed bulkhead (including proposed construction materials and placement of bulkhead relevant to property lines).
4. Approval from the Subdivision or Homeowners Association (if applicable).

Step 2: Lake Conroe Division staff review for compliance with rules related to bulkhead construction and placement:

1. SJRA's general policy is that there be no taking of public property or reduction of reservoir volume via the placement of a bulkhead.
2. Repairs to existing bulkheads will generally be approved provided that the repaired bulkhead remains in the same location as the existing bulkhead.
3. Proposals for new bulkhead construction or bulkhead repair projects that are proposed to be placed outside the existing bulkhead location will be reviewed on an individual basis to ensure minimal encroachment into the reservoir or onto public land.
4. If a new bulkhead or a repaired bulkhead that is placed outside of the existing bulkhead is proposed to be located on public land owned by SJRA, the property owner must either enter into SJRA's standard Encroachment Agreement (to be filed with the County Deed records) or purchase the property by following the process for a sliver sale (see separate procedure for Surplus Property Sales).
5. If the proposed construction of a new or repaired bulkhead would result in any additional encroachment into the reservoir, whether located on public or private property, the construction plans must include compensating excavated volume adequate to prevent any loss of water storage capacity in the lake.

6. All bulkhead construction must be in compliance with the U.S. Army Corps of Engineers permits for fill within waters of the U.S. and any additional necessary permits from the County and/or City of jurisdiction, as appropriate.

Step 3: When compliant with SJRA rules and the submittals and procedures described above, SJRA will issue a permit for construction to the property owner within 30 days of such determination. If any issues are identified that require resolution before approval, SJRA will promptly advise the property owner.

Related Documents

1. Application for Bulkhead Construction Permit
2. Standard Encroachment Agreement
3. Procedure for Surplus Property Sales
4. Procedure for Dredging Permit

PROCEDURE OF THE SAN JACINTO RIVER AUTHORITY

Permits for Dredging

Description:

Property owners adjacent to Lake Conroe occasionally desire to dredge the area around their existing boat slip or an area that would improve their boat slip's access to the main body of the lake. In order to dredge on Lake Conroe, the property owner or contractor must contact SJRA with the appropriate documents to obtain approval before the dredging begins. This process is designed to make sure that all contractors are licensed while operating on Lake Conroe, but also to make SJRA aware of any construction on the reservoir and to help ensure compliance with all local, state, and federal rules and regulations for activity on the lake.

Process:

Step 1: Contractor or property owner to submit the following items to Lake Conroe Division:

1. Completed application for dredging.
2. A map of the area proposed to be dredged (identifying the dredged location(s), including the longitude and latitude).
3. Estimated total volume of material to be removed and target depth proposed for dredge location.

Step 2: Lake Conroe Division staff will review the application for dredging. The contractor must be licensed to do work on the reservoir and compliant with all SJRA rules and regulations. The general rules for dredging are as follows:

1. SJRA will generally allow dredging within the reservoir for valid purposes and within reasonable limits.
2. All dredged material must be removed from the reservoir. It cannot be stored on the lake bottom. It must be placed in a storage container or on approved adjacent property.
3. All dredging operations must be compliant with the U.S. Army Corps of Engineers rules and regulations for dredging and obtain any necessary permits from the appropriate regulatory agencies.

Step 3: If there are no issues discovered during review and all the necessary documentation is received, SJRA staff will issue an approval to the contractor or entity responsible for the dredging operation. The contractor must display the permit at all times during construction. All construction is subject to inspection during and after completion.

APPENDIX 4 – TCFWSD

TITUS COUNTY FRESH WATER SUPPLY DISTRICT NO.1

A MUNICIPAL UTILITY DISTRICT

GOVERNING THE USE AND ENJOYMENT OF

LAKE BOB SANDLIN

AND FORT SHERMAN DAM

OFFICIAL MANUAL OF POLICIES, RULES AND REGULATIONS

Adopted by
Board of Directors
October 22, 2010
Amended August 17, 2015

SECTION 1 - GENERAL

1.100 - HISTORICAL AND STATUTORY AUTHORITY

Titus County Fresh Water Supply District No. 1 (referred to herein as "District") was created in 1966 under the provisions of Chapter 4, Title 128, RCS of Texas and acts 1967, 60th Legislature, regular session, Chapter 221, the boundaries being the same as that of Titus County. Land acquisition for the Lake Bob Sandlin Reservoir started in 1973 and construction of Fort Sherman Dam began in 1974. The City of Mt. Pleasant and Luminant, a subsidiary of Energy Future Holdings (EFH) (formerly known as Industrial Generating Company), contracted for the purchase of water from the lake, and certainly, these contracts were a big factor in getting the lake built and made possible the financing of the project. The City of Pittsburg is permitted to take water from the lake under an agreement between the District and Northeast Texas Municipal Water District. Fort Sherman Dam was closed August 19, 1977 and the lake began filling, with elevations of 300 plus recorded in January 1979. Lake Bob Sandlin filled to normal elevation of 337.50' MSL on February 18, 1983 covering approximately 9500 surface acres.

1.110 - RESPONSIBILITIES

In consideration of contractual agreements for the supply of raw water the District recognizes its responsibility to maintain and operate the lake for its primary purpose of water supply, and to do all things necessary to provide for the adequacy and quality of the water. The Lake is remarkably free of any pollution and the District realizes that it is its responsibility to those who use and enjoy the lake to prevent any future pollution.

In recognition of these responsibilities, the Board of Directors has adopted the rules and regulations contained herein, as amended, for the purposes of:

(1) Securing, preserving and maintaining the sanitary condition and chemical quality of the waters in and flowing into the reservoir;

(2) Preventing waste of water and unauthorized use thereof;

(3) Controlling hunting, fishing, boating and camping, and all other recreational and business privileges along or around the reservoir; and

(4) Regulating privileges on any land or easement owned or controlled by the District.

(5) Fulfilling any purposes for which the District was created.

The District has no taxing powers for maintenance and operation. Thus, its maintenance and operation must be paid out of revenues obtained from the sale of water. Feeling that these are not sufficient, certain fees, charges and rentals for the use of the lake for designated purposes have been established by the Board of Directors in order to provide additional revenues. These funds will be used to provide for maintenance personnel, equipment, notices and publications necessary for the operation and maintenance of the lake.

1.120 - SUPERVISION

Supervision and operation of Lake Bob Sandlin and Fort Sherman Dam are under the general management of the Executive Director of the District. The District offices are located at 352 Fort Sherman Dam Road, Mt. Pleasant, Texas with the mailing address being P.O. Box 650, Mt. Pleasant, Texas, 75456-0650. The telephone number is 903-572-1844 and you can visit the District's website at www.tcfreshwater.com.

All inquiries pertaining to the policies, rules and regulations will be directed in writing to the Executive Director at the address stated. All applications for permits will be made on appropriate forms which may be obtained from the District office. All applications of any kind and for any purpose will be filed with the office, accompanied by the designated filing fee, and considered on an individual basis. No permits will be valid until approved by the Executive Director or their designee.

Enforcement of all rules and regulations established herein is the function of the District's Police Department operating under the direction of the Executive Director, as well as authorized local and State officers.

SECTION 2 – POLICIES

2.100 - GENERAL

(1) In promulgating these policies, rules and regulations, the District is acting under the Water Code of the State of Texas, as amended, and other applicable State or Federal law or regulations.

(2) All policies, rules and regulations relating to the operation and use of Lake Bob Sandlin and Fort Sherman Dam have been established by resolution of the Board of Directors in an official meeting on the 17th day of August, 2015, notice of which meeting was duly posted in the time and manner required by law, and the meeting held at the District offices at 352 Fort Sherman Dam Road, Mt. Pleasant, Texas. These policies, rules and regulations will supersede all previous publications.

(3) These policies, rules and regulations are in effect five (5) days after the date of publication of these policies, rules and regulations, and shall remain in effect until amended, revised, or rescinded by official action on the part of the Board of Directors.

(4) Notice of amendments, revisions or rescissions shall be published as required by the Water Code of the State of Texas as amended.

(5) All activities on the lake shall be at the sole risk of the person indulging therein, whether with or without a permit from the District.

(6) Any person desiring to protest to any policy, rule, regulation or decision by the Executive Director shall file the protest in writing with the Executive Director; and thereafter, the Executive Director shall meet with the protestant and shall make a full report to the Board. In the event the Executive Director is unable to resolve the protest, then the matter shall be referred to the Board of Directors and the Board shall set the matter for hearing and all interested persons shall have the right of appearance to protest the decision of the Executive Director. Variances to Policies, Rules and Regulations can only be issued by the Board of Directors. Variances can be submitted to Executive Director to be presented to the Board.

(7) A violation of any District permit, rule or regulation may be cause for cancellation of all District permits held by the violator or denied issuance of additional permits to same.

SECTION 3 - PROPERTY OF DISTRICT AND DISPOSITION OF SAME

3.100 - PROPERTIES OWNED BY DISTRICT

(1) All of the property required for the administration building, appurtenances, and shop, dam, spillway, outlet works, the lake proper, and necessary protective areas are owned by the District. In addition, the District owns an easement in other properties surrounding, but above, the lake water surface area.

(2) The spillway level is 337.50' MSL, and the District owns fee simple title to all lands to this elevation. In addition thereto, the District owns a 100 foot flowage easement outside the property line or to 342.00' MSL, whichever is greater.

(3) The policy is herein established that no fee simple property owned by the District shall be available for sale or lease to private, public or commercial use so long as such property is required for present or future uses of the District. And, no fee simple property of the District shall be used for any purpose other than District uses without the express consent of the District.

(4) No property owned by the District will be disposed of unless and until such property is determined by the Board of Directors to be surplus to any use by the authority.

(5) It is considered that from time to time adjustments on boundary lines may be necessary between the District and adjoining owners and this may be accomplished by resolution of the Board of Directors. Any adjoining owner requesting an adjustment shall pay all surveying fees and other charges or fees.

SECTION 4 - USE OF EASEMENT AREA

4.100 - EASEMENT LIMITATIONS

All land acquisitions by District, whether by deed or eminent domain, places the following limitations on the easement area:

(1) Grantee shall have the right to regularly and periodically inundate the easement area when necessary by reason of flood conditions and without claim by Grantors for damages

resulting to said lands or any improvements or other properties that may be thereon;

(2) Grantee's agents, servants and employees shall have the right of entry at all times on the easement area for all purposes;

(3) Grantee shall have the right to grant easements for the construction and maintenance of utilities, both public and private, on and across the easement area;

(4) No buildings or other Structures shall be located within the confines of the easement area except upon written consent of Grantee;

(5) No alteration of the shoreline by excavation, filling, channeling, or in any other manner, shall be permitted within the easement area except upon the written consent of the Grantee;

(6) Septic systems placed in the easement area shall be constructed and maintained in accordance with tried and established rules and regulations of the Texas Commission on Environmental Quality (TCEQ) or its successor. Septic lines are allowed in accordance with such regulations;

(7) Grantor releases any rights as to claims for future damage occasioned by the fluctuation in the water level of the reservoir, operation of the reservoir as a water supply project, wind and wave action, siltation or growth of underbrush and aquatic vegetation; and

(8) The rights, powers, privileges, uses and restrictions herein stated as being applicable to the easement area shall be binding upon the heirs, assigns and personal representatives of both parties, and shall be covenants running with and covering the land.

The acquisition documents are recorded, and the originals are on file in District's office; and the Executive Director will review these any time with adjoining owners.

4.110 - <u>CONSENT BY DISTRICT OF CONSTRUCTION ON EASEMENT AREA</u>

In the exercise of the rights granted to District in this easement area, District agrees that in all instances where consent of the District is required, that District will not unreasonably or arbitrarily withhold such consent.

4.120 - <u>UTILITY EASEMENTS IN EASEMENT AREA</u>

In granting easements for utilities in the easement or fee area, the District shall require the Grantee to file an application with the District setting out the type of utility and the purpose for which the easement is sought, as well as the general location. In granting the application, the

District shall use due care to the end that the utilities shall be at such location, if at all possible, so that the use of the easement area by the owner will not be impaired. When the utility line has been completely installed, the Grantee will furnish the District with a plat showing the location of the utility on the easement area and any poles or other installations.

This section shall not be applicable to any contract or agreement between the land owner and the utility company for the location or extension of utilities to any improvements on the easement area by the owner, his lessee or assigns, and such owner may contract for the installation of such utilities on the easement area as the owner desires, except sewage easements.

4.130 - <u>BUILDINGS OR STRUCTURES</u>

Any owner of an easement area, his lessee or assigns, desiring to place a building or other structure upon the easement area shall file with the District, upon forms provided by the District, a general description of the type of building or structure and its location; and thereupon, the District may issue a permit. This permit shall contain a provision to the effect that the owner shall keep the building or structure in reasonable repair and structurally sound, and upon their failure to do so, the District may, after 90 days written notice to the owner, remove same at owner's expense.

In contemplation of the fact that more than one person may have an interest in the building or structure, the application shall require the applicant to designate one person by name and address who shall be the District's correspondent to whom all notices may be sent; and the owners will furnish the District with any change in this person.

4.140 - <u>RIGHTS RESERVED TO DISTRICT</u>

(1) District, through these policies, calls to the attention of the owners, his lessee and assigns, of the easement area, rights reserved to the District in parts (1) and (7) of Sec. 4.100 EASEMENT LIMITATIONS. Part (1) provides that the District shall have the right to regularly and periodically inundate the easement area when necessary by reason of flood conditions and without claim by the landowners for damages resulting to said lands or any improvements or properties that may be thereon. This right of inundation will be exercised only when there are flood conditions to the extent that the spillway cannot take the flood

waters; or, by reason of flooding in the Cypress Basin, the District will be required to hold water until it can be safely released. Part (7) releases the District from any damages occasioned by the fluctuation in the water level of the reservoir, operation of the reservoir as a water supply project, wind and wave action, siltation, or growth of underbrush and aquatic vegetation.

(2) The water level of the lake is not a constant level and there may be times when due to drought, flooding or other matters beyond District's control, the water level will be less than 337.50' MSL and on occasion greater than 337.50' MSL. All permits are issued subject to such fluctuation in water level.

SECTION 5 - USE OF WATER AND LANDS OWNED BY DISTRICT

5.100 - DUCK BLINDS

Any person desiring to use a hunting blind on the lake will get permission from the District. All hunting blinds shall be temporary in nature, and must be put up and removed by the Permittee on each use. Permanent hunting blinds will not be permitted on the lake.

5.110 - TRESPASSERS

All persons, except those temporarily fishing, hunting, boating, sail-boating or skiing on the waters of Lake Bob Sandlin shall be liable for trespassing on District's property; and such trespassers will be subject to prosecution.

5.120 - APPROPRIATION OF WATER FROM LAKE

The appropriation of water from Lake Bob Sandlin for any purposes is expressly prohibited, save and except when permits have been secured from lawful authority, and contract entered into with the District. The District exercises the right to grant or deny permits at the sole discretion of the District. Property owners shall notify the District of changes to current mailing addresses. A Shoreline Management Residential Water Use Permit shall be in the following form as amended August 17, 2015:

1. **Water Use.** Property owners with waterfront property only (Permittee) may divert water from Lake Bob Sandlin (Lake), at the location described in Application for Residential Water Use Permit (Exhibit A), attached hereto and incorporated by reference herein. Permittee agrees to observe all applicable rules and regulations or other requirements of the District with regard to the maintenance and use of all pipelines, pumping equipment, electrical lines and all other facilities (Facilities) necessary for transporting the water, including specifically the conditions set forth in this Permit.

   The water made available pursuant to this Permit is provided year to year on an "as available" basis. The District shall not be responsible for availability, purity, quality, quantity or regularity of flow at anytime, it being expressly recognized that this raw water use is subordinate to present and future municipal use.

   Water users shall hold the District harmless from any direct or indirect damages, injuries, or illnesses that might occur from the use of such raw water. The water in the Lake is not potable. It is expressly agreed that the water is not suitable for drinking. Water withdrawals shall be solely for the purpose of supplying domestic water for irrigation purposes only to lake front property of the Permittee at the residence located at the address of the Permittee, and in no event shall such water be used for filling ponds, commercial use or by any other person or entity other than Permittee.

   In the event the drought contingency plan is amended at any time during this permit, any new restrictions shall become a part of the permit and Permittee shall reduce its water diversion accordingly.

   The normal pool elevation of the Lake is 337.50' MSL. If the District invokes water conservation measures under its currently approved drought contingency plan, every holder of a water pumping permit shall curtail such water usage as follows:

   - Stage 1 – Voluntary - 10% Voluntary Reduction – 8' below pool elevation (329.50' MSL)
   - Stage 2 – Mandatory – Watering Schedule – 13' below pool elevation (324.50' MSL)
   - Stage 3 – No Outdoor Watering – 18' below pool elevation (319.50' MSL)

NOTICE TO PERMITEE

The District shall only have available 1,000 acre feet of water on an annual basis for all Permittees. The District is limited to this amount of water due to its existing contracts for the sale of water. Should, at any time during the existence of this permit, a party to a water supply contract exercise its option to take additional amounts of water from Lake Bob Sandlin, the District, in its sole discretion, may reduce or completely curtail the use of water under this permit, thereby causing the Permittee and all other Permittees to reduce their water consumption accordingly. In addition, after examination of water usage under this and other permit holders, the District may, in its sole discretion, reduce the amount of water available based on the usage by Permittees. If at any time the District determines that supplying water under this permit shall be in conflict with any existing water supply contract, or shall receive notice from any party to a water supply contract that the District is in violation of such water supply contract, the District may, in its absolute discretion, discontinue the

availability of water under this permit and Permittee shall promptly remove all equipment used in the diversion of water from Lake Bob Sandlin.

2. **Land Rights and Easement.** This Permit does not grant Permittee permission to place Facilities upon or across land owned or leased by anyone other than the Permittee and does not grant Permittee any easement into Lake Bob Sandlin for the purpose of installing equipment necessary to divert water.
3. **Term.** This Permit is issued upon proper application (Exhibit A) and payment of the appropriate fees associated with this Permit. This Permit shall commence upon the Effective Date and shall continue until terminated by the Permittee or at the discretion of the District. The Board of Directors of the District reserves the right, in its sole discretion, to change or discontinue this Permit at any time.
4. **Fees**. Permittee shall be subject to the following fees:

    - **Application Fee.** A one-time, non-refundable Application Fee of $50.00 upon submission of Exhibit A for consideration. The Application Fee may be adjusted in the future by the District, at its sole discretion.
    - **Annual Permit Fee.** The Annual Permit Fee for the privilege of installing and maintaining the Facilities and the right to divert water will be $150.00.
      The Annual Permit Fee may be adjusted in the future by the District, at its sole discretion.
    - **Payment.** ***Payment of the Application Fee and the Annual Permit Fee must accompany this Agreement.*** This Permit may be continued from year to year by paying annually in advance an annual permit fee set by the Board of Directors of the District. ***Fees must be paid by the last day of January of each succeeding year in order to avoid past due penalties and/or termination of this Permit.*** Fees will be considered past due after January 31 and will have a $50.00 late fee assessed if paid in February or a $100.00 late fee assessed if paid in March. If payment has not been received within this 60 day past due period, the District may remove the equipment at owner's expense. All permits currently issued to the property owner may be terminated at this time and may not be re-issued until restitution has been made. Payment of the required annual fee is due regardless of whether Permittee actually diverts water during the term of this Permit. Fees are non-refundable. If you decide at a later date not to renew the permit, **all** equipment, including pumps, must be removed from the lake. There will be a $100.00 reconnect fee and another application for a new facility will be required prior to reinstalling the equipment.
    - **Default, Cure, and Cancellation.** Permittee shall be considered in default of this Permit if for any reason 1) Permittee violates any provisions of any applicable rules, regulations and/or guidelines of the District, or 2) Permittee violates the terms of this permit, including, but not limited to, the failure to pay permit fees when due and any violations regarding the installations, maintenance and use of the requested Facilities. In the event of default, other than failure to pay permit fees, the District shall provide Permittee with written notice of such default and Permittee shall have 30 days to cure such default other than failure to pay permit fees. If Permittee fails to cure such default in such 30 days, the District may, in its sole discretion, cancel this permit and terminate this permit. All permits currently issued to the property owner may be terminated at this time and may not be re-issued until default is resolved.
5. **Removal of Water Facilities.** In the event that District cancels this permit and terminates this Permit, the District may, in its sole discretion, require the Facilities (pump, piping, electrical lines, and all Facilities necessary for the transporting water) to be removed. If Permittee fails to remove the Facilities after such a request by the District, the District may

remove the Facilities and Permittee shall be liable for any and all costs incurred by the District related to the removal of the Facilities.

6. **Assignment.** This Permit may not be assigned by Permittee, and any such assignment shall be void.
7. **Water Level.** The water level in Lake Bob Sandlin (the Lake) will not be constant. While it is the desire of the District to keep the Lake as full as possible, the level of the water will vary, depending on the amount of water used, evaporation rates, amounts of rainfall and runoff, and other factors. The District will not credit, prorate, refund or provide any form of compensation for the inability of Permittee to divert water as permitted.
8. **Facilities.** Permittee shall install and maintain, at Permittee's expense, the appropriate intake and pump equipment as required by District to divert water from the lake. Intake and pump equipment may not be placed in or on Lake without an approved Residential Water Use Permit. The District shall have access to and the right to inspect equipment at all times. Submersible pumps for residential irrigation ***shall not*** be placed in the Lake. ***Only existing operational submersible pumps installed prior to this Permit may remain in the lake without any further modifications.*** PVC pipes must be limited to no larger than a 2" inside diameter restriction.
9. **Additional Requirements Regarding Residential Water Use Permits.** This Permit must be approved and signed by the District before installation of the Facilities is initiated.

- The electrical services shall be installed in accordance with the National Electric Code as amended and revised. The District performs cursory electrical inspections for general compliance only. **Property owners with permitted submersible pumps shall have a licensed electrician inspect all electrical components to ensure that the installation meets all requirements specified in the National Electric Code and provide a dated and signed written statement from said electrician as to that effect to submit with application.**
- The requested Facilities shall be installed and maintained only in the location specifically authorized by the District.
- Facilities may be required to be removed or modified if, in the opinion of the Executive Director or Code Enforcement Officer, or their designee, it or its operation is an inconvenience to others or if it constitutes a hazard to navigation, public health, safety, welfare, or a hazard to anyone occupying or utilizing the Lake or adjacent land.
- This water shall be used on Permittee's premises and ***is not*** for resale to others.
- Permittee agrees that the District may enter onto Permittee's property for the purposes of inspecting the Facilities.
- At this time the District does not require that an individual meter be installed at the diversion point but the District, in its sole discretion, may require that such a device be installed at Permittee's expense as a condition of a future Permit.
- Permittee agrees to observe and abide by all applicable Federal, State and local laws, ordinances and regulations pertaining to the activities herein permitted and nothing contained herein shall be construed as alleviating the Permittee of any responsibility to obtain any permit, license or other approval required by any agency in connection with the activities herein permitted.
- The Permittee shall indemnify and hold harmless the District for any damages, costs and charges to which Permittee may be subject or which Permittee may have to pay by reason of any injury to any person or property, or loss of life or property, suffered or sustained by any person whatsoever arising out of the activities here permitted; Permittee shall, at his own expense, assume the defense of all claims and actions for

damages arising out of any such injuries by third persons, and shall pay all judgments that may be rendered on such actions.

SECTION 6- PERMITS

The District exercises the right to grant or deny any and all permits at the sole discretion of the District without recourse. Permits shall be obtained before performing any work on the lakebed or over the water. Property owners and/or their contractor should contact the District's office with any questions or concerns they have before any construction or work begins. A fee of $250.00 payable to the District may be imposed for failure to obtain the proper permit in addition to a possible written citation issued by the District Police Department and/or removal of structure.

Permits for fish habitat structures and/or the number per permit to be introduced into the waters of Lake Bob Sandlin may be limited annually based upon the number of permits issued during that year.

6.100 - CONSTRUCTION OF STRUCTURES IN LAKE

(1) All floating or stationary piers, wharves, boat houses, marinas, docks, fences, and/or barges and other facilities will not be allowed on the fee land of the District, which is elevation 337.50' MSL or less, except on permits which are considered on an individual basis and granted by District for such construction and in accordance with District specifications as stated in the Rules and Regulations Built on Lake Bob Sandlin. Property owners shall notify the District of changes to current mailing addresses. The distance the entire structure is allowed to extend into the lake shall not exceed 75 feet measured from the water line; that is, elevation of 337.50' MSL. The District, at its discretion, may allow such facilities to extend onto the reservoir to a maximum total length of not more than 150 feet perpendicular to water line; that is, elevation of 337.50' MSL, and will be determined by the Executive Director or their designee. Maximum total size of the above mentioned structures will not be greater than 1,600 square feet, excluding the walkway, with an annual fee charged on the entire square footage, including the walkway, as set out in the "SCHEDULE OF FEES", and all shall be kept in good repair. The billing cycle for annual fees runs from January 1 through December 31. Statements will be mailed the first week of January and are due by

January 31. Fees are past due after January 31 and will have a $50.00 late fee assessed if paid in February or a $100.00 late fee assessed if paid in March. If accounts become delinquent, the District may, after 60 days written notice to the owner, remove structure at owner's expense if the account is not brought current. Fees incurred by the District to remove a structure for nonpayment of annual fees or due to a safety hazard will be charged to the respective property owner for full payment up to and including any legal fees. All permits currently issued to the property owner may be terminated at this time and may not be re-issued until restitution has been made. Variances to Policies, Rules and Regulations for Structures Built on Lake Bob Sandlin can only be issued by the Board of Directors. Variances can be submitted to the Executive Director to be presented to the Board.

Regulations For Structures Built On Lake Bob Sandlin

Approved and Adopted by the Board-Effective January 11, 2010-Revised August 17, 2015

Water Level. The water level in the lake will not be constant. Lake Bob Sandlin is a water supply and conservation project. While it is the desire of the Titus County Fresh Water Supply District No. 1 (District) to keep the lake as full as possible, the level of the water will vary, depending on the amount of water used from the lake, evaporation rates, amounts of rainfall and runoff upstream, and other factors. The District will not credit, pro-rate, refund, or provide any form of compensation for the inability of Permittee to utilize permitted structures.

Boathouse and Piers

1. The privilege of installing a structure on the lake is not an inherent right with the control or ownership of waterfront property. If a structure is permitted for construction, it is to be used responsibly and should not contribute to domestic wastes, especially human waste, entering the lake.
2. The District exercises the right to grant or deny structure permits and any modifications to structures as deemed appropriate at the sole discretion of the District.
3. The District may permit no more than one boathouse and one pier on any one shoreline lot with a minimum of 100 feet of shoreline. A minimum of 25 feet of shoreline is required for a pier and 50 feet of shoreline is required for a boathouse. Structures shall not be built within 5 feet from the property line. Adjoining lots owned by 1 owner may build 1 structure per lot unless the lots have been joined in a manner prohibiting the separation of the lots.
4. Construction plans, including floor plan, elevation plan and walkway, must be submitted with the permit application, along with the permit fee, and approved by the District prior to any work being done. A visual inspection will be required prior to approval. A permit/placard must be obtained and placed in plain view from the lake and kept there until all work is completed. Permits are to be obtained before repairs are made to structures.
5. All structures built adjacent to one lot may not exceed an aggregate total of 2,000 square feet. The footprint of a boathouse, including boat slip(s) and deck area, may not exceed 1,600 square feet. Additional square footage will be allowed for a walkway to the structure provided the walkway does not exceed 6 feet in width. The footprint of a pier may not exceed 400 square feet. Additional square footage will be allowed for a walkway to the structure provided the walkway does not exceed 6 feet in width. Neither temporary nor permanent living will be allowed on any structure.
6. No boathouse or pier shall be constructed which is more than1 story in height. This means that a boathouse or pier may have a deck on top, but the deck may not be enclosed and may not have a

roof over it. No covered two-story deck/boathouse structures will be permitted. The roof of a structure shall be a flat top or have a maximum of 5 in 12 pitch.

7. Outer walls may be used to protect lifted boats from the weather so long as the bottom of the wall is not lower than 4 feet below the roof edge or 4 feet above the floor. The District will allow fully enclosed storage area, not to exceed 100 square feet floor space, with one dimension of the enclosure not to exceed 6 feet.
8. Lakefront property owners should be aware that the District may, at its discretion, remove the un-permitted structure/portion if you build a new structure, or add on to an existing structure without first obtaining a permit and a fee of $250.00 payable to the District may be imposed in addition to a possible written citation and/or removal of structure. Make sure all permits are obtained.

Permit Guidelines

1. The permit will become invalid if the project, including plans and specifications of the approved permit, is altered or deviated from in any substantive manner without prior authorization from the District. The Applicant will remove all unauthorized modifications or deviations and the shoreline will be restored to its original condition at the Applicant's expense.
2. All construction permits will expire 90 days from issuance. If construction is not completed within the 90 days the contractor or property owner will contact the District by phone at 903-572-1844 or email jbarton@tcfreshwater.com to request one extension of an additional 90 days. No more than one extension may be granted. (If additional time is required, requests will be considered on a case-by-case basis.)
3. Once constructed, the construction permits become a renewable annual permit. Failure to keep appropriate fees paid each year may result in the structure being removed from Lake Bob Sandlin at the expense of the owner. In the event an annual fee is not kept current, the District will notify the owner and allow 60 days to bring fees current before further action is taken.
    - Structures built with more than 1 walkway will be assessed an annual fee for the waters that are enclosed within those walkways.
    - An annual fee will be assessed on the entire structure built over the waters of the lake regardless of property lines or pool elevation.

Inspections

1. The District may inspect the structure on a periodic basis during construction to ensure compliance with all rules, regulations and guidelines. After all construction is completed it shall be the duty of the contractor, his designee or the property owner to contact the District by phone at 903-572-1844 or email jbarton@tcfreshwater.com for final inspection of the structure.
2. The District reserves the right to perform an inspection of this structure for compliance at any time, during or after construction.

Plumbing and Electrical

1. Toilets, showers, sinks, faucets, or any similar plumbing fixtures in an enclosed area will not be allowed to be installed on structures over the waters of Lake Bob Sandlin. Exterior exposed plumbing (sinks and faucets) will be permitted.
2. The electrical services shall be installed in accordance with the National Electric Code as amended and revised. The District performs cursory electrical inspections for general compliance only. The property owner is advised to have a licensed electrician, electrical inspector, or other professional with expertise in electrical installations to inspect all electrical components to ensure that the installation meets all requirements specified in the National Electric Code.

Safety and General Repair

1. The distance the entire structure is allowed to extend into the lake shall not exceed 75 feet measured from the water line; that is, elevation of 337.50' MSL. The District, at its discretion, may allow such facilities to extend onto the reservoir to a maximum total length of not more than 150 feet perpendicular to water line; that is, elevation of 337.50' MSL, and will be determined by the Executive Director or their designee.
2. No structure may be situated in a manner that interferes or obstructs access to other permitted structures or neighboring properties or that may be a safety hazard as determined by the District.
3. It is recommended that the property owner install the 911 property address with 4 inch reflective numbers and letters on the structure that are visible from the lake.

4. Safety lights (wired, battery or solar) shall be installed on the lake end of all structures. Additional lights shall be installed at 50 feet intervals if structure extends more than 50 feet into the lake or at least half the distance between shore and lake.
5. A maximum of 30 gallons of fuel may be stored on the structure in D.O.T. approved containers as long as doing so does not create a potential health or environmental hazard. Storage of pesticides, herbicides, fertilizers or other poisonous substances over the waters of Lake Bob Sandlin is strictly prohibited.
6. Insecticide misters are not to be installed on structures over the lake.
7. All piers, boathouses, or other like structures must be kept in a safe condition and be kept in good repair. Owners of unsafe or rundown structures will be given 90 days to make necessary repairs, as determined by the District.
8. Structures may be required to be removed or modified if, in the opinion of the District, they constitute a hazard to navigation, public health, safety, welfare, or a hazard to anyone occupying or utilizing the lake or structure.

Dredging

1. All dredging in Lake Bob Sandlin (including that associated with retaining walls, shoreline leveling and/or contouring, and boat ramp construction) shall be performed in accordance with rules and guidelines established by the U.S. Army Corps of Engineers. All dredging requires a dredging permit from the District (including those projects where no permit or notice is required by the Corps of Engineers). If a dredging permit is issued from the District, dredging will be allowed only under the footprint of the structure or for backfill of retaining wall.
2. Acceptable erosion control measures must be utilized throughout the construction period (i.e. containment, silt screens, other physical structures to minimize the amount of sediment entering the reservoir).
3. Retaining walls may be constructed along your property line. If an eroded area along the shoreline is approved by the District to be reclaimed, a portion of the backfill material may also be reclaimed from the reservoir, dependent upon the amount needed. Any material used to backfill must be pre-approved by the District. Soil testing may be required at property owner's expense.
4. If more than 50 cubic yards of nontoxic dredged or fill material (native soil, concrete, sand, gravel or rock) are to be discharged below elevation of 337.50' MSL in the construction of the requested structure, Permittee must obtain a Department of the Army permit for such structure from the U.S. Army Corps of Engineers.

Exceptions and Variances

1. Existing structures that were built prior to these revisions of the rules and regulations and that were built in compliance with the approved permit that was issued upon construction, and are still in compliance, may remain in the lake without modifications at the discretion of the District. Those structures with un-permitted modifications or additions which make them no longer compliant with their approved permit will be addressed on a case-by-case basis by the District to bring the structure into compliance with these revised rules and regulations.
2. Any variance to the rules and regulations stated in this document must be brought before the Board for consideration and ruling.
3. Violations to any of the above District rules and regulations will result in appropriate penalties in accordance with Federal, State and local laws.

(2) All floating facilities mentioned in the preceding paragraph must be securely moored in an approved manner at all times and anchored properly in order to prevent such from becoming unmoored and floating away. All shall be kept in good repair. The barges referred to herein are not those used for fishing or pleasure and which are propelled by motor.

(3) Before construction of any facilities mentioned in this section:

(a) Application must be made to the District accompanied by a sketch showing location, dimensions, construction plans and method of anchoring. The application shall give the name and address of the person acting as agent for the Permittee and with whom correspondence may be had; and

(b) After inspection of property and review of plans and payment of the prescribed fee, permit may be issued if plans conform to District's specifications and in the opinion of the Executive Director, or their designee, do not interfere with lake uses.

6.110 - CONTEST PERMITS

Any person, firm, club or corporation desiring to stage any type of contest on Lake Bob Sandlin, such as boat racing or fishing tournament, shall make application to the District upon forms to be provided by the District. If approved, the District may issue a permit. No such contest shall be held without securing a permit.

6.120 - SPECIFIC USE PERMITS

Permit for a specific use must be approved by the Board of Directors.

6.130 - WHEN PERMITS NOT REQUIRED FROM DISTRICT

Any person, firm or corporation holding permits from, or registered with, Texas Commission on Environmental Quality (TCEQ) (formerly known as Water Quality Board), or its successor, or any other authorized agency, for the disposal of solid and/or liquid waste shall not be required to secure any permit from the District but would notify the District of any such activity.

SECTION 7- RECREATIONAL ACTIVITIES AND RESTRICTED AREAS

7.100 - RESTRICTED AREAS

Public use of Lake Bob Sandlin of any nature is unconditionally prohibited in restricted areas marked with regulatory floating buoys marked "Keep Out". Any city or other permitted user of

Lake Bob Sandlin wanting to restrict an area will make application for such, and, if granted, pay the cost of buoys as stated in the Buoy Permitting Policy as amended.

SECTION 8- PROHIBITED ACTIVITIES

8.100 - DESTRUCTION OF DISTRICT PROPERTY

The destruction, damage, defacement, removal or excavating of any District property, including vegetation, soil, rocks, minerals or water, is specifically prohibited under penalty of removal from District's property, revocation or cancellation of any granted privileges or permits, and consequences of prosecution therefore. This includes, but is not limited to, activities in or on the lake, and/or dry lake bed caused during drought conditions (i.e. burning, driving, parking, cutting trees, etc.).

8.110 - FIREARMS AND EXPLOSIVES PROHIBITED

Firearms and explosives of any kind are prohibited on the water surface, except when in possession of a law enforcement officer or District employee on official business. Shotguns are allowed during migratory bird season only (ducks and geese). Hunting will be strictly prohibited near any populated area around the lake. No firearms or explosives shall be fired on the lake except by law enforcement officers, District employees or persons with hunting permits during hunting seasons applicable to the lake. No hunting will be allowed on any District property, other than on the surface waters of Lake Bob Sandlin in accordance with any State or Federal law or regulations, unless authorized by a Specific Use Permit approved by the Board.

8.120 - SANITATION

It shall be unlawful for any person to throw, discard, or discharge into the waters of Lake Bob Sandlin or on any owned lands and facilities any refuse, garbage, trash, sewage, rubbish or waste of any kind.

8.130 - GASOLINE, OIL AND HAZARDOUS MATERIAL STORAGE

A maximum of 30 gallons of fuel may be stored on the structure in D.O.T. approved containers as long as doing so does not create a potential health or environmental hazard. Storage of pesticides, herbicides, fertilizers or other poisonous substances over the waters of Lake Bob Sandlin is strictly prohibited.

Commercial use storage facilities for gasoline and other inflammable or combustible materials shall not be stored in or on Lake Bob Sandlin or on any lands or facilities owned by the District without permit secured from the District or as specified in the Rules and Regulations for Structures Built on Lake Bob Sandlin. Application for such permit shall state the location and quantity of the stored product. Permitted commercial storage facilities will provide an annual certified inspection report to the District and the District reserves the right to request additional inspections if there is a potential issue with the facility. No leakage into the lake shall be permitted. This permit shall be cancelled on violation. This provision on storage only shall not be applicable to municipalities, corporations or governmental entities that may have permits to remove water from the lake. It shall be unlawful to dump in or on the waters of Lake Bob Sandlin any petroleum or similar products, or dump same in an area that will result in drainage into the lake.

8.140 - UNAUTHORIZED SOLICITATION AND BUSINESS ACTIVITIES

It shall be unlawful for any person, firm or corporation, or their representative to engage in or solicit any business on Lake Bob Sandlin.

8.150 - COMMERCIAL OPERATIONS

No commercial operation or activities on the waters of Lake Bob Sandlin or on lands owned by it shall be conducted.

8.160 - ALCOHOLIC BEVERAGES

The possession, sale and/or consumption of beer, wine, and intoxicating liquids in violation of applicable State or local option laws on the water surface of the reservoir and/or within the

District's recreational park facility is specifically prohibited.

8.170 - GAMBLING

Laws of the State of Texas shall govern and dictate the prohibition of any and all forms of gambling on the water surface of the reservoir, or any land area owned or controlled by District.

8.180 - ABANDONMENT OF PERSONAL PROPERTY

Abandonment of personal property or buildings on the reservoir, on land owned by the District or on lands in which the District has an easement, is prohibited, and any such property may be taken in charge by the District. If not reclaimed or removed and impoundment charge (if any) paid within 90 days, it will be sold, destroyed, converted to District use, or otherwise disposed of by the District.

8.190 - SPECIAL ZONES

In conformity with Parks and Wildlife Code of Texas, as amended, the District may, through the Executive Director or order of the Board of Directors, from time to time designate areas of the lake for special uses; such as, swimming, skiing or prohibition of motor boats, and in such cases, floating buoys shall be placed with appropriate markings thereon. The Executive Director or Board of Directors may designate an area to be temporarily used for the purposes stated herein.

8.200 - DIVING OR JUMPING INTO THE LAKE

Diving or jumping into Lake Bob Sandlin from any public highway, roadway bridge or railroad bridge is strictly prohibited. This is a violation of the District's Rules and Regulations.

8.210 - AIRCRAFT

Storage of any and all aircraft in the easement area and/or on District property is strictly prohibited. (Exception: emergency medical services). This provision does not restrict landings and take-offs on the water of the Lake.

SECTION 9 - BOATING REGULATIONS

9.100 - TEXAS WATER SAFETY ACT AND FEDERAL ACTS

All watercraft on Lake Bob Sandlin shall be equipped and operated in accordance with the provisions of the U.S. Coast Guard Inland Rules, as amended, which shall apply to waters of Lake Bob Sandlin.

The Texas Water Safety Act of Parks and Wildlife Code of the State of Texas, as amended, and any Federal act or regulation applicable to the operation of all watercraft on public waters shall be applicable to the waters of Lake Bob Sandlin.

9.110 - SANITATION REQUIREMENTS

Any boat or houseboat which has sleeping quarters, or all boats and barges with restrooms or holding tanks for all refuse and sewage will not be allowed on Lake Bob Sandlin.

9.120 - COMMERCIAL PERMIT REQUIRED

No boats, vessels, piers, barges, or other floating marine craft used for commercial purposes shall be allowed on Lake Bob Sandlin without first obtaining a permit from the District. See Commercial Use Fees.

9.130 - NUMBERING MOTORIZED WATERCRAFT

No person shall operate a motorized watercraft upon the waters of Lake Bob Sandlin without having the same properly numbered and registered with appropriate State and/or Federal authorities. Information regarding the numbering of such watercraft may be secured from Parks and Wildlife Department of the State of Texas.

9.140 - CLASSIFICATION OF BOATS

(1) Watercraft shall be classified as provided by and defined by the Parks and Wildlife Code of the State of Texas as amended.

(2) Commercial Boats - Boats or barges rented to others, or the carriage of any person or persons by a vessel for a valuable consideration, whether directly or indirectly flowing to the owner, charterer, operator, agent, or any other person who has interest in the vessel, or the carriage of any goods, wares, or merchandise, or any other freight for a valuable consideration, whether directly or indirectly flowing to the owner, charterer, operator, agent, or any other person who has an interest in the vessel, or any person performing a service for hire.

9.150 - GENERAL BOAT AND BARGE OPERATIONS

(1) No watercraft which is deemed to be unseaworthy shall be permitted to operate on Lake Bob Sandlin. The District shall bear no responsibility for the safe condition, proper design, or safe operation of any boat or other craft placed in or upon the water controlled by the District.

(2) No person shall operate or cause to be operated any watercraft equipped with a motor or internal combustion engine, regardless of whether such a motor or engine is temporarily or permanently attached to said watercraft, on the waters of Lake Bob Sandlin, unless such motor or engine is equipped with an efficient muffler, in good working order and in constant operation so as to prevent excessive noise and annoying smoke. No outboard motor or internal combustion engine shall be deemed equipped with an efficient muffler unless the exhaust gases are discharged underwater or are so muffled as to not be noisier or more annoying than an internal combustion engine of like power equipped with an underwater exhaust. No inboard motor or internal combustion engine shall be deemed equipped with an efficient muffler unless the exhaust gases are condensed and silenced by the continuous circulation of water through the exhaust manifold, or are so muffled as to not be noisier or more annoying than when so condensed and silenced by water circulation through the exhaust manifold of an internal combustion engine of like power.

(3) Any watercraft or other object found adrift or sunken on Lake Bob Sandlin or found not anchored or securely grounded shall be taken up by District Police Officers and District

shall have a lien thereon for the taking, towing and keeping of same. Unless the owner thereof takes same into possession and pays the charges within 90 days after being notified, District may dispose of same as abandoned property.

(4) The operator of any watercraft involved in an accident on Lake Bob Sandlin resulting in injury or death to any person or damage to property shall immediately stop such watercraft at the scene of the accident and shall give their name, address and full identification of their watercraft and the name and address of the owner of the boat or barge to the person struck or occupant of the boat or barge collided with, and shall render reasonable assistance to any person injured in the accident, and shall report such accident immediately to a representative of the Parks and Wildlife Department and/or the District.

(5) No person shall operate an air-drive boat on Lake Bob Sandlin, except during the performance of duties by District personnel.

(6) Any motorized watercraft, when moving under power, shall not come within 50 feet of row-boats and sailboats.

(7) All watercraft shall be operated in a careful and prudent manner at idling speed within 200 feet from any shoreline.

9.160 - WARNING TO BOAT AND BARGE OPERATORS

All operators of watercraft are hereby warned to be on the lookout for floating debris or partially submerged objects at all times. Excessive speed may be dangerous due to floating debris or partially submerged objects. The District shall not be held liable for any damage caused by floating debris or partially submerged objects.

9.170 - PUBLIC DOCKING FACILITIES

No person shall operate public mooring or docking facilities except as specifically authorized by a permit. See Commercial Use Fees.

SECTION 10 - FISHING AND HUNTING

The general and special laws of Texas, and Rules and Regulations of Parks & Wildlife Department of Texas, in effect now or as amended, will control the taking of fish from, and the

hunting in and on, Lake Bob Sandlin. No hunting will be allowed on any District property, other than on the surface waters of Lake Bob Sandlin in accordance with any State or Federal law or regulations, unless authorized by a Specific Use Permit approved by the Board.

See also SECTION 8-PROHIBITED ACTIVITIES, 8.110 FIREARMS AND EXPLOSIVES PROHIBITED.

SECTION 11 - WATER SPORTS

11.100 - SWIMMING AND BATHING

Swimming in Lake Bob Sandlin will be unsupervised and there will be no life guards in attendance. Swimming will be at the sole risk of the participant.

11.110 - WATER SKIING AND AQUAPLANES

Those engaging in skiing or aquaplaning will do so at their sole risk.

SECTION 12 – SANITATION

12.100 - GENERAL SANITATION

The history of lakes shows that with the passing of time, dwellings, motels, marinas, and other developments surround the lake. In practically all instances of such development, there is no central sewage collection and disposal system, and this results in the construction and use of an on-site sewage system. To prevent pollution, an on-site sewage system must be constructed and maintained in accordance with tried and established rules and regulations of the Texas Commission on Environmental Quality (TCEQ) or its successor. Septic lines are allowed in accordance with such regulations. In addition to the sewage from buildings and other developments, there can be pollution from industrial and agricultural operations. The counties of Titus, Camp, Franklin and Wood will be the enforcing agencies of these rules and regulations. The District's duty is to prevent pollution of the waters of Lake Bob Sandlin.

12.110 - BUILDINGS ON EASEMENT AREA

Although it is not the policy of the District to restrict buildings or other installations on easement areas, yet the District, in its duty to prevent pollution, must call to the attention of all persons using the easement area that no type of building installation, activity or business will be permitted in this area that will cause pollution of the waters of Lake Bob Sandlin. The District's employees will cooperate and advise with any person desiring to use the easement area on the matter of whether or not such use might or might not cause pollution. In so doing, the District's employees may require a survey of the easement area showing the type of use and location of buildings or installations. Any type of living quarters to be built in the easement must be permitted and be above 342.00' MSL to avoid possible flooding. Any other permitted structure or improvement built below 342.00' MSL is subject to flooding.

12.120 - MARINAS, ETC. TO HAVE HOLDING TANKS

All marinas, boat and barge storage Permittees are required to have and maintain sewage holding tanks and facilities. All such facilities must comply with Texas Commission on Environmental Quality (TCEQ) (formerly known as Water Quality Board), or its successor, as the same now reads or as amended and all other rules and regulations of other State agencies.

12.130 - AREAS OUTSIDE OF EASEMENT AREA

To prevent pollution, an on-site sewage system must be constructed and maintained in accordance with tried and established rules and regulations of the Texas Commission on Environmental Quality (TCEQ) or its successor. The counties of Titus, Camp, Franklin and Wood will be the enforcing agencies of these rules and regulations. The construction of on-site sewage system or septic tanks and field lines for an area of 2,000 feet outside of the spillway level of 337.50' MSL must be done in accordance to the above referenced rules and regulations. The owner and/or user of on-site septic systems or septic tanks and field lines in this 2,000 foot area that may or might cause pollution of the lake will be subject to civil and criminal penalties and injunctions for the continued use of the same after notice to abate the nuisance.

SECTION 13 - SECURITY AND ENFORCEMENT REGULATIONS

13.100 - POLICE OFFICERS

The District will have in its employment one or more police officers working under the Executive Director who will be authorized to make arrests when necessary to prevent or abate the commission of any offense against the rules and regulations of the District and against the laws of the State of Texas when the offense or threatened offense occurs on any land, waters or easement owned or controlled by the District, and making an arrest in case of an offense involving injury or detriment to any property owned or controlled by the District, and the police officer will be authorized to file complaints in the appropriate court of jurisdiction in Titus County, being the county in which the District's principal office is located or in such other Courts as may have jurisdiction. They are further authorized to perform any duties placed upon them by these Rules and Regulations or by the Water Code of the State of Texas, as amended, or any other law, rule or regulation of the State of Texas.

13.110 - VENUE

All complaints for violation of these Rules and Regulations shall be filed in an appropriate court of jurisdiction in Titus County, Texas; this being the county in which the District's principal office is located. Such procedure is authorized by the Water Code of the State of Texas as amended.

13.120 - CANCELLATION OF PERMITS

Any person, firm or corporation found guilty of violation of any section of these regulations, or any conditions of a permit, or any law, rule or regulation of the State of Texas or any other governmental entity, shall, upon request of the District, surrender his permit, and the same shall be cancelled without return of any permit fee or any portion thereof. If the Permittee has any property of any type on the waters of Lake Bob Sandlin or fee land, the Permittee must immediately remove same and clean the site; and upon failure to do so within 10 days after cancellation of the permit, the District may proceed to remove same at the cost to the Permittee and dispose of the same as herein provided.

13.130 - DISPOSAL OF PROPERTIES OF OTHERS COMING INTO POSSESSION OF DISTRICT

Any property of others taken into possession by the District under any of the provisions of these regulations shall be retained by the District for a period of 90 days, during which time the District shall give notice to the owner of the possession of the property and the owner may redeem same by paying any fees or charges and removing same. Notice shall be by certified mail to the last known address; and if no known address, then by publication one time in a newspaper published in the area. The notice shall state the name of the owner, if known; the property in possession; and will state if not claimed and fees and charges paid by a certain date, the same will be disposed of by the District. In disposing of any property not redeemed, the District may convert it to District use, or destroy it, sell it; and in the event of a sale, the funds received shall become District funds for maintenance and operation.

SCHEDULE OF FEES
Approved August 17, 2015
Effective January 1, 2016

All applications for permits shall be on forms provided by the District and no permit shall be issued until such time as the required fee is paid.

The District will charge the following fees:

Application for Permit: $50.00
Includes but not limited to:
Dredging, Retaining Wall, Construction, Residential Water Use, Buoy

Revisions to Permit: $50.00

Repairs, Painting or Staining *no charge*

Work barge Permit: $150.00 per year

Annual fee for Residential Water Use Permit: $150.00
Reconnect fee: $100.00

Annual fee for private use structure:

Boathouse Maximum square footage (excluding walkway) ***1,600 square feet***
Pier Maximum square footage (excluding walkway) ***400 square feet***
Maximum for boathouse & pier on 1 lot ***2,000 square feet***

Pier	.15 per square foot
Dock	.15 per square foot
Walkway	.15 per square foot
Boat House	.15 per square foot
Floating Boat House	.15 per square foot
Buoy – Class 2	$10.00 per year

Late fee assessed to all annual fees: ***(Past due after January 31 each year)***

If Paid in February	$50.00
If Paid in March	$100.00

Fee for non-permitted structure: **$250.00 and/or removal of structure**

Commercial Use Fees:

Effective May 24, 2011, contingent on the application of a construction permit for a commercial use structure or permit for commercial use, the annual fees will be set by the Board. Existing commercial structures permitted prior to this date will be grandfathered.

Titus County Fresh Water Supply District No. 1

Lake Bob Sandlin / Fort Sherman Dam
P.O. Box 650, Mt. Pleasant, TX 75456-0650
Phone 903-572-1844 Fax 903-572-0164
www.tcfreshwater.com

APPLICATION FOR PERMIT TO PLACE A PIER, BOATHOUSE, RETAINING WALL, BUOY OR OTHER INSTALLATION ON WATER DISTRICT PROPERTY OR WITHIN EASEMENT

Permits for any work done in easement, lake bed or properties owned by Titus County Fresh Water Supply District #1 will be reviewed on an individual basis. A representative of the Water District may make an onsite evaluation of request.

1. Name of Applicant _____
2. Telephone (Home) _____ (Other) _____
3. Mailing Address _____
   City, State, Zip _____
4. Property 911 Address _____ City _____ County _____
   Subdivision _____ Lot _____ Block _____
5. Structure: ( ) Pier ( ) Boathouse ( ) Class 1 Buoy ( ) Class 2 Buoy *
   ( ) Retaining Wall _____
   ( ) Other _____
6. Use: ( ) Private ( ) Commercial
7. Contractor _____ Phone Number _____
8. Does Applicant own land or lease land abutting Water District owned Reservoir? ( ) Yes ( ) No

The District has the right to regularly and periodically inundate the easement area (100 feet from shoreline or 342 msl, whichever is greater) when necessary by reason of flood conditions and without claim by permitee for damages resulting to said lands or any improvements or other properties within the easement area. Any type of living quarters to be built in the easement must be permitted and be above 342 msl to avoid possible flooding. Any other permitted structure or improvement built below 342 msl is subject to flooding. The water levels in the Lake will not be constant, and shall vary depending on the amount of water used and delivered from the Lake, evaporation rates, rainfall amounts, runoff, and other factors beyond the District's control. The District shall not be held liable for any damage caused due to any particular water level.

**A violation of any District permit, rule or regulation may be cause for cancellation of all District permits held by the violator or denied issuance of additional permits to same. Any structure built in lake bed or easement area shall be kept in reasonable repair and structurally sound. Failure to do so may result in the removal of structure by the District at the owner's expense.

Upon completion of the construction and before the contractor leaves the work site, the Water District must be notified as a final inspection will be required. Failure to comply with inspections could result in significant penalties and/or fines.

The required location plat and construction plans (including floor plan, elevation plan and dimensions as well as method of anchoring) are attached. Permit will not be approved without the entire above list of required plans.

Applicant agrees to pay all fees, rentals and charges as established by the Water District, and to abide by all Rules, Regulations, Conditions and Restrictions regarding the placement and use of above facility as well as all Rules, etc. pertaining to general use of the Lake as published by the Water District under penalty of revocation for non-compliance therewith, or of violation thereof.

Applicant agrees to abide by all County, State, Federal, Water District, and Texas Parks and Wildlife Rules and Regulations.

I CERTIFY THAT THE ABOVE INFORMATION IS TRUE AND CORRECT AND HAS BEEN ANSWERED AND FURNISHED TO THE BEST OF MY ABILITY AND I UNDERSTAND THE REGULATIONS FOR STRUCTURES AS STATED ON THE REVERSE SIDE.

Construction Permit Fee: See Schedule of Fees
* Class 2 Buoy Permit Fee: See Schedule of Fees

Annual Fee on Structure: See Schedule of Fees (not to include retaining wall)
* Class 2 Buoy Renewal Fee: See Schedule of Fees

_____
Signature of Applicant Date

****Regulations for Structures Built on Lake Bob Sandlin on Reverse Side****

District Use Only

Permit Approved / Denied By _____ Date _____ Expiration Date _____

Final Inspection By _____ Date _____

Completed Measurements:

Walkway	x	=	Square feet
Walkway	x	=	Square feet
Pier	x	=	Square feet
Pier	x	=	Square feet
Boathouse	x	=	Square feet
Enclosed Storage	x	=	Square feet
Enclosed Storage	x	=	Square feet

Grand Total _____ Square feet

Roofline _____

*****Refer to Official Manual of Policies, Rules and Regulations of Titus County Fresh Water Supply District #1, Pages 8 & 26***

Revised 08/31/15

Regulations For Structures Built On Lake Bob Sandlin
Approved and Adopted by the Board-Effective January 11, 2010-Revised August 17, 2015

Water Level. The water level in the lake will not be constant. Lake Bob Sandlin is a water supply and conservation project. While it is the desire of the Titus County Fresh Water Supply District No. 1 (District) to keep the lake as full as possible, the level of the water will vary, depending on the amount of water used from the lake, evaporation rates, amounts of rainfall and runoff upstream, and other factors. The District will not credit, pro-rate, refund, or provide any form of compensation for the inability of Permittee to utilize permitted structures.

Boathouse and Piers

1. The privilege of installing a structure on the lake is not an inherent right with the control or ownership of waterfront property. If a structure is permitted for construction, it is to be used responsibly and should not contribute to domestic wastes, especially human waste, entering the lake.
2. The District exercises the right to grant or deny structure permits and any modifications to structures as deemed appropriate at the sole discretion of the District.
3. The District may permit no more than one boathouse and one pier on any one shoreline lot with a minimum of 100 feet of shoreline. A minimum of 25 feet of shoreline is required for a pier and 50 feet of shoreline is required for a boathouse. Structures shall not be built within 5 feet from the property line. Adjoining lots owned by 1 owner may build 1 structure per lot unless the lots have been joined in a manner prohibiting the separation of the lots.
4. Construction plans, including floor plan, elevation plan and walkway, must be submitted with the permit application, along with the permit fee, and approved by the District prior to any work being done. A visual inspection will be required prior to approval. A permit/placard must be obtained and placed in plain view from the lake and kept there until all work is completed. Permits are to be obtained before repairs are made to structures.
5. All structures built adjacent to one lot may not exceed an aggregate total of 2,000 square feet. The footprint of a boathouse, including boat slip(s) and deck area, may not exceed 1,600 square feet. Additional square footage will be allowed for a walkway to the structure provided the walkway does not exceed 6 feet in width. The footprint of a pier may not exceed 400 square feet. Additional square footage will be allowed for a walkway to the structure provided the walkway does not exceed 6 feet in width. Neither temporary nor permanent living will be allowed on any structure.
6. No boathouse or pier shall be constructed which is more than1 story in height. This means that a boathouse or pier may have a deck on top, but the deck may not be enclosed and may not have a roof over it. No covered two-story deck/boathouse structures will be permitted. The roof of a structure shall be a flat top or have a maximum of 5 in 12 pitch.
7. Outer walls may be used to protect lifted boats from the weather so long as the bottom of the wall is not lower than 4 feet below the roof edge or 4 feet above the floor The District will allow fully enclosed storage area, not to exceed 100 square feet floor space, with one dimension of the enclosure not to exceed 6 feet.
8. Lakefront property owners should be aware that the District may, at its discretion, remove the un-permitted structure/portion if you build a new structure, or add on to an existing structure without first obtaining a permit and a fee of $250.00 payable to the District may be imposed in addition to a possible written citation and/or removal of structure. Make sure all permits are obtained.

Permit Guidelines

1. The permit will become invalid if the project, including plans and specifications of the approved permit, is altered or deviated from in any substantive manner without prior authorization from the District. The Applicant will remove all unauthorized modifications or deviations and the shoreline will be restored to its original condition at the Applicant's expense.
2. All construction permits will expire 90 days from issuance. If construction is not completed within the 90 days the contractor or property owner will contact the District by phone at 903-572-1844 or email jbarton@tcfreshwater.com to request one extension of an additional 90 days. No more than one extension may be granted. (If additional time is required, requests will be considered on a case-by-case basis.)
3. Once constructed, the construction permits become a renewable annual permit. Failure to keep appropriate fees paid each year may result in the structure being removed from Lake Bob Sandlin at the expense of the owner. In the event an annual fee is not kept current, the District will notify the owner and allow 60 days to bring fees current before further action is taken.
    - Structures built with more than 1 walkway will be assessed an annual fee for the waters that are enclosed within those walkways.
    - An annual fee will be assessed on the entire structure built over the waters of the lake regardless of property lines or pool elevation.

Inspections

1. The District may inspect the structure on a periodic basis during construction to ensure compliance with all rules, regulations and guidelines. After all construction is completed it shall be the duty of the contractor, his designee or the property owner to contact the District by phone at 903-572-1844 or email jbarton@tcfreshwater.com for final inspection of the structure.
2. The District reserves the right to perform an inspection of this structure for compliance at any time, during or after construction.

Plumbing and Electrical

1. Toilets, showers, sinks, faucets, or any similar plumbing fixtures in an enclosed area will not be allowed to be installed on structures over the waters of Lake Bob Sandlin. Exterior exposed plumbing (sinks and faucets) will be permitted.
2. The electrical services shall be installed in accordance with the National Electric Code as amended and revised. The District performs cursory electrical inspections for general compliance only. The property owner is advised to have a licensed electrician, electrical inspector, or other professional with expertise in electrical installations to inspect all electrical components to ensure that the installation meets all requirements specified in the National Electric Code.

Safety and General Repair

1. The distance the entire structure is allowed to extend into the lake shall not exceed 75 feet measured from the water line; that is, elevation of 337.50' MSL. The District, at its discretion, may allow such facilities to extend onto the reservoir to a maximum total length of not more than 150 feet perpendicular to water line; that is, elevation of 337.50' MSL, and will be determined by the Executive Director or their designee.
2. No structure may be situated in a manner that interferes or obstructs access to other permitted structures or neighboring properties or that may be a safety hazard as determined by the District.
3. It is recommended that the property owner install the 911 property address with 4 inch reflective numbers and letters on the structure that are visible from the lake.
4. Safety lights (wired, battery or solar) shall be installed on the lake end of all structures. Additional lights shall be installed at 50 feet intervals if structure extends more than 50 feet into the lake or at least half the distance between shore and lake.
5. A maximum of 30 gallons of fuel may be stored on the structure in D.O.T. approved containers as long as doing so does not create a potential health or environmental hazard. Storage of pesticides, herbicides, fertilizers or other poisonous substances over the waters of Lake Bob Sandlin is strictly prohibited.
6. Insecticide misters are not to be installed on structures over the lake.
7. All piers, boathouses, or other like structures must be kept in a safe condition and be kept in good repair. Owners of unsafe or rundown structures will be given 90 days to make necessary repairs, as determined by the District.
8. Structures may be required to be removed or modified if, in the opinion of the District, they constitute a hazard to navigation, public health, safety, welfare, or a hazard to anyone occupying or utilizing the lake or structure.

Dredging

1. All dredging in Lake Bob Sandlin (including that associated with retaining walls, shoreline leveling and/or contouring, and boat ramp construction) shall be performed in accordance with rules and guidelines established by the U.S. Army Corps of Engineers. All dredging requires a dredging permit from the District (including those projects where no permit or notice is required by the Corps of Engineers). If a dredging permit is issued from the District, dredging will be allowed only under the footprint of the structure or for backfill of retaining wall.
2. Acceptable erosion control measures must be utilized throughout the construction period (i.e. containment, silt screens, other physical structures to minimize the amount of sediment entering the reservoir).
3. Retaining walls may be constructed along your property line. If an eroded area along the shoreline is approved by the District to be reclaimed, a portion of the backfill material may also be reclaimed from the reservoir, dependent upon the amount needed. Any material used to backfill must be pre-approved by the District. Soil testing may be required at property owner's expense.
4. If more than 50 cubic yards of nontoxic dredged or fill material (native soil, concrete, sand, gravel or rock) are to be discharged below elevation of 337.50' MSL in the construction of the requested structure, Permittee must obtain a Department of the Army permit for such structure from the U.S. Army Corps of Engineers.

Exceptions and Variances

1. Existing structures that were built prior to these revisions of the rules and regulations and that were built in compliance with the approved permit that was issued upon construction, and are still in compliance, may remain in the lake without modifications at the discretion of the District. Those structures with un-permitted modifications or additions which make them no longer compliant with their approved permit will be addressed on a case-by-case basis by the District to bring the structure into compliance with these revised rules and regulations.
2. Any variance to the rules and regulations stated in this document must be brought before the Board for consideration and ruling.
3. Violations to any of the above District rules and regulations will result in appropriate penalties in accordance with Federal, State and local laws.

Reviewed by _____ (Property Owner) Date _____

APPENDIX 5 – TRWD

GENERAL ORDINANCE

REGULATIONS FOR WATER AND LAND UNDER THE JURISDICTION OF TARRANT REGIONAL WATER DISTRICT, A WATER CONTROL AND IMPROVEMENT DISTRICT

AS ADOPTED BY ITS BOARD OF DIRECTORS

MARCH 19, 2002

AND

AS REVISED BY ITS BOARD OF DIRECTORS

NOVEMBER 15, 2011

TABLE OF CONTENTS

CAPTION

An ORDINANCE enacted by the Board of Directors of Tarrant Regional Water District, a Water Control and Improvement District, a political subdivision of the State of Texas, created under authority of Article XVI, Sec. 59 of the Texas Constitution, and operating under the powers and provisions of Chapter 31 of the Texas Parks and Wildlife Code, Chapter 340 of the General and Special Laws enacted by the 44th Legislature of Texas at its Regular Session, now appearing as Sections 51.127, et seq., of the Texas Water Code, as amended, and also under the powers and provisions of Chapters 49, 50 and 51 of the Texas Water Code, as amended. Declaring the general policy of the Ordinance and providing an aid to the interpretation of the provisions thereof, and enacted for accomplishing among other purposes, the following purposes:

To afford protection of the lands, physical properties and improvements of the District;

To protect the public against indiscreet acts and improper entries upon said properties;

To safeguard the quality of the water stored in the reservoirs owned and controlled by the District;

To regulate the use of the lands forming the margins of said waters, in order to preserve the quality of the water stored by the District, to the end that the same may be suitable for use by persons and animals;

To prevent the waste or unauthorized use of water controlled by the District;

To regulate camping, residence, hunting, fishing, swimming, skiing, boating and all recreational and business privileges, when done, occurring or taking place upon the waters stored or impounded by the dams owned by the District, and to provide such regulations with reference to any lands owned by the District, under easement to it, controlled by it, or held under any right whatever.

Providing for certain licenses or permits, the fees to be charged therefor by the District, and further forbidding the performance of certain acts without the prior grant of licenses or permits therefor by the District. Declaring certain acts or the maintenance of certain conditions to be a malicious mischief or nuisance. Declaring the entry upon waters or grounds closed to entry by the District to be unlawful trespasses. Providing certain civil and misdemeanor penalties for the violation of the terms of this Ordinance and also establishing the judicial processes under which this Ordinance may be enforced. Providing for the establishment of peace officers for the District and defining the powers of such officers. Providing for the suspension or cancellation of permits or licenses, in the event that the holder thereof shall be guilty of violating the terms of such licenses or permits; also providing for the forfeiture of any fees which may have been paid by the licensee or penalties as consideration for the, granting of the licenses or permits, as to which any such violation may occur. Providing for the lawful publication of notice of the enactment of this Ordinance and fixing the time at which this Ordinance shall be in full force and effect, and making full and lawful provision for advice to the public as to the terms and provisions thereof.

BE IT THEREFORE ENACTED AND ORDAINED BY THE BOARD OF DIRECTORS OF TARRANT REGIONAL WATER DISTRICT, A WATER CONTROL AND IMPROVEMENT DISTRICT

PREAMBLE

This Article is deemed necessary for the purpose of furnishing aid to the interpretation of the provisions of the succeeding portions of this Ordinance. This general declaration of purpose shall not be deemed to be exclusive of other reasons for the specific provisions embraced in this Ordinance, but shall be deemed to be a statement of the most fundamental reasons which give rise to the enactment hereof. These most fundamental reasons are as follows:

(a) To protect the properties, works and improvements of the District against injury, interference with the efficient operation thereof, to preserve the same in efficient condition at the minimum of costs, and to protect the properties, waters, and marginal lands owned by the District against trespassers or persons who may go upon, interfere with or use the same in any manner detrimental to the public welfare.

(b) It is recognized that the water stored in the reservoirs owned and controlled by the District must be protected as to quality thereof to the end that the same may be suitable for human consumption and domestic purposes, and uses by the persons who may reside upon, camp upon, or desire to take water directly from said reservoirs for the satisfying of human or animal needs. This Ordinance is designed to effect such protection.

(c) It is recognized that said reservoirs will be utilized by the rightful users of the lands forming the margins thereto and as well by persons who may desire to go to or upon the water for boating, for special events, for fishing and for the purpose of hunting migratory waterfowls. It is realized that an uncontrolled exercise of these privileges by boaters, fishermen, and hunters might result in invasion of the lawful rights of the users of the marginal lands and might subject the public in general to indiscreet or

harmful acts on the part of boaters, hunters and those desiring to take fish from said waters, and that such abuses should be controlled.

(d) It is also realized that this District, as a political subdivision of the State of Texas, acting for and on behalf of the State, has the duty to give cooperation to Local, State and Federal Governments, with reference to the enforcement of laws which now exist or may hereafter exist, whether Local, State, or Federal, enacted to control the taking or slaughtering of fish and aquatic fowls. This Ordinance shall be liberally interpreted to the end that such cooperation may be effectively given.

(e) In view of the fact that use of the waters controlled by the District and the marginal lands owned or controlled by the District will be sought by persons who may desire to utilize said water or said lands for purposes of profit, upon a commercial basis, it is anticipated that these uses will give rise to the need for regulation, which would cast the expense of regulation upon the District, and it is essential that the District be given the power to mitigate this expense by requiring payment of license or permit fees if deemed necessary by the District.

(f) It is conceived that an unregulated use of the waters controlled by the District for the purposes of boating, fishing, and hunting could create hazards to the public in general, and that adequate regulation would cause the District expense which should be borne by the persons seeking such uses. It is essential that the District be given the power to mitigate this expense by requiring the payment of license or permit fees if deemed necessary by the District.

(g) All regulations and ordinances for the governing of the District's lakes and lands previously adopted by the District are repealed as of the time this Ordinance becomes effective.

(h) It is recognized that the water stored in reservoirs owned and controlled by the District must be conserved and used in a manner that is not wasteful or excessive in

order to ensure that adequate water supplies remain available for all current and future District customers, including municipal, domestic, commercial, and industrial users, as well as lakeside residents. This Ordinance is designed to effect such protection.

ARTICLE I: DEFINITIONS OF TERMS AND DEFINING CERTAIN VIOLATIONS OF THIS ORDINANCE

When used in this ordinance, the following words and terms shall be defined as follows:

1. Abode: A watercraft is considered to be a place of abode if it is occupied for more than 14 consecutive nights or for more than 30 nights total in any 90 day period.
2. Airboat: A shallow-draft boat driven by an airplane propeller and steered by an airplane rudder, including hovercraft and other similar craft.
3. Boat: Same definition as "Watercraft".
4. Breach of License Regulations: The commission of any act or the maintenance of any condition (otherwise lawful) by any person without first having procured from the District a license or permit for the commission of any such act in all cases as to which a permit or license is, or may be, required by the District as authorized by this Ordinance and shall include the commission of any such act or the maintenance of any such condition after the expiration of the time limit fixed by any such permit or license, or violation of the terms of any such permit or license. Breach of license regulations is a violation of the Ordinance and is punishable as herein provided in Article XVII.
5. Breach Of The Peace: To inflict upon another person bodily harm, in the presence of another person; to deprive him of property lawfully in his possession or control, in the presence of another person; to assert control over or injure any property then lawfully in the possession or control of any such person; to commit any act which reasonably should be anticipated to produce bodily harm, or the fear of bodily

harm, to any other person; to commit any act which reasonably should be anticipated to produce injury to any property then lawfully in the possession of any other person; or, to commit, say or act in any such manner as reasonably should be anticipated to provoke physical resistance on the part of the person whose peace or rights may be affected or threatened; to threaten to commit any one or more of the foregoing acts; to encourage or aid another to commit any one or more of the foregoing acts; to disregard any lawful request of any peace officer or other lawfully constituted law enforcement officer; or to resist any such officer when he is engaged in the lawful discharge of his duties; and, in addition thereto, or concurrently therewith, shall embrace those acts prohibited by Section 42 of the Texas Penal Code, as the same is or may be amended. Said provisions shall be considered as part hereof. Breach of the peace is punishable as herein provided in Article XVIII.

6. Commercial Activity: Any operation, action, or activity for which a fee, or other valuable consideration, is received in exchange for goods or services, including any facility which contributes directly or indirectly to the existence of a commercial operation.
7. Community Dock: Any dock or boat slip facility which is used exclusively by members of a development, property owners' association or multi-family residence complex.
8. District: Tarrant Regional Water District, a Water Control and Improvement District.
9. District Land: All land owned by, controlled by, or under the jurisdiction of the District, including lands which are so located and conditioned as to cause them to drain to the District's reservoirs polluting matter of a nature likely to be detrimental to the health of persons who may use water furnished by said reservoirs.

10. District Officers: All Lake Supervisors, Lake Superintendents, Inspectors and Peace Officers employed by the District.
11. District Peace Officer: A Peace Officer contracted for or employed by the District in accordance with Section 49.216 of the Texas Water Code and licensed under the provisions of the Texas Administrative Code, Title 37 - Public Safety, Part VII - Texas Commission on Law Enforcement Standards and Education.
12. District Water: All streams, lakes, reservoirs, water courses, and all other bodies or accumulations of water, natural or artificial, which are owned or controlled by the District.
13. Floodway: Those lands and waters owned or controlled by the District in association with the flood control project along the West Fork Trinity River and Clear Fork Trinity River and their tributaries. The portion of the Clear Fork Trinity River within the boundaries of the floodway begins upstream at the point where State Highway 183 crosses the Clear Fork and continues downstream to the confluence of the Clear Fork with the West Fork Trinity River immediately north of downtown Fort Worth, Texas. The portion of the West Fork Trinity River within the boundaries of the floodway begins approximately 1000 feet upstream of the point where Meandering Road crosses the West Fork Trinity River in Fort Worth, Texas, and continues downstream to approximately 1500 feet east of the point where the West Fork Trinity River crosses under the Beach Street overpass in Fort Worth, Texas.
14. Flood Flowage Boundary: The contour elevation measured in feet above mean sea level known as elevation 325 feet upon the lands forming the margins of Cedar Creek Reservoir, elevation 320 feet upon the lands forming the margins of Richland-Chambers Reservoir, elevation 668 feet upon the lands forming the margins of Eagle Mountain Lake, elevation 851 feet upon the lands forming the

margins of Lake Bridgeport and elevation 715.2 feet upon the lands forming the margins of Marine Creek Lake.

15. Forbidden Zone: Where not otherwise indicated, will be understood to mean any area upon the lands or water owned or controlled by the District into which or upon which the public in general may not enter after anytime at which the District may post signs or otherwise give advice appropriate to constitute notice as to a particular area being a forbidden zone; and, said expression shall be further understood to include any area of water within any of said reservoirs which may be defined by the placing of buoys or signs adequate as to give advice as to the boundaries of any such forbidden zone, for all purposes, or some particular purpose, as the case may be. Entry into a forbidden zone is a violation of this Ordinance and is punishable as herein provided in Article XVIII.
16. Hazardous Waste: A liquid or solid that is listed by the Environmental Protection Agency (EPA) as a hazardous waste or exhibits the characteristics of ignitability, corrosivity, reactivity or toxicity as defined by EPA.
17. Headway Speed: Slowest possible speed a watercraft may travel under power.
18. Improvement: All structures, devices, contrivances or artificially created objects placed, constructed or erected on land or water owned by, controlled by or under the jurisdiction of the District.
19. Jurisdiction: Any body or stream of water, or any body of land, or any easement owned or controlled by the District.
20. Lake Resident Water Conservation and Drought Management Plan: A Water Conservation and Drought Management Plan containing a combination of strategies designed to conserve water over the long-term in order to reduce the volume of water withdrawn from District Reservoirs, to reduce the loss or waste of water, and/or to maintain or improve the efficiency in the use of water from District

Reservoirs. The Plan also includes a series of water management responses to temporary or potential water supply shortages that may occur as the result of drought conditions or other water supply emergencies. The rules and regulations contained in the plan are applicable to all lakeside residents withdrawing water from any District Reservoir for irrigation purposes.

21. Life Preserver: A Coast Guard approved device designed to buoy the body while in the water.
22. Malicious Mischief: Tampering without permission with any improvement, water line, power line, structure, earthen embankment, telephone line, telegraph line, fiber optic line, craft, fence, gate, gauge, warning device or any District contrivance. Malicious mischief also includes any act prohibited by Section 28.03 of the Texas Penal Code. An act of malicious mischief is a violation of this Ordinance and is punishable as herein provided in Article XVIII.
23. Nuisance: The commission of any act prohibited by those provisions of Section 42 of The Texas Penal Code, as amended or to be amended. In addition to the definitions of "nuisance" as derived from the above cited Section 42, the word shall be understood to include the commission of any act, having a continuing or enduring nature or the maintenance of any object, activity or condition which would: (1) impair the quality and sanitary condition of water stored in the District's reservoirs; (2) to create any hazard to the properties, water control devices and structures owned and controlled by the District; (3) produce a hazard for the safe condition of properties and structures placed upon the lands forming the margins of said reservoirs; (4) create hazards for any craft or improvement placed in, over or upon the water stored in the District's reservoirs; or (5) produce fear of bodily harm to, or discomfort of, those persons who lawfully may be upon the water stored by the District or upon the lands forming the margins thereto. Further, the word

"nuisance" shall include the commission of any act having an enduring effect or the maintenance of any condition which is forbidden by the succeeding provisions of this ordinance, unless such act, or such maintenance shall have first been expressly authorized by the District. To cause a nuisance is a violation of this Ordinance and is punishable by law as herein provided in Article XVIII.

24. Occupant: Any person who is using, occupying, or enjoying District land or water.
25. Parasail: A parachute or other type of apparatus used for hovering or gliding behind a watercraft.
26. Person: The singular, the plural, male and female, partnerships, corporations, associations, groups, organizations, or any other entity. Pronouns appropriate for the masculine singular shall include feminine and the plural.
27. Personal Watercraft: A type of motorboat that is specifically designed to be operated by a person or persons sitting, standing, or kneeling on the vessel rather than in the conventional manner of sitting or standing inside the vessel.
28. Regulated Land: Land which is administered according to District rules and laws.
29. Reservoir, Reservoirs, Lake or Lakes: Either Lake Bridgeport, situated in Wise and Jack Counties, Texas; Eagle Mountain Lake, situated in Tarrant and Wise Counties, Texas; Marine Creek Lake and Cement Creek Lake, situated in Tarrant County, Texas; Cedar Creek Reservoir situated in Henderson and Kaufman Counties, Texas; or Richland-Chambers Reservoir, situated in Freestone and Navarro Counties, Texas, either one or all as the context may indicate. This also includes earthen embankments, structures, dams, levees, machinery, devices and all other appurtenances which are provided by the District.
30. Restricted Areas: An area of land or water marked by signs or buoys that restrict activity beyond that point. The type of restriction shall be stated on the signs and marker buoys.

31. Sewage: Water which contains, or which has been in contact with, organic and/or inorganic contaminants such as human or animal wastes, vegetable matter, cooking fats and greases, laundry, hand and dish washing wastes and/or other chemical compounds and waste products.
32. Shoreline: The extended point where the plane of the surface of the water stored in any of said reservoirs touches land, at whatever elevation this may occur at any given time.
33. Spillway Elevation: The contour elevation measured in feet above mean sea level at which the reservoir is at optimum capacity, known as elevation 649 feet upon the lands forming the margins of Eagle Mountain Lake, elevation 836 feet upon the lands forming the margins of Lake Bridgeport, elevation 322 feet upon the lands forming the margins of Cedar Creek Reservoir, elevation 315 feet upon the lands forming the margins of Richland-Chambers Reservoir and elevation 687 feet upon the lands forming the margins of Marine Creek Lake.
34. Sunrise: The rising of the sun above the horizon at the time determined and published by the National Weather Service.
35. Sunset: The descent of the sun below the horizon at the time determined and published by the National Weather Service.
36. Tampering With Warning Devices: To deface, destroy, render inefficient, move or remove any buoy, sign, or other device provided as a means of warning, whether upon land or upon water, either by the District or by some person having authority therefor from the District. Tampering with warning devices is a misdemeanor and is punishable by law.
37. Toilet Facility: A disposal apparatus used to receive body waste on or within any watercraft.

38. Trespass: (1) The entry into or upon any forbidden zone or unauthorized activity in any restricted area, hereafter established and defined by the District; (2) opening any gate or crossing over, under or through any fence placed around or on any land owned by the District, regardless of the occupancy of said land; (3) going into any housed-in or fenced area, at, upon, or near to, any of the dams, levees, or earthen embankments owned by the District, which areas are hereby established as forbidden zones, without the posting of signs or other defining of such areas; (4) placing any manner of improvement in, under or upon the water controlled by the District or upon any land controlled by it, without first having the District's written evidence of assent thereto unless such improvement is authorized by other provisions of this Ordinance; (5) passing over any land forming the margins of said reservoirs without first having permission from the rightful occupant of any such land; (6) making any unauthorized entry into or upon any improvement, watercraft, or structure, either in or upon the water in said reservoirs, or upon the land forming the margins thereto, when such lands are owned or controlled by the District; or (7) cutting, taking away, or burning timber upon any land owned by the District. Trespassing is a violation of this Ordinance and is punishable as herein provided in Article XVIII.
39. Watercraft: Any boat, personal watercraft, raft, or device for floating upon the water which is not anchored or conditioned for remaining in one location.
40. Wake: To operate a watercraft in such a manner and speed so as to cause the waves from the watercraft to crest.

ARTICLE II: DESIGNATED USE AREAS ON RESERVOIRS

A. The General Manager of the District is authorized and may, from time to time, designate:
   1. Areas of a Reservoir exclusively for swimming, fishing, water skiing, operation of vessel or personal watercraft or a combination of such activities.
   2. Areas in which the operation of certain vessels, including personal watercraft, shall be prohibited or restricted or in which speed shall be restricted.

B. Such areas shall be clearly marked by buoys in accordance with Title 31, Chapter 55, Subchapter G of the Texas Administrative Code or signs indicating the boundaries, limits and purpose(s) of such designation.

C. No person shall engage in any activity in violation of such designated boundaries, limits or purpose(s).

D. This section shall not apply to vessels owned or operated by the District, the Texas Parks and Wildlife Department, or any other governmental agency having jurisdiction and in the performance of their official duties.

E. The General Manager of the District is authorized and may from time to time, designate areas upon the respective reservoirs for public waterfowl hunting. A map showing such areas shall be posted at each reservoir office.

ARTICLE III: BOATING

A. Watercraft on District reservoirs shall be equipped and operated in accordance with the provisions of the U.S. Coast Guard Inland Rules, as amended, which shall apply to all District lakes and reservoirs.

B. Watercraft on District reservoirs shall be equipped and operated in accordance with the provisions of the Texas Water Safety Act, Chapter 31, Texas Parks and

Wildlife Code; Texas Water Code, Title 2, Chapter 26; and Texas Administrative Code, Title 30, Chapter 321, Subchapter A, as amended, which shall apply to all District lakes and reservoirs.

C. In addition to the U.S. Coast Guard Inland Rules and the Texas Water Safety Act, the following rules and regulations concern the operation of watercraft in or upon District lakes and reservoirs.

1. No watercraft which is deemed to be unseaworthy shall be permitted to operate on District lakes. The District shall bear no responsibility for the safe condition, proper design, or safe operation of any boat or other craft placed in or upon the water controlled by the District. All craft and boats must be properly documented by the United States Government or licensed by the State of Texas and the certificate displayed as required by law.

2. No person shall operate or cause to be operated any watercraft equipped with a motor or internal combustion, engine, regardless of whether such a motor or engine is temporarily or permanently attached to said watercraft, on any of the waters of the reservoirs, unless such motor or engine is equipped with an efficient muffler, in good working order and in constant operation so as to prevent excessive noise and annoying smoke. No outboard motor or internal combustion engine shall be deemed equipped with an efficient muffler unless the exhaust gases are discharged underwater or are so muffled as to be not noisier or more annoying than an internal combustion engine of like power equipped with an underwater exhaust. No inboard motor or internal combustion engine shall be deemed equipped with an efficient muffler unless the exhaust gases are condensed and silenced by the continuous circulation of water through the exhaust manifold, or are so muffled as to be not noisier or more annoying than when so condensed and silenced by water circulation

through the exhaust manifold of an internal combustion engine of like power.

3. All watercraft with an enclosure capable of containing toilet facilities are required to affix to the windshield of such watercraft an inspection decal issued by the District. Such inspection decal will be issued by the District after inspection of the watercraft docked or operated on each District reservoir at such times and places as may be established by the District, for which inspection a reasonable fee will be charged in such amount as may be set from time to time by the District. Notice of the inspection times and places shall be given to the owners of all affected watercraft, either in person, by certified mail or by publication in a newspaper with general circulation in the locality of the reservoir where the watercraft is docked. After the fifth day following the expiration of the period designated for the inspection of the watercraft, no person shall have located on nor shall operate on the reservoirs of the District any watercraft unless a valid decal of inspection is displayed thereon as required in this section. Failure of the owners of watercraft to present such watercraft for inspection at the times and places designated by the District and failure to display such decal while locating or operating watercraft on District reservoirs shall constitute a violation of this Ordinance and be punishable as herein provided in Article XVIII. A Justice of the Peace, at his or her discretion, may dismiss the charge of operating a watercraft with an expired inspection decal if the defendant remedies this defect before the hearing. No person shall display or cause or permit to be displayed any inspection decal knowing the same to be fictitious or issued for another watercraft or issued without the required inspection having been made. No person may transfer an inspection certificate from one watercraft to another without the permission of the District.

4. No sewage from boats or watercraft may be emptied into District waters. In addition, any toilet located on or within any boat or other watercraft operated or maintained upon the waters of the District shall have a valid permit issued by the District and be a marine toilet having securely affixed to the discharge outlet a holding tank located on the boat, provided so as to meet the following specifications:
   a. The holding tank shall be constructed so as to allow the removal of the sewage only by pumping to onshore facilities approved by the District.
   b. The holding tank shall be constructed of material which will withstand the corrosive effects of the sewage and the disinfecting chemical used. It shall be so located as to minimize the possibility of rupture.
   c. The holding tank shall be properly vented to the outside of the boat in such a manner as not to defile the interior of the boat structure.
5. No airboat shall be allowed in or upon any District lake or reservoir except by special permit.
6. No watercraft in or upon District waters shall serve as a place of abode.
7. Use of sirens by watercraft with the exception of boats operated by District officers or other enforcement agencies is prohibited.
8. Boats shall not tow or pull by any means parasails or parachutes on any District lake or reservoir except by special permit.
9. No occupants of any boat may position themselves to be on or to be hanging or dangling over the bow, stern, or sides of the boat while the boat is under way.
10. The operators of watercraft shall obey all wake signs and other warning signs and buoys.
11. No boat or watercraft shall pass under a bridge or highway overpass at a

greater speed than headway speed.

12. No boat or watercraft shall approach closer than 100 feet to any area designated as a Forbidden Zone by the District.
13. No boat or watercraft shall approach closer than 100 feet to any other boat or watercraft at greater than headway speed.
14. No boat or watercraft shall approach closer than 100 feet at greater than headway speed to designated swimming areas, boathouse, docks, fishermen, shoreline or buoy marked lines except for launching and loading.
15. No person shall anchor, attach or moor to any permitted buoy that is closer than 100 feet to any shoreline, dock or boathouse.
16. No person controlling a watercraft shall leave the vessel in the water without fastening it to an anchorage, either in the water or upon the land, or the watercraft must be removed from the water at a sufficient distance to give assurance that it may not be caused to float away from its station because of rising water.
17. Any watercraft found abandoned or adrift in a District lake or reservoir, or any uninspected watercraft thereon, or any watercraft not in use found not anchored or grounded in compliance with Section 16 of this Article, shall be deemed to be a derelict, and shall be taken by the District and the District shall have a lien thereon for all unpaid license fees therefor, and the expenses of taking, towing and keeping the same, which shall be done at the owner's risk and without any liability whatever on the part of the District. Watercraft left unattended for more than thirty-six (36) hours shall be deemed to have been abandoned. This provision does not apply to watercraft properly secured in or at a permitted boat livery, marina, pier, dock, boathouse, barge or floating facility if the permitee of such facilities has granted permission for

said watercraft to be moored there. Such watercraft taken by the District shall be disposed of under the terms and provisions provided in Chapter 683 of the Texas Transportation Code for the disposition of abandoned motor vehicles. The District shall have all the rights and duties therein provided for a "law enforcement agency", such watercraft shall be treated the same as therein provided and the owners of such watercraft and of liens thereon, shall have all the rights and duties therein provided.

ARTICLE IV: ABANDONMENT OF PERSONAL PROPERTY OTHER THAN WATERCRAFT

A. No person shall abandon personal property on the Reservoir or on lands owned or controlled by the District.

B. If personal property is left unattended for a period of more than thirty-six (36) hours, it shall be deemed to have been abandoned. This rule does not apply to facilities properly permitted under Section X.

C. Abandoned personal property may be impounded by the District and held in custody. Such abandoned personal property may be reclaimed by the payment of one dollar per day storage fees plus additional cost to the District which was incurred in recovering the property from a reservoir or land and moving it to the site for storage.

D. Abandoned personal property which has been impounded and which has not been reclaimed within ninety (90) days from the date of impoundment by the payment of the above specified charge, may be sold, destroyed or otherwise disposed of by the District without liability to the owner thereof, as the District, in its sole discretion, deems appropriate with or without notice by the District.

ARTICLE V: WATER SKIING AND SIMILAR ACTIVITIES

A. Boats towing water skiers and the water skiers themselves may not approach closer than 100 feet of docks, swimming areas, other watercraft, fishermen or shoreline.

B. Personal watercraft and water skiing are not permitted on Marine Creek Lake except in designated areas by special permit from the District.

C. All persons riding personal watercraft, participating in wind surfing, skiing, aquaplaning or other similar activities, are required to wear a Coast Guard approved Type I, II, III or V personal flotation device.

ARTICLE VI: SWIMMING

A. No person is permitted to wade or swim within 100 feet of boat launching areas, except within buoyed swimming areas.

B. No person shall be at a distance of more than 100 feet from the shoreline unless accompanied by a boat, except within buoyed swimming areas.

ARTICLE VII: FIREARMS, EXPLOSIVES AND FIREWORKS

A. Except as provided in this section as to shotguns, no person may shoot, fire or discharge a firearm, explosive device, fireworks, pellet gun, BB gun, crossbow, longbow, slingshot, or any other impact device in, on, across, or along any District reservoir or lands except by special permit.

B. The use of shotguns with steel shot is allowed when used in the hunting of waterfowl during the season open to such hunting and upon District lands and waters located below spillway elevation at each respective reservoir and designated for such public hunting.

C. No firearms, fireworks or explosives of any type shall be permitted on Marine Creek Lake or surrounding lands.

D. Commercial fireworks may be discharged by special permit only and other fireworks may not be used in a dangerous manner over District lands or water.

E. This section does not apply to District peace officers or other representatives of the District or the Texas Parks and Wildlife Department in the discharge of their official duties.

ARTICLE VIII: HUNTING

All rules and regulations established by the Texas Parks and Wildlife Department regarding hunting shall apply to District land, lakes and reservoirs, where firearms are permitted.

ARTICLE IX: FISHING

All rules and regulations established by the Texas Parks and Wildlife Department regarding fishing shall apply to District lakes, reservoirs and watercourses.

ARTICLE X: IMPROVEMENTS ON DISTRICT PROPERTY

A. It is unlawful to construct, place or operate any improvement or facility of any type on land or water, or to excavate or place fill materials therein, below spillway elevation on Lake Bridgeport and Eagle Mountain Lake, and at or below the flood flowage boundary on Cedar Creek Reservoir and Richland-Chambers Reservoir, or on any land or water regulated or controlled by the District, unless an application has been submitted to the District and a written permit has been granted by the

District. Permits are also required for any additions and/or modifications. The District's Improvement Permit Guidelines are incorporated herein, and made a part hereof, as the Guidelines now exist or are hereafter amended.

B. Any wharf, dock, boat house or other such structure which is deemed dilapidated or abandoned by any District Officer or any other authorized District personnel shall be repaired by the owner so as to meet District standards or the permit for same may be revoked and such structure will be demolished or removed by the owner or the District at the owner's expense.

C. Any raw water intake for a purpose other than the irrigation of a shorefront single-family residence requires a water use contract with the District.

D. Fuel pumping facilities are not allowed on any noncommercial facility, or any watercraft.

E. District Officers have the right to inspect any facility constructed on or over District water or land at any reasonable time.

F. All permits for the placing of structures on land or water owned or controlled by the District shall be revocable by the District whenever the structure has become (1) dilapidated, (2) in violation of this Ordinance, (3) a hindrance to the operation of the District's lakes or reservoirs, or (4) a nuisance or (5) a hazard to navigation. The District can remove all such structures at owner's expense after revocation of applicable permits.

G. Failure of a permittee to proceed with the construction or repair of the improvements in accordance with the permit issued by the District or failure of the permittee to comply with any of the other terms and conditions of the permit constitutes Breach of License Regulations and may result in the revocation of the permit and/or a penalty for violation of this Ordinance as provided herein in Article XVIII. If the District determines that the construction of the improvements is not

proceeding in accordance with the permit issued by the District, the District will give the permittee written notice of such determination and permittee will have at least five (5) days in which to comply with the permit before the permit is revoked. The District may charge the permittee with fees to compensate the District for time expended by the District personnel in visiting the site to inspect the construction of the improvements if the District determines that construction is not in accordance with the permit. District reserves the right to remove the improvement at the owner's expense.

H. Any improvement or facility existing on the effective date of this ordinance or any amendment hereto, that is designed and/or operating in a manner not permitted by this ordinance shall be allowed to remain on District property until further order of the District. However, it will be designated as a noncomplying facility.

1. In the District's sole discretion, a noncomplying facility may be enlarged or altered if it is determined that same will not adversely affect public safety, health or navigation. Ordinary maintenance and repairs are permitted.
2. Should a noncomplying facility be removed or destroyed by any means to the extent that it would require substantial replacement, it will not be reconstructed except by permit and in compliance with the provisions of this ordinance.
3. Should a noncomplying facility be permanently moved for any reason, it shall be done by permit and thereafter comply to the provisions of this ordinance.
4. If a noncomplying facility becomes a hindrance to the operation of the District's reservoir, or a nuisance, or hazard to navigation, or becomes dilapidated or an environmental or safety hazard, it shall be removed at the owner's expense.

ARTICLE XI: COMMERCIAL ACTIVITIES

A. All commercial activities on the District's lakes, reservoirs and land are regulated by the District's Commercial Facilities Ordinance, which is incorporated herein by reference and made a part hereof as if quoted verbatim in this section as it now exists and as it may hereafter be amended.

B. Some commercial activities may require an additional or separate operating permit due to the nature of the operation. The issuance of this permit and the fee charged will be at the sole discretion of the District.

C. Community boat docks are considered operations subject to the District's Commercial Facilities Ordinance. Community boat docks will not be required to meet the insurance requirements or be charged the annual square foot fee specified in the Commercial Facilities Ordinance if they meet all of the following criteria:

   1. The community dock is 1200 square feet or less in size.
   2. There is no fee charged for the use of the slips other than a minimal maintenance fee.
   3. The slips are used only by current residents or property owners of the complex.

D. Notwithstanding any provision in the District's Commercial Facilities Ordinance to the contrary, the District has the sole discretion to deny any commercial facility permit if:

   1. The District determines that such a permit would cause or contribute to unsafe boat traffic and/or boat traffic congestion on the lake; or
   2. The District determines that the applicant and/or owner of the proposed commercial facility has not evidenced sufficient financial ability to complete or operate the commercial facility satisfactorily or in compliance with the District's Commercial Facilities Ordinance.

F. Any commercial water based facility which is deemed by any District Officer to be dilapidated or abandoned shall be repaired by the owner so as to meet District Ordinances or such facility will be demolished or removed by the District at the owner's expense.

ARTICLE XII: DESTRUCTION OF DISTRICT PROPERTY

It is unlawful to destroy, damage, deface, remove, render inefficient, relocate or remove any of the District's property, including, but not limited to, buoys, signs or warning devices upon land or upon water, without the prior written approval of the District.

ARTICLE XIII: MODIFICATION OF DISTRICT LANDS

Any modification of the natural conditions of topography or terrain of District lands without the written permit necessary for such activities is prohibited. If modifications are made contrary to the plans and specifications agreed upon by the District, the modifier may be required to return said District lands to their prior natural conditions of topography or terrain.

ARTICLE XIV: SANITATION

Sanitation activities are regulated by the District's On-Site Sewage Facilities Order, which is incorporated herein by reference as if quoted verbatim in this section as it now exists and as it may hereafter be amended, and all other applicable laws, rules, regulations and orders of any federal, state, local governmental agency of other regulatory agency having jurisdiction. Violation of the District's On-Site Sewage Facilities Order subjects the violator to civil and criminal penalties as provided in 30 Texas Administrative Code, Ch. 285.

A. A permit is required for the construction or placement of any container or on-site sewage facility on lands subject to the District's On-Site Sewage Facilities Order. A non-refundable permit application fee is required prior to on-site sewage facility construction. The permit will remain in force for a period of one year from the date of issue. If final inspection has not been, completed within this time the permit shall terminate, and a new application must be submitted with the appropriate fee.

B. It is prohibited to allow to remain on District land or waters dead animals, vegetables, grass clippings, food or any other matter of any kind which, by its decay, could pollute the land, air or water over which the District exercises jurisdiction,

C. It is prohibited for any person to discharge or release any type of garbage, trash, beverage containers or bodily waste into District reservoirs.

D. It is prohibited for any person or any manufacturing, industrial or commercial enterprise to throw or release any type of refuse into areas over which the District exercises jurisdiction.

E. It is prohibited for any person to place or operate any slaughterhouse or facility for the killing of animals or to place or operate any feed lot or other enclosure in which the refuse and accumulation could pollute the land, air or water over which the District exercises jurisdiction.

F. Refuse, including garbage, rubbish, and litter, shall be deposited onshore in approved type receptacles, which are maintained properly, with ultimate disposal in such a manner as to prevent the creation of a public health nuisance, as well as prevent possible entrance into the waters of the District.

G. Non-commercial fish cleaning stations are allowed. They must be operated in a manner as to not create a nuisance condition.

ARTICLE XV: POLLUTION PROHIBITED

The District owns and operates the various reservoirs named in this Ordinance and the District has a continuing responsibility and duty to supply therefrom the highest possible quality fresh water to large sections of Tarrant, Wise, Navarro, Henderson and surrounding counties of Texas, for domestic, municipal, agricultural, mining, industrial and other authorized uses. This duty includes, among other things, the responsibility to prevent pollution in the reservoirs of the District and in the drainage areas of these reservoirs.

The District shall continue to maintain surveillance programs on the watersheds above its lakes and reservoirs and to pursue a concerted water quality control program. Detection or reports of present or potential pollution from oil, gas or other hydrocarbons, from raw sewage, from hazardous waste, from garbage, sediment or from any other unpermitted discharge, shall be promptly and vigorously investigated by the District and reported to all governmental agencies having jurisdiction thereof, including the investigative and enforcement resources of the United States Environmental Protection Agency, the Texas Railroad Commission, the Texas Natural Resource Conservation Commission, the United States Army Corp of Engineers and the Texas Department of Health as well as any other federal, state or local agency, having jurisdiction of such matter.

Use of chemicals (including, but not limited to pesticides and herbicides) at or below the spillway level is prohibited unless a written permit is granted by the District. This will require submittal of a report detailing the type of chemical, target vegetation, application method, dose, estimated dispersion of chemical and potential threat to both human and wildlife.

All application or removal of paint must be performed in a manner so as not to allow any paint or paint residue to enter into or onto the water of the District.

No oil, gas or other hydrocarbons or any raw sewage, hazardous waste, garbage, sediment or other unpermitted discharge in any form or in combination with any other materials or constituents (including bilge water), from whatever source, shall be permitted to flow or be discharged into the District's reservoirs or onto the adjacent marginal lands and drainage areas, whether the cause of the flowage or discharge is an intentional act or caused by an accident.

The District shall immediately report the sighting of any form of water pollution to the operator or person responsible for such pollution and such operator or other person shall immediately remove such oil, gas or other hydrocarbons, raw sewage, hazardous waste, garbage, sediment or other unpermitted discharge from the waters and the marginal lands and drainage areas where it is found. Such removal operations will be at the sole expense of the operator or other person responsible for such pollution or in possession or control of the premises where such pollution occurs or where the act causing such pollution was committed.

If the operator or other person responsible for such pollution or in possession or control of the premises where such pollution occurs or where the act causing such pollution was committed fails to take immediate and effective remedial action to correct such pollution, the District may do so. The District is under no legal or other obligation to correct such pollution on behalf of the operator, or other person responsible for such pollution or in possession or control of the premises where such pollution occurs or where the act causing such pollution was committed, but if such action is taken by the District, such operator or other person shall be liable to forthwith reimburse the District for all costs incurred by the District in taking such action. Failure of the operator or other responsible person to promptly reimburse the District for such pollution clean-up costs will result in legal action by the District to enforce the liability for same.

The District may enjoin operations by any entity, or suspend any permit previously granted by the District for any operation, when it appears that the provisions of this article are being, have been or will be violated.

Any intentional violation hereof shall be punishable as provided in Article XVIII of this Ordinance.

ARTICLE XVI: WATER CONSERVATION AND DROUGHT MANAGEMENT PLAN

A. In order to reduce the loss and waste of water in District Reservoirs, to improve efficiency in the use of water, and to extend the life of current water supplies, especially during periods of drought, the District adopted a Lake Resident Water Conservation and Drought Management Plan.

B. All shoreline residents of District lakes and reservoirs shall comply with the Lake Resident Water Conservation and Drought Management Plan, as in effect from time to time.

ARTICLE XVII: EMERGENCY PROCEDURES

A. In order to protect properties and provide for the general welfare of the public, all access to District lakes, reservoirs and other waters may be restricted when it is deemed necessary.

B. Watercraft or persons found upon the waters of District lakes, reservoirs or other waters during times of restriction, without prior consent of the District or by virtue of other lawful reason, shall be guilty of a trespassing under Article I, Section 38 of this Ordinance.

C. Every officer, agent or employee of the District, while responding to emergency calls or reacting to emergency situations, is hereby authorized to act in such a

manner as to effectively deal with the emergency. An action or inaction is "effective" if it in any way contributes or can reasonably be thought to contribute to preserving any lives or property. This section of the Ordinance shall prevail over every other Ordinance of the District and, to the extent to which the District has authority to so authorize, over any other law establishing standards of care in conflict with this section. Neither the District nor the employee, agent or officer thereof, shall be liable for the failure to use ordinary care in such emergency. Subject to the above, the District's officers, agents or employees responding to an emergency or an emergency call shall use a reasonable rate of speed under the circumstances, using a vehicle or boat marked as belonging to the District, if such is available within a reasonable time under the circumstances of the emergency then existing, and shall take reasonable measures to prevent the destruction of property or injury to persons.

ARTICLE XVIII: VIOLATIONS OF THIS ORDINANCE

A. A person who violates a rule or regulation contained herein commits a Class C Misdemeanor as defined in Section 12.23, Texas Penal Code as amended, unless specifically provided otherwise by law. Each twenty-four (24) hour period of any violation constitutes a separate offense.

B. In addition to penal fines and penalties, failure to abide by any of the rules and regulations contained herein shall be punishable by a Civil Penalty of not less than ten dollars ($10.00) nor more than one thousand dollars ($1,000.00) for each violation or each day of a continuing violation. The penalty hereby authorized shall be in addition to any other penalties provided by the State of Texas. The District shall also be entitled to all available and applicable equitable relief, including but not limited to writs of injunction.

ARTICLE XIX: ENFORCEMENT

The Board of Directors of this District is authorized and empowered to contract for or employ peace officers. Each peace officer shall have the authority to enforce local laws and the laws of the State of Texas, the provisions of this Ordinance and any amendments hereto that may be adopted in accordance with the Texas Water Code and shall have all additional powers authorized by the Texas Water Code, the Texas Penal Code or any other law. Failure to obey instructions or warnings from all District officers shall be a violation of this Ordinance and punishable as provided herein in Article XVIII. A peace officer who arrests and or issues a citation to a person for a violation of this ordinance may deliver to the alleged violator a written notice to appear, within 15 days after the date of this notice, before a Justice of the Peace Court having jurisdiction of the offense. The person arrested or cited shall sign the notice to appear, promising to make an appearance in accordance with the requirements set forth in this notice. After signing the notice, the arrested person may be released. Failure to appear before the Justice Court having jurisdiction constitutes a violation of the District regulations. A warrant for the arrest of the person failing to appear may be issued.

ARTICLE XX: SEVERABILITY

In case any particular provision of this Ordinance, or any portion of any Article, section or paragraph hereof is judicially declared to be invalid, nevertheless, those parts of this Ordinance and its several subdivisions, which after such declaration, remain to afford a workable plan for accomplishing a purpose or purposes of this Ordinance shall have full force and effect.

ARTICLE XXI: LEGAL NOTICES REQUIRED

All provisions of this Ordinance not imposing a penalty for the violation thereof shall instantly be in full force and effect; however, those provisions thereof which provide penal penalties shall remain in suspense until the sixth day next after the appropriate officers of this District shall have caused substantive statements of all the penal provisions hereof to be published once a week for two consecutive weeks in one or more newspapers with general circulation in the area in which the property of the District is located; all to be done in manner and substance as provided by Chapter 340 of the General and Special Laws enacted by the 44th Legislature, at its Regular Session, now appearing as Sections 51.129, et seq., of the Texas Water Code, as amended.

ARTICLE XXII: PRESENT AND FUTURE LAKES

All provisions of this Ordinance shall be applicable to, any and all lakes or reservoirs constructed, operated or maintained by Tarrant Regional Water District, a Water Control and Improvement District, whether now in existence or hereafter constructed.

ARTICLE XXIII: RELATIONSHIP TO OTHER LAWS

Whenever regulations or restrictions imposed by this ordinance are either more or less restrictive than regulations or restrictions imposed by any governmental authority through legislation, rule, or regulation, the regulations, rules or restrictions which are more restrictive or which impose higher standards or requirements shall govern.

As evidence of the enactment hereof on the 19th day of March, 2002, and revision and amendment of same on this 15th day of November, 2011,

WITNESS the signing hereof on this day by Victor W. Henderson, as President of the Board of Directors of the District, and the attest hereof by Jack R. Stevens, as Secretary of the Board of Directors of the District, with the imprinting of the District's seal.

Victor W. Henderson, President

ATTEST:

Jack R. Stevens, Secretary

RESOLUTION OF THE BOARD OF DIRECTORS
OF
TARRANT REGIONAL WATER DISTRICT

April 15, 2008

WHEREAS, on March 27, 2007, the Tarrant Regional Water District, a Water Control and Improvement District (the "District") acquired title to an approximately 400 acre tract of land adjacent to Eagle Mountain Lake (the "Eagle Mountain Park") from the State of Texas; and

WHEREAS, the Board of Directors of the District has determined that it is in the best interests of the District and the public served by the District to preserve the Eagle Mountain Park as undeveloped, public access parkland; and

WHEREAS, the Board of Directors has determined that it is necessary and appropriate to amend the General Ordinance of the District to adopt and make known reasonable regulations concerning the public's recreational and business privileges on the Eagle Mountain Park.

NOW THEREFORE BE IT RESOLVED by the Board of Directors of the Tarrant Regional Water District that:

1. The General Ordinance of the District is hereby amended to insert the regulations concerning the public's recreational and business privileges on the Eagle Mountain Park attached hereto as Exhibit "A" (the "Eagle Mountain Park Regulations").

2. The General Manager of the District should be and is hereby authorized and directed to make such other non-substantive, conforming amendments to the General Ordinance of the District as may be necessary to implement the Eagle Mountain Park Regulations.

3. The District shall publish once a week for two consecutive weeks a substantive statement of the Eagle Mountain Park Regulations, and the penalties for violation thereof, in compliance with Section 51.129 of the Texas Water Code.

4. The penalty provisions of the Eagle Mountain Park Regulations shall be in full force and effect not earlier than the sixth day next after the second such publication.

5. The General Manager of the District should be and is hereby authorized to take such other and further actions as may be reasonably necessary to implement the Eagle Mountain Park Regulations and the foregoing resolutions in compliance with applicable law.

ADOPTED AND APPROVED this 15th day of April 2008.

TARRANT REGIONAL WATER DISTRICT, a Water Control and Improvement District

By: _____
Victor W. Henderson
President, Board of Directors

ATTEST:

_____
Jack R. Stevens
Secretary, Board of Directors

In addition to all other applicable provisions of this Ordinance, the following Article shall apply to the approximately 400 acres of parkland owned by the District and located in Tarrant County, Texas bordering the east side of Eagle Mountain Lake south of Peden Road and west of Morris Dido Newark Road (hereinafter, the "Park"):

A. General

1. The Park shall be open to the general public from thirty (30) minutes before Sunrise until thirty (30) minutes after Sunset. Other than at such times, no Persons (other than authorized District representatives) may enter into, or remain in, the Park.
2. No Person under the age of sixteen (16) is allowed in the Park unless accompanied by a competent adult over the age of eighteen (18).
3. No camping (whether overnight or otherwise) is allowed in the Park. No Person shall establish or maintain any camp or other temporary lodging or sleeping place within the Park.
4. No soliciting is allowed in the Park. No Person in the Park shall sell, or offer for sale, any good or service unless such sale is pursuant to a written contract approved by the District.
5. Activity which creates a public nuisance is prohibited in the Park. No Person shall engage in disruptive, destructive, or violent behavior which endangers (i) property, (ii) the natural habitat of the Park, or (iii) the health or safety of any Person or animal.
6. Visitors to the Park shall not create excessive noise, excessive being a level which disturbs (i) the natural habitat of the Park, (ii) other visitors of the Park or (iii) adjacent residents of the Park.
7. Indecent or abusive language of any nature is prohibited in the Park.
8. Adults are responsible for their minor children's actions. Children in the Park under the age of twelve (12) shall be accompanied and supervised by a competent adult over the age of eighteen (18) at all times.
9. The District shall have the right to exclude any Person from the Park who is deemed to be a risk to (i) the natural habitat of the Park or (ii) the health or safety of any Person or animal.

10. In addition to all other penalties provided in the General Ordinance of the District, a District Officer or law enforcement officer may order any Person violating this Article or any other provision of the General Ordinance of the District to immediately leave the Park, and no Person shall ignore such an order.

B. Habitat Preservation

1. The District is committed to preserving the ecology and natural habitat of the Park and intends to permit only low-impact recreational and educational uses of the Park. As such, the Park is a "no trace" and "low-impact" area and all Persons shall take appropriate precautions to (i) respect the natural ecology of the Park and (ii) preserve the natural habitat of the Park.

2. Motorized vehicles are prohibited in all areas the Park (except for emergency or maintenance use by designated District representatives, Park employees, peace officers, or emergency personnel). Wheel chairs, scooters, and similar mobility aids are permitted for Persons with disabilities.

3. No Person shall remove from the Park any property, natural feature or part thereof including, but not limited to, all buildings, equipment, signs, rocks, stones, mineral formations, earthen materials, wood, trees, shrubs, flowers, plants, nuts, or seeds. Plants may not be brought into the Park. The cutting or gathering of firewood in the Park is prohibited. Metal detectors are prohibited in the Park.

4. No Person shall injure, destroy, mark, or otherwise damage any property or natural feature located in the Park, including but not limited to, all buildings, equipment, signs, rocks, asphalt, concrete, mineral formations, earthen materials, wood, trees, shrubs, flowers, plants, nuts, or seeds. No Person shall disturb any archaeological, paleontological, or historical features of the Park.

5. No Person shall impound, or cause to be impounded, any waters of the Park or in any way alter or affect the normal flow of such waters without the express written permission of the District.
6. No Person shall deposit, discard, dump, or leave behind any garbage, solid waste, liquid waste, litter, or other material of any kind in the Park, except for materials arising from the normal use and enjoyment of the Park in receptacles which are provided for such purpose.
7. Visitors are prohibited from disturbing, feeding, collecting, or releasing animals in the Park. No Person shall hunt, capture, take, trap, or in any other way abuse, molest, injure, pursue, or destroy any animal or flora in the Park.
8. No Person shall move, injure, or destroy any bird nest, bird egg, or any other animal habitation in the Park. No Person shall disturb the wildlife and their natural habitat.
9. Visitors are prohibited from carving, painting, or otherwise marking any tree, fence, rock, building, or other structure or material located in the Park. Visitors are prohibited from physically altering the location of any barrier, fence, or similar control device located in the Park.
10. No Person shall display, erect, or attach any sign, placard, notice, advertisement, circular, banner, or statement of any kind within the Park which will adversely affect the natural habitat or ecology of the Park.
11. Smoking is strictly prohibited in the Park.
12. No Person shall start or maintain a fire or open flame in the Park.

C. Health and Safety

1. Consumption or possession of alcoholic beverages in the Park is prohibited. No Person shall consume, or be under the influence of, illegal drugs in the Park. Intoxicated Persons shall not be allowed in the Park.
2. No pets or animals (including dogs and horses) are allowed in the Park. Service animals are permitted for Persons with disabilities.
3. No Person in the Park shall carry or possess weapons of any kind, including, but not limited to, firearms, knives, bow and arrows, crossbows,

air guns, slingshots, paintball guns, tasers, dangerous gases or sprays, and dangerous projectile-throwing or impact devices. No Person shall cause any such devices to be discharged in any Park area.

4. No Person shall bring or use glass containers in the Park.

5. The use of bicycles is permitted in the Park on designated trails, provided that:

   (a) Riders under the age of twelve (12) have constant, uninterrupted adult supervision;

   (b) The rider exhibits prudent judgment at all times, taking into account the natural habitat of the Park and the safety of other Persons and animals;

   (c) The rider's speed is kept below fifteen (15) miles per hour;

   (d) The rider yields at all times to pedestrians;

   (e) Proper safety equipment is worn at all times; and

   (f) No Person may ride bicycles in Park pavilions or similar areas;

6. The use of skateboards, roller skates, roller blades, and similar devices is prohibited in the Park.

7. Persons jogging or running along the trails of the Park shall yield to those Persons walking.

8. No Person in the Park shall possess, or cause to ignite or detonate, any form of fireworks or explosives.

9. No Person in the Park shall appear in a state of nudity or commit, perform or engage in any lewd, lascivious, obscene, illicit, or indecent act.

10. No Person in the Park shall solicit or procure participants for, engage in or promote any game or activity, which is played for money or other things of value.

D. Exemptions

1. The acts of the following Persons shall be exempt from this Article only to the extent necessary for the performance of their authorized duties: (i) the District, its employees and agents; (ii) law enforcement agencies; and (iii) emergency personnel.

2. The General Manager of the District, or his authorized designee, may, from time to time, conduct or permit activities which are otherwise prohibited by this Article.

E. Construction

1. In the event of any conflict between the provisions of this Article and the other provisions of the General Ordinance of the District, the provisions of this Article shall prevail with respect to the Park.
2. The Board of Directors of the District shall have the authority to modify this Article at any time, and the General Manager of the District is authorized in his sole discretion to revoke, suspend, or modify any Person's privileges of use of the Park upon good cause.
3. Disputes or questions of interpretation or uncertainty arising out of this Article shall be considered by the General Manager of the District, or his authorized designee, who will render a final determination.

TARRANT REGIONAL WATER DISTRICT

BOARD OF DIRECTORS
Victor W. Henderson, President
Hal S. Sparks III, Vice President
Jack R. Stevens, Secretary
James W. Lane
Martha V. Leonard

James M. Oliver
General Manager

WESTERN RESERVOIR OPERATIONS
10201 North Shore Drive
Fort Worth, Texas 76135
Telephone 817-237-8585
FAX 817-237-8563

BRIDGEPORT LAKE
Improvement Permit Guidelines

A permit is required for all construction, placement or operation of any structure, improvement of facility of any type, or to excavate or place fill materials, at or below elevation 836.00 (expressed in feet above mean sea level). This includes any addition or modification to any existing structure or improvement.

The conservation or spillway elevation of Bridgeport Lake is 836.00 feet above m.s.l. The current 100-year flood level is 842.60. Due to the potential of shoreline flooding the District purchased a flood easement that encompasses the property between the conservation level of 836.00 and elevation 851.00. Bridgeport Lake is a water supply and water conservation project and the level of water in the lake will vary depending on the amount of water used from the lake, evaporation rates, amounts of rainfall and runoff in the reservoir watershed and other factors.

The following must be submitted before a permit will be considered:

1. A completed application, including signatures of owner, contractor, and master electrician (when applicable).

2. A recorded plat of the property showing the shore front dimensions and location of the improvement.

3. Proof of ownership of the property (i.e. copy of deed, tax statement, sales contract).

4. Plans, specifications, construction details and a list of materials to be used. The drawing must be to scale, one inch to thirty feet (1 inch = 30 feet) or larger and include views from all five sides when applicable (see Attachments # 1, 2, 3,).

5. A $100.00 non-refundable application fee. Please make check or money order payable to TRWD. **CASH WILL NOT BE ACCEPTED!**

6. Outside corners of the lot at roadside and at elevation 836.00 feet m.s.l. **must** be clearly marked at the time of the pre-permit inspection for a permit to be issued and remain marked throughout the construction process.

7. A copy of the contractor's general liability insurance policy. The District requires that all contractors working on District Reservoirs provide a Certificate of Insurance. Each certificate must name Tarrant Regional Water District as additional insured, as well as provide a waiver of subrogation. Liability coverage shall be no less than $500,000 per occurrence.

Applicants should allow 10 working days for the processing of all permit applications. A construction permit is valid for a period to be determined by the District, with a minimum of 30 days and a maximum of 90 days. A construction extension may be granted at the sole discretion of the District. The extension fee is $50.00 and is valid for a period to be determined by the

District with a maximum of 90 days. No more than one extension will be granted. Permits are required for alterations on existing structures. The $100.00 fee may be waived, at the discretion of the District, for applications requesting additions to existing structures. Other than general maintenance, construction is not permitted without an approved written permit.

Any construction without a permit is a violation of the General Ordinance. At any time the condition or presence of this improvement interferes with the operation of the reservoir or the safety of the persons or property using the surface thereof, the Owner agrees to immediately make any and all changes or corrections necessary to make the improvement comply with the General Ordinance or remove the improvement from District property at Owner's expense. A person who violates the General Ordinance commits an offense. An offense is a Class C Misdemeanor and shall be subject to a civil penalty of not less than $10.00 and not more than $1000.00 for each violation or each day of continuing violation.

GUIDELINES FOR RETAINING WALLS, DREDGING, AND FILL WORK

1. Retaining walls shall be constructed in a manner that improves the shoreline alignment. If an eroded area along the shoreline is approved by the District to be reclaimed then the backfill material must also be reclaimed from the reservoir.

2. Approved materials for seawalls include concrete, soil cement, minimum 8 gauge steel sheet piling, PVC sheet piling, pressure treated lumber, and rip rap. Other materials with a long life expectancy will be considered. Creosote materials will not be approved.

3. All dredging activity must be performed in such a manner that will maintain a gently sloping lake bottom and prevent the formation of holes or sudden drop-offs.

4. All construction activities disturbing the soil at or below the flood flowage boundary of the reservoir must employ erosion control practices to minimize the amount of sediment entering the reservoir.

5. All dredged materials shall be placed in such a manner as to prevent any sediment runoff back into the reservoir. Containment and/or silt screens may be required.

6. The District recommends that before any dredging contractor begins work that he/she first call 1-800-DIGTESS (1-800-344-8377) to determine if underground utilities are located in the area.

GUIDELINES FOR RAW WATER USAGE

1. The use of raw water from Bridgeport Lake for irrigation purposes shall be limited to irrigation of residential shoreline property that is contiguous to the reservoir.

2. Water transmission lines will not be allowed to cross any public thoroughfare.

3. The electrical services shall be installed by a Master Electrician in accordance with the National Electric Code as amended and revised (see Attachment #4). The District performs cursory electrical inspections for general compliance **only**. The Master Electrician is responsible to inspect all electrical components to ensure that the installation meets all requirements specified in the National Electric Code.

4. A permit fee of $100.00 will be assessed.

5. Submersible pumps for residential irrigation and fish cleaning stations **shall not** be placed in District Reservoirs.

6. The intake for above ground pumps will be located and anchored in a manner so as not to be a hazard to navigation or recreation.

7. Raw water may be plumbed to one fish cleaning station only. It is the homeowners responsibility to see that the operation and condition of the fish cleaning station does not become a nuisance

GUIDELINES FOR STRUCTURE IMPROVEMENT

1. If a residence cannot be built or placed on a lot, an improvement may not be permitted for that property.

2. Community boat structures will be considered commercial operations and therefore fall under the Commercial Facilities Ordinance.

3. The area measured is to be the largest area at the end of a walkway. The largest area may be either the outside corners of the structure or the roofline if it has more than a two-foot overhang.

4. The maximum size allowed for any structure is determined as follows:

    a. Eight (8) square feet of structure is allowed per linear foot of shoreline owned up to 150 linear feet (1200 square feet).

    b. An additional four (4) square feet of structure is allowed for each linear foot of shoreline owned from 151-250 linear feet (1,204-1,600 square feet).

    c. An additional two (2) square feet of structure is allowed for each linear foot of shoreline owned from 251-450 linear feet (1,602-2,000 square feet).

    d. An additional one (1) square foot of structure is allowed for each linear foot of shoreline owned over 450 linear feet.

    e. The area measurement shall exclude one walkway not to exceed eight (8) feet wide to one structure only. If there is more than one structure approved for the property then the entire area of the second, as well as any additional structures, shall be included in the area measurement. The distance the structure extends into the reservoir shall be kept as short a distance as is practical so as not to impair navigation and to maintain continuity with the shoreline. The maximum square footage may not be allowed in all cases.

5. Where large undivided tracts or multiple lots are used to determine the maximum area of an improvement, an agreement shall be signed and recorded whereby the linear footage of shoreline for a certain area is set aside and cannot be used for the future determination of other structures.

6. No part of an improvement can be closer than five feet to the property line, excluding fences, sidewalks and retaining walls. Structures over 1200 square feet must be twenty feet from property lines.

7. No structure may occupy more than one third of any channel width and in no case shall any part of the structure come within ten feet of the centerline of the channel. Exceptions may be granted for structures located at the end of a channel.

8. There will be no living quarters built over any area below the spillway elevation of a reservior whether it be spanned, cantilevered or by other means.

9. Enclosed structures are not allowed on District Reservoirs. In order to protect a raised boat within a dock from the elements, solid sides on the dock will only be permitted for a maximum of two (2) feet downward from the point where the ceiling joist meets the top plate. No additional materials (i.e. lattice, fencing, bars, screen fabric, doors, glass, etc.) may be installed below the two (2) foot sidewall.

10. A small storage area is allowed on the first floor (lower deck) of the structure for storing tackle, life jackets, etc. Products considered hazardous or which have warning labels prohibiting it's use near public water supplies shall not be stored in these areas. A twenty (20) square foot enclosure shall be considered maximum for any such storage area.

11. No toilet facilities of any type will be allowed on structures. A portable water supply can only be plumbed to one fish cleaning station on the first floor (lower deck). No plumbing will be allowed on upper deck.

12. Fuel pumping facilities are not allowed on any non-commercial facility or watercraft.

13. A three-story sun deck will not be approved.

14. Any structure that extends more than fifty feet from the shoreline shall be equipped with a photocell light that operates continually from dusk till dawn. At the discretion of the District additional lighting may be required on docks exceeding 50 feet. Circumstances may require that lighting be placed on docks which are less than 50 feet in length. The light must be capable of sufficiently illuminating the structure and shall be white. It is the homeowner's responsibility to ensure that all permanent lighting required by the District is properly maintained and operational at all times. The homeowner or contractor may also be required to provide temporary safety lighting during the construction of any improvement extending into the reservoir. If required, lighting must be located on the end of the structure during construction and remain until permanent lighting is installed.

15. The first floor (lower deck) of a structure shall be no less than 18 inches above elevation 836.00 feet msl.

16. The electrical services shall be installed by a Master Electrician in accordance with the National Electric Code as amended and revised. A complete electrical plan must be provided with the application (see Attachment #4). The District performs cursory electrical inspections for general compliance **only**. The Master Electrician is responsible to inspect all electrical components to ensure that the installation meets all requirements specified in the National Electric Code.

17. All materials exposed to the elements shall be cedar, redwood, treated wood, concrete or steel materials. Other materials with long life expectancy will be considered. No metal barrels may be used for flotation. Only extruded (closed cell) polystyrene or foam bead expanded polystyrene that is encased in a high quality protective cover and that has been approved by the District may be used for flotation. Any replacement of flotation on existing structures must be made using the approved encapsulated polystyrene. Creosote treated materials will not be permitted below conservation level.

18. All connections below the walkway shall be bolted with galvanized, zinc plated, cadmium plated or stainless steel bolts. Steel materials may be welded. Other connections may be nailed or attached by screws.

19. All construction activities disturbing the soil at or below the flood flowage boundary of the reservoir must employ erosion control practices to minimize the amount of sediment entering the reservoir.

20. Steel pilings shall be a minimum of two and seven eighths inches (2 7/8) in diameter. Wood pilings must be pressure treated and at least six inches in diameter. Creosote pilings will not be allowed.

21. The roof of a structure shall have a maximum of 6 in 12 pitch.

22. The attic space created by the roof design may be utilized as storage or as a temporary day-shelter from the elements provided it's built in accordance with the District's roof pitch requirements. This space **shall not** have raw water, potable water, or sewage disposal facilities plumbed into it. This space cannot be utilized as living quarters.

23. A permit issued by the District in no way releases the improvement owner from the responsibility of meeting the requirements of Federal, State, County or City regulations or any Development Deed Restrictions that may apply.

24. Circumstances will arise in which some of the above guidelines may not be practicable. In these cases, the District management reserves the right to use its own discretion.

25. Improvements are placed on District property at the District's sole discretion.

BRIDGEPORT LAKE AREA

Dock Builders, Retaining Walls, & Erosion Control

Docks & More (Daryl Mills) ..... (817) 220-5249
Molsbee Unlimited (Keith Molsbee) ..... (940) 841-1002
Earp Steel Buildings & Boat Docks..... (940) 644-2135
Perkins Pile Driving (Gary Staley)` ..... (817) 233-8560
Superior Paving Systems (Randy Staley)……(817) 371-1976
……(817) 220-0413

The above contractors have requested to be included in this packet. Other contractors may be acceptable or property owners may do their own construction. The District does not endorse any of the contractors listed, it is provided simply for the convenience of the property owners. This list is revised from time to time without notice.

On-Site Sewage Facilities (OSSF) located within 2000' of the conservation level of Bridgeport Lake (836.00 m.s.l.) require a permit issued by the District. Information and application packets are available at any District Office

APPLICATION FOR IMPROVEMENT PERMIT

Permit #: _____ Approved Square Footage: _____

Date Issued: _____ Expiration Date: _____

Type of Improvement: _____

Special Conditions: _____

Approved by: _____ Receipt #: _____

FOR DISTRICT USE ONLY, DO NOT WRITE ABOVE THIS LINE

Lake: _____ Application Date: _____

Owner: _____ Phone #: _____

Mailing Address: _____

Address of Permit: _____

Lot: _____ Block: _____ Addition: _____

Description of Improvement: _____

_____

_____

Contractor	Phone	Type of Work
1.		
2.		

Owner and Contractor agree to accomplish the construction in strict compliance with the plans and specifications and construction must be completed prior to the expiration of the permit. Owner or contractor must notify the District to arrange for a general inspection upon completion.

Owner represents that he owns and/or controls the above referenced property and that he will comply with all applicable laws, ordinances, rules, and regulations of governmental agencies concerning the construction, specifically including but not limited to the General Ordinance of the District and the ordinances, rules and regulations of the United States Army Corp of Engineers, the United States Environmental Protection Agency, and the Texas Commission on Environmental Quality. The Owner further represents that he will not be in violation of any regulations or restrictions imposed by any Country of Municipal agency or by any deed restrictions which may be attached to the property and that any required variance has been secured. The District assumes no responsibility for, and the Owner will hold the District harmless from, disputes of title, rights, or liability for damages to persons or property arising from the construction maintenance or existence of such improvements. At any time the condition or presence of this improvement interferes with the operation of the reservoir or the safety of the persons or property using the surface thereof, the Owner agrees to immediately make any and all changes or corrections necessary to make the improvement comply with the General Ordinance or remove the improvement from District property at the Owner's expense.

By acceptance of the subsequent permit, you hereby release and discharge Tarrant Regional Water District and its agents, and directors, and agree that Tarrant Regional Water District shall not be held liable or responsible for, and shall be indemnified and held harmless by, you, your successors, assigns, and heirs, from and against any and all claims and damages of every kind for injury indirect, to operation, use, or existence, of the improvement which you are requesting permission to construct on the District's Reservoir, or from any act of the District, its agents, or directors, including the operation BASED IN WHOLE OR IN PART ON THE ALLEGED NEGLIGENCE OR OTHER TORT OF TARRANT REGIONAL WATER DISTRICT OR ITS AGENTS OR DIRECTORS, THE PARTIES HERETO INTENDING TO THE EXPRESS NEGLIGENCE DOCTRINE.

This release and indemnification shall survive termination or expiration of the permit.

Agreed to by the undersigned this _____ day of _____, 20_____.

_____ _____

Property Owner Contractor

trwd
Tarrant Regional Water District

Application for Improvement Permit

Permit #: _____ Approved Square Footage: _____

Date Issued: _____ Expiration Date: _____

Type of Improvement:_____

Special Conditions:_____

Approved by: _____ Receipt #: _____

FOR DISTRICT USE ONLY. DO NOT WRITE ABOVE THIS LINE.

Lake: _____ Application Date: _____

Owner: _____ Phone #:_____

Mailing Address: _____

Address of Permit: _____

Lot: _____ Block: _____ Addition: _____

Description of Improvement: _____

_____

Contractor	Phone	Type of Work
1._____		
2._____		

Owner and Contractor agree to accomplish the construction in strict compliance with the plans and specifications and construction must be completed prior to the expiration of the permit. Owner or contractor must notify the District to arrange for a general inspection upon completion.

Owner represents that he owns and/or controls the above referenced property and that he will comply with all applicable laws, ordinances, rules and regulations of governmental agencies concerning this construction, specifically including but not limited to the General Ordinance of the District and the ordinances, rules and regulations of the United States Army Corp of Engineers, the United States Environmental Protection Agency, and the Texas Natural Resource Conservation Commission. The Owner further represents that he will not be in violation of any regulations or restrictions imposed by any County or Municipal Agency or by any deed restrictions which may be attached to the property and that any required variance has been secured. The District assumes no responsibility for, and the Owner will hold the District harmless from, disputes of title, rights, or liability for damages to persons or property arising from the construction, maintenance, or existence of such improvements. At any time the condition or presence of this improvement interferes with the operation of the reservoir or the safety of the persons or property using the surface thereof, the Owner agrees to immediately make any and all changes or corrections necessary to make the improvement comply with the General Ordinance or remove the improvement from District property at Owner's expense.

By acceptance of the subsequent permit, you hereby release and discharge Tarrant Regional Water District and its agents, and directors, and agree that Tarrant Regional Water District shall not be held liable or responsible for, and shall be indemnified and held harmless by you, your successors, assigns, and helps, from and against any and all claims and damages of every kind for injury indirectly, to operation, use, or existence, of the improvement which you are requesting permission to construct on the District's Reservoir, or from any act of the District, its agents and directors including the operation BASED IN WHOLE OR IN PART ON THE ALLEGED NEGLIGENCE OR OTHER TORT OF TARRANT REGIONAL WATER DISTRICT OR ITS AGENTS OR DIRECTORS, THE PARTIES HERETO INTENDING HEREBY TO SATISFY THE EXPRESS NEGLIGENCE DOCTRINE.

This release and indemnification shall survive termination or expiration of the permit,

Agreed to by the undersigned this _____ day of _____ 20____.

_____ _____

Property Owner Contractor

_____

Contractor

CEDAR CREEK LAKE

Improvement Permit Guidelines

A permit is required for all construction, placement or operation of any structure, improvement of facility of any type, or to excavate or place fill materials, at or below elevation **325.00'** (expressed in feet above mean sea level). This includes any addition or modification to any existing structure or improvement.

The conservation or spillway elevation of **Cedar Creek Lake** is **322.00** feet above m.s.l. The current 100 year flood level is **325.00**. Due to the potential of shoreline flooding the District purchased a flood easement that encompasses the property between the conservation level of **322.00** and elevation **325.00**. Cedar Creek Lake is a water supply and water conservation project and the level of water in the lake will vary depending on the amount of water used from the lake, evaporation rates, amounts of rainfall and runoff in the reservoir watershed and other factors.

The following must be submitted before a permit will be considered:

1. A completed application, including signatures of owner and contractor.

2. A recorded plat of the property showing the shore front dimensions and location of the improvement.

3. Proof of ownership of the property (i.e. copy of deed, tax statement, sales contract).

4. Plans, specifications, construction details and a list of materials to be used. The drawing must be to scale, one inch to thirty feet (1 inch = 30 feet) or larger and include views from all five sides when applicable.

5. A $100.00 non-refundable application fee. Please make check or money order payable to TRWD. **CASH WILL NOT BE ACCEPTED!**

6. Outside corners of the lot at roadside and at elevation **325.00** feet m.s.l. **must** be clearly marked at the time of the pre-permit inspection for a permit to be issued and remain marked throughout the construction process.

7. A copy of the contractor's general liability insurance policy. The District requires that all contractors working on District Reservoirs provide a Certificate of Insurance. Each certificate must name Tarrant Regional Water District as additional insured, as well as provide a waiver of subrogation. Liability coverage shall be no less than $500,000 per occurrence.

Applicants should allow 10 working days for the processing of all permit applications. A construction permit is valid for a period to be determined by the District, with a minimum of 30 days and a maximum of 90 days. A construction extension may be granted at the sole discretion of the District. The extension fee is $50.00 and is valid for a period to be determined by the District with a maximum of 90 days. No more than one extension will be granted. Permits are required for alterations on existing structures. The $100.00 fee may be waived, at the discretion of the District, for applications requesting additions to existing structures. Other than general maintenance, construction is not permitted without an approved written permit.

Any construction without a permit is a violation of the General Ordinance. At any time the condition or presence of this improvement interferes with the operation of the reservoir or the safety of the persons or property using the surface thereof, the Owner agrees to immediately

make any and all changes or corrections necessary to make the improvement comply with the General Ordinance or remove the improvement from District property at Owner's expense. A person who violates the General Ordinance commits an offense. An offense is a Class C Misdemeanor and shall be subject to a civil penalty of not less than $10.00 and not more than $1000.00 for each violation or each day of continuing violation.

GUIDELINES FOR RETAINING WALLS, DREDGING, AND FILL WORK

1. Retaining walls shall be constructed in a manner that improves the shoreline alignment. If an eroded area along the shoreline is approved by the District to be reclaimed then the backfill material must also be reclaimed from the reservoir.

2. Approved materials for seawalls include concrete, soil cement, minimum 8 gauge steel sheet piling, PVC sheet piling, pressure treated lumber, and rip rap. Other materials with a long life expectancy will be considered. Creosote materials will not be approved.

3. All dredging activity must be performed in such a manner that will maintain a gently sloping lake bottom and prevent the formation of holes or sudden drop-offs.

4. All construction activities disturbing the soil at or below the flood flowage boundary of the reservoir must employ erosion control practices to minimize the amount of sediment entering the reservoir.

5. All dredged materials shall be placed in such a manner as to prevent any sediment runoff back into the reservoir. Containment and/or silt screens may be required.

6. The District recommends that before any dredging contractor begins work that he/she first call 1-800-DIGTESS (1-800-344-8377) to determine if underground utilities are located in the area.

GUIDELINES FOR IRRIGATION SYSTEMS

1. The use of raw water from **Cedar Creek** for irrigation purposes shall be limited to irrigation of residential shoreline property that is contiguous to the reservoir.

2. Water transmission lines will not be allowed to cross any public thoroughfare.

3. The electrical services shall be installed in accordance with the National Electric Code as amended and revised. The District performs cursory electrical inspections for general compliance **only**. The homeowner is advised to have a licensed electrician, electrical inspector, or other professional with expertise in electrical installations to inspect all electrical components to ensure that the installation meets all requirements specified in the National Electric Code.

4. A permit fee of $100.00 will be assessed.

5. Submersible pumps shall not be placed in District Reservoirs.

6. The intake for above ground pumps will be located and anchored in a manner so as not to be a hazard to navigation or recreation.

GUIDELINES FOR STRUCTURE IMPROVEMENT

1. If a residence cannot be built or placed on a lot, an improvement may not be permitted for that property.

2. Community boat structures will be considered commercial operations and therefore fall under the Commercial Facilities Ordinance.

3. The area measured is to be the largest area at the end of a walkway. The largest area may be either the outside corners of the structure or the roofline if it has more than a two-foot overhang.

4. The maximum size allowed for any structure is determined as follows:

    a. Eight (8) square feet of structure is allowed per linear foot of shoreline owned up to 150 linear feet (1200 square feet).

    b. An additional four (4) square feet of structure is allowed for each linear foot of shoreline owned from 151-250 linear feet (1,204-1,600 square feet).

    c. An additional two (2) square feet of structure is allowed for each linear foot of shoreline owned from 251-450 linear feet (1,602-2,000 square feet).

    d. An additional one (1) square foot of structure is allowed for each linear foot of shoreline owned over 450 linear feet.

    e. The area measurement shall exclude one walkway not to exceed eight (8) feet wide to the structure. The distance the structure extends into the reservoir shall be kept as short a distance as is practical so as not to impair navigation and to maintain continuity with the shoreline. The maximum square footage may not be allowed in all cases.

5. Where large undivided tracts or multiple lots are used to determine the maximum area of an improvement, an agreement shall be signed and recorded whereby the linear footage of shoreline for a certain area is set aside and cannot be used for the future determination of other structures.

6. No part of an improvement can be closer than five feet to the property line, excluding fences, sidewalks and retaining walls. Structures over 1200 square feet must be twenty feet from property lines.

7. No structure may occupy more than one third of any channel width and in no case shall any part of the structure come within ten feet of the centerline of the channel. Exceptions may be granted for structures located at the end of a channel.

8. There will be no living quarters built over any area below the spillway elevation of a reservior whether it be spanned, cantilevered or by other means.

9. Enclosed structures are not allowed on District Reservoirs. In order to protect a raised boat within a dock from the elements, solid sides on the dock will only be permitted for a maximum of two (2) feet downward from the roofline. No additional materials (i.e. lattice, fencing, bars, screen fabric, doors, glass, etc.) may be installed below the two (2) foot sidewall.

10. A small storage area is allowed on the structure for tackle, life jackets, etc. A twenty (20) square foot enclosure shall be considered maximum for any such storage area.

11. No toilet facilities of any type will be allowed on structures.

12. Fuel pumping facilities are not allowed on any non-commercial facility or watercraft.

13. A three-story sun deck will not be approved.

14. Any structure that extends more than fifty feet from the shoreline shall be equipped with a light from dusk to dawn. At the discretion of the District, additional lighting may be required on docks exceeding 50 feet. Circumstances may require that lighting be placed on docks, which are less than 50 feet in length. The light must be capable of sufficiently illuminating the structure and shall be white. The homeowner or contractor may also be required to provide temporary safety lighting during the construction of any improvement extending into the reservoir. If required, lighting must be located on the end of the structure during construction and remain until permanent lighting is installed.

15. The deck of a structure shall be no less than 18 inches above elevation **322.00** feet msl.

16. The electrical services shall be installed in accordance with the National Electric Code as amended and revised. A complete electrical plan must be provided with the application. The District performs cursory electrical inspections for general compliance **only**. The homeowner is advised to have a licensed electrician, electrical inspector, or other professional with expertise in electrical installations to inspect all electrical components to ensure that the installation meets all requirements specified in the National Electric Code.

17. All materials exposed to the elements shall be cedar, redwood, treated wood, concrete or steel materials. Other materials with long life expectancy will be considered. No metal barrels may be used for flotation. Only extruded (closed cell) polystyrene or foam bead expanded polystyrene that is encased in a high quality protective cover and that has been approved by the District may be used for flotation. Any replacement of flotation on existing structures must be made using the approved encapsulated polystyrene. Creosote treated materials will not be permitted below conservation level.

18. All connections below the walkway shall be bolted with galvanized, zinc plated, cadmium plated or stainless steel bolts. Steel materials may be welded. Other connections may be nailed or attached by screws.

19. All construction activities disturbing the soil at or below the flood flowage boundary of the reservoir must employ erosion control practices to minimize the amount of sediment entering the reservoir.

20. Steel pilings shall be a minimum of two and seven eighths inches (2 7/8) in diameter. Wood pilings must be pressure treated and at least six inches in diameter. Creosote pilings will not be allowed.

21. The roof of a structure shall have a maximum of 4 in 12 pitch.

22. A permit issued by the District in no way releases the improvement owner from the responsibility of meeting the requirements of Federal, State, County or City regulations or any Development Deed Restrictions that may apply.

23. Circumstances will arise in which some of the above guidelines may not be practicable. In these cases, the District management reserves the right to use its own discretion.

24. Improvements are placed on District property at the District's sole discretion.

trwd
Tarrant Regional Water District

Application for Improvement Permit

Permit #: _____ Approved Square Footage: _____

Date Issued: _____ Expiration Date: _____

Type of Improvement:_____

Special Conditions:_____

Approved by: _____ Receipt #: _____

FOR DISTRICT USE ONLY. DO NOT WRITE ABOVE THIS LINE.

Lake: _____ Application Date: _____

Owner: _____ Phone #:_____

Mailing Address: _____

Address of Permit: _____

Lot: _____ Block: _____ Addition: _____

Description of Improvement: _____

_____

Contractor	Phone	Type of Work
1._____		
2._____		

Owner and Contractor agree to accomplish the construction in strict compliance with the plans and specifications and construction must be completed prior to the expiration of the permit. Owner or contractor must notify the District to arrange for a general inspection upon completion.

Owner represents that he owns and/or controls the above referenced property and that he will comply with all applicable laws, ordinances, rules and regulations of governmental agencies concerning this construction, specifically including but not limited to the General Ordinance of the District and the ordinances, rules and regulations of the United States Army Corp of Engineers, the United States Environmental Protection Agency, and the Texas Natural Resource Conservation Commission. The Owner further represents that he will not be in violation of any regulations or restrictions imposed by any County or Municipal Agency or by any deed restrictions which may be attached to the property and that any required variance has been secured. The District assumes no responsibility for, and the Owner will hold the District harmless from, disputes of title, rights, or liability for damages to persons or property arising from the construction, maintenance, or existence of such improvements. At any time the condition or presence of this improvement interferes with the operation of the reservoir or the safety of the persons or property using the surface thereof, the Owner agrees to immediately make any and all changes or corrections necessary to make the improvement comply with the General Ordinance or remove the improvement from District property at Owner's expense.

By acceptance of the subsequent permit, you hereby release and discharge Tarrant Regional Water District and its agents, and directors, and agree that Tarrant Regional Water District shall not be held liable or responsible for, and shall be indemnified and held harmless by you, your successors, assigns, and helps, from and against any and all claims and damages of every kind for injury indirectly, to operation, use, or existence, of the improvement which you are requesting permission to construct on the District's Reservoir, or from any act of the District, its agents and directors including the operation BASED IN WHOLE OR IN PART ON THE ALLEGED NEGLIGENCE OR OTHER TORT OF TARRANT REGIONAL WATER DISTRICT OR ITS AGENTS OR DIRECTORS, THE PARTIES HERETO INTENDING HEREBY TO SATISFY THE EXPRESS NEGLIGENCE DOCTRINE.

This release and indemnification shall survive termination or expiration of the permit,

Agreed to by the undersigned this _____ day of _____ 20____.

_____ _____

Property Owner Contractor

_____

Contractor

TARRANT REGIONAL WATER DISTRICT

BOARD OF DIRECTORS
Victor W. Henderson, President
Hal S. Sparks III, Vice President
Jack R. Stevens, Secretary
James W. Lane
Martha V. Leonard

James M. Oliver
General Manager

EAGLE MOUNTAIN OFFICE
10201 North Shore Drive
Fort Worth, Texas 76135
Telephone 817-237-8585
FAX 817-237-8563

EAGLE MOUNTAIN LAKE
Improvement Permit Guidelines

A permit is required for all construction, placement or operation of any structure, improvement of facility of any type, or to excavate or place fill materials, at or below elevation 649.00 (expressed in feet above mean sea level). This includes any addition or modification to any existing structure or improvement.

The conservation or spillway elevation of Eagle Mountain Lake is 649.00 feet above m.s.l. The current 100-year flood level is 657.35. Due to the potential of shoreline flooding the District purchased a flood easement that encompasses the property between the conservation level of 649.00 and elevation 668.00. Eagle Mountain Lake is a water supply and water conservation project and the level of water in the lake will vary depending on the amount of water used from the lake, evaporation rates, amounts of rainfall and runoff in the reservoir watershed and other factors.

The following must be submitted before a permit will be considered:

1. A completed application, including signatures of owner, contractor, and master electrician (when applicable).

2. A recorded plat of the property showing the shore front dimensions and location of the improvement.

3. Proof of ownership of the property (i.e. copy of deed, tax statement, sales contract).

4. Plans, specifications, construction details and a list of materials to be used. The drawing must be to scale, one inch to thirty feet (1 inch = 30 feet) or larger and include views from all five sides when applicable (see Attachments # 1, 2, 3,).

5. A $100.00 non-refundable application fee. Please make check or money order payable to TRWD. **CASH WILL NOT BE ACCEPTED!**

6. Outside corners of the lot at roadside and at elevation 649.00 feet m.s.l. **must** be clearly marked at the time of the pre-permit inspection for a permit to be issued and remain marked throughout the construction process.

7. A copy of the contractor's general liability insurance policy. The District requires that all contractors working on District Reservoirs provide a Certificate of Insurance. Each certificate must name Tarrant Regional Water District as additional insured, as well as provide a waiver of subrogation. Liability coverage shall be no less than $500,000 per occurrence.

Applicants should allow 10 working days for the processing of all permit applications. A construction permit is valid for a period to be determined by the District, with a minimum of 30 days and a maximum of 90 days. A construction extension may be granted at the sole discretion

of the District. The extension fee is $50.00 and is valid for a period to be determined by the District with a maximum of 90 days. No more than one extension will be granted. Permits are required for alterations on existing structures. The $100.00 fee may be waived, at the discretion of the District, for applications requesting additions to existing structures. Other than general maintenance, construction is not permitted without an approved written permit.

Any construction without a permit is a violation of the General Ordinance. At any time the condition or presence of this improvement interferes with the operation of the reservoir or the safety of the persons or property using the surface thereof, the Owner agrees to immediately make any and all changes or corrections necessary to make the improvement comply with the General Ordinance or remove the improvement from District property at Owner's expense. A person who violates the General Ordinance commits an offense. An offense is a Class C Misdemeanor and shall be subject to a civil penalty of not less than $10.00 and not more than $1000.00 for each violation or each day of continuing violation.

GUIDELINES FOR RETAINING WALLS, DREDGING, AND FILL WORK

1. Retaining walls shall be constructed in a manner that improves the shoreline alignment. If an eroded area along the shoreline is approved by the District to be reclaimed then the backfill material must also be reclaimed from the reservoir.

2. Approved materials for seawalls include concrete, soil cement, minimum 8 gauge steel sheet piling, PVC sheet piling, pressure treated lumber, and rip rap. Other materials with a long life expectancy will be considered. Creosote materials will not be approved.

3. All dredging activity must be performed in such a manner that will maintain a gently sloping lake bottom and prevent the formation of holes or sudden drop-offs.

4. All construction activities disturbing the soil at or below the flood flowage boundary of the reservoir must employ erosion control practices to minimize the amount of sediment entering the reservoir.

5. All dredged materials shall be placed in such a manner as to prevent any sediment runoff back into the reservoir. Containment and/or silt screens may be required.

6. The District recommends that before any dredging contractor begins work that he/she first call 1-800-DIGTESS (1-800-344-8377) to determine if underground utilities are located in the area.

GUIDELINES FOR RAW WATER USAGE

1. The use of raw water from Eagle Mountain Lake for irrigation purposes shall be limited to irrigation of residential shoreline property that is contiguous to the reservoir.

2. Water transmission lines will not be allowed to cross any public thoroughfare.

3. The electrical services shall be installed by a Master Electrician in accordance with the National Electric Code as amended and revised (see Attachment #4). The District performs cursory electrical inspections for general compliance **only**. The Master Electrician is responsible for inspecting all electrical components to ensure that the installation meets all requirements specified in the National Electric Code.

4. A permit fee of $100.00 will be assessed.

5. Submersible pumps for residential irrigation and fish cleaning stations **shall not** be placed in District Reservoirs.

6. The intake for above ground pumps will be located and anchored in a manner so as not to be a hazard to navigation or recreation.

7. Raw water may be plumbed to one fish cleaning station only. It is the homeowner's responsibility to see that the operation and condition of the fish cleaning station does not become a nuisance.

GUIDELINES FOR STRUCTURE IMPROVEMENT

1. If a residence cannot be built or placed on a lot, an improvement may not be permitted for that property.

2. Community boat structures will be considered commercial operations and therefore fall under the Commercial Facilities Ordinance.

3. The area measured is to be the largest area at the end of a walkway. The largest area may be either the outside corners of the structure or the roofline if it has more than a two-foot overhang.

4. The maximum size allowed for any structure is determined as follows:

    a. Eight (8) square feet of structure is allowed per linear foot of shoreline owned up to 150 linear feet (1200 square feet).

    b. An additional four (4) square feet of structure is allowed for each linear foot of shoreline owned from 151-250 linear feet (1,204-1,600 square feet).

    c. An additional two (2) square feet of structure is allowed for each linear foot of shoreline owned from 251-450 linear feet (1,602-2,000 square feet).

    d. An additional one (1) square foot of structure is allowed for each linear foot of shoreline owned over 450 linear feet.

    e. The area measurement shall exclude one walkway not to exceed eight (8) feet wide to one structure only. If there is more than one structure approved for the property then the entire area of the second, as well as any additional structures, shall be included in the area measurement. The distance the structure extends into the reservoir shall be kept as short a distance as is practical so as not to impair navigation and to maintain continuity with the shoreline. The maximum square footage may not be allowed in all cases.

5. Where large undivided tracts or multiple lots are used to determine the maximum area of an improvement, an agreement shall be signed and recorded whereby the linear footage of shoreline for a certain area is set aside and cannot be used for the future determination of other structures.

6. No part of an improvement can be closer than five feet to the property line, excluding fences, sidewalks and retaining walls. Structures over 1200 square feet must be twenty feet from property lines.

7. No structure may occupy more than one third of any channel width and in no case shall any part of the structure come within ten feet of the centerline of the channel. Exceptions may be granted for structures located at the end of a channel.

8. There will be no living quarters built over any area below the spillway elevation of a reservior whether it be spanned, cantilevered or by other means.

9. Enclosed structures are not allowed on District Reservoirs. In order to protect a raised boat within a dock from the elements, solid sides on the dock will only be permitted for a maximum of two (2) feet downward to the point where the ceiling joist meets the top plate. No additional materials (i.e. lattice, fencing, bars, screen fabric, doors, glass, etc.) may be installed below the two (2) foot sidewall.

10. A small storage area is allowed on the first floor (lower deck) of the structure for storing tackle, life jackets, etc. Products considered hazardous or which have warning labels prohibiting its use near public water supplies shall not be stored in these areas. A twenty (20) square foot enclosure shall be considered maximum for any such storage area.

11. No toilet facilities of any type will be allowed on structures. A portable water supply can only be plumbed to one fish cleaning station on the first floor (lower deck). No plumbing will be allowed on upper deck.

12. Fuel pumping facilities are not allowed on any non-commercial facility or watercraft.

13. A three-story sun deck will not be approved.

14. Any structure that extends more than fifty feet from the shoreline shall be equipped with a photocell light that operates continually from dusk till dawn. At the discretion of the District, additional lighting may be required on docks exceeding 50 feet. Circumstances may require that lighting be placed on docks, which are less than 50 feet in length. The light must be capable of sufficiently illuminating the structure and shall be white. It is the homeowner's responsibility to ensure that all permanent lighting required by the District is properly maintained and operational at all times. The homeowner or contractor may also be required to provide temporary safety lighting during the construction of any improvement extending into the reservoir. If required, lighting must be located on the end of the structure during construction and remain until permanent lighting is installed.

15. The first floor (lower deck) of a structure shall be no less than 18 inches above elevation 649.00 feet msl.

16. The electrical services shall be installed by a Master Electrician in accordance with the National Electric Code as amended and revised. A complete electrical plan must be provided with the application (see Attachment #4). The District performs cursory electrical inspections for general compliance **only**. The Master Electrician is responsible to inspect all electrical components to ensure that the installation meets all requirements specified in the National Electric Code.

17. All materials exposed to the elements shall be cedar, redwood, treated wood, concrete or steel materials. Other materials with long life expectancy will be considered. No metal barrels may be used for flotation. Only extruded (closed cell) polystyrene or foam bead expanded polystyrene that is encased in a high quality protective cover and that has been approved by the District may be used for flotation. Any replacement of flotation on existing structures must be made using the approved encapsulated polystyrene. Creosote treated materials will not be permitted below conservation level.

18. All connections below the walkway shall be bolted with galvanized, zinc plated, cadmium plated or stainless steel bolts. Steel materials may be welded. Other connections may be nailed or attached by screws.

19. All construction activities disturbing the soil at or below the flood flowage boundary of the reservoir must employ erosion control practices to minimize the amount of sediment entering the reservoir.

20. Steel pilings shall be a minimum of two and seven eighths inches (2 7/8) in diameter. Wood pilings must be pressure treated and at least six inches in diameter. Creosote pilings will not be allowed.

21. The roof of a structure shall have a maximum of 6 in 12 pitch.

22. The attic space created by the roof design may be utilized as storage or as a temporary day-shelter from the elements provided it's built in accordance with the District's roof pitch requirements. This space **shall not** have raw water, potable water, or sewage disposal facilities plumbed into it. This space cannot be utilized as living quarters.

23. A permit issued by the District in no way releases the improvement owner from the responsibility of meeting the requirements of Federal, State, County or City regulations or any Development Deed Restrictions that may apply.

24. Circumstances will arise in which some of the above guidelines may not be practicable. In these cases, the District management reserves the right to use its own discretion.

25. Improvements are placed on District property at the District's sole discretion.

EAGLE MOUNTAIN LAKE AREA

Dock Builders, Retaining Walls, & Erosion Control

B & G Welding (Bob Hoop)..... (817) 233-1088
Custom Marine Structures (Diamond D Welding & Design)..... (817) 837-1034
Docks & More (Daryl Mills) ..... (817) 846-9042
Docks On Demand, Inc. ..... (817) 341-1103
E.M. Marine, Inc (Debra Richards) ..... (817) 917-2000
Fowler Enterprises (Arlon Fowler) ..... (903) 474-3218
..... (817) 236-6408
Harco Retaining Walls ..... (817) 996-2905
..... (817) 236-2900
Perkins Construction, Inc..... (817) 236-7003
Earp Steel Buildings & Boat Docks (Jason Earp) ..... (940) 393-6642
..... (940) 644-2135
BMH Carpentry & Construction (Brian Hensley)..... (817) 229-7668
Texoma Custom Docks (John Vick)……..…(903) 651-1090
Farmer John's Custom Stone……..…….(817) 371-8045
Superior Paving Systems (Randy Staley)……..(817) 371-1976
……..(817) 220-0413

The above contractors have requested to be included in this packet. Other contractors may be acceptable or property owners may do their own construction. The District does not endorse any of the contractors listed; it is provided simply for the convenience of the property owners. This list is revised from time to time without notice.

On-Site Sewage Facilities (OSSF) located within 2000' of the conservation level of Eagle Mountain Lake (649.00 m.s.l.) require a permit issued by the District. Information and application packets are available at any District Office

APPLICATION FOR IMPROVEMENT PERMIT

Permit #: _____ Approved Square Footage: _____

Date Issued: _____ ר Date: _____

Type of Improvement: _____

Special Conditions: _____

Approved by: _____ Receipt #: _____

FOR DISTRICT USE ONLY, DO NOT WRITE ABOVE THIS LINE

Lake: _____ Application Date: _____

Owner: _____ Phone #: _____

Mailing Address: _____

Address of Permit: _____

Lot: _____ Block: _____ Addition: _____

Description of Improvement: _____

_____

_____

Contractor: _____ Type of Work: _____

Contact Person: _____Title: _____ Phone #: _____

Address: _____

Owner and Contractor agree to accomplish the construction in strict compliance with the plans and specifications and construction must be completed prior to the expiration of the permit. Owner or contractor must notify the District to arrange for a general inspection upon completion.

Owner represents that he owns and/or controls the above referenced property and that he will comply with all applicable laws, ordinances, rules, and regulations of governmental agencies concerning the construction, specifically including but not limited to the General Ordinance of the District and the ordinances, rules and regulations of the United States Army Corp of Engineers, the United States Environmental Protection Agency, and the Texas Commission on Environmental Quality. The Owner further represents that he will not be in violation of any regulations or restrictions imposed by any Country of Municipal agency or by any deed restrictions which may be attached to the property and that any required variance has been secured. The District assumes no responsibility for, and the Owner will hold the District harmless from, disputes of title, rights, or liability for damages to persons or property arising from the construction maintenance or existence of such improvements. At any time the condition or presence of this improvement interferes with the operation of the reservoir or the safety of the persons or property using the surface thereof, the Owner agrees to immediately make any and all changes or corrections necessary to make the improvement comply with the General Ordinance or remove the improvement from District property at the Owner's expense.

By acceptance of the subsequent permit, you hereby release and discharge Tarrant Regional Water District and its agents, and directors, and agree that Tarrant Regional Water District shall not be held liable or responsible for, and shall be indemnified and held harmless by, you, your successors, assigns, and heirs, from and against any and all claims and damages of every kind for injury indirect, to operation, use, or existence, of the improvement which you are requesting permission to construct on the District's Reservoir, or from any act of the District, its agents, or directors, including the operation BASED IN WHOLE OR IN PART ON THE ALLEGED NEGLIGENCE OR OTHER TORT OF TARRANT REGIONAL WATER DISTRICT OR ITS AGENTS OR DIRECTORS, THE PARTIES HERETO INTENDING TO THE EXPRESS NEGLIGENCE DOCTRINE.

This release and indemnification shall survive termination or expiration of the permit.

Agreed to by the undersigned this _____ day of _____, 20_____.

_____ _____

Property Owner Signature Contractor Signature

_____	_____
Property Owner Printed Name	Contractor Printed Name

trwd
Tarrant Regional Water District

Application for Improvement Permit

Permit #: _____ Approved Square Footage: _____

Date Issued: _____ Expiration Date: _____

Type of Improvement:_____

Special Conditions:_____

Approved by: _____ Receipt #: _____

FOR DISTRICT USE ONLY. DO NOT WRITE ABOVE THIS LINE.

Lake: _____ Application Date: _____

Owner: _____ Phone #:_____

Mailing Address: _____

Address of Permit: _____

Lot: _____ Block: _____ Addition: _____

Description of Improvement: _____

_____

Contractor	Phone	Type of Work
1._____		
2._____		

Owner and Contractor agree to accomplish the construction in strict compliance with the plans and specifications and construction must be completed prior to the expiration of the permit. Owner or contractor must notify the District to arrange for a general inspection upon completion.

Owner represents that he owns and/or controls the above referenced property and that he will comply with all applicable laws, ordinances, rules and regulations of governmental agencies concerning this construction, specifically including but not limited to the General Ordinance of the District and the ordinances, rules and regulations of the United States Army Corp of Engineers, the United States Environmental Protection Agency, and the Texas Natural Resource Conservation Commission. The Owner further represents that he will not be in violation of any regulations or restrictions imposed by any County or Municipal Agency or by any deed restrictions which may be attached to the property and that any required variance has been secured. The District assumes no responsibility for, and the Owner will hold the District harmless from, disputes of title, rights, or liability for damages to persons or property arising from the construction, maintenance, or existence of such improvements. At any time the condition or presence of this improvement interferes with the operation of the reservoir or the safety of the persons or property using the surface thereof, the Owner agrees to immediately make any and all changes or corrections necessary to make the improvement comply with the General Ordinance or remove the improvement from District property at Owner's expense.

By acceptance of the subsequent permit, you hereby release and discharge Tarrant Regional Water District and its agents, and directors, and agree that Tarrant Regional Water District shall not be held liable or responsible for, and shall be indemnified and held harmless by you, your successors, assigns, and helps, from and against any and all claims and damages of every kind for injury indirectly, to operation, use, or existence, of the improvement which you are requesting permission to construct on the District's Reservoir, or from any act of the District, its agents and directors including the operation BASED IN WHOLE OR IN PART ON THE ALLEGED NEGLIGENCE OR OTHER TORT OF TARRANT REGIONAL WATER DISTRICT OR ITS AGENTS OR DIRECTORS, THE PARTIES HERETO INTENDING HEREBY TO SATISFY THE EXPRESS NEGLIGENCE DOCTRINE.

This release and indemnification shall survive termination or expiration of the permit,

Agreed to by the undersigned this _____ day of _____ 20____.

_____ _____

Property Owner Contractor

_____

Contractor

RICHLAND CHAMBERS LAKE

Improvement Permit Guidelines

A permit is required for all construction, placement or operation of any structure, improvement of facility of any type, or to excavate or place fill materials, at or below elevation 320.00' (expressed in feet above mean sea level). This includes any addition or modification to any existing structure or improvement.

The conservation or spillway elevation of **Richland Chambers Lake** is **315.00** feet above m.s.l. The current 100 year flood level is **318.00**. Due to the potential of shoreline flooding the District purchased a flood easement that encompasses the property between the conservation level of **315.00** and elevation **320.00**. Richland Chambers Lake is a water supply and water conservation project and the level of water in the lake will vary depending on the amount of water used from the lake, evaporation rates, amounts of rainfall and runoff in the reservoir watershed and other factors.

The following must be submitted before a permit will be considered:

1. A completed application, including signatures of owner and contractor.

2. A recorded plat of the property showing the shore front dimensions and location of the improvement.

3. Proof of ownership of the property (i.e. copy of deed, tax statement, sales contract).

4. Plans, specifications, construction details and a list of materials to be used. The drawing must be to scale, one inch to thirty feet (1 inch = 30 feet) or larger and include views from all five sides when applicable.

5. A $100.00 non-refundable application fee. Please make check or money order payable to TRWD. **CASH WILL NOT BE ACCEPTED!**

6. Outside corners of the lot at roadside and at elevation **315.00** feet m.s.l. **must** be clearly marked at the time of the pre-permit inspection for a permit to be issued and remain marked throughout the construction process.

7. A copy of the contractor's general liability insurance policy. The District requires that all contractors working on District Reservoirs provide a Certificate of Insurance. Each certificate must name Tarrant Regional Water District as additional insured, as well as provide a waiver of subrogation. Liability coverage shall be no less than $500,000 per occurrence.

Applicants should allow 10 working days for the processing of all permit applications. A construction permit is valid for a period to be determined by the District, with a minimum of 30 days and a maximum of 90 days. A construction extension may be granted at the sole discretion of the District. The extension fee is $50.00 and is valid for a period to be determined by the District with a maximum of 90 days. No more than one extension will be granted. Permits are required for alterations on existing structures. The $100.00 fee may be waived, at the discretion of the District, for applications requesting additions to existing structures. Other than general maintenance, construction is not permitted without an approved written permit.

Any construction without a permit is a violation of the General Ordinance. At any time the condition or presence of this improvement interferes with the operation of the reservoir or the

safety of the persons or property using the surface thereof, the Owner agrees to immediately make any and all changes or corrections necessary to make the improvement comply with the General Ordinance or remove the improvement from District property at Owner's expense. A person who violates the General Ordinance commits an offense. An offense is a Class C Misdemeanor and shall be subject to a civil penalty of not less than $10.00 and not more than $1000.00 for each violation or each day of continuing violation.

GUIDELINES FOR RETAINING WALLS, DREDGING, AND FILL WORK

1. Retaining walls shall be constructed in a manner that improves the shoreline alignment. If an eroded area along the shoreline is approved by the District to be reclaimed then the backfill material must also be reclaimed from the reservoir.

2. Approved materials for seawalls include concrete, soil cement, minimum 8 gauge steel sheet piling, PVC sheet piling, pressure treated lumber, and rip rap. Other materials with a long life expectancy will be considered. Creosote materials will not be approved.

3. All dredging activity must be performed in such a manner that will maintain a gently sloping lake bottom and prevent the formation of holes or sudden drop-offs.

4. All construction activities disturbing the soil at or below the flood flowage boundary of the reservoir must employ erosion control practices to minimize the amount of sediment entering the reservoir.

5. All dredged materials shall be placed in such a manner as to prevent any sediment runoff back into the reservoir. Containment and/or silt screens may be required.

6. The District recommends that before any dredging contractor begins work that he/she first call 1-800-DIGTESS (1-800-344-8377) to determine if underground utilities are located in the area.

GUIDELINES FOR IRRIGATION SYSTEMS

1. The use of raw water from **Richland Chambers** for irrigation purposes shall be limited to irrigation of residential shoreline property that is contiguous to the reservoir.

2. Water transmission lines will not be allowed to cross any public thoroughfare.

3. The electrical services shall be installed in accordance with the National Electric Code as amended and revised. The District performs cursory electrical inspections for general compliance **only**. The homeowner is advised to have a licensed electrician, electrical inspector, or other professional with expertise in electrical installations to inspect all electrical components to ensure that the installation meets all requirements specified in the National Electric Code.

4. A permit fee of $100.00 will be assessed.

5. Submersible pumps shall not be placed in District Reservoirs.

6. The intake for above ground pumps will be located and anchored in a manner so as not to be a hazard to navigation or recreation.

GUIDELINES FOR STRUCTURE IMPROVEMENT

1. If a residence cannot be built or placed on a lot, an improvement may not be permitted for that property.

2. Community boat structures will be considered commercial operations and therefore fall under the Commercial Facilities Ordinance.

3. The area measured is to be the largest area at the end of a walkway. The largest area may be either the outside corners of the structure or the roofline if it has more than a two-foot overhang.

4. The maximum size allowed for any structure is determined as follows:

    a. Eight (8) square feet of structure is allowed per linear foot of shoreline owned up to 150 linear feet (1200 square feet).

    b. An additional four (4) square feet of structure is allowed for each linear foot of shoreline owned from 151-250 linear feet (1,204-1,600 square feet).

    c. An additional two (2) square feet of structure is allowed for each linear foot of shoreline owned from 251-450 linear feet (1,602-2,000 square feet).

    d. An additional one (1) square foot of structure is allowed for each linear foot of shoreline owned over 450 linear feet.

    e. The area measurement shall exclude one walkway not to exceed eight (8) feet wide to the structure. The distance the structure extends into the reservoir shall be kept as short a distance as is practical so as not to impair navigation and to maintain continuity with the shoreline. The maximum square footage may not be allowed in all cases.

5. Where large undivided tracts or multiple lots are used to determine the maximum area of an improvement, an agreement shall be signed and recorded whereby the linear footage of shoreline for a certain area is set aside and cannot be used for the future determination of other structures.

6. No part of an improvement can be closer than five feet to the property line, excluding fences, sidewalks and retaining walls. Structures over 1200 square feet must be twenty feet from property lines.

7. No structure may occupy more than one third of any channel width and in no case shall any part of the structure come within ten feet of the centerline of the channel. Exceptions may be granted for structures located at the end of a channel.

8. There will be no living quarters built over any area below the spillway elevation of a reservior whether it be spanned, cantilevered or by other means.

9. Enclosed structures are not allowed on District Reservoirs. In order to protect a raised boat within a dock from the elements, solid sides on the dock will only be permitted for a maximum of two (2) feet downward from the roofline. No additional materials (i.e. lattice, fencing, bars, screen fabric, doors, glass, etc.) may be installed below the two (2) foot sidewall.

10. A small storage area is allowed on the structure for tackle, life jackets, etc. A twenty (20) square foot enclosure shall be considered maximum for any such storage area.

11. No toilet facilities of any type will be allowed on structures.

12. Fuel pumping facilities are not allowed on any non-commercial facility or watercraft.

13. A three-story sun deck will not be approved.

14. Any structure that extends more than fifty feet from the shoreline shall be equipped with a light from dusk to dawn. At the discretion of the District, additional lighting may be required on docks exceeding 50 feet. Circumstances may require that lighting be placed on docks, which are less than 50 feet in length. The light must be capable of sufficiently illuminating the structure and shall be white. The homeowner or contractor may also be required to provide temporary safety lighting during the construction of any improvement extending into the reservoir. If required, lighting must be located on the end of the structure during construction and remain until permanent lighting is installed.

15. The deck of a structure shall be no less than 18 inches above elevation **315.00** feet msl.

16. The electrical services shall be installed in accordance with the National Electric Code as amended and revised. A complete electrical plan must be provided with the application. The District performs cursory electrical inspections for general compliance **only**. The homeowner is advised to have a licensed electrician, electrical inspector, or other professional with expertise in electrical installations to inspect all electrical components to ensure that the installation meets all requirements specified in the National Electric Code.

17. All materials exposed to the elements shall be cedar, redwood, treated wood, concrete or steel materials. Other materials with long life expectancy will be considered. No metal barrels may be used for flotation. Only extruded (closed cell) polystyrene or foam bead expanded polystyrene that is encased in a high quality protective cover and that has been approved by the District may be used for flotation. Any replacement of flotation on existing structures must be made using the approved encapsulated polystyrene. Creosote treated materials will not be permitted below conservation level.

18. All connections below the walkway shall be bolted with galvanized, zinc plated, cadmium plated or stainless steel bolts. Steel materials may be welded. Other connections may be nailed or attached by screws.

19. All construction activities disturbing the soil at or below the flood flowage boundary of the reservoir must employ erosion control practices to minimize the amount of sediment entering the reservoir.

20. Steel pilings shall be a minimum of two and seven eighths inches (2 7/8) in diameter. Wood pilings must be pressure treated and at least six inches in diameter. Creosote pilings will not be allowed.

21. The roof of a structure shall have a maximum of 4 in 12 pitch.

22. A permit issued by the District in no way releases the improvement owner from the responsibility of meeting the requirements of Federal, State, County or City regulations or any Development Deed Restrictions that may apply.

23. Circumstances will arise in which some of the above guidelines may not be practicable. In these cases, the District management reserves the right to use its own discretion.

24. Improvements are placed on District property at the District's sole discretion.

trwd
Tarrant Regional Water District

Application for Improvement Permit

Permit #: _____ Approved Square Footage: _____

Date Issued: _____ Expiration Date: _____

Type of Improvement:_____

Special Conditions:_____

Approved by: _____ Receipt #: _____

FOR DISTRICT USE ONLY. DO NOT WRITE ABOVE THIS LINE.

Lake: _____ Application Date: _____

Owner: _____ Phone #:_____

Mailing Address: _____

Address of Permit: _____

Lot: _____ Block: _____ Addition: _____

Description of Improvement: _____

_____

Contractor	Phone	Type of Work
1._____		
2._____		

Owner and Contractor agree to accomplish the construction in strict compliance with the plans and specifications and construction must be completed prior to the expiration of the permit. Owner or contractor must notify the District to arrange for a general inspection upon completion.

Owner represents that he owns and/or controls the above referenced property and that he will comply with all applicable laws, ordinances, rules and regulations of governmental agencies concerning this construction, specifically including but not limited to the General Ordinance of the District and the ordinances, rules and regulations of the United States Army Corp of Engineers, the United States Environmental Protection Agency, and the Texas Natural Resource Conservation Commission. The Owner further represents that he will not be in violation of any regulations or restrictions imposed by any County or Municipal Agency or by any deed restrictions which may be attached to the property and that any required variance has been secured. The District assumes no responsibility for, and the Owner will hold the District harmless from, disputes of title, rights, or liability for damages to persons or property arising from the construction, maintenance, or existence of such improvements. At any time the condition or presence of this improvement interferes with the operation of the reservoir or the safety of the persons or property using the surface thereof, the Owner agrees to immediately make any and all changes or corrections necessary to make the improvement comply with the General Ordinance or remove the improvement from District property at Owner's expense.

By acceptance of the subsequent permit, you hereby release and discharge Tarrant Regional Water District and its agents, and directors, and agree that Tarrant Regional Water District shall not be held liable or responsible for, and shall be indemnified and held harmless by you, your successors, assigns, and helps, from and against any and all claims and damages of every kind for injury indirectly, to operation, use, or existence, of the improvement which you are requesting permission to construct on the District's Reservoir, or from any act of the District, its agents and directors including the operation BASED IN WHOLE OR IN PART ON THE ALLEGED NEGLIGENCE OR OTHER TORT OF TARRANT REGIONAL WATER DISTRICT OR ITS AGENTS OR DIRECTORS, THE PARTIES HERETO INTENDING HEREBY TO SATISFY THE EXPRESS NEGLIGENCE DOCTRINE.

This release and indemnification shall survive termination or expiration of the permit,

Agreed to by the undersigned this _____ day of _____ 20____.

_____ _____

Property Owner Contractor

_____

Contractor

INDEMNIFICATION

In consideration of **Tarrant Regional Water District, a Water Control and Improvement District ("the District")** granting the undersigned access to District Property, the undersigned hereby releases, relinquishes, and discharges and agrees to **indemnify and hold harmless** the District, and the District's officers, directors, servants, agents and employees from any and all claims, demands, liabilities, suits, causes of action, obligations, damages, injuries, losses, penalties, costs, charges, and expenses (including, without limitation, attorney's fees, court costs, consultant fees, expert fees, and other litigation-related expenses) of whatsoever kind or character directly or indirectly resulting from, arising out of or in connection with, or relating to (1) any condition of the District Property; (2) any use or occupation of the District Property; (3) any act of negligence, whether of omission or commission, of the undersigned or any of its officers, directors, agents, servants, employees, contractors, subcontractors, or any other person acting on behalf of the undersigned; (4) any damage to the property of the undersigned which may arise in connection with the District's operation and maintenance of said District Property; (5) any accident, injury, or damage whatsoever caused to any person, firm, corporation, or property. This indemnification extends to and includes any an all claims for bodily injury, death, sickness, disease, property damage or destruction, consequential damage, or economic loss caused to or suffered by any person or property, including, but not limited to the undersigned, and any officers, directors, agents, servants, employees, contractors, subcontractors, or any other person acting on behalf of the undersigned, or any other person or entity. In case of any action or proceeding brought against the District by reason of any such claim the undersigned, upon notice from the District, agrees to defend the action or proceedings by counsel acceptable to the District at the cost of the undersigned. **THE PROVISIONS OF THIS RELEASE AND INDEMNIFICATION SHALL REMAIN AND BE IN FULL FORCE AND EFFECT EVEN IF ANY CLAIM, DEMAND, LOSS, LIABILITY, DAMAGE, OR EXPENSE, OR CLAIM THEREFOR, BY ANY PERSON OR ENTITY, DIRECTLY OR INDIRECTLY RESULTS FROM, ARISES OUT OF, OR RELATES TO, OR IS ASSERTED TO HAVE RESULTED FROM, ARISEN OUT OF, OR BE RELATED TO, IN WHOLE OR IN PART, ONE OR MORE NEGLIGENT ACTS OR OMISSIONS OF THE DISTRICT, OR ANY OF THE DISTRICT'S OFFICERS, DIRECTORS, AGENTS, SERVANTS, EMPLOYEES, OR ANY OTHER PERSON OR ENTITY ACTING ON BEHALF OF THE DISTRICT, THE PARTIES INTENDING HEREBY TO SATISFY THE EXPRESS NEGLIGENCE DOCTRINE.** This indemnification shall survive termination or expiration of this Permit.

_____	_____
SIGNATURE	COMPANY NAME
_____	_____
PRINTED NAME	STREET ADDRESS
_____	_____
DATE	CITY/STATE/ZIP
	_____
	PHONE NUMBER

APPENDIX 6 – USACE

US Army Corps
of Engineers

RULES AND REGULATIONS

GOVERNING PUBLIC USE OF CORPS OF ENGINEERS WATER RESOURCES DEVELOPMENT PROJECTS

EP 1165-2-316
May 2000

FOREWARD

The following rules and regulations, published in the Federal Register of February 11, 2000 and amended on May 5, 2000, govern the public use of water resources development projects administered by the Chief of Engineers. Visitors are bound by these Title 36 regulations.

FOR THE COMMANDER:

RUSSELL L. FUHRMAN
Major General, U.S. Army
Chief of Staff

Title 36 -- Parks, Forests, and Public Property
CHAPTER 111 -- U.S. ARMY CORPS OF ENGINEERS
PART 327--RULES AND REGULATIONS GOVERNING PUBLIC USE OF WATER RESOURCES DEVELOPMENT PROJECTS ADMINISTERED BY THE CHIEF OF ENGINEERS

Section

Authority: 16 U.S.C. 460d; 16 U.S.C. 4601-6a; Sec. 210, Pub. L. 90-483, 82 Stat. 746.; 33 U.S.C. 1, 28 Stat. 362.

327.0 Applicability.

The regulations covered in this part 327 shall be applicable to water resources development projects, completed or under construction, administered by the Chief of Engineers, and to those portions of jointly administered water resources development projects which are under the administrative jurisdiction of the Chief of Engineers. ALL OTHER FEDERAL, STATE AND LOCAL LAWS AND REGULATIONS REMAIN IN FULL FORCE AND EFFECT WHERE APPLICABLE TO THOSE WATER RESOURCES DEVELOPMENT PROJECTS.

327.1 Policy.

(a) It is the policy of the Secretary of the Army, acting through the Chief of Engineers, to manage the natural, cultural and developed resources of each project in the public interest, providing the public with safe and healthful recreational opportunities while protecting and enhancing these resources.

(b) Unless otherwise indicated in this part, the term "District Commander" shall include the authorized representatives of the District Commander.

(c) The term "project" or "water resources development project" refers to the water areas of any water resources development project administered by the Chief of Engineers, without regard to ownership of underlying land, to all lands owned in fee by the Federal Government and to all facilities therein or thereon of any such water resources development project.

(d) All water resources development projects open for public use shall be available to the public without regard to sex, race, color, creed, age, nationality or place of origin. No lessee, licensee, or concessionaire providing a service to the public shall discriminate against any person because of sex, race, creed, color, age, nationality or place of origin in the conduct of the operations under the lease, license or concession contract.

(e) In addition to the regulations in this part 327, all applicable Federal, state and local laws and regulations remain in full force and effect on project lands or waters which are outgranted by the District Commander by lease, license or other written agreement.

(f) The regulations in this part 327 shall be deemed to apply to those lands and waters which are subject to treaties and Federal laws and regulations concerning the rights of Indian Nations and which lands and waters are incorporated, in whole or in part, within water resources development projects administered by the Chief of Engineers, to the extent that the regulations in this part 327 are not inconsistent with such treaties and Federal laws and regulations.

(g) Any violation of any section of this part 327 shall constitute a separate violation for each calendar day in which it occurs.

(h) For the purposes of this part 327, the operator of any vehicle, vessel or aircraft as described in this part shall be presumed to be responsible for its use on project property. In the event where an operator cannot be determined, the owner of the vehicle, vessel, or aircraft, whether attended or unattended, will be presumed responsible. Unless proven otherwise, such presumption will be sufficient to issue a citation for the violation of regulations applicable to the use of such vehicle, vessel or aircraft as provided for in Sec. 327.25.

(i) For the purposes of this part 327, the registered user of a campsite, picnic area, or other facility shall be presumed to be responsible for its use. Unless proven otherwise, such presumption will be sufficient to issue a citation for the violation of regulations applicable to the use of such facilities as provided for in Sec. 327.25.

327.2 Vehicles.

(a) This section pertains to all vehicles, including, but not limited to, automobiles, trucks, motorcycles, mini-bikes, snowmobiles, dune buggies, all-terrain vehicles, and trailers, campers, bicycles, or any other such equipment.

(b) Vehicles shall not be parked in violation of posted restrictions and regulations, or in such a manner as to obstruct or impede normal or emergency traffic movement or the parking of other vehicles, create a safety hazard, or endanger any person, property or environmental feature. Vehicles so parked are subject to removal and impoundment at the owner's expense.

(c) The operation and/or parking of a vehicle off authorized roadways is prohibited except at locations and times designated by the District Commander. Taking any vehicle through, around or beyond a restrictive sign, recognizable barricade, fence, or traffic control barrier is prohibited.

(d) Vehicles shall be operated in accordance with posted restrictions and regulations.

(e) No person shall operate any vehicle in a careless, negligent or reckless manner so as to endanger any person, property or environmental feature.

(f) At designated recreation areas, vehicles shall be used only to enter or leave the area or individual sites or facilities unless otherwise posted.

(g) Except as authorized by the District Commander, no person shall operate any motorized vehicle without a proper and effective exhaust muffler as defined by state and local laws, or with an exhaust muffler cutout open, or in any other manner which renders the exhaust muffler ineffective in muffling the sound of engine exhaust.

(h) Vehicles shall be operated in accordance with applicable Federal, state and local laws, which shall be regulated by authorized enforcement officials as prescribed in Sec. 327.26.

327.3 Vessels.

(a) This section pertains to all vessels or watercraft, including, but not limited to, powerboats, cruisers, houseboats, sailboats, rowboats, canoes, kayaks, personal watercraft, and any other such equipment capable of navigation on water or ice, whether in motion or at rest.

(b) The placement and/or operation of any vessel or watercraft for a fee or profit upon project waters or lands is prohibited except as authorized by permit, lease, license, or concession contract with the Department of the Army. This paragraph shall not apply to the operation of commercial tows or passenger carrying vessels not based at a Corps project which utilize project waters as a link in continuous transit over navigable waters of the United States.

(c) Vessels or other watercraft may be operated on the project waters, except in prohibited or restricted areas, in accordance with posted regulations and restrictions, including buoys. All vessels or watercraft so required by applicable Federal, state and local laws shall display an appropriate registration on board whenever the vessel is on project waters.

(d) No person shall operate any vessel or other watercraft in a careless, negligent, or reckless manner so as to endanger any person, property, or environmental feature.

(e) All vessels, when on project waters, shall have safety equipment, including personal flotation devices, on board in compliance with U.S. Coast Guard boating safety requirements and in compliance with boating safety laws issued and enforced by the state in which the vessel is located. Owners or operators of vessels not in compliance with this section may be requested to remove the vessel immediately from project waters until such time as items of non-compliance are corrected.

(f) Unless otherwise permitted by Federal, state or local law, vessels or other watercraft, while moored in commercial facilities, community or corporate docks, or at any fixed or permanent mooring point, may only be used for overnight occupancy when such use is incidental to recreational boating. Vessels or other watercraft are not to be used as a place of habitation or residence.

(g) Water skis, parasails, ski-kites and similar devices are permitted in nonrestricted areas except that they may not be used in a careless, negligent, or reckless manner so as to endanger any person, property or environmental feature.

(h) Vessels shall not be attached or anchored to structures such as locks, dams, buoys or other structures unless authorized by the District Commander. All vessels when not in actual use shall be removed from project lands and waters unless securely moored or stored at designated areas approved by the District Commander. The placing of floating or stationary mooring facilities on, adjacent to, or interfering with a buoy, channel marker or other navigational aid is prohibited.

(i) The use at a project of any vessel not constructed or maintained in compliance with the standards and requirements established by the Federal Safe Boating Act of 1971 (Pub. L. 92-75, 85 Stat. 213), or promulgated pursuant to such act, is prohibited.

(j) Except as authorized by the District Commander, no person shall operate any vessel or watercraft without a proper and effective exhaust muffler as defined by state and local laws, or with an exhaust muffler cutout open, or in any other manner which renders the exhaust muffler ineffective in muffling the sound of engine exhaust.

(k) All vessels or other watercraft shall be operated in accordance with applicable Federal, state and local laws, which shall be regulated by authorized enforcement officials as prescribed in Sec. 327.26.

327.4 Aircraft.

(a) This section pertains to all aircraft including, but not limited to, airplanes, seaplanes, helicopters, ultra-light aircraft, motorized hang gliders, hot air balloons, any non-powered flight devices or any other such equipment.

(b) The operation of aircraft on project lands at locations other than those designated by the District Commander is prohibited. This provision shall not be applicable to aircraft engaged on official business of Federal, state or local governments or law enforcement agencies, aircraft used in emergency rescue in accordance with the directions of the District Commander or aircraft forced to land due to circumstances beyond the control of the operator.

(c) No person shall operate any aircraft while on or above project waters or project lands in a careless, negligent or reckless manner so as to endanger any person, property or environmental feature.

(d) Nothing in this section bestows authority to deviate from rules and regulations or prescribed standards of the appropriate State Aeronautical Agency, or the Federal Aviation Administration, including, but not limited to, regulations and standards concerning pilot certifications or ratings, and airspace requirements.

(e) Except in extreme emergencies threatening human life or serious property loss, the air delivery or retrieval of any person, material or equipment by parachute, balloon, helicopter or other means onto or from project lands or waters without written permission of the District Commander is prohibited.

(f) In addition to the provisions in paragraphs (a) through (e) of this section, seaplanes are subject to the following restrictions:

(1) Such use is limited to aircraft utilized for water landings and takeoff, in this part called seaplanes, at the risk of owner, operator and passenger(s).

(2) Seaplane operations contrary to the prohibitions or restrictions established by the District Commander (pursuant to part 328 of this title) are prohibited. The responsibility to ascertain whether seaplane operations are prohibited or restricted is incumbent upon the person(s) contemplating the use of, or using, such waters.

(3) All operations of seaplanes while upon project waters shall be in accordance with U.S. Coast Guard navigation rules for powerboats or vessels and Sec. 327.3.

(4) Seaplanes on project waters and lands in excess of 24 hours shall be securely moored at mooring facilities and at locations permitted by the District Commander. Seaplanes may be temporarily moored on project waters and lands, except in areas prohibited by the District Commander, for periods less than 24 hours providing:

(i) The mooring is safe, secure, and accomplished so as not to damage the rights of the Government or members of the public, and

(ii) The operator remains in the vicinity of the seaplane and reasonably available to relocate the seaplane if necessary.

(5) Commercial operation of seaplanes from project waters is prohibited without written approval of the District Commander following consultation with and necessary clearance from the Federal Aviation Administration (FAA) and other appropriate public authorities and affected interests.

(6) Seaplanes may not be operated at Corps projects between sunset and sunrise unless approved by the District Commander.

327.5 Swimming.

(a) Swimming, wading, snorkeling or scuba diving at one's own risk is permitted, except at launching sites, designated mooring points and public docks, or other areas so designated by the District Commander.

(b) An international diver down, or inland diving flag must be displayed during underwater activities.

(c) Diving, jumping or swinging from trees, bridges or other structures which cross or are adjacent to project waters is prohibited.

327.6 Picnicking.

Picnicking and related day-use activities are permitted, except in those areas where prohibited by the District Commander.

327.7 Camping.

(a) Camping is permitted only at sites and/or areas designated by the District Commander.

(b) Camping at one or more campsites at any one water resource project for a period longer than 14 days during any 30-consecutive-day period is prohibited without the written permission of the District Commander.

(c) The unauthorized placement of camping equipment or other items on a campsite and/or personal appearance at a campsite without daily occupancy for the purpose of reserving that campsite for future occupancy is prohibited.

(d) The digging or leveling of any ground or the construction of any structure without written permission of the District Commander is prohibited.

(e) Occupying or placement of any camping equipment at a campsite which is posted or otherwise marked or indicated as "reserved" without an authorized reservation for that site is prohibited.

327.8 Hunting, fishing, and trapping.

(a) Hunting is permitted except in areas and during periods where prohibited by the District Commander.

(b) Trapping is permitted except in areas and during periods where prohibited by the District Commander.

(c) Fishing is permitted except in swimming areas, on boat ramps or other areas designated by the District Commander.

(d) Additional restrictions pertaining to these activities may be established by the District Commander.

(e) All applicable Federal, State and local laws regulating these activities apply on project lands and waters, and shall be regulated by authorized enforcement officials as prescribed in Sec. 327.26.

327.9 Sanitation.

(a) Garbage, trash, rubbish, litter, gray water, or any other waste material or waste liquid generated on the project and incidental to authorized recreational activities shall be either removed from the project or deposited in receptacles provided for that purpose. The improper disposal of such wastes, human and animal waste included, on the project is prohibited.

(b) It is a violation to bring onto a project any household or commercial garbage, trash, rubbish, debris, dead animals or litter of any kind for disposal or dumping without the written permission of the District Commander. For the purposes of this section, the owner of any garbage, trash, rubbish, debris, dead animals or litter of any kind shall be presumed to be responsible for proper disposal. Such presumption will be sufficient to issue a citation for violation.

(c) The spilling, pumping, discharge or disposal of contaminants, pollutants or other wastes, including, but not limited to, human or animal waste, petroleum, industrial and commercial products and by-products, on project lands or into project waters is prohibited.

(d) Campers, picnickers, and all other persons using a water resources development project shall keep their sites free of trash and litter during the period of occupancy and shall remove all personal equipment and clean their sites upon departure.

(e) The discharge or placing of sewage, galley waste, garbage, refuse, or pollutants into the project waters from any vessel or watercraft is prohibited.

327.10 Fires.

(a) Gasoline and other fuels, except that which is contained in storage tanks of vehicles, vessels, camping equipment, or hand portable containers designed for such purpose, shall not be carried onto or stored on the project without written permission of the District Commander.

(b) Fires shall be confined to those areas designated by the District Commander, and shall be contained in fireplaces, grills, or other facilities designated for this purpose. Fires shall not be left unattended and must be completely extinguished prior to departure. The burning of materials that produce toxic fumes, including, but not limited to, tires, plastic and other floatation materials or treated wood products is prohibited. The District Commander may prohibit open burning of any type for environmental considerations.

(c) Improper disposal of lighted smoking materials, matches or other burning material is prohibited.

327.11 Control of animals.

(a) No person shall bring or allow dogs, cats, or other pets into developed recreation areas or adjacent waters unless penned, caged, on a leash under six feet in length, or otherwise physically restrained. No person shall allow animals to impede or restrict otherwise full and free use of project lands and waters by the public. No person shall allow animals to bark or emit other noise which unreasonably disturbs other people. Animals and pets, except properly trained animals assisting those with disabilities (such as seeing-eye dogs), are prohibited in sanitary facilities, playgrounds, swimming beaches and any other areas so designated by the District Commander. Abandonment of any animal on project lands or waters is prohibited. Unclaimed or unattended animals are subject to immediate impoundment and removal in accordance with state and local laws.

(b) Persons bringing or allowing pets in designated public use areas shall be responsible for proper removal and disposal of any waste produced by these animals.

(c) No person shall bring or allow horses, cattle, or other livestock in camping, picnicking, swimming or other recreation areas or on trails except in areas designated by the District Commander.

(d) Ranging, grazing, watering or allowing livestock on project lands and waters is prohibited except when authorized by lease, license or other written agreement with the District Commander.

(e) Unauthorized livestock are subject to impoundment and removal in accordance with Federal, state and local laws.

(f) Any animal impounded under the provisions of this section may be confined at a location designated by the District Commander, who may assess a reasonable impoundment fee. This fee shall be paid before the impounded animal is returned to its owner(s).

(g) Wild or exotic pets and animals (including but not limited to cougars, lions, bears, bobcats, wolves, and snakes), or any pets or animals displaying vicious or aggressive behavior or otherwise posing a threat to public safety or deemed a public nuisance, are prohibited from project lands and waters unless authorized by the District Commander, and are subject to removal in accordance with Federal, state and local laws.

327.12 Restrictions.

(a) The District Commander may establish and post a schedule of visiting hours and/or restrictions on the public use of a project or portion of a project. The District Commander may close or restrict the use of a project or portion of a project when necessitated by reason of public health, public safety, maintenance, resource protection or other reasons in the public interest. Entering or using a project in a manner which is contrary to the schedule of visiting hours, closures or restrictions is prohibited.

(b) Quiet shall be maintained in all public use areas between the hours of 10 p.m. and 6 a.m., or those hours designated by the District Commander. Excessive noise during such times which unreasonably disturbs persons is prohibited.

(c) Any act or conduct by any person which interferes with, impedes or disrupts the use of the project or impairs the safety of any person is prohibited. Individuals who are boisterous, rowdy, disorderly, or otherwise disturb the peace on project lands or waters may be requested to leave the project.

(d) The operation or use of any sound producing or motorized equipment, including but not limited to generators, vessels or vehicles, in such a manner as to unreasonably annoy or endanger persons at any time or exceed state or local laws governing noise levels from motorized equipment is prohibited.

(e) The possession and/or consumption of alcoholic beverages on any portion of the project land or waters, or the entire project, may be prohibited when designated and posted by the District Commander.

(f) Unless authorized by the District Commander, smoking is prohibited in Visitor Centers, enclosed park buildings and in areas posted to restrict smoking.

327.13 Explosives, firearms, other weapons and fireworks.

(a) The possession of loaded firearms, ammunition, loaded projectile firing devices, bows and arrows, crossbows, or other weapons is prohibited unless:

(1) In the possession of a Federal, state or local law enforcement officer;

(2) Being used for hunting or fishing as permitted under 327.8, with devices being unloaded when transported to, from or between hunting and fishing sites;

(3) Being used at authorized shooting ranges; or

(4) Written permission has been received from the District Commander.

(b) Possession of explosives or explosive devices of any kind, including fireworks or other pyrotechnics, is prohibited unless written permission has been received from the District Commander.

327.14 Public property.

(a) Destruction, injury, defacement, removal or any alteration of public property including, but not limited to, developed facilities, natural formations, mineral deposits, historical and archaeological features, paleontological resources, boundary monumentation or markers and vegetative growth, is prohibited except when in accordance with written permission of the District Commander.

(b) Cutting or gathering of trees or parts of trees and/or the removal of wood from project lands is prohibited without written permission of the District Commander.
(c) Gathering of dead wood on the ground for use in designated recreation areas as firewood is permitted, unless prohibited and posted by the District Commander.

(d) The use of metal detectors is permitted on designated beaches or other previously disturbed areas unless prohibited by the District Commander for reasons of protection of archaeological, historical or paleontological resources. Specific information regarding metal detector policy and designated use areas is available at the Manager's Office. Items found must be handled in accordance with Sections 327.15 and 327.16 except for non-identifiable items such as coins of value less than $25.

327.15 Abandonment and impoundment of personal property.

(a) Personal property of any kind shall not be abandoned, stored or left unattended upon project lands or waters. After a period of 24 hours, or at any time after a posted closure hour in a public use area or for the purpose of providing public safety or resource protection, unattended personal property shall be presumed to be abandoned and may be impounded and stored at a storage point designated by the District Commander, who may assess a reasonable impoundment fee. Such fee shall be paid before the impounded property is returned to its owner.

(b) Personal property placed on Federal lands or waters adjacent to a private residence, facility and/or developments of any private nature for more than 24 hours without permission of the District Commander shall be presumed to have been abandoned and, unless proven otherwise, such presumption will be sufficient to impound the property and/or issue a citation as provided for in Sec. 327.25.

(c) The District Commander shall, by public or private sale or otherwise, dispose of all lost, abandoned or unclaimed personal property that comes into Government custody or control. However, property may not be disposed of until diligent effort has been made to find the owner, heirs, next of kin or legal representative(s). If the owner, heirs, next of kin or legal representative(s) are determined but not found, the property may not be disposed of until the expiration of 120 days after the date when notice, giving the time and place of the intended sale or other disposition, has been sent by certified or registered mail to that person at the last known address. When diligent efforts to determine the owner, heirs, next of kin or legal representative(s) are unsuccessful, the property may be disposed of without delay except that if it has a fair market value of $100 or more the property may not be disposed of until 90 days after the date it is received at the storage point designated by the District Commander. The net proceeds from the sale of property shall be conveyed into the Treasury of the United States as miscellaneous receipts.

327.16 Lost and found articles.

All articles found shall be deposited by the finder at the Manager's office or with a ranger. All such articles shall be disposed of in accordance with the procedures set forth in Sec. 327.15.

327.17 Advertisement.

(a) Advertising and the distribution of printed matter is allowed within project land and waters provided that a permit to do so has been issued by the District Commander and provided that this activity is not solely commercial advertising.

(b) An application for such a permit shall set forth the name of the applicant, the name of the organization (if any), the date, time, duration, and location of the proposed advertising or the distribution of printed matter, the number of participants, and any other information required by the permit application form. Permit conditions and procedures are available from the District Commander.

(c) Vessels and vehicles with semipermanent or permanent painted or installed signs are exempt as long as they are used for authorized recreational activities and comply with all other rules and regulations pertaining to vessels and vehicles.

For permit terms and conditions see the Federal Register, Volume 65, No. 88, May 5, 2000, page 26137.

327.18 Commercial activities.

(a) The engaging in or solicitation of business on project land or waters without the express written permission of the District Commander is prohibited.

(b) It shall be a violation of this part to refuse to or
fail to comply with any terms, clauses or conditions of any lease, license or agreements issued by the District Commander.

327.19 Permits.

(a) It shall be a violation of this part to refuse to or fail to comply with the fee requirements or other terms or conditions of any permit issued under the provisions of this part 327.

(b) Permits for floating structures (issued under the authority of Sec. 327.30) of any kind on/in waters of water resources development projects, whether or not such waters are deemed navigable waters of the United States but where such waters are under the management of the Corps of Engineers, shall be issued at the discretion of the District Commander under the authority of this section. District Commanders will delineate

those portions of the navigable waters of the United States where this provision is applicable and post notices of this designation in the vicinity of the appropriate Manager's office.

(c) Permits for non-floating structures (issued under the authority of Sec. 327.30) of any kind constructed, placed in or affecting waters of water resources development projects where such waters are deemed navigable waters of the U.S. shall be issued under the provisions of section 10 of the Rivers and Harbors Act approved March 3, 1899 (33 U.S.C. 403). If a discharge of dredged or fill material in these waters is involved, a permit is required under Section 404 of the Clean Water Act (33 U.S.C. 1344). (See 33 CFR parts 320 through 330.)

(d) Permits for non-floating structures (issued under the authority of Sec. 327.30) of any kind in waters of water resources development projects, where such waters are under the management of the Corps of Engineers and where such waters are not deemed navigable waters of the United States, shall be issued as set forth in paragraph (b) of this section. If a discharge of dredged or fill material into any water of the United States is involved, a permit is required under section 404 of the Clean Water Act (33 U.S.C. 1344) (See 33 CFR parts 320 through 330). Water quality certification may be required pursuant to Section 401 of the Clean Water Act (33 U.S.C. 1341).

(e) Shoreline Use Permits to authorize private shoreline use facilities, activities or development (issued under the authority of section 327.30) may be issued in accordance with the project Shoreline Management Plan. Failure to comply with the permit conditions issued under Section 327.30 is prohibited.

327.20 Unauthorized structures.

The construction, placement, or existence of any structure (including, but not limited to, roads, trails, signs, non-portable hunting stands or blinds, buoys, docks, or landscape features) of any kind under, upon, in or over the project lands, or waters is prohibited unless a permit, lease, license or other appropriate written authorization has been issued by the District Commander. The design, construction, placement, existence or use of structures in violation of the terms of the permit, lease, license, or other written authorization is prohibited. The government shall not be liable for the loss of, or damage to, any private structures, whether authorized or not, placed on project lands or waters. Unauthorized structures are subject to summary removal or impoundment by the District Commander. Portable hunting stands, climbing devices, steps, or blinds, that are not nailed or screwed into trees and are removed at the end of a day's hunt may be used.

327.21 Special events.

(a) Special events including, but not limited to, water carnivals, boat regattas, fishing tournaments, music festivals, dramatic presentations or other special recreation programs are prohibited unless written permission has been granted by the District Commander. Where appropriate, District Commanders can provide the state a blanket letter of permission to permit fishing tournaments while coordinating the scheduling and details of tournaments with individual projects. An appropriate fee may be charged under the authority of Sec. 327.23.

(b) The public shall not be charged any fee by the sponsor of such event unless the District Commander has approved in writing (and the sponsor has properly posted) the proposed schedule of fees. The District Commander shall have authority to revoke permission, require removal of any equipment, and require restoration of an area to pre-event condition, upon failure of the sponsor to comply with terms and conditions of the permit/permission or the regulations in this part 327.

327.22 Unauthorized occupation.

(a) Occupying any lands, buildings, vessels or other facilities within water resource development projects for the purpose of maintaining the same as a full- or part-time residence without the written permission of the District Commander is prohibited. The provisions of this section shall not apply to the occupation of lands for the purpose of camping, in accordance with the provisions of Sec. 327.7.

(b) Use of project lands or waters for agricultural purposes is prohibited except when in compliance with terms and conditions authorized by lease, license or other written agreement issued by the District Commander.

327.23 Recreation use fees.

(a) In accordance with the Land and Water Conservation Fund Act of 1965 (16 U.S.C. 460l) and the Omnibus Budget Reconciliation Act of 1993, Pub. L. 103-66, the Corps of Engineers collects day use fees, special recreation use fees and/or special permit fees for the use of specialized sites, facilities, equipment or services related to outdoor recreation furnished at Federal expense.

(b) Where such fees are charged, the District Commander shall insure that clear notice of fee requirements is prominently posted at each area, and at appropriate locations therein and that the notice be included in publications distributed at such areas. Failure to pay authorized recreation use fees as established pursuant to Pub. L. 88-578, 78 Stat. 897, as amended (16 U.S.C. 460l-6a), is prohibited and is punishable by a fine of not more than $100.

(c) Failure to pay authorized day use fees, and/or properly display applicable receipt, permit or pass is prohibited.

(d) Any Golden Age or Golden Access Passport permittee shall be entitled, upon presentation of such a permit, to utilize special recreation facilities at a rate of 50 percent off the established use fee at Federally operated areas. Fraudulent use of a Golden Age or Golden Access Passport is prohibited.

327.24 Interference with Government employees.

(a) It is a Federal crime pursuant to the provisions of sections 111 and 1114 of Title 18, United States Code, to forcibly assault, resist, oppose, impede, intimidate, or interfere with, attempt to kill or kill any civilian official or employee of the U.S. Army Corps of Engineers engaged in the performance of his or her official duties, or on account of the performance of his or her official duties. Such actions or interference directed against a Federal employee while carrying out the regulations in this part are also a violation of such regulations and may be a state crime pursuant to the laws of the state where they occur.

(b) Failure to comply with a lawful order issued by a Federal employee acting pursuant to the regulations in this part shall be considered as interference with that employee while engaged in the performance of their official duties. Such interference with a Federal employee includes failure to provide a correct name, address or other information deemed necessary for identification upon request of the Federal employee, when that employee is authorized by the District Commander to issue citations in the performance of the employee's official duties.

327.25 Violations of rules and regulations.

(a) Any person who violates the provisions of the regulations in this part, other than for a failure to pay authorized recreation use fees as separately provided for in Sec. 327.23, may be punished by a fine of not more than $5,000 or imprisonment for not more than six months or both and may be tried and sentenced in accordance with the provisions of section 3401 of Title 18, United States Code. Persons designated by the District Commander shall have the authority to issue a citation for violation of the regulations in this part, requiring any person charged with the violation to appear before the United States Magistrate within whose jurisdiction the affected water resources development project is located (16 U.S.C. 460d).

(b) Any person who commits an act against any official or employee of the U.S. Army Corps of Engineers that is a crime under the provisions of section 111 or section 1114 of Title 18, United States Code or under provisions of pertinent state law may be tried and sentenced as further provided under Federal or state law, as the case may be.

327.26 State and local laws.

(a) Except as otherwise provided in this part or by Federal law or regulation, state and local laws and ordinances shall apply on project lands and waters. This includes, but is not limited to, state and local laws and ordinances governing:

(1) Operation and use of motor vehicles, vessels, and aircraft;

(2) Hunting, fishing and trapping;

(3) Use or possession of firearms or other weapons;

(4) Civil disobedience and criminal acts;

(5) Littering, sanitation and pollution; and

(6) Alcohol or other controlled substances.

(b) These state and local laws and ordinances are enforced by those state and local enforcement agencies established and authorized for that purpose.

327.27 (Reserved)

327.28 (Reserved)

327.29 (Reserved)

327.30 Shoreline Management on Civil Works Projects

(a) Purpose. The purpose of this regulation is to provide policy and guidance on management of shorelines of Civil Works projects where 36 CFR Part 327 is applicable.

(A complete copy of 327.30 is available at the Resource Manager's Office, District Office, Division Office or from HQUSACE CECW-ON, Washington, DC 20314-1000.)

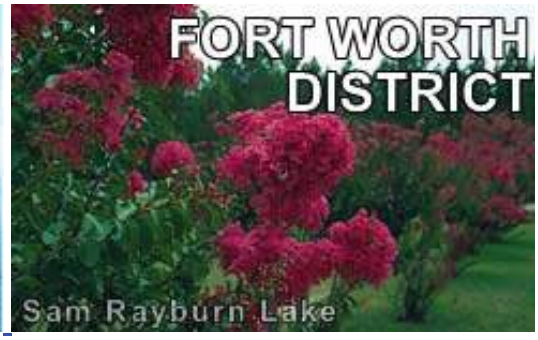
A violation of the provisions of this regulation shall subject the violator to a fine of not more than $5000.00 or imprisonment for not more than 6 months, or both.

In the interest of more effective resource management and to increase the overall enjoyment of the visitor experience available at Corps of Engineers water resources development projects, the preceding rules and regulations have been established. Your observance of these rules while a visitor to these projects will make your visit and the visits of others more pleasant and enjoyable.

THIS REVISION SUPERSEDES EP 1165-2-316, May 1986

U.S. Army Corps of Engineers
Fort Worth District
819 Taylor Street
P.O. Box 17300
Fort Worth, TX 76102
Phone: (817)886-1326
Email: Public.Affairs.usace.army.mil
Internet: www.swf.usace.army.mil

US Army Corps of Engineers ®
Fort Worth District



Adjacent Landowner Information

GOVERNMENT-OWNED (FEE) LAND

Government-owned (fee) land was purchased by the government, and extends from underneath the reservoir upward to the boundary line. The upper extent of government-owned land managed by the U.S. Army Corps of Engineers (COE) is usually indicated by an orange painted line on trees, fiberglass post with COE markings, and concrete markers with bronze caps.

Click here to read the Shoreline Management Policy

THE ADJACENT LANDOWNER MAY:

1. Apply for a permit to mow and underbrush property (permission to remove dead or hazardous trees may be approved under this permit).

2. Apply for a permit to perform shoreline erosion control work.

3. Apply for a water license to withdraw water and place a water line on government property. A contract must be obtained from the Lower Neches Valley Authority (LNVA), P.O. Box 3464, Beaumont, Texas 77704, Phone: 409-892-4011, before the U.S. Army Corps of Engineers will issue a license.

THE ADJACENT LANDOWNER CANNOT:

1. Place personal property of any kind, including but not limited to boats, buildings, stairways, bird houses, tables, etc., on government property for more than 24 hours. Such actions may result in summary removal and impoundment of the property or other action. Portable (roll-away) docks are prohibited at all times.

2. Construct roads, buildings, or other items on government property.

3. Moor a boat or other floating device.

4. Restrict public use of this land verbally, by posting signs, by fencing, to the water, by erection of obstacles, or by other methods.

5. Drive vehicles (including ATV's and golf carts) to the lake, except at authorized access or launching points.

6. Camp on government land, except in designated areas.

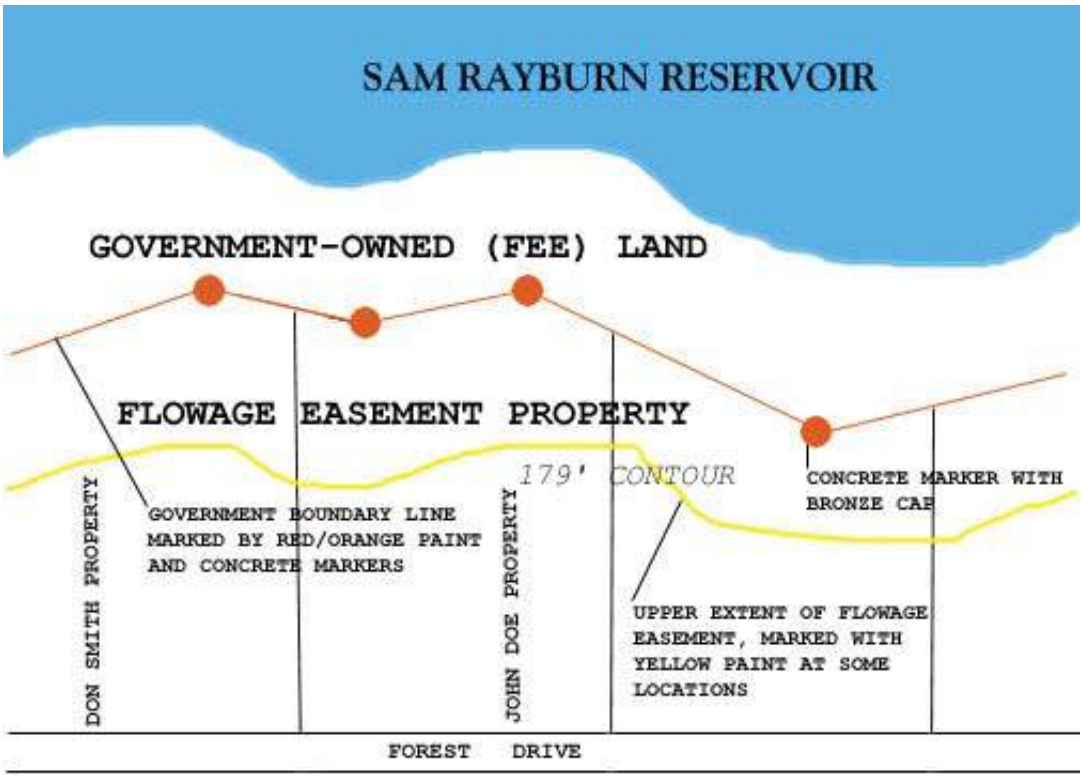
7. Dump household garbage or other debris on government property.

8. Cut trees, clear brush or mow, (except as authorized under a mowing and underbrushing permit), dig , excavate channels, or otherwise deface or destroy government property.

9. Excavate, dig, alter, or remove cultural resources, including but not limited to pottery, pottery shards, arrow heads, bone, and tools.

FLOWAGE EASEMENT LAND

Flowage easement land is privately-owned land between the government boundary line and the elevation contour on which the U.S. Army Corps of Engineers has purchased the right to flood. The typical flowage easement contour on Sam Rayburn Reservoir is 179' MSL however, in the upper reaches of the reservoir flowage easement land may run as high as 189' elevation contour. The concept of flowage easement allows you, the landowner, to make use of property which otherwise would have been purchased by the government. Therefore, flowage easement land is different than government-owned land. The graphic below presents an example of the relationship between Government owned Fee Land and private land encumbered with a floweage easement.



THE LANDOWNER MAY:

1. Fence flowage easement to the government boundary line, and/or along the government boundary line at his/her discretion. Any fence must be constructed so that lake water can flow through it.

2. Plant grass, shrubs, trees, or gardens on flowage easement at his/her discretion.

3. Mow, underbrush, or cut trees on flowage easement at his/her own discretion.

THE LANDOWNER MUST:

1. Apply for a permit to construct or place storage buildings, fish cleaners, pump houses, garages, etc., on flowage easements. Houses, trailers, and other structures suitable for human habitation ARE NOT ALLOWED.

2. Apply for a permit to drill a water well or place utility lines on flowage easement.

THE LANDOWNER CANNOT:

1. Construct or place any house, trailer, RV or other structure for human habitation, permanent or temporary, on flowage easement.

2. Dredge, fill or otherwise alter the land contours.

PERMIT APPLICATIONS

1. Government-owned (fee) land

a. Mowing and Underbrushing permit applications require an Application for Shoreline Use Permit (available at the project office), and a property plat showing the location of the proposed activity in relation to COE boundary line and monuments.

b. Shoreline Erosion Control permit applications require an Application for Shoreline Use Permit (available at the project office), a property plat showing the location of proposed construction in relation to COE boundary line and monuments and 164' elevation contour, and a plan showing detailed design and materials of proposed work. If excavation is required, a archeological survey is usually required.

c. Permit request such as water withdrawal permits that require excavation on government property will require an archeological review by this office, and may require a archeological survey.

2. Flowage easement permit applications must include:

a. Application for Shoreline Use Permit.

b. Plat showing location of the proposed construction in relation to the flowage easement elevation contour and the COE boundary line and monuments.

c. Plan showing detailed design and materials of proposed building or construction.

d. In addition to the above three items, applications for roads on flowage easement should also include a plan showing the linear profile of the road and a typical cross-section of the road. Some of these items may be combined on the same sheet. Items a, b, and c, plus the LNVA contract are required for the water license.

3. Permit applications, detailed requirements, and any questions you may have should be addressed to Sam Rayburn Project Office, 7696 RR 255 W, Jasper, Texas, 75951-9598, or by phone at (409) 384-5716. Any correspondence should include a complete return address and phone number. See Ranger Districts below for e-mail information.

SPACE RESTRICTIONS

Before purchasing land adjacent to Sam Rayburn Reservoir, there are three items which should be checked to determine if the land is suitable for your intended uses.

1. Check to see if the 179' elevation contour (upper extent of flowage easement) and government property line are identified. This is usually done by the person selling the land

when the property lines are surveyed and legal descriptions of the easement may be found in the deed. If they are not identified contact the Sam Rayburn Project Office for information on the government property line. The flowage easement elevation can be located by a surveyor. The landowner is responsible for locating and respecting these lines.

2. Contact the Angelina-Neches River Authority, (A.N.R.A) 210 Lufkin, Avenue, P.O. Box 387, Lufkin, Texas 75901, Phone: 936-632-7795, for information on the size and location of septic systems. A.N.R.A. personnel will tell you how to apply for a septic system permit, run soil test and help design the system.

3. Establish on ground if there is enough space ABOVE the flowage easement elevation contour (upper extent of flowage easement) on which to place a trailer or construct a house with a septic system.

--After the land is purchased, apply for all necessary permits, licenses, and contracts well in advance of construction.

FOR YOUR PROTECTION

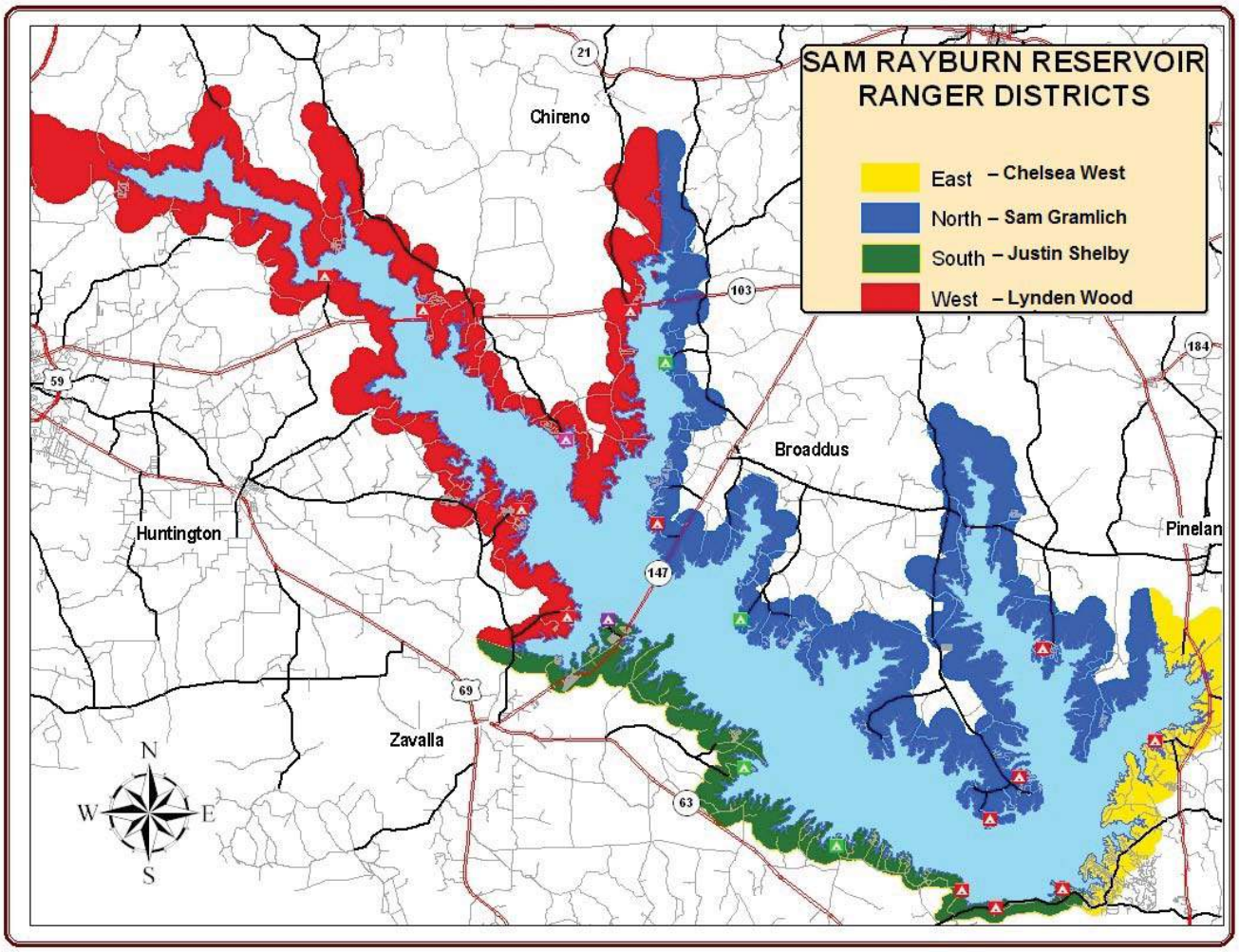
--These regulations were designed for the protection of the rights and privileges of adjacent landowners and visitors to the reservoir, as well as the protection of government interests vital to the operation of the reservoir. If followed, the regulations should help avoid damage and/or loss of your property and contamination of drinking water in the event of flooding. In addition, the clean appearance of the shoreline with the absence of cluttered docks, boats, and partially sunken boathouses makes Sam Rayburn Reservoir one of the great natural attractions of Texas. To continue this high goal will require the cooperation and assistance of every individual.

RANGER DISTRICTS

Sam Rayburn is divided into four Ranger Districts, each with a specific Park Ranger that is responsible for activities within that district, including processing permits and other requests from adjacent landowners. The Park Ranger responsible for your area can be seen on the map below.

Contact by E-mail: click on Ranger's name **Contact by Telephone: 409-384-5716**

Chelsea West **Sam Gramlich** **Justin Shelby** **Lynden Wood**



If you do not have a copy of Acrobat Reader, click here

This site last updated on September 5, 2014

Page Counter: 7279

APPENDIX 7 – FCWD

RULES AND REGULATIONS

OF

FRANKLIN COUNTY WATER DISTRICT

RULES AND REGULATIONS
OF
FRANKLIN COUNTY WATER DISTRICT

WHEREAS, the FRANKLIN COUNTY WATER DISTRICT was created by certain enabling legislation pursuant to Article XVI, Sec. 59 of the Texas Constitution for the purposes of protecting the water-shed of Lake Cypress Springs and the water impounded therein; and

WHEREAS, the Board of Directors of the District has determined that the incidental use of certain designated areas of the Lake by the general public for development and recreational activities will not conflict with the operation and maintenance of the reservoir for its primary purpose of water supply and conservation; and

WHEREAS, the Board has further determined that the following Rules and Regulations are in the best interest of the District and all persons who may be entitled or permitted to utilize the Lake or the property owned by the District.

NOW, THEREFORE, in consideration of the foregoing premises, the Board does hereby promulgate the following Rules and Regulations for public safety and welfare; and

FURTHER, declares that such Rules and Regulations shall be applicable to the waters of Lake Cypress Springs and all property adjacent thereto or in the vicinity thereof owned, controlled or supervised by the District; and

FURTHER, declares that such Rules and Regulations may be enforced by the District or any certified peace officer in the State of Texas.

DEFINITIONS

For the purposes of these Rules and Regulations, the following terms shall have these meanings:

"***Accessory Building***" means a permanent, detached subordinate building arranged and designed for a use which is clearly incidental to that of the main building or to the use of the land, provided that a trailer or mobile home shall never be construed to be an Accessory Building.

"***Board***" means the Board of Directors of the Franklin County Water District.

"***Boathouse***" means a building or structure extending partially or completely over the water for the primary purpose of sheltering or protecting boats or other watercraft.

"***Commercial Operations***" means any activity which involves the solicitation or acceptance of any public patronage.

"***Contractor Registry***" shall have the definition assigned in Section 14.23 below.

"***Dam***" means the Franklin County Dam situated at the east end of the Lake.

"***District***" means the Franklin County Water District.

"***District Property***" means all real property owned by, or under the control or supervision of, the District, including without limitation the Lake.

"***Dwelling Unit***" means a building or portion thereof designed exclusively for residential occupancy.

"***Environmental Law***" means all federal, state, and local statutes, ordinances, regulations, and rules relating to environmental quality, health, safety, contamination and clean-up, including, without limitation, the Clean Air Act, 42 U.S.C. Section 7401 et seq.; the Clean Water Act, 33 U.S.C. Section 1251 et seq., and the Water Quality Act of 1987; the Federal Insecticide, Fungicide, and Rodenticide Act, 70 U.S.C. Section 136 et seq. (FIFRA); the Marine Protection, Research, and Sanctuaries Act, 33 U.S.C. Section 1401 et seq.; the National Environmental Policy Act, 42 U.S.C. Section 4321 et seq.; the Noise Control Act, 42 U.S.C. Section 4901 et seq,; the Occupational Safety and Health Act, 29 U.S.C. Section 651 et seq.; the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. Section 6901 et seq., as amended by the Hazardous and Solid Waste Amendments of 1984; the Safe Drinking Water Act, 42 U.S.C. Section 300f et seq.; the Comprehensive Environmental

Response, Compensation and Liability Act (CERCLA), 42 U.S.C. Section 9601 et seq., as amended by the Superfund Amendments and Reauthorization Act, the Emergency Planning and Community Right-to-Know Act, and Radon Gas and Indoor Air Quality Research Act; the Toxic Substances Control Act (TSCA), 15 U.S.C. Section 2601 et seq.; the Atomic Energy Act, 42 U.S.C. Section 2011 et seq., and the Nuclear Waste Policy Act of 1982, 42 U.S.C. Section 10101 et seq.; and state super-lien and environmental clean-up statutes, with implementing regulations and guidelines. Environmental Laws shall also include all state, regional, county, municipal, and other local laws, regulations, and ordinances insofar as they are equivalent or similar to the federal laws recited above or purport to regulate Hazardous Materials.

"***Family***" means one or more persons related by blood, adoption, or marriage, or not more than four (4) unrelated persons living and cooking together as a single housekeeping unit.

"***Garage***" means an improvement intended to be used primarily for the parking or temporary storage of automobiles or other vehicles. A garage may either be an Accessory Building or attached to the main building.

"Golf Cart" means a vehicle with at least three wheels that has a normal maximum speed of between 15 – 25 mph, and is manufactured primarily for operation on golf courses.

"***Guest House***" means living quarters located within a detached Accessory Building located on the same premises with the main building, for use by temporary guests of the occupants of the premises, such quarters having no separate kitchen facilities and not rented or otherwise used as a separate Dwelling Unit.

"***Hazardous Materials***" means the following, including mixtures thereof: any hazardous substance, pollutant, contaminant, waste, by-product or constituent regulated under CERCLA; oil and petroleum products and natural gas, natural gas liquids, liquefied natural gas, and synthetic gas usable for fuel; pesticides regulated under FIFRA; asbestos and asbestos-containing materials; PCBs and other substances regulated under TSCA; source material, special nuclear material, by-product material, and any other radioactive materials or radioactive wastes, however produced, regulated under the Atomic Energy Act or the Nuclear Waste Policy Act; chemicals subject to the OSHA Hazard Communication Standard, 29 C.F.R. ' 1910.1200 et seq.; and industrial process and pollution control wastes whether or not hazardous within the meaning of RCRA.

"***Illuminated Sign***" means a Sign that is artificially lighted, whether from an interior or exterior light source.

"***Improvement***" means constructed additions to real property, including without limitation Dwelling Units, Accessory Buildings, Garages, Guest Houses, fences, driveways, retaining walls, piers, boathouses, etc.

"***Improvement Survey***" means a comprehensive survey of a parcel of real property prepared by a licensed professional land surveyor or engineer that depicts the boundaries of such real property and accurately shows the location of any and all Improvements.

"***Kitchen Facilities***" means a space adapted to cooking or preparing food and containing one or more of the following: stove, oven, range, cook top, dishwasher or trash compactor.

"***Lake***" means Lake Cypress Springs, including the lake property, all its streams, inlets, drains, and tributaries, and all lands and premises covered in whole or in part by water owned by or under the control or supervision of the Franklin County Water District.

"***Leased Property***" means a portion of District Property which is the subject of a valid lease between the District, as landlord, and a Lessee, as tenant.

"***Lessee***" means the holder of any leasehold estate in any Leased Property pursuant to a written Lease between such holder, as tenant, and the District, as landlord.

"***Manage***" shall mean to generate, manufacture, process, treat, store, use, re-use, refine, recycle, reclaim, blend or burn for energy recovery, incinerate, accumulate speculatively, transport, transfer, dispose of, or abandon Hazardous Materials.

"***Manager***" means the person employed by the District to serve as its general manager.

"***Mining***" shall mean the extraction, removal, or stockpiling of earth materials, including soil, sand, gravel, oil, gas, or other minerals or materials found in the earth, whether accomplished by digging, drilling, pumping or any other current or future technology.

"***Nonconforming Uses***" means lots, structures, improvements, and uses existing on District Property that would otherwise be prohibited, regulated, or restricted under these Rules, whether or not such nonconformities were properly permitted at the time of their origination.

"***Originally Permitted Nonconforming Uses***" means a Nonconforming Use for which the applicable Lessee obtained a properly issued permit or other approval from the District at the time such nonconformity was originated.

"***OSSF***" means on-site sewage facility.

"***Pier***" means a platform or other structure supported on pillars and extending partially or completely over the water for use as a landing place for watercraft or as an entertainment area.

"***Release***" shall mean any actual or threatened spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing of Hazardous Materials into the environment, as "environment" is defined in CERCLA.

"***Repair***" means the act of fixing or mending a structure that is suffering from damage, wear and tear, or defect, with the sole objective of restoring the structure to its original fully functioning and safe condition. Repair does <u>not</u> include the enhancement, improvement or replacement of the structure.

"***Rules***" means these Rules and Regulations of the Franklin County Water District.

"***Sign***" means every message, announcement, declaration, illustration, insignia, surface or space, whether personal, professional or commercial in nature, erected or maintained in view of the observer for identification, expression, entertainment or promotion, including those of both a temporary and permanent nature. The definition of Sign includes the sign structure, supports, lighting system and any attachments, ornaments or other features used to draw the attention of observers.

"***Single Family***" means one or more persons related by blood, adoption, or marriage to the first or second degree of consanguinity or affinity; or not more than two (2) unrelated persons living and cooking together as a single housekeeping unit.

"***TCEQ***" means the Texas Commission on Environmental Quality and any successor thereto.

"***Unpermitted Nonconforming Uses***" means a Nonconforming Use that has never been properly permitted or approved by the District.

"***Walkway***" means a sidewalk, pathway, deck or passageway constructed over the ground for walking.

ARTICLE I
<u>WAIVER OF LIABILITY</u>

Neither the District, the Board, the Manager, nor any of their respective agents, employees, or contractors shall be liable to any party for any injury, death, damage or loss to persons or property of any kind occurring in, around or upon District Property from any cause whatsoever, **INCLUDING WITHOUT LIMITATION THE NEGLIGENCE OF THE DISTRICT, THE BOARD, THE MANAGER, OR THEIR RESPECTIVE AGENTS, EMPLOYEES OR CONTRACTORS.** Voluntary entry upon District Property by any party shall be at the sole risk of such entering party and shall constitute an express waiver and release of all claims against the District, the Board, the Manager, and their respective agents, employees and contractors for all such injury, damage or loss to persons or property.

All Leased Property is accepted by the Lessee thereof **AS IS, WHERE IS, WITH ALL FAULTS.** The District makes no warranties or representations of any kind, express or implied, with respect to any Leased Property including, without limitation, as to habitability, fitness or suitability for a particular purpose.

ARTICLE II
RESTRICTED AREAS

2.1 No person, vehicle or water craft of any kind shall be allowed:

(a) On the Lake within two hundred feet (200') of any water intake or spillway structure (e.g., the "Morning Glory" spillway);

(b) On any stream bed or other land area downstream (east) of the Dam; or

(c) In any other area specifically marked "Restricted" or "No Trespassing" by the District.

2.2 Entry by any unauthorized party onto the embankment of the Dam, including fishing, mooring boats, or trespassing in any other manner, is strictly prohibited.

2.3 The use or operation of any motor vehicle within the emergency spillway, or the embankments on either side thereof, is strictly prohibited, except as specifically authorized by the District.

2.4 Only specifically authorized personnel shall be allowed in any District maintenance shops, equipment buildings, and operations quarters.

2.5 All vehicular traffic is prohibited on green belt areas designated by the District, including without limitation the west end park area and Mary King Park.

2.6 The District may install marker buoys to designate restricted areas upon the Lake.

2.7 It is a violation of the laws of the State of Texas for any person to move, remove, tamper with, willfully damage or anchor any water craft to a buoy. Additionally, no buoy shall be placed on the Lake without specific prior approval from the District.

ARTICLE III
FIREWORKS

3.1 Fireworks shall be allowed in designated areas of District Property on the Fourth of July, New Years Eve, New Years Day and other times specifically authorized by the District.

ARTICLE IV
HUNTING AND FISHING

4.1 All forms of hunting are strictly prohibited on all District Property.

4.2 All applicable laws, ordinances and regulations of the State of Texas, as supplemented by these Rules, shall govern the taking of fish from the Lake.

4.3 No fishing shall be allowed in any designated swimming areas.

4.4 No fishing shall be allowed within two hundred feet (200') of any water intake structure.

4.5 Taking, removing, injuring, capturing, or attempting to take, remove, injure, or capture, Triploid Grass Carp from the Lake is strictly prohibited.

4.6 Commercial fishing or harvesting of any kind is prohibited on the Lake, except as specifically authorized by contract with the District. For purposes of these Rules, the term "commercial fishing" shall include the taking of any fish, mussels or other aquatic wildlife from the waters of the Lake, by any means whatsoever, for sale or trade for anything of value.

ARTICLE V
BOATS, AIRCRAFT, AUTOMOBILES, BICYCLES AND OTHER VEHICLES

5.1 The Texas Water Safety Act and all amendments thereto are incorporated herein by reference and shall be applicable to all District Property.

5.2 Boats shall only be launched onto the Lake from boat ramps properly designated by the District.

5.3 No boat or other water craft exceeding twelve feet (12') in width or twenty-six feet (26') in length shall be allowed on the Lake at any time, with the exception of a "work barge" with a valid permit.

5.4 All boats and water craft shall be operated in a careful and prudent manner at idling speed within two hundred feet (200') from any shoreline.

5.5 Any person being towed behind a boat or other water craft (e.g., skiing, aquaplaning, jet skiing, wet biking, etc.) must wear a Coast Guard approved personal flotation device such as a life jacket.

5.6 All boats and other water craft shall be kept securely moored and anchored when not in use.

5.7 Any boat or water craft found abandoned, adrift or unattended shall be impounded by the District and subject to an impound fee. Any impounded boat or water craft not claimed within thirty (30) days may be sold by the District.

5.8 No airplanes of any kind (including gliders, weedhoppers, or any other motor propelled aircraft) shall be permitted on District Property, provided however that the foregoing restriction shall not prohibit airplanes from landing or taking off directly from the surface of the waters of the Lake.

5.9 No specialized recreational device which is not designed for on water use and remaining in constant contact with the water surface (e.g., parasailing, ultra lights, etc.) shall be permitted on the Lake.

5.10 All motor vehicles on District Property, including automobiles, motor bikes and motorcycles, must be registered and operated in compliance with the laws of the State of Texas.

5.11 All drivers and operators of motor vehicles and golf carts on District Property must have a current, valid drivers license.

5.12 Pursuant to the authority granted to the District in §542.202 of the Texas Transportation Code and §51.127 of the Texas Water Code, the District is authorized to designate speed limits on public park areas of District Property, which shall be marked with signs posted by the District with the maximum allowed speeds. No motor vehicle or golf cart shall be operated in such marked areas in excess of the posted speed.

5.13 The District does not post, and shall not be responsible for regulating or enforcing, traffic regulations (e.g., speed limits) on any road, street, drive or other right of way located within any private development on Leased Property.

5.14 Except for golf carts (as provided in Section 5.17 below), all non-registered, off-road vehicles, including go-carts, dune buggies, four wheelers, and all other types of all-terrain vehicles, are expressly prohibited on public park areas of District Property.

5.15 All motor vehicles and golf carts are prohibited on public beach areas of District Property.

5.16 Bicyclists on District Property shall comply with all applicable bicycle traffic and safety laws of the State of Texas.

5.17 Golf carts shall be allowed on all public park areas of District Property, except Mary King Park and the West End Park.

5.18 All golf carts on District Property shall at all times be operated in a safe and prudent manner and in accordance with these Rules and Regulations. Any violation of these Rules and Regulations by an operator of a golf cart may result in prohibition from further operation on District Property.

ARTICLE VI
SWIMMING

6.1 All swimming on District Property shall be done in a safe and prudent manner.

6.2 No swimming is allowed in the Lake at a distance of more than one hundred feet (100') from the shoreline unless accompanied by a boat, and then only if swimmer is wearing a Coast Guard approved flotation device.

6.3 No person shall wade, swim or dive within fifty feet (50') of any boat launch areas, or in any other area designated by the District as a prohibited swimming area.

6.4 All diving or jumping into the Lake from public highways, roadway bridges or utility towers is strictly prohibited.

ARTICLE VII
PUBLIC AREAS, PARKS, AND PAVILIONS

7.1 All persons using public park areas within District Property shall use reasonable care to keep and maintain such areas in good and clean condition.

7.2 All trash, rubbish, garbage or other waste generated on District Property shall be disposed of only at designated disposal sites.

7.3 Public trash receptacles on District Property are solely to be used for disposing of trash generated in public areas of District Property. It shall be unlawful to transport and deposit any household garbage, rubbish, trash or waste in a public trash receptacle owned by the District.

7.4 Children twelve (12) years of age or under shall be accompanied and supervised by an adult at all times while on District Property.

7.5 All pets shall be kept on leashes or otherwise restrained while on public park areas. No vicious or dangerous animals shall be brought onto District Property.

7.6 Glass beverage containers and metal cans (e.g., soft drinks, beer, alcoholic beverages, etc.) are strictly prohibited on public beach areas.

7.7 Glass beverage containers are strictly prohibited in all pavilions.

7.8 No fires shall be allowed in any pavilion.

7.9 No fish cleaning shall be allowed in any pavilion.

7.10 Personal property shall not be left unattended or abandoned on District Property. Any such personal property abandoned for a period in excess of forty-eight (48) hours may be impounded by the District and subject to an impound fee. Impounded property that is not reclaimed (including payment of any applicable impound fee) may be sold, destroyed, converted to District use, or otherwise disposed of, at the sole discretion of the District.

7.11 No generators shall be operated on District Property in a manner so as to disturb others.

7.12 No trees on public park areas of District Property shall be cut, removed, mutilated, broken, burned, or otherwise damaged without prior written permission from the District.

ARTICLE VIII
CAMPING

8.1 Camping shall be allowed on District Property only within designated camping areas.

8.2 No person shall camp on District Property without first paying the applicable fee and receiving written confirmation thereof.

8.3 No person shall camp on District Property for a period of fourteen (14) consecutive days or longer without obtaining prior consent or authorization from the District.

8.4 No picnicking, parking or loitering is allowed in any camping area (including associated pavilions) without payment of the applicable camping fee, as required in Section 8.2 above.

8.5 Fires shall be permitted only in designated areas and shall not be left unattended. All fires shall be completely extinguished prior to campers leaving the camp site.

8.6 No disposal outlet shall be opened, nor shall any effluent, “gray water”, or other liquid waste be discharged on District Property except at designated dump stations.

8.7 The installation of any kind of permanent or semi-permanent structure or improvement on a designated camping area is strictly prohibited.

ARTICLE IX
RESERVATIONS AND SPECIAL EVENTS

9.1 Reservations for recreational vehicle camping sites and pavilions may be made in person, by telephone, or on the website, up to sixty (60) days in advance of the check-in date.

9.2 Reservations are not confirmed until payment in full is received by the District.

9.3 Pavilion reservations may also require payment of a security deposit, which shall be refunded only upon District confirmation that the reserved area was left clean and in good condition.

9.4 Any special event to be conducted on District Property, including without limitation boat races, regattas, water-skiing competitions, festivals, or similar activities shall require a special event permit from the District, which shall designate the location and duration of such event, in addition to any other restriction imposed by the District. Concession stands shall only be permitted on District Property in conjunction with a properly permitted special event.

ARTICLE X
COMMERCIAL ACTIVITIES

10.1 Commercial Operations are prohibited on District Property except as specifically allowed by a permit or other written agreement with the District, and then only on areas designated by the District for Commercial Operations. Notwithstanding the foregoing, the advertising and sale of a Lessee's leased property by such Lessee shall not be prohibited, provided that the foregoing exclusion shall not permit the operation of realty, brokerage, or other real estate related business on District Property.

10.2 The character, extent, and duration of any permitted Commercial Operations shall be as specified in a permit, concession, or other written agreement with the District.

10.3 Private notices, billboards, and all other forms of advertising (including commercial, business and professional Signs) are strictly prohibited on District Property except as specifically authorized by the District in writing. Notwithstanding the foregoing, a Lessee may display up to two (2) "For Sale" or "For Rent" Signs on such Lessee's leased property, provided however that such Signs may not exceed 2' x 2' in size, shall only pertain to the actual property upon which they are located, and shall otherwise comply with the requirements of Section 12.8 below.

ARTICLE XI
MAINTENANCE OF LEASED PROPERTY

11.1 All Leased Property shall be maintained by the Lessees thereof in a safe, clean and reasonable manner, including the control of undesirable weeds and undergrowth and proper drainage. Notwithstanding the foregoing, unimproved property may be left substantially in its natural state, as long as such property otherwise complies with these Rules.

11.2 All improvements on Leased Property, including buildings, structures, retaining walls, piers, boathouses and docks, shall be maintained in a safe and orderly manner so as to not detract from the beauty of the Lake or create a safety hazard.

11.3 Construction materials, supplies, or equipment may only be stored on Leased Property on a temporary basis for a period not to exceed thirty (30) calendar days.

11.4 No Leased Property shall be modified or altered so as to allow or contribute to erosion or otherwise detract from the natural beauty of such property.

11.5 No livestock or poultry of any kind shall be raised, bred or kept on District Property.

11.6 All swimming pools on District Property shall be maintained in a safe and sanitary manner free from stagnant water, filth, carrion, trash, rubbish, or any condition likely to produce disease, impurity or other unhealthy condition.

11.7 A Lessee shall notify the District immediately in the event of any modification to the OSSF serving such Lessee's Leased Property and shall thereafter provide the District with a diagram and other acceptable documentation evidencing such modification.

11.8 Travel trailers, motor homes, and other recreational vehicles may be stored on Leased Property, but shall not be connected to any external utility hook-ups or otherwise used for camping or residential purposes while on Leased Property.

ARTICLE XII
DEVELOPMENT STANDARDS

12.1 No development shall be permitted on District Property until the District has reviewed construction and development plans and specifications for such development.

12.2 Single Family residential.

(a) The development of Single Family residential areas or the construction of Single Family Dwelling Units shall be permitted only in areas designated by the District for such development and construction.

(b) Those portions of District Property designated as "Single Family Residential" by the District shall be restricted to private, non-commercial, Single Family residential use and shall contain no more than one Dwelling Unit per lot. Notwithstanding the foregoing, garages, guest houses and other Improvements incidental to residential use may be permitted on Single Family Residential lots, provided such Improvements (i) comply in all other respects with these Rules, and (ii) are not used as a separate Dwelling Unit.

(c) No Lessee may sell, transfer or convey, or offer for sale, transfer or conveyance, any partial or fractional interest (other than the entirety) in any Leased Property or leasehold interest.

(d) No Leased Property may be made part of, or used for, a timeshare, tenant-in-common, or other formal multiple-party ownership structure.

(e) Leased Property and leasehold interests may only be titled, owned and held by and in the name (or names) of natural persons, subject to the other provisions of this Article.

(f) Notwithstanding the foregoing restrictions, the following shall be permitted:

(i) Leased Property and leasehold interests may be titled, owned and held by and in the name of a family partnership, family trust, or other similar entity, so long as all the beneficial interests in such entity are owned by members of a Single Family and the use thereof complies in all other respects with these Rules.

(ii) During the initial construction or subsequent remodeling of a Dwelling Unit for purposes of marketing and resale, Leased Property and leasehold interests may be temporarily titled, owned and held by and in the name of the building company; provided, however, that all subsequent conveyances thereof shall comply in all respects with this Article and the other Rules.

(g) Any sale, conveyance or transfer, or attempted sale, conveyance or transfer, of Leased Property or any leasehold interest therein made in contravention of this Article shall constitute a violation of these Rules and shall, at the election of the District, be null and void ab initio.

12.3 Drainage.

(a) Where a watercourse, drainage way, natural channel, or stream traverses a proposed development, there shall be provided an easement or right-of-way conforming substantially to the limits of such watercourse.

(b) The location and size of required drainage easements shall be determined by the District.

(c) All bridges, culverts, improved channels, or other drainage structures must be approved by the District before installation or construction.

(d) No site improvement shall permit storm water or natural water to stand or be otherwise impounded upon said site.

12.4 Minimum Lot Sizes.

(a) All residential lots shall be at least one-half acre in size.

(b) All residential lots shall be of a depth sufficient to permit an adequate disposal area for an OSSF.

(c) The waterfront boundary of all lots abutting the Lake shall be at least one hundred feet (100').

12.5 Minimum Residence Size and Residence Origin. No single family residence constructed on District Property shall have less than one thousand (1,000) square feet, excluding open or screened porches, terraces, patios, driveways, carports and garages.

12.6 Camping Restricted.

(a) No camping shall be allowed on any District Property designated for single family residential use unless a building permit has been issued and on-site construction of a residence has commenced.

(b) Any camping permitted by provisions of Section 12.6(a) above shall require a camping permit, which may be issued at the sole discretion of the District.

(c) The District will not issue a camping permit under this Section 12.6 if the governing homeowner's association or other applicable restrictive covenant prohibits camping.

12.7 Mobile / Modular Home Areas. The installation, use or occupancy of any type of mobile or modular home on District Property is strictly prohibited.

12.8 Signs.

(a) Except as specifically provided herein, no Sign shall be erected, raised or maintained by any Lessee, occupant or contractor on District Property.

(b) All commercial, business and professional Signs are prohibited on District Property except as set forth in Section 10.3 above.

(c) A Lessee shall be allowed to display personal (i.e., non-commercial) Signs on such Lessee's leased property provided that:

(i) the governing homeowner's association (if any) does not prohibit such Signs;

(ii) no Illuminated Signs are allowed;

(iii) no Signs that are obscene, pornographic, threatening, or otherwise reasonably considered to be in conflict with the character of a Single Family Residential neighborhood are allowed;

(iii) no Signs that are flashing, pulsating, animated, moving or rotating are allowed;

(iv) all Signs allowed hereunder shall be installed and maintained in a good and workmanlike manner so that the sign structure does not become a hazard or nuisance; and

(vii) all Signs allowed hereunder shall comply with all other applicable Rules, including without limitation setback and height requirements.

(d) Notwithstanding the foregoing, nothing contained in this Rule shall prohibit flags, seasonal decorations (during the applicable season only), address designations, or any Signs required by applicable law.

ARTICLE XIII
RE-PLATTING

13.1 In order to be considered by the District for approval, all re-plats must:

(a) Contain an accurate field note description of all parcels of Leased Property directly affected by the replat (whether by boundary revision, merger, redesignation, etc.);

(b) Depict both the previous boundary lines (in grayed-out or other legible format) and the new boundary lines of all parcels of Leased Property directly affected by the replat;

(c) Display the square footage and acreage of all parcels of Leased Property directly affected by the replat;

(d) Either (i) depict all improvements located on all parcels of Leased Property directly affected by the replat, or (ii) be submitted along with a separate, current Improvement Survey of all parcels of Leased Property directly affected by the replat; and

(e) Contain signature blocks for the District, the Franklin County commissioner's court (or the then-current approving authority), each Lessee whose Leased Property is directly affected by the replat, and the applicable homeowner's association (if any) governing all of such affected Leased Property.

INCOMPLETE REPLATS THAT DO NOT MEET ALL OF THE ABOVE REQUIREMENTS WILL NOT BE ACCEPTED FOR CONSIDERATION BY THE DISTRICT.

13.2 The District's approval of a replat shall be conditioned on the execution of the District's standard replat lease amendment by all Lessees of Leased Property affected by such replat.

13.3 The District shall not approve a replat of any Leased Property containing any uncured violations of these Rules, including without limitation unpermitted Improvements, encroachments, protrusions or setback violations.

13.4 Upon receipt of a complete replat request meeting all of the requirements of Section 13.1 above, the District shall have a minimum of thirty (30) days to review such replat before issuing any approval or denial. No "fast-track" or accelerated procedure exceptions shall be allowed.

13.5 The District shall not require a replat if a Lessee assigns its leasehold interest in Leased Property that includes a partial lot, provided that documentation of such partial lot has been previously filed with and accepted by the District. A replat shall be required for any newly created or undocumented partial lot.

ARTICLE XIV
CONSTRUCTION ON DISTRICT PROPERTY

14.1 Except as otherwise specifically provided in this Article, a permit shall be required for the construction, improvement or replacement of any building, structure or improvement on District Property. No construction activity associated with such construction, improvement or replacement may commence until the District has approved the permit and issued an authorization to construct.

14.2 Notwithstanding the provisions of Section 14.1 above, but subject to the District's right to require a permit in any case that it reasonably deems necessary, no permit shall be required for the following:

(a) The Repair of any existing permitted structure;

(b) Open decks or porches (including screened-in porches) added to an existing Dwelling Unit or Guest House;

(c) Fences, provided that all fences must be located so as to minimize any obstruction of the view of the Lake by other Lessees;

(d) Temporary or above-ground swimming pools;

(e) Prefabricated, personal water craft lifts that can be attached to an existing, permitted Improvement and allow the water craft to be suspended and stored over such existing Improvement;

(f) Storage buildings, not to exceed 144 square feet;

(g) Water wells; and

(h) Non-elevated Walkways, not to exceed 5 feet in width.

All of the foregoing work and Improvements must still comply in all other respects with these Rules, including setback requirements.

14.3 Application Process.

(a) All construction permit requests shall be submitted to the District office in writing and shall be accompanied by:

(i) a properly executed permit agreement;

(ii) a complete set of plans and specifications for the requested construction, improvement or replacement, including a site plan;

(iii) a copy of the plans and specifications for such OSSF and a copy of the authorization to construct, if the permitted construction requires an OSSF;

(iv) the name of any contractor or, in the event the Lessee intends to act as its own contractor, any subcontractor who will be performing the work; and

(v) the applicable application fee.

THE DISTRICT SHALL NOT ACCEPT FOR CONSIDERATION ANY INCOMPLETE PERMIT REQUESTS THAT DO NOT INCLUDE ALL OF THE FOREGOING ITEMS (AS APPLICABLE).

(b) The District shall review the application, the file for the affected Leased Property, and the Contractor Registry to determine any conditions, prior uncured violations, Lease defaults, contractor defaults, and other relevant factors.

(c) The District may conduct an on-site inspection to confirm compliance with these Rules and all other applicable governmental standards.

(d) Provided that the District has received a complete permit application with all required information, the District shall respond to such permit request within ten (10) days, based on consideration of the foregoing items and other pertinent criteria contained in these Rules.

14.4 In addition to any permit application fees, the District may require the payment of certain annual fees in connection with any permitted Improvement.

14.5 All requests for amendment or modification to a permit application or approved permit shall be made in writing and contain such plans and specifications as necessary to document the requested change.

14.6 Except as provided in Section 14.23(c) below, only contractors properly registered on the Contractor Registry and in good standing thereunder shall perform work on District Property that requires a permit pursuant to the terms of this Article. Notwithstanding the foregoing, a Lessee shall be responsible for ensuring that all contractors hired by such Lessee to perform work on its Leased Property comply with the terms of the District permit as well as all applicable federal, state and local regulations and these Rules pertaining to the construction project. ANY DEVIATION FROM THE TERMS OF AN APPROVED PERMIT IS STRICTLY PROHIBITED WITHOUT THE PRIOR, WRITTEN AUTHORIZATION OF THE DISTRICT. ANY DEVIATION FROM THE TERMS OF AN APPROVED PERMIT IS STRICTLY PROHIBITED WITHOUT THE PRIOR, WRITTEN AUTHORIZATION OF THE DISTRICT.

14.7 The expiration date for building permits shall be as follows:

(a) Standard building permits shall expire one (1) year from the date of issuance.

(b) Dredging permits shall expire two (2) weeks from the date of issuance.

(c) All other permits shall expire six (6) months from the date of issuance.

Upon written request of the permit holder, the District, in its sole discretion, may grant an extension for any permit.

14.8 Failure to complete any construction, improvement or replacement prior to the expiration of the applicable permit shall constitute a default under these Rules, which shall entitle the District, in addition to any other rights and remedies it may have hereunder, at law or in equity, to forced removal of any incomplete structures or improvements at the Lessee’s sole expense.

14.9 Both the holder of a construction permit and the contractor (if applicable) shall ensure that all Improvements, whether they require a permit or not, are located within the applicable boundary lines and setback lines of the applicable Leased Property and otherwise comply with these Rules.

14.10 Upon completion of the permitted construction, improvements or replacement, the Lessee shall promptly notify the District to arrange for a final inspection. Final approval of permitted construction projects shall be expressly conditioned upon (i) satisfactory completion of a final inspection by the District, and (ii) receipt by the District of an As-Built Survey (or such other comparable evidence as the District deems acceptable) showing that the construction, improvement or replacement has been completed in accordance with the terms of the permit and does not encroach over property lines or setback lines.

14.11 NO CONSTRUCTION, IMPROVEMENT OR REPLACEMENT THAT ENCROACHES OVER PROPERTY OR SETBACK LINES, OR IS OTHERWISE NOT IN COMPLIANCE WITH THE TERMS OF THE PERMIT OR THESE RULES, SHALL RECEIVE FINAL APPROVAL FROM THE DISTRICT. Any such noncompliance that remains uncorrected after notice from the District shall constitute a default under these Rules, the terms of the Lessee's lease, and the Contractor Registry (if applicable), and may result in the imposition of an administrative penalty, the forced removal of noncompliant improvements at Lessee's sole expense, and termination of Lessee's leasehold interest, in addition to any other remedies available to District.

14.12 All Improvements shall be designed and constructed so as to preserve and protect the integrity of the natural beauty of the Lake and District Property, which shall include the minimum, reasonable removal of trees for such Improvements.

14.13 All Improvements shall be designed and constructed so as to minimize any interference with the access to or use of another Lessee's Leased Property.

14.14 No Improvements shall be constructed on or over any portion of an OSSF.

14.15 Setback Lines. All construction on District Property shall be subject to the following minimum setback lines:

(a) Fifteen feet (15') along the boundary of residential lots with any public street.

(b) Five feet (5') along the interior boundary lines of all non-corner residential lots.

(c) Ten feet (10') from the lakeside property line or the normal lake elevation shoreline (whichever is further inland) on waterfront lots.

14.16 Piers and Boathouses.

(a) A boathouse may not be the primary structure on a lot and shall only be constructed on a lot containing an existing single family residence.

(b) Every boathouse on District Property shall have an identifying tag affixed to it in a location designated by the District so as to maximize visibility from the water. The District shall provide such identifying tags free of charge and the Lessee upon whose Leased Property the boathouse is located shall be responsible for installing and maintaining the identifying tag in the specified location.

(c) No boathouse containing bathroom facilities (e.g., toilet, bathtub, shower or [except as specifically provided in Section 14.22 below] sink) shall be allowed on District Property.

(d) All materials used in the construction of piers, docks and boathouses on District Property must be approved by the District prior to construction.

(e) Flotation-type docks shall not be exempt from the permit requirements of these Rules and must be anchored securely.

(f) No pier or boathouse constructed on District Property shall exceed a total combined length of forty feet (40'), inclusive of all porches, decks, and other attachments or protrusions. Notwithstanding the foregoing length restriction, all piers and boathouses on the Lake shall be limited in length so as to maintain a clear channel of at least forty feet (40') between (x) the most Lake-ward edge of such pier or boathouse, and (y) the closer of (i) the nearest Improvement on the opposite shoreline, or (ii) the opposite shoreline itself, such channel to be located as nearly as possible over the deepest portion of that section of the Lake.

(g) No single pier or boathouse constructed on District Property shall exceed a total of twenty-four hundred (2,400) square feet in area, with the total of all the piers and/or boathouses not exceeding thirty-five hundred (3,500) square feet in area; provided, however, that if a lot contains more than one boathouse and/or pier, each boathouse and/or pier must be located at least five feet (5') away from every other boathouse and/or pier (measured between the closest points on both structures).

(h) No boathouse constructed on District Property shall exceed one (1) story. Notwithstanding the foregoing, a flat deck area may be permitted on the roof; provided, however, that the total height of all structures (including parapets, handrails, or any other architectural feature) shall not exceed twenty feet (20') above 378 feet MSL.

(i) Boathouses shall be designed and constructed so as to minimize any obstruction of the view of the Lake by other Lessees.

(j) A permit shall be required whenever painting, staining or other similar procedures are to be performed on any pier or boathouse extending out over the Lake. If the painting or staining is being done as part of a construction or renovation project requiring a permit under Section 14.1 above, the Lessee shall inform the District and the District shall waive any additional permit fee for the painting or staining permit. For all painting, staining and other similar procedures performed on piers and boathouses, the following conditions shall apply:

(i) If the paint, stain, or other substance to be applied to the pier or boathouse is non-petroleum based, no special draping or wrapping of the work area shall be required; provided, however that the Lessee and/or its contractor shall make the product available to the District for inspection prior to beginning any work.

(ii) If the paint, stain, or other substance is petroleum based but is to be applied to the pier or boathouse with conventional brushes or rollers only (i.e., no spraying), no special draping or wrapping of the work area shall be required; provided, however, that the Lessee and/or its contractor shall make the work area and all equipment and the petroleum based product available to the District for inspection prior to beginning any work.

(iii) If the paint, stain, or other substance is petroleum based and is to be applied by spraying (whether all or in part), the Lessee shall (x) cause the work area to be draped or wrapped with protective sheeting so as to minimize the dispersion of any petroleum based product into the Lake or the surrounding environment, and (y) notify the District when draping is complete so that the work area, including all equipment and the petroleum based product, can be inspected prior to beginning any work.

(iv) Upon completion of any painting or staining process (whether or not draping and wrapping is required), the Lessee shall immediately notify the District and make the work area available for a final inspection.

14.17 Boat Ramps.

(a) All boat ramps shall be designed and constructed so as to inhibit erosion.

(b) Boat ramps shall not be exempt from the permit requirements of these Rules; provided, however, there shall be no permit fee charged for construction of a boat ramp that will be made available for public use at no charge. In such case, a sign must be erected adjacent to the boat ramp indicating that it may be used by the public at no charge.

14.18 Swimming Pools.

(a) No in-ground swimming pools shall be installed on District Property without a permit.

(b) All swimming pools on District Property must be enclosed by a fence at least four feet (4') in height or other safety enclosure acceptable to the District, with a fully operational, childproof lock.

14.19 Retaining Walls. Retaining walls shall be constructed in compliance with the terms of the applicable permit and the applicable standards promulgated by the District, if any.

14.20 Dredging.

(a) No dredging, filling, or otherwise altering or reconfiguring the beds of the Lake shall be conducted on District Property without a dredging permit from the District.

(b) Upon requesting a dredging permit, the requesting Lessee must advise the District whether dredged soil is to be spread on the Lessee's lot or hauled off site. No dredged soil or fill material shall be deposited in the Lake.

(c) The holder of a dredging permit shall notify the District to schedule an inspection before the dredging actually occurs. No dredging shall commence prior to such inspection.

(d) The holder of a dredging permit shall notify the District to schedule an inspection upon completion of all permitted dredging.

(e) No dredging is permitted on District Property within six feet (6') of a retaining wall or bulkhead.

14.21 Water Pumps.

(a) A Lessee may request a private, limited permit to allow the Lessee to pump and use water from the Lake by making application at the District office. No water shall be pumped or diverted from the Lake except as specifically authorized by the issuance of such permit.

(b) Issuance and renewal of such permits shall be conditioned on payment of an annual fee, which shall be payable in advance each year.

(c) If the District invokes water conservation measures under its approved drought contingency plan, every holder of a water pumping permit shall curtail such water usage as follows:

(i) Mild – Voluntary reduction in water usage.

(ii) Moderate – Nonessential use prohibited, mandatory lawn watering schedule.

(iii) Severe – Suspension of use permit.

(iv) Emergency – As determined by the Manager.

14.22 Outdoor Sinks in Boathouses. One (1) outdoor sink may be installed in boathouses, subject to the following conditions:

(a) Lessee must obtain a construction permit from the District, prior to the installation of the sink (e.g., may be included as part of a permit to construct a new boathouse or remodel an existing boathouse). Prior to receiving a construction permit from the District, the Lessee must obtain written approval for a variance to the Texas Commission on Environmental Quality (TCEQ) rules for such sinks from the Franklin County OSSF Authorized Agent.

(b) The sink must be constructed in strict compliance with Franklin County OSSF Authorized Agent's approved plans and specifications for gray-water sinks in boathouses, a copy of which will be provided to the Lessee upon approval of the permit.

(c) The sink may require the installation of additional OSSF or other disposal facilities on the Leased Property, as determined by the Franklin County OSSF Authorized Agent.

14.23 Contractor Registry. The District shall establish and maintain a registry (the "***Contractor Registry***") of all contractors who have performed, or desire to perform, work upon District Property, subject to the following provisions:

(a) The Contractor Registry shall contain the following information with respect to each registered contractor:

(i) Company name

(ii) Names of all principals, officers and key personnel

(iii) Mailing address

(iv) Telephone number

(v) E-mail address

(vi) Emergency contact information

(vii) Current status (i.e., good standing, default, suspension, etc.)

Contractors shall promptly provide the District with updated registration information when changes occur.

(b) Except as provided in Section 14.23(c) below, no contractor shall perform any work on District Property that requires a permit unless such contractor is (i) listed on the Contractor Registry, and (ii) currently in good standing with the District.

(c) Notwithstanding the foregoing requirement, any Lessee shall have the right to act as its own contractor for performing work on its own Leased Property (but no other), provided that (i) no other uncured violations exist with respect to such Lessee or the Leased Property, (ii) such Lessee shall comply in all other respects with these Rules in the performance of such work, (iii) any contractors or subcontractors hired by Lessee must be in good standing and compliance with the provisions of this Section 14.23, and (iv) the District reserves the right to require that certain work on District Property must be performed, reviewed or supervised by a contractor, engineer or architect reasonably acceptable to the District if the District reasonably determines that such work is of a nature or character that performance by the Lessee alone could pose a risk to persons or property or otherwise cause a violation of these Rules.

(d) Any contractor, regardless of past history with the District, shall be eligible for initial registration on the Contractor Registry upon filling out the registration form with complete and accurate information and paying the applicable registration fee.

(e) A contractor's inclusion on the Contractor Registry shall not imply any endorsement, recommendation, or preferred status with the District, and no contractor shall advertise or hold itself out to the public as receiving any such endorsement, recommendation or preferred status.

(f) In addition to any other rights and remedies available to District hereunder, including without limitation against the applicable Lessee, any violation of the terms of an applicable permit or these Rules by a contractor in the performance of any work on District Property (including, without limitation, the performance of unpermitted work) shall be noted in the Contractor Registry for a period of twelve (12) calendar months. Additionally, the District shall have the right to assess the following penalties for each such violation by a contractor:

(i) First violation: Contractor shall meet with the Manager to discuss the violation and shall receive a written warning in the Contractor Registry.

(ii) Second violation in any 12-month period: Contractor shall pay a $1,000 administrative penalty and shall be immediately suspended from receiving a permit or performing any work on District Property until thirty (30) days from the later of (x) the discovery of the violation by the District, or (y) the expiration or finalization of the contractor's latest, currently-issued permit.

(iii) Third violation in any 12-month period: Contractor shall pay a $2,500 administrative penalty and shall be immediately suspended from receiving a permit or performing any work on District Property until ninety (90) days from the later of (x) the discovery of the violation by the District, or (y) the expiration or finalization of the contractor's latest, currently-issued permit.

(iv) Fourth violation in any 12-month period: Contractor shall be immediately suspended from receiving a permit or performing any work on District Property until one (1) year from the later of (x) the discovery of the violation by the District, or (y) the expiration or finalization of the contractor's latest, currently-issued permit.

ARTICLE XV
VARIANCES

15.1 The District may from time to time authorize such variance from the terms of any provisions of these Rules as will not be contrary to the public interest, where, owing to special conditions, a literal enforcement of the provisions of such Articles would result in unnecessary hardship and in order that the intent of these Rules shall be observed and substantial justice done.

15.2 Possible grounds for granting a variance shall include, but not be limited to, the following:

(a) A variance from the setback requirements of any lot may be permitted where there are unusual difficulties or unnecessary hardships in complying with such setback requirements due to an irregular shape of such lot, topographical or other conditions.

(b) A variance from the requirements regarding construction or alteration of buildings and improvements may be permitted where strict compliance would impose unusual difficulties or particular hardship and such variance is in harmony with the general purpose and intent of the regulation.

15.3 The District shall only grant a variance to alleviate some demonstrable and unusual hardship or difficulty so great as to warrant a deviation from the standards established by these Rules, when such deviation would not materially, adversely affect the surrounding property. Without limiting the foregoing, the following shall specifically not be grounds for issuance of a variance:

(a) Financial hardship.

(b) Lessee convenience.

(c) The fact that any other Leased Property or Improvements thereon do not comply with these Rules.

15.4 A written application for variance shall be submitted to the District by the requesting Lessee, accompanied by an accurate legal description, maps, site plans, drawings and any other written documentation adequately demonstrating the following:

(a) Certain special conditions and circumstances exist which are peculiar to the land, structure or building involved and which are not generally applicable to other lands, structures or buildings;

(b) The special conditions and circumstances do not result, directly or indirectly, from the acts or omissions of the Lessee;

(c) A strict enforcement of the relevant provision of these Rules would deprive the Lessee of rights commonly enjoyed by other Lessees properties under these Rules;

(d) Granting the variance requested will not confer on the requesting Lessee any special privilege that is denied by these Rules to other lands, structures or buildings;

(e) The governing homeowner's association (if any) does not object to the variance; and

(f) Input from affected adjoining Lessees.

15.5 Upon receipt of a complete variance request meeting all of the requirements of Section 15.4 above, the District shall have a minimum of thirty (30) days to review such request before issuing any approval or denial. No "fast-track" or accelerated procedure exceptions shall be allowed.

15.6 When a properly permitted Improvement encroaches over a boundary line, the District will allow the affected Lessees to execute and record an easement agreement granting a perpetual, exclusive easement over the encroached Leased Property benefiting the encroaching Leased Property to the extent of the encroachment.

15.7 All disputes between two or more Lessees related to property lines, encroachments, or protrusions shall be considered private matters by the District and shall be resolved by such disputing Lessees' obtaining an Improvement Survey, at their sole cost and expense, which accurately depicts the disputed boundary lines and the location of any encroaching or protruding Improvements.

ARTICLE XVI
NONCONFORMING USE PERMITS

16.1 Intent. Subject to the provisions hereof, it is the intent of the District to permit Nonconforming Uses to continue under certain conditions until they are removed, but not to encourage their perpetuation. It is further the intent of the District that Nonconforming Uses shall not be enlarged upon, expanded or extended, or be used as the basis for adding other structures or uses prohibited elsewhere, except as may be specifically provided herein.

16.2 Originally Permitted Nonconforming Uses. A Lessee may, but shall not be required to, obtain a Nonconforming Use Permit for an Originally Permitted Nonconforming Use existing on such Lessee's Leased Property. Whether or not a Nonconforming Use Permit has been obtained, an Originally Permitted Nonconforming Use may be repaired in

accordance with the provisions hereof. Subject to the District's right of final approval and issuance of a permit (if otherwise required under these Rules), an Originally Permitted Nonconforming Use may have non-material, non-substantial changes made to it, but may not be enlarged, expanded, extended or used as the basis for adding other structures or uses prohibited elsewhere, except as specifically provided in Section 16.6 below.

16.3 Issuance of Nonconforming Use Permit.

(a) Subject to the other provisions of this Article, the District may issue a Nonconforming Use Permit for any Nonconforming Use upon satisfaction of the following conditions:

(i) Submission of written documentation reasonably acceptable to the District that the Nonconforming Use existed in its current state prior to October 8, 2002;

(ii) Cure of any and all other outstanding defaults with respect to the nonconforming property by the requesting Lessee;

(iii) Execution by the requesting Lessee of a Nonconforming Use Permit application form as promulgated by the District, which shall include an indemnity of the District by the Lessee for any and all damages and costs incurred by the District in connection with the Nonconforming Use;

(iv) Payment of any required application and processing fee assessed by the District.

(b) Subject to the other provisions of this Article, any Nonconforming Use for which a Nonconforming Use Permit has been properly issued in accordance with this Article may be continued and shall be exempt from further enforcement action by the District only with respect to the particular nonconformity specified in the Nonconforming Use Permit.

16.4 Ineligible Nonconforming Uses. Notwithstanding anything to the contrary, the District shall not issue a Nonconforming Use Permit for any Nonconforming Use to which one or more of the following conditions apply:

(a) The Nonconforming Use causes a violation with any other applicable local, county, state or federal law, statute, rule or regulation.

(b) The Nonconforming Use poses an unacceptable risk of harm or damage to persons or property (whether owned by the Lessee, third parties, or the District, including without limitation, the Lake) as reasonably determined by the District.

(c) The Nonconforming Use actually encroaches over a property boundary line onto property not leased or owned by the requesting Lessee.

(d) Other extenuating or extraordinary circumstances, as reasonably determined by the District, require that the Nonconforming Use not be allowed to continue.

16.5 Application Procedure.

(a) Applications for Nonconforming Use Permits shall be submitted to the District along with copies of required documentation supporting the assertion that the Nonconforming Use existed prior to October 8, 2002.

(b) The District may, on its own motion, require that a Lessee apply for a Nonconforming Use Permit for an Unpermitted Nonconforming Use existing on such Lessee's lot.

(c) Upon receipt of a complete application for a Nonconforming Use Permit meeting all of the requirements of this Article XVI, the District shall have a minimum of thirty (30) days to review such application before issuing any approval or denial. No "fast-track" or accelerated procedure exceptions shall be allowed.

16.6 Conditions. All Nonconforming Uses shall be subject to the following conditions:

(a) No Nonconforming Use may be enlarged, expanded, extended or used as the basis for adding other structures or uses prohibited elsewhere, provided however that a Lessee shall be permitted to construct a pier or boathouse attached to a nonconforming retaining wall for which a Nonconforming Use Permit has been properly issued, so long as the pier or boathouse itself complies in all other respects with these Rules.

(b) Nonconforming structures or improvements that are partially damaged may be repaired to the same specifications as existed before such damage or destruction, provided that Lessee complies with all other provisions of this Article and these Rules.

(c) Except as specifically permitted in subsections (d) and (e) below, nonconforming structures that are substantially or totally destroyed may not be rebuilt in a non-conforming manner, but shall be rebuilt (if at all) in compliance with these Rules such that the Nonconforming Use is not perpetuated following such destruction.

(d) If a nonconforming Dwelling Unit, Accessory Building, or Garage is substantially destroyed but the foundation or slab for such nonconforming structure is still useable, the nonconforming structure may be rebuilt in the same location upon such foundation or slab, provided that the Lessee has applied for and received a Nonconforming Use Permit under this Article XVI.

(e) If a nonconforming retaining wall is partially or totally removed for repair or replacement purposes, such nonconforming retaining wall may be rebuilt in the location and configuration, provided that (i) the Lessee has applied for and received a Nonconforming Use Permit under this Article XVI, and (ii) the foregoing right to replace the retaining wall shall not include the right to replace a Boathouse located on or over such retaining wall.

ARTICLE XVII
ENVIRONMENTAL PROTECTION REGULATIONS

17.1 All applicable Environmental Laws, including all rules and regulations established by TCEQ are incorporated herein by reference and shall be applicable to all District Property.

17.2 Littering is strictly prohibited on all District Property, including the Lake.

17.3 No person shall Manage or Release any Hazardous Materials on District Property except in strict compliance with a permit issued by the District.

17.4 Any Release of Hazardous Materials on District Property shall be immediately reported to the District's office and the Franklin County Sheriff's office, in addition to any required state and federal reporting.

17.5 Dumping or disposing of any kind of trash, construction debris, garbage, refuse or solid waste (e.g., abandoned automobiles, ashes, street cleanings, dead animals, leaves, grass clippings, etc.) on District Property is strictly prohibited.

17.6 The open burning of any kind of trash, construction debris, garbage, refuse or solid waste materials is strictly prohibited on District Property. Notwithstanding the foregoing, a Lessee may, on such Lessee's own Leased Property, burn leaves, grass cuttings and prunings generated on such Leased Property, unless a ban on outdoor burning is currently in effect.

17.7 In conjunction with the performance of any construction or other activity requiring a permit under these Rules, the use of equipment requiring gasoline, oil or any other petroleum product for its operation is strictly prohibited anywhere within fifty feet (50') of the Lake unless the work area is contained on the water side with properly secured, skirted containment booms. Additionally, containment booms shall be required whenever any such equipment is in use directly over the Lake, whether or not the activity requires a permit hereunder. Whenever containment booms are required under this Rule, the containment booms shall be placed at least fifty feet (50') from all such equipment or any portion thereof. While such equipment is not in use but is parked on District Property, the containment booms shall be placed at least ten feet (10') from all such equipment or any portion thereof. The foregoing rule shall not apply to small equipment for personal (i.e., non-construction, non-commercial) use including generators, air compressors, lawn mowers, skid loaders, small tractors, small trenchers and other similar yard maintenance equipment, unless such equipment is being used directly over the Lake.

17.8 The District has enacted an aquatic plant management plan. Cutting, harvesting, destroying, spraying or otherwise damaging aquatic vegetation of any kind on District Property is strictly prohibited, except with a permit issued by the District.

17.9 The District participates in an ecosystem restoration program. Moving, damaging, or destroying any planting sites, cages or other protective enclosures on District Property is strictly prohibited.

17.10 No Mining shall be permitted anywhere on District Property; provided, however, that this Rule shall not prohibit any extraction, removal, or stockpiling of earth materials incidental to an approved dredging or construction permit as otherwise provided in Article XIV hereof.

17.11 No person, firm or corporation shall drill, construct, operate or maintain a well or any other type of drilling or pumping technology on District Property for the purposes of bringing to the surface of the ground any oil, natural gas or other hydrocarbon or mineral, whether in liquid or gaseous form.

ARTICLE XVIII
VIOLATIONS AND PENALTIES

18.1 A violation of these Rules caused by a Lessee, its agents, contractors, heirs or assigns, or occurring on a Lessee's Leased Property shall automatically constitute a default under such Lessee's Lease, which shall entitle the District to exercise any remedy available to it by contract, at law or in equity, including termination of the defaulting Lessee's Lease and forfeiture of leasehold estates.

18.2 A violation of any of these Rules by the holder of a permit issued by the District shall, in addition to any other rights and remedies of the District hereunder, subject such permit to immediate suspension, cancellation or revocation without refund of any permit fee.

18.3 Upon prior notice to a defaulting Lessee or permit holder (as applicable), the District may, but shall not be obligated to, cure a violation of these Rules, in which case the District shall be reimbursed on demand by such defaulting Lessee or permit holder for all expenses incurred in curing such violations.

18.4 Any improvement located on District Property that is not in full compliance with these Rules, whether through variance, nonconforming use permit, or otherwise, is subject to forced removal by the District.

18.5 Each violation of these Rules shall be a Class C misdemeanor under the laws of the State of Texas.

18.6 Each occurrence of a continuing or repeated violation of these Rules shall constitute a separate offense.

18.7 Any peace officer licensed by the State of Texas and having jurisdiction within Franklin County, Texas under the laws of the State of Texas is hereby authorized to enforce the provisions of these Rules.

ARTICLE XIX
GENERAL

19.1 These Rules are made by the District for the orderly administration and protection of District Property and shall be enforceable only by the District in the exercise of its sole discretion.

19.2 In determining whether to approve or deny any request or application made to the District under these Rules (e.g., construction permits, variances, Nonconforming Use Permits, special event permits, etc.), the District shall consider the standing of the applicant, including whether the applicant is currently in default under any other obligations to the District and the applicant's prior compliance and payment history.

19.3 The water levels in the Lake will not be constant, and shall vary depending on the amount of water used and delivered from the Lake, evaporation rates, rainfall amounts, runoff, and other factors beyond the District's control. No party shall have any claim against the District for the maintenance of any particular water level.

19.4 Outdoor burning on District Property is subject to all applicable governmental regulations, including without limitation the rules contained in Chapter 111, Subchapter B of the Texas Administrative Code.

19.5 Notwithstanding anything to the contrary contained in these Rules, the District reserves the right to restrict activities and usage, or deny approval for any permit that would otherwise be allowed hereunder, in order to preserve, protect and maintain the integrity, value and sustainability of the Lake, the District Property, and the improvements located thereon.

TBPE No. F-882

LLOYD GOSSELINK

ENGINEERING RECOMMENDATIONS FOR LAKEFRONT STRUCTURES

TECHNICAL MEMORANDUM NO. 2 PRIVATE ON-WATER STRUCTURES

FINAL
July, 2016

10375 RICHMOND AVENUE, SUITE 1625 • HOUSTON, TEXAS 77042 • P. 281.872.4512 • F. 281.872.4505

LLOYD GOSSELINK

ENGINEERING RECOMMENDATIONS FOR LAKEFRONT STRUCTURES

TECHNICAL MEMORANDUM NO. 2

PRIVATE ON-WATER STRUCTURES

TABLE OF CONTENTS

Page No.

LIST OF TABLES

LIST OF FIGURES

1.0 BACKGROUND INFORMATION

Pursuant to your request, Carollo Engineers, Inc. (Carollo) has developed this technical memorandum (TM) number 2 for Lloyd Gosselink Attorneys at Law (LG), on behalf of the Franklin County Water District (FCWD), which provides engineering recommendations for the permitting of private on-water structures including boat houses, docks, piers, platforms, and stationary inflatable devices.

1.1 Dam and Spillway Functionality

The State of Texas contains hundreds of water bodies – from small farm tanks to huge reservoirs – but within the state's 269,000 square mile area, there is only one naturally-formed lake – Caddo Lake on the Texas Louisiana border – the rest are man-made reservoirs.

Lake Cypress Springs, a man-made lake designed for water supply, operates with a morning-glory spillway elevation set at 378.0 feet above mean sea level (msl). This conservation elevation is not constant and will vary depending on evaporation, consumer water-use, rainfall patterns, and other factors effecting the lake volume. Due to this type of spillway, the FCWD has limited ability to control releases of water from the dam. The only controlled releases of water occur with a low-flow 18-inch service spillway used to meet obligations to a downstream water-right owner, Mount Pleasant. The dam elevation is set at 390.0 feet above msl and the emergency spillway to divert water around the dam and into Lake Bob Sandlin is set at 385.0 feet above msl.

A frequency analysis completed by Freese Nichols Inc. (FNI) dated 09/22/2009 determined the lake elevations for a given storm event. A summary of the results of this analysis are presented below:

Table 1Summary Lake Elevations Engineering Recommendations for Lakefront Structures Lloyd Gosselink	
Event	**Elevation**
2-year	379.20
5-year	379.57
10-year	379.98
25-year	380.62
50-year	381.40
100-year	382.35
500-year	384.77

1.2 Existing Permitting Requirements

As Carollo understands, a permit is required from the FCWD for any activities involving the construction or placement of a structure on Lake Cypress Spring's lakefront properties. This includes the improvement or replacement of any building or structure on FCWD property. The applicable permitting requirements already pertaining to private on-water structures are as follows:

14.16 Piers and Boathouses.

(a) A boathouse may not be the primary structure on a lot and shall only be constructed on a lot containing an existing single family residence.

(b) Every boathouse on District Property shall have an identifying tag affixed to it in a location designated by the District so as to maximize visibility from the water. The District shall provide such identifying tags free of charge and the Lessee upon whose Leased Property the boathouse is located shall be responsible for installing and maintaining the identifying tag in the specified location.

(c) No boathouse containing bathroom facilities (e.g., toilet, bathtub, shower or [except as specifically provided in Section 14.22 below] sink) shall be allowed on District Property.

(d) All materials used in the construction of piers, docks and boathouses on District Property must be approved by the District prior to construction.

(e) Flotation-type docks shall not be exempt from the permit requirements of these Rules and must be anchored securely.

(f) No pier or boathouse constructed on District Property shall exceed a total combined length of forty feet (40'), inclusive of all porches, decks, and other attachments or protrusions. Notwithstanding the foregoing length restriction, all piers and boathouses on

the Lake shall be limited in length so as to maintain a clear channel of at least forty feet (40') between (x) the most Lake-ward edge of such pier or boathouse, and (y) the closer of (i) the nearest Improvement on the opposite shoreline, or (ii) the opposite shoreline itself, such channel to be located as nearly as possible over the deepest portion of that section of the Lake.

(g) No single pier or boathouse constructed on District Property shall exceed a total of twenty-four hundred (2,400) square feet in area, with the total of all the piers and/or boathouses not exceeding thirty-five hundred (3,500) square feet in area; provided, however, that if a lot contains more than one boathouse and/or pier, each boathouse and/or pier must be located at least five feet (5') away from every other boathouse and/or pier (measured between the closest points on both structures).

(h) No boathouse constructed on District Property shall exceed one (1) story. Notwithstanding the foregoing, a flat deck area may be permitted on the roof; provided, however, that the total height of all structures (including parapets, handrails, or any other architectural feature) shall not exceed twenty feet (20') above 378 feet MSL.

(i) Boathouses shall be designed and constructed so as to minimize any obstruction of the view of the Lake by other Lessees.

(j) A permit shall be required whenever painting, staining or other similar procedures are to be performed on any pier or boathouse extending out over the Lake. If the painting or staining is being done as part of a construction or renovation project requiring a permit under Section 14.1 above, the Lessee shall inform the District and the District shall waive any additional permit fee for the painting or staining permit. For all painting, staining and other similar procedures performed on piers and boathouses, the following conditions shall apply:

(i) If the paint, stain, or other substance to be applied to the pier or boathouse is nonpetroleumbased, no special draping or wrapping of the work area shall be required; provided, however that the Lessee and/or its contractor shall make the product available to the District for inspection prior to beginning any work.

(ii) If the paint, stain, or other substance is petroleum based but is to be applied to the pier or boathouse with conventional brushes or rollers only (i.e., no spraying), no special draping or wrapping of the work area shall be required; provided, however, that the Lessee and/or its contractor shall make the work area and all equipment and the petroleum based product available to the District for inspection prior to beginning any work.

(iii) If the paint, stain, or other substance is petroleum based and is to be applied by spraying (whether all or in part), the Lessee shall (x) cause the work area to be draped or wrapped with protective sheeting so as to minimize the dispersion of any petroleum based product into the Lake or the surrounding environment, and (y) notify the District when

draping is complete so that the work area, including all equipment and the petroleum based product, can be inspected prior to beginning any work.

(iv) Upon completion of any painting or staining process (whether or not draping and wrapping is required), the Lessee shall immediately notify the District and make the work area available for a final inspection.

2.0 RESEARCH SUMMARY

Carollo researched many of the lakes in Texas and documented the findings related to private on-water structures in this memorandum. This exercise was important to discover potential deficiencies in FCWD rules and regulations. Carollo has prepared a matrix of comparables between the different agencies rules and regulations that are located in Appendix 7: FCWD. This matrix provides a visual side-by-side comparison of the agency regulations.

2.1 Brazos River Authority (BRA)

Carollo investigated the BRA's boat-house regulations on Lake Granbury, Lake Possum Kingdom, and Lake Limestone. Other reservoirs in the Brazos River Basin (Lake Proctor, Whitney, Aquilla, Belton, Stillhouse Hollow, Georgetown, Granger, and Somerville) are federal reservoirs and discussed in a section below.

Pursuant to the authority granted in §51.127 of the Texas Water Code, the following provisions apply to On-Water Facilities, including but not limited to: docks, piers, platforms, and stationary inflatable devices which are 10 feet or more in length/width.

a) *Installation of On-Water Facilities and Permit Application Process The privilege of installing an On-Water Facility is not an inherent right with the control or ownership of waterfront property. No facility shall be situated in, on, or over the waters of the lakes or on BRA land without the appropriate BRA permit. Any such facility without the appropriate BRA permit shall be subject to immediate removal at the owner's expense. A permit or contractual relationship shall be obtained from the appropriate Area Project Manager prior to construction, modification, or transfer of any on-water facility in, on, or over the Lakes. Applications for permits shall be made on forms provided by the BRA. The BRA exercises the right to grant or deny On- Water Facility Permits as deemed appropriate in the sole discretion of the BRA.*

b) *Requirements for On-Water Facilities: The On-Water Facility owner is responsible for the safety and structural soundness of any On-Water Facility placed on or over the Lakes. BRA approvals and/or inspections relating to On-Water Facilities shall not constitute a warrant of the functionality, structural integrity, safety, workmanship, materials, or water worthiness of any On-Water Facility. All On-Water Facilities must meet the following requirements:*

1) *All On-Water Facilities must be constructed and maintained in a structurally sound manner which does not create a safety hazard or environmental concern.*

2) *On-Water Facilities may not be situated in a manner that unreasonably interferes or obstructs access to other permitted facilities or neighboring properties.*

3) *There shall be no more than one On-Water Facility on any one shoreline lot.*

4) *On-Water Facilities shall not extend more than one-third of the distance between opposite shorelines of any area of the Lakes where the distance between the shorelines is less than 300 feet.*

5) *Lake level fluctuation shall not constitute a basis for extending On-water facilities further into the Lakes.*

6) *In narrow sections of the Lakes where the distance between opposite shorelines is 120 feet or less, a clear channel, at least 40 feet in width, shall be maintained between the facilities on opposite shorelines, with the location of such channel being as nearly as practicable over the deepest portion of that section of the Lake.*

7) *A scaled drawing showing the location and dimensions of the proposed facility must be included in the application. In addition, if property boundaries are uncertain, a property survey may be required.*

8) *Applicant must own or lease the land adjoining the Lake at the location of the proposed facility and provide to the BRA, at the time of permit application, documentation establishing the ownership or leasehold interest in the property.*

9) *The On-Water Facility identification number, furnished by the BRA, must be posted conspicuously on all On-Water Facilities.*

10) *Buoyancy for all floating facilities shall be provided by polystyrene, multiple air filled internal compartments, or a similar flotation material that is encapsulated in an approved rustproof, non-corrosive, UV resistant shell that is a minimum of 0.15 inches in thickness (such as, high impact polyethylene).*

11) *Barrels, pontoons, drums or other improvised equipment shall not be used for flotation.*

12) *Amber reflectors must be installed on all sides of facilities at no greater than20-foot intervals. Those portions of on-water facilities extending farther than 100 feet into the Lakes shall be illuminated during hours of darkness in such a manner as to make such facilities visible to boat traffic on the Lakes without the lights themselves impairing the vision of boaters.*

13) *On-Water Facilities may not be more than one story; however, On-Water Facilities may include a gabled or flat roof that can be used as a sun deck. Sun Decks located on the roof of an On-Water Facility may include a covering for shade; however, coverings may not be used as a third-story.*

14) *On-Water Facilities may be built with side and back walls; however, there must be a Lake-side entrance into the On-Water Facility that is fully open and subject to visible inspection by BRA personnel from a Watercraft at all times.*

15) *A storage closet, no larger than 40 square feet, will be allowed for an On- Water Facility, provided that the storage closet is included in the approved design. (One storage closet per Commercial/condominium/home-owners association On-Water Facility slip or Residential On-Water Facility.)*

16) *Living quarters, kitchens (any space adapted to cook or prepare food), plumbing, sinks, bathing facilities or toilet facilities are not allowed in or on facilities permitted on the Lakes.*

c) *The BRA reserves the right, in its sole discretion, to further restrict On-Water Facilities on BRA Lakes if placement of the On-Water Facility: creates a hazard to navigation; results in a nuisance; impairs the BRA's ability to operate and maintain the Lake; or interferes with or restricts access to adjacent properties or On-Water Facilities.*

d) *Additional Residential On-Water Facility Requirements*

(1) *All Residential On-Water Facilities will generally be located as close to the center-most part of the water frontage as possible.*

(2) *The area for all Residential On-Water Facilities (including areas for Watercraft slips or storage) shall not exceed 2,000 square feet in total. Walkways to the On-Water Facilities, 6 feet or less in width, may be constructed and shall not be included in the calculation of the total area for Residential On-Water Facilities.*

(3) *Residential On-Water Facilities, previously permitted to exceed 2,000 square feet, may re-build or replace the facility with a structure of the same square footage. All other facility specifications apply.*

(4) *Personal water craft may be stored on the sides of a permitted Residential On-Water Facility; however, Watercraft storage shall be managed in a manner that does not create an unreasonable hazard or overcrowding.*

(5) *Residential On-water facilities shall not extend further than 100 feet into the Lake from the shoreline.*

(6) *BRA may, in its sole discretion, permit a Residential On-Water Facility to extend beyond 100 feet into the Lake from the shoreline, utilizing the following criteria:*

a) *Sufficient water depth based on water available at historical average lake elevation;*

b) *Distance into lake of adjacent docks on either side;*

c) *Clear channel requirements (40 feet minimum) and/or hazards to boater navigation;*

d) *Location of walkway on lot; and*

e) *Dock size and configuration.*

However, in no event shall a residential On-Water Facility extend further than 200 feet from the shoreline of any Lake.

(7) *Privately operated fuel/oil dispensing systems are prohibited. Automatic shut-off valves are required for pre-existing systems.*

e) *Additional Requirements for Commercial On-Water Facilities*

(1) *Due to the unique nature of Commercial On-Water Facilities, such facilities shall be evaluated on a case by case and BRA reserves the right to establish appropriate restrictions, limitations and requirements.*

(2) *Commercial On-Water Facilities with slips greater than 26 feet in length must provide, at a minimum, one sewage pump-out facility.*

(3) *The design of a Commercial On-Water Facility must be signed and sealed by a professional engineer/architect licensed to do business in the State of Texas.*

f) *Other On-Water Facilities or Structures*

Other structures such as duck blinds, casting targets, slalom courses, shall not be erected on the Lakes except by written permission of the BRA.

g) *All facilities must comply with any and all additional requirements of federal, state, and local laws.*

h) *Floating habitable structures are prohibited on BRA owned, operated, or managed lakes. Houseboats or other watercraft with overnight accommodations that are designed for navigation are excluded from this prohibition.*

i) Pre-Existing On-Water Facilities: Except as provided in Subsection 8d.(3), On-Water Facilities in place prior to October 27, 2014, shall be allowed to remain in their present location and configuration until such time as substantive repairs on the On-Water Facility become necessary. A substantive repair is any repair which:

1) Requires removal of the On-Water Facility from the Lake (vertically or horizontally);

2) Is due to deterioration to the point of becoming a safety hazard;

3) Is due to an environmental hazard;

4) Results in the replacement or rebuilding of sidewalls; or

5) Results in the addition, replacement, or upgrading of the electrical wiring system.

Voluntary replacement of non-encapsulated flotation that does not involve or require the repair, replacement or upgrading of existing structures (other than the substructure supporting the encapsulated flotation) shall not be considered a substantive repair and shall not require additional upgrade of the On-Water Facility.

2.2 Lower Colorado River Authority (LCRA)

Carollo investigated the LCRA's regulations on land and water use for the Highlands System of Lakes (Lake Buchanan, Inks Lake, Lake LBJ, Lake Marble Falls, Lake Travis, Lake Austin, and Lady Bird Lake). As of Dec. 20, 2002, there were approximately 6,000 residential docks on the Highland Lakes with more being added continually. The regulation of these docks includes:

FLOTATION

New Residential Docks using flotation must use Encased Flotation. If Flotation is being replaced in conjunction with the replacement of the Structures of the Residential Dock in its entirety, Encased Flotation must be used. An Existing Residential Dock using Flotation on the Effective Date of these Standards may continue to use Flotation that is not Encased F*lotation until Feb. 18, 2014. At that time, all Flotation must be Encased Flotation. Flotation must be kept free of vegetation. Metal barrels or drums are prohibited for new or replacement flotation and must be replaced within three years of the Effective Date of these Standards.*

LIGHTING

A Residential Dock must be lighted continuously from sunset to sunrise and during periods of restricted visibility if the dock: (1) extends beyond the maximum distance from the Shoreline, or (2) otherwise poses a navigation hazard.

The minimum safety lighting allowed under these Standards shall adequately define the presence of all Structures located on or over the water surface and be lighted so as to clearly identify the walkway and the entire structure. Lighting shall be so located and configured or shielded so as not to present a hazard to navigation.

A Residential Dock that, due to sudden rises in lake elevation resulting from flooding, can be expected to extend past the maximum distance from the Shoreline allowed under these Standards shall be lighted in accordance with these Standards during the period the dock exceeds the maximum distance from the Shoreline.

A swim platform must be continuously lighted from sunset to sunrise and during periods of restricted visibility if the platform (1) extends beyond the maximum distance from the Shoreline, (2) otherwise poses a navigation hazard, or (3) is located within the maximum distance from the Shoreline, but which, from its furthest extension, is located more than 50 feet from the Shoreline or any other Structure (such as a Residential Dock). The minimum safety lighting shall adequately define the presence of the structure.

ANCHORING

A Residential Dock must be securely attached to the shore, taking into consideration water depth, lake level fluctuation and exposure to wind, fast moving water and wave action. Anchor cables for floating docks shall (1) not create a hazard to navigation or block ingress or egress for Watercraft, (2) be maintained in good condition and have a minimum working load of 1,000 pounds, (3) have thimbles or other chafing protection.

ELECTRICAL

Overhead wiring spans above the open water surface are prohibited. These include electrical conductors and communication cables such as television, telephone, etc.

LAKE ACCESS

(1) With the exceptions noted here, a Residential Dock shall be located within the maximum distance from the Shoreline (measured perpendicular from the Shoreline).

Maximum distance from Shoreline shall be:

- *Lake Buchanan . . . 150 feet*
- *Lake Inks . . . . . 35 feet*
- *Lake LBJ. . . . . 50 feet*

- *Lake Marble Falls. . 35 feet*
- *Lake Travis. . . . . 100 feet*

Exception A: In shallow areas of the Highland Lakes, a Residential Dock may exceed the maximum distance from the Shoreline but in any event shall not:

1. *Extend further than 200 feet from the Shoreline*
2. *Pose a hazard to navigation*
3. *Extend further than the maximum distance from the Shoreline solely to avoid having to move floating docks to accommodate varying lake levels*
4. *Extend further from the Shoreline than necessary to allow for boat access to docks in shallow water*
5. *Violate any other provision of these Standards related to lake access.*

Exception B: An Existing Residential Dock so affixed to realty (Fixed Dock) as to make its relocation impractical may exceed the maximum distance from the Shoreline but may not be extended further.

(2) A Residential Dock shall not be constructed, relocated, expanded or modified to further restrict the existing access available for watercraft in areas where the water surface is 40 feet wide or less at the Design Elevation.

Note: A Residential Dock on Lake Travis or Lake Buchanan may further restrict access during periods of Low Lake Levels as long as the access for watercraft is not unreasonably restricted for any dock owner within a cove.

(3) Residential Docks shall not be constructed, located, expanded or modified in any manner that would interfere with the ability of an LCRA permitted Marina Facility to maintain the Navigable Passage required under the Highland Lakes Marina Ordinance where the Navigable Passage is located entirely over property owned, leased or otherwise controlled by the Marina Facility.

(4) A New Residential Dock or Existing Residential Dock that is relocated, modified or expanded and occupies more than 1,500 square feet of the Water Surface Area may not extend a distance of more than 33 percent of the width of the unobstructed open water from Shoreline to Shoreline or from Shoreline to a Structure located on the opposite Shoreline (measured perpendicular from the Shoreline at the Design Elevation).

Measurements to Structures located on the opposite Shoreline will include only those Structures so located as permitted by LCRA or otherwise exempt from LCRA rules or regulations.

Note: A Residential Dock temporarily moved due to seasonal lake elevation changes does not constitute a relocation for the purposes of this provision.

VARIANCES

LCRA staff shall have discretion to grant a variance to the provisions of these Standards where strict adherence to one or more of the provisions would, in the judgment of LCRA staff, result in a grave injustice or an unreasonable hardship to the owner of a Residential Dock.

2.3 San Jacinto River Authority (SJRA)

Carollo investigated the SJRA's regulations on Lake Conroe for on-water private structures. Carollo had to request information from SJRA because the information was not publicly available online. This is why the documents in Appendix 3: SJRA contain some documents that are unformatted for public use. The SJRA requires that lakefront property owners obtain a permit for

Section 6.01: General Statement. The right to engage in construction, placement, operation and maintenance of Private Structures, Marinas, bulkheads, buildings, and other facilities or Encroachments on the Reservoir or Authority Land is not an inherent right that comes with the control or ownership of waterfront property.

Section 6.02: Permit Required at All Times. (a) Except as provided under Section 6.03, it is a violation of these Rules for any Person to construct, operate or maintain an Encroachment on the Reservoir or any Authority Land at any time except in strict compliance with a valid Permit authorizing same.

(b) A request for a Permit for an Encroachment shall be directed to the Authority and processed in accordance with procedures approved by the General Manager from time to time. The Authority exercises the right to grant, deny, condition or renew such Permit as deemed appropriate in the sole discretion of the Authority.

Structure on Lake Conroe (dock/pier/cut in) the following must be followed:

1. *40’ out from bulkhead*
2. *If on a canal must keep 30’ center channel for navigational purpose*
3. *May have upper deck but, no enclosures (no walls, may have small storage closet)*
4. *Must use licensed contractor*
5. *Must have POA/HOA approval if required by POA/HOA*
6. *Wooden structures*

2.4 Tarrant Regional Water District (TRWD)

Carollo researched the TRWD's rules and regulations for on-water structures. This included their rules and regulations but also their application for the permit. The pertinent information was gathered and includes:

A. It is unlawful to construct, place or operate any improvement or facility of any type on land or water, or to excavate or place fill materials therein, below spillway elevation on Lake Bridgeport and Eagle Mountain Lake, and at or below the flood flowage boundary on Cedar Creek Reservoir and Richland-Chambers Reservoir, or on any land or water regulated or controlled by the District, unless an application has been submitted to the District and a written permit has been granted by the District. Permits are also required for any additions and/or modifications. The District's Improvement Permit Guidelines are incorporated herein, and made a part hereof, as the Guidelines now exist or are hereafter amended.

B. Any wharf, dock, boat house or other such structure which is deemed dilapidated or abandoned by any District Officer or any other authorized District personnel shall be repaired by the owner so as to meet District standards or the permit for same may be revoked and such structure will be demolished or removed by the owner or the District at the owner's expense.

C. Any raw water intake for a purpose other than the irrigation of a shorefront single family residence requires a water use contract with the District.

D. Fuel pumping facilities are not allowed on any noncommercial facility, or any watercraft.

E. District Officers have the right to inspect any facility constructed on or over District water or land at any reasonable time.

F. All permits for the placing of structures on land or water owned or controlled by the District shall be revocable by the District whenever the structure has become (1)dilapidated, (2) in violation of this Ordinance, (3) a hindrance to the operation of the District's lakes or reservoirs, or (4) a nuisance or (5) a hazard to navigation. The District can remove all such structures at owner's expense after revocation of applicable permits.

G. Failure of a permittee to proceed with the construction or repair of the improvements in accordance with the permit issued by the District or failure of the permittee to comply with any of the other terms and conditions of the permit constitutes Breach of License Regulations and may result in the revocation of the permit and/or a penalty for violation of this Ordinance as provided herein in ArticleXVIII. if the District determines that the construction of the improvements is not proceeding in accordance with the permit issued by the District, the District will give the permittee written notice of such determination and permittee will have at least five (5) days in which to comply with the permit before the permit is revoked. The District may charge the permittee with fees to compensate the District for time expended by the District personnel in visiting the site to inspect the construction of the

improvements if the District determines that construction is not in accordance with the permit. District reserves the right to remove the improvement at the owner's expense.

H. Any improvement or facility existing on the effective date of this ordinance or any amendment hereto, that is designed and/or operating in a manner not permitted by this ordinance shall be allowed to remain on District property until further order of the District. However, it will be designated as a noncomplying faculty.

1. In the District's sole discretion, a noncomplying facility may be enlarged or altered if it is determined that same will not adversely affect public safety, health or navigation. Ordinary maintenance and repairs are permitted.

2. Should a noncomplying facility be removed or destroyed by any means to the extent that it would require substantial replacement, it will not be reconstructed except by permit and in compliance with the provisions of this ordinance.

3. Should a noncomplying facility be permanently moved for any reason, it shall be done by permit and thereafter comply to the provisions of this ordinance.

4. If a noncomplying facility becomes a hindrance to the operation of the District's reservoir, or a nuisance, or hazard to navigation, or becomes dilapidated or an environmental or safety hazard, it shall be removed at the owner's expense.

Carollo also found this regulation language inside the permit application for a private on-water structure:

1. If a residence cannot be built or placed on a lot, an improvement may not be permitted for that property.

2. Community boat structures will be considered commercial operations and therefore fall under the Commercial Facilities Ordinance.

3. The area measured is to be the largest area at the end of a walkway. The largest area may be either the outside corners of the structure or the roofline if it has more than a two-foot overhang.

4. The maximum size allowed for any structure is determined as follows:

a. Eight (8) square feet of structure is allowed per linear foot of shoreline owned up to 150 linear feet (1200 square feet).

b. An additional four (4) square feet of structure is allowed for each linear foot of shoreline owned from 151-250 linear feet (1,204-1,600 square feet).

c. An additional two (2) square feet of structure is allowed for each linear foot of shoreline owned from 251-450 linear feet (1,602-2,000 square feet).

d. An additional one (1) square foot of structure is allowed for each linear foot of shoreline owned over 450 linear feet.

e. The area measurement shall exclude one walkway not to exceed eight (8) feet wide to one structure only. If there is more than one structure approved for the property then the entire area of the second, as well as any additional structures, shall be included in the area measurement. The distance the structure extends into the reservoir shall be kept as short a distance as is practical so as not to impair navigation and to maintain continuity with the shoreline. The maximum square footage may not be allowed in all cases.

5. Where large undivided tracts or multiple lots are used to determine the maximum area of an improvement, an agreement shall be signed and recorded whereby the linear footage of shoreline for a certain area is set aside and cannot be used for the future determination of other structures.

6. No part of an improvement can be closer than five feet to the property line, excluding fences, sidewalks and retaining walls. Structures over 1200 square feet must be twenty feet from property lines.

7. No structure may occupy more than one third of any channel width and in no case shall any part of the structure come within ten feet of the centerline of the channel. Exceptions may be granted for structures located at the end of a channel.

8. There will be no living quarters built over any area below the spillway elevation of a reservior whether it be spanned, cantilevered or by other means.

9. Enclosed structures are not allowed on District Reservoirs. In order to protect a raised boat within a dock from the elements, solid sides on the dock will only be permitted for a maximum of two (2) feet downward from the point where the ceiling joist meets the top plate. No additional materials (i.e. lattice, fencing, bars, screen fabric, doors, glass, etc.) may be installed below the two (2) foot sidewall.

10. A small storage area is allowed on the first floor (lower deck) of the structure for storing tackle, life jackets, etc. Products considered hazardous or which have warning labels prohibiting it's use near public water supplies shall not be stored in these areas. A twenty (20) square foot enclosure shall be considered maximum for any such storage area.

11. No toilet facilities of any type will be allowed on structures. A portable water supply can only be plumbed to one fish cleaning station on the first floor (lower deck). No plumbing will be allowed on upper deck.

12. Fuel pumping facilities are not allowed on any non-commercial facility or watercraft.

13. A three-story sun deck will not be approved.

14. Any structure that extends more than fifty feet from the shoreline shall be equipped with a photocell light that operates continually from dusk till dawn. At the discretion of the District additional lighting may be required on docks exceeding 50 feet. Circumstances may require that lighting be placed on docks which are less than 50 feet in length. The light must be capable of sufficiently illuminating the structure and shall be white. It is the homeowner's responsibility to ensure that all permanent lighting required by the District is properly maintained and operational at all times. The homeowner or contractor may also be required to provide temporary safety lighting during the construction of any improvement extending into the reservoir. If required, lighting must be located on the end of the structure during construction and remain until permanent lighting is installed.

15. The first floor (lower deck) of a structure shall be no less than 18 inches above elevation 836.00 feet msl.

16. The electrical services shall be installed by a Master Electrician in accordance with the National Electric Code as amended and revised. A complete electrical plan must be provided with the application (see Attachment #4). The District performs cursory electrical inspections for general compliance only. The Master Electrician is responsible to inspect all electrical components to ensure that the installation meets all requirements specified in the National Electric Code.

17. All materials exposed to the elements shall be cedar, redwood, treated wood, concrete or steel materials. Other materials with long life expectancy will be considered. No metal barrels may be used for flotation. Only extruded (closed cell) polystyrene or foam bead expanded polystyrene that is encased in a high quality protective cover and that has been approved by the District may be used for flotation. Any replacement of flotation on existing structures must be made using the approved encapsulated polystyrene. Creosote treated materials will not be permitted below conservation level.

18. All connections below the walkway shall be bolted with galvanized, zinc plated, admium plated or stainless steel bolts. Steel materials may be welded. Other connections may be nailed or attached by screws.

19. All construction activities disturbing the soil at or below the flood flowage boundary of the reservoir must employ erosion control practices to minimize the amount of sediment entering the reservoir.

20. Steel pilings shall be a minimum of two and seven eighths inches (2 7/8) in diameter. Wood pilings must be pressure treated and at least six inches in diameter. Creosote pilings will not be allowed.

21. The roof of a structure shall have a maximum of 6 in 12 pitch.

22. The attic space created by the roof design may be utilized as storage or as a temporary day-shelter from the elements provided it's built in accordance with the District's roof pitch

requirements. This space shall not have raw water, potable water, or sewage disposal facilities plumbed into it. This space cannot be utilized as living quarters.

23. A permit issued by the District in no way releases the improvement owner from the responsibility of meeting the requirements of Federal, State, County or City regulations or any Development Deed Restrictions that may apply.

24. Circumstances will arise in which some of the above guidelines may not be practicable. In these cases, the District management reserves the right to use its own discretion.

25. Improvements are placed on District property at the District's sole discretion.

2.5 Titus Count Fresh Water Supply District No. 1 (TCFWSD)

Carollo investigated the TCFWSD No. 1 rules and regulations for Lake Bob Sandlin. The TCFWSD regulates boat houses and private structured constructed on the lake through their document titled: (1) Regulations for Structures Built on Lake Bob Sandlin. Carollo attached this document in Appendix 4: TCFWSD. The pertinent regulations language included:

1. The privilege of installing a structure on the lake is not an inherent right with the control or ownership of waterfront property. If a structure is permitted for construction, it is to be used responsibly and should not contribute to domestic wastes, especially human waste, entering the lake.

2. The District exercises the right to grant or deny structure permits and any modifications to structures as deemed appropriate at the sole discretion of the District.

3. The District may permit no more than one boathouse and one pier on any one shoreline lot with a minimum of 100 feet of shoreline. A minimum of 25 feet of shoreline is required for a pier and 50 feet of shoreline is required for a boathouse. Structures shall not be built within 5 feet from the property line. Adjoining lots owned by 1 owner may build 1 structure per lot unless the lots have been joined in a manner prohibiting the separation of the lots.

4. Construction plans, including floor plan, elevation plan and walkway, must be submitted with the permit application, along with the permit fee, and approved by the District prior to any work being done. A visual inspection will be required prior to approval. A permit/placard must be obtained and placed in plain view from the lake and kept there until all work is completed. Permits are to be obtained before repairs are made to structures.

5. All structures built adjacent to one lot may not exceed an aggregate total of 2,000 square feet. The footprint of a boathouse, including boat slip(s) and deck area, may not exceed 1,600 square feet. Additional square footage will be allowed for a walkway to the structure provided the walkway does not exceed 6 feet in width. The footprint of a pier may not exceed 400 square feet. Additional square footage will be allowed for a walkway to the

structure provided the walkway does not exceed 6 feet in width. Neither temporary nor permanent living will be allowed on any structure.

6. No boathouse or pier shall be constructed which is more than1 story in height. This means that a boathouse or pier may have a deck on top, but the deck may not be enclosed and may not have a roof over it. No covered two-story deck/boathouse structures will be permitted. The roof of a structure shall be a flat top or have a maximum of 5 in 12 pitch.

7. Outer walls may be used to protect lifted boats from the weather so long as the bottom of the wall is not lower than 4 feet below the roof edge or 4 feet above the floor The District will allow fully enclosed storage area, not to exceed 100 square feet floor space, with one dimension of the enclosure not to exceed 6 feet.

8. Lakefront property owners should be aware that the District may, at its discretion, remove the un-permitted structure/portion if you build a new structure, or add on to an existing structure without first obtaining a permit and a fee of $250.00 payable to the District may be imposed in addition to a possible written citation and/or removal of structure. Make sure all permits are obtained.

2.6 United States Army Corp (USACE) Lakes

Carollo investigated the USACE rules and regulations for Corp-owned lakes in Texas. This exercise was to verify suspicions that Corp-owned lakes do not allow the construction of any structures on project lands. According to the USACE Governing Public Use of Corps of Engineers Water Resources Development Projects:

- *The construction, placement, or existence of any structure (including, but not limited to, roads, trails, signs, non-portable hunting stands or blinds, buoys, docks, or landscape features) of any kind under, upon, in or over the project lands, or waters is prohibited unless a permit, lease, license or other appropriate written authorization has been issued by the District Commander. The design, construction, placement, existence, or use of structures in violation of the terms of the permit, lease, license, or other written authorization is prohibited. The government shall not be liable for the loss of, or damage to, any private structures, whether authorized or not, placed on project lands or waters.*

3.0 RECOMMENDED MODIFICATIONS

After careful review of FCWD's existing regulations, with the consideration of rules and regulations from other applicable entities, it is recommended that LG implement the following or similar language into the FCWD rules and regulations considerations related to the construction of private on-water structures (boathouses).

Major Recommended Additions:

Internal Range is a structural measurement that should be regulated by FCWD. This minimum value was determined by using the distance from conservation pool (378') to the emergency spillway elevation (385'), or seven feet (7'). The bell curve sample of boat heights was also utilized. A diagram of these measurements is attached in Appendix 7: FCWD.

- Boat lifts are required to maintain a minimum 16.00 foot Internal Range, as measured by the distance from the lowest lift obstruction to the normal pool water surface elevation.
- The floor deck of any boat house structure shall be no less than 24 inches above elevation 378.00 feet msl.

Minor Recommended Additions:

- All materials, fixtures, and assets shall be able to withstand periodic temporary flooding.
- Boathouses will not contain finished areas, as defined by square-footage with enclosed walls, floors, or ceilings of materials generally accepted for interior residential construction (e.g., windows, drywall/sheet rock, insulated walls, carpet, etc.). Screened-in porches and sun-rooms with exterior-grade ceiling fans and/or heaters are allowed.
- On-Water Facilities must be constructed and maintained in a structurally sound manner which does not create a safety hazard or environmental concern.
- On-Water Facilities may not be situated in a manner that unreasonably interferes or obstructs access to other permitted facilities or neighboring properties.
- All boathouse electrical components (e.g. wire, outlets, fixtures, motors, etc.) must be installed above an elevation of 385.5 feet above mean sea level. Submersible electrical components are allowed at any elevation.
- A single fully enclosed storage area per boathouse structure is allowed, not to exceed 100 square feet, with one dimension of the enclosure not to exceed 6 feet.
- Property owner is advised to have a licensed electrician, electrical inspector, or other professional with expertise in electrical installations to inspect all electrical components to ensure that the installation meets all requirements specified by federal, state, and local regulations.
- Floating on-water boat house facilities shale maintain tethered functional floatation at a water surface elevation of 385.50 feet above mean sea level or greater.

- The FCWD reserves the right, in its sole discretion, to further restrict boat house structures on Lake Cypress Springs if placement of the On-Water Facility: creates a hazard to navigation; results in a nuisance; impairs the FCWD's ability to operate and maintain the Lake; or interferes with or restricts access to adjacent properties or other boat houses. Due to the unique nature of boat houses, facilities shall be evaluated on a case by case and BRA reserves the right to establish appropriate restrictions, limitations, and requirements.

- Boats stored in boathouses shall be lifted and kept at their maximum height at all times. Boats containing bimini tops, wakeboard/speaker towers, or any other obstructions that would prevent the boat from rising as high as possible in the boat slip must be lowered or removed.

- All boats lifted and stored in boathouses shall be restricted, by tie (rope, chain, chord, etc.), or obstruction (bar, pole, post, etc.), from floating outside of the boathouse perimeter.

Recommended Amendments:

In addition to these rules, Carollo recommends the removal of the "View Rule" documented below (~~stricken~~). The "obstruction of the view of the Lake" is subjective. Additionally, the catch-all terminology and the maximum height of an on-water structure will provide FCWD authority to regulate view-related problems.

- ~~Boathouses shall be designed and constructed so as to minimize any obstruction of the view of the Lake by other Lessees.~~

The figure below was developed by using the fee assessed by FCWD to each property owner around the lake. Each owner is assessed a fee of $0.35 per square foot of boathouse area. Currently FCWD regulates a boathouse to a maximum of 2,400 SF on District property with a total maximum of 3,500 SF. Other entities have similar restrictions on size that limit the square footage (see matrix of comparables Appendix 7: FCWD). Based on the comparison to other agencies and the figure below, Carollo recommends modifying the maximum square footage of boathouse square feet to 2,000 with a total maximum area of 3,000 SF.

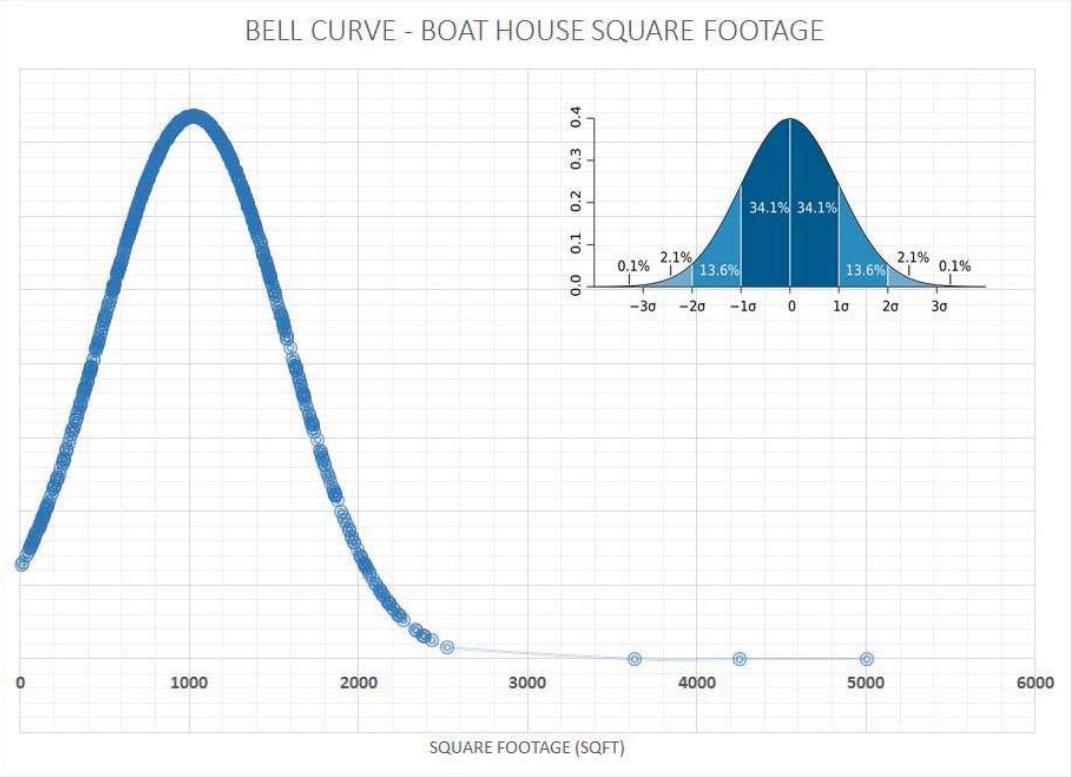


FIGURE 1.1: Bell Curve - Boat House Square Footage

- No single pier or boathouse constructed on District Property shall exceed a total of ~~twenty-four hundred (2,400)~~ two thousand (2,000) square feet in area, with the total of all the piers and/or boathouses not exceeding ~~thirty-five hundred (3,500)~~ three thousand (3,000) square feet in area; provided, however, that if a lot contains more than one boathouse and/or pier, each boathouse and/or pier must be located at least five feet (5') away from every other boathouse and/or pier (measured between the closest points on both structures).

Carollo developed a set of calculations attached in Appendix 7: FCWD that show standard dimensions of a typical Lake Cypress Springs boat house. By regulating Operational Range and Internal Range, FCWD should modify the maximum total height of a boathouse structure from 20' to 25.' This will provide owners with enough flexibility to accommodate for these Ranges.

- No boathouse constructed on District Property shall exceed one (1) story. Notwithstanding the foregoing, a flat deck area may be permitted on the roof; provided, however, that the total height of all structures (including parapets, handrails, or any other architectural feature) shall not exceed ~~twenty feet (20')~~ twenty-five feet (25') above 378 feet MSL.

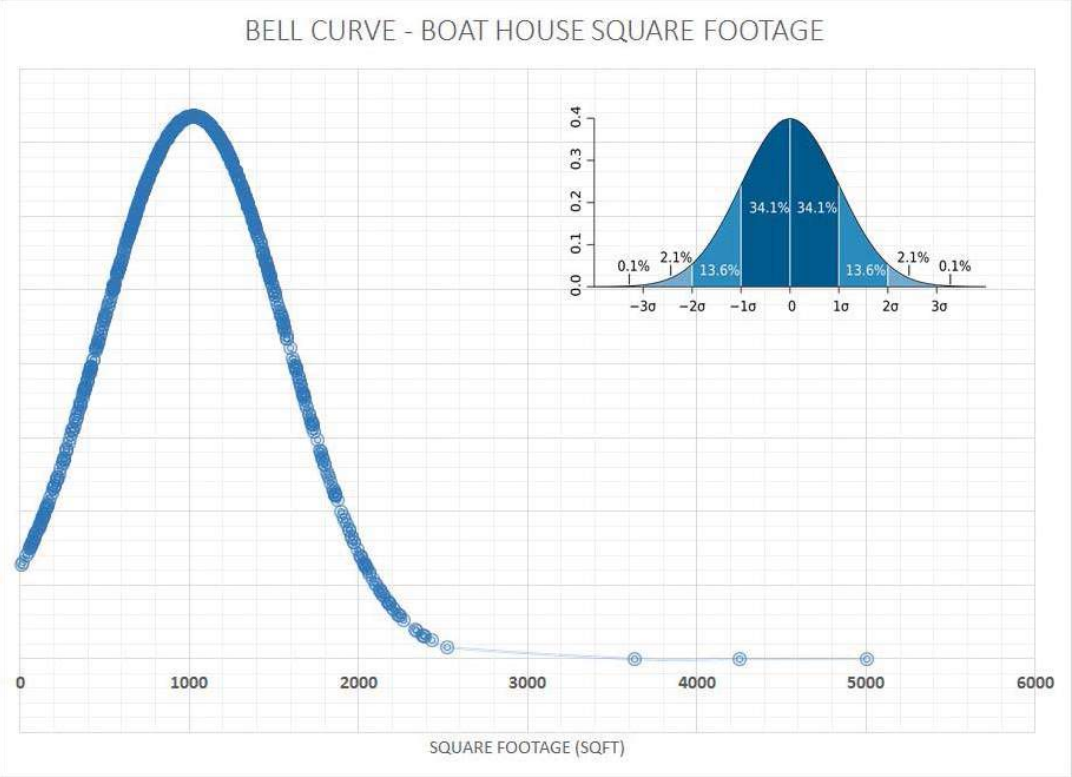


FIGURE 1.1: Bell Curve - Boat House Square Footage

- No single pier or boathouse constructed on District Property shall exceed a total of ~~twenty-four hundred (2,400)~~ two thousand (2,000) square feet in area, with the total of all the piers and/or boathouses not exceeding ~~thirty-five hundred (3,500)~~ three thousand (3,000) square feet in area; provided, however, that if a lot contains more than one boathouse and/or pier, each boathouse and/or pier must be located at least five feet (5') away from every other boathouse and/or pier (measured between the closest points on both structures).

Carollo developed a set of calculations attached in Appendix 7: FCWD that show standard dimensions of a typical Lake Cypress Springs boat house. By regulating Operational Range and Internal Range, FCWD should modify the maximum total height of a boathouse structure from 20' to 25.' This will provide owners with enough flexibility to accommodate for these Ranges.

- No boathouse constructed on District Property shall exceed one (1) story. Notwithstanding the foregoing, a flat deck area may be permitted on the roof; provided, however, that the total height of all structures (including parapets, handrails, or any other architectural feature) shall not exceed ~~twenty feet (20')~~ twenty-five feet (25') above 378 feet MSL.

APPENDIX 1 – BRA

Purposefully removed to shorten

See TM No. 1 - Engineering Recommendations for Lakefront Structures

for the BRA Rules and Regulations

APPENDIX 2 – LCRA

Purposefully removed to shorten

See TM No. 1 - Engineering Recommendations for Lakefront Structures:

Retaining Walls, Dredging, and Fill Works

for the LCRA Rules and Regulations

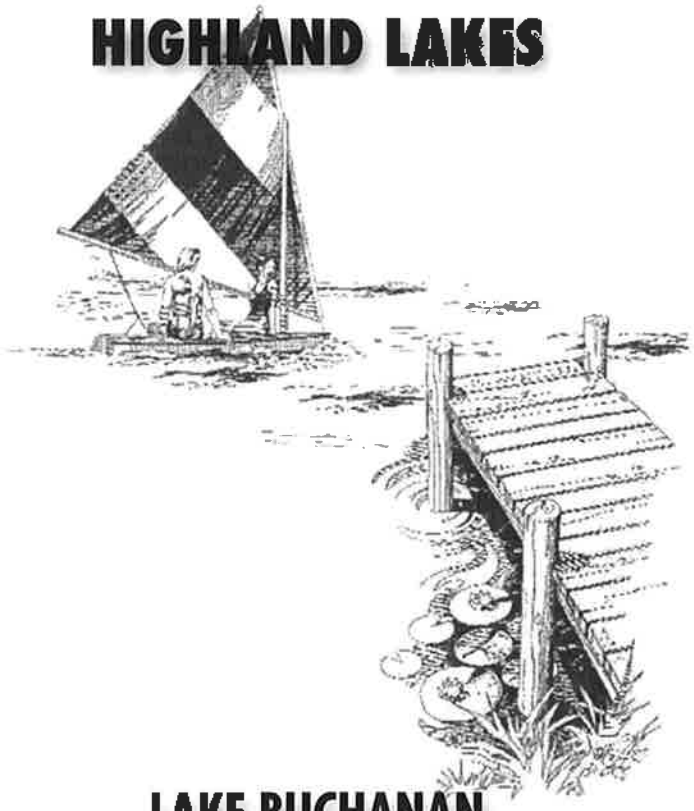
WATER SURFACE MANAGEMENT

SAFETY STANDARDS

FOR RESIDENTIAL DOCKS

ON THE

HIGHLAND LAKES



LAKE BUCHANAN

INKS LAKE

LAKE LBJ

LAKE MARBLE FALLS

LAKE TRAVIS

LCRA

ENERGY • WATER • COMMUNITY SERVICES

SAFETY STANDARDS FOR RESIDENTIAL DOCKS ON THE HIGHLAND LAKES

PURPOSE AND PREFACE

These safety standards of the Lower Colorado River Authority (LCRA) apply to all residential docks on the Highland Lakes and are adopted pursuant to its authority and intended to provide minimum requirements to protect public safety, access and water quality.

As of Dec. 20, 2002, there were approximately 6,000 residential docks on the Highland Lakes and more are being added continually. LCRA recognizes the utility and convenience of these residential docks for their owners, but it also is charged with the responsibility to ensure public safety, navigation and water quality of the Highland Lakes.

LCRA developed these Safety Standards for Residential Docks on the Highland Lakes in response to its recognition of the value of residential docks and its concern for the safety and welfare of the Highland Lakes. LCRA will not assess any fees as part of the implementation of these standards.

For additional copies of these standards, questions or concerns, please contact Water Surface Management at 1-800-776-5272, Ext. 2309 or 2405.

EXEMPTIONS

HIGHLAND LAKES MARINA ORDINANCE

Notwithstanding any contrary requirement set forth in the Highland Lakes Marina Ordinance (HLMO), Residential Docks, regardless of size, are not required to obtain a permit under the HLMO, but shall instead comply with the Safety Standards for Residential Docks on the Highland Lakes. However, a Floating Dock located on Lake Travis or Lake Buchanan that occupies more than 1,500 square feet of Water Surface Area, excluding the square footage occupied by the Gangway, shall be considered a Marina Facility.

RECESSED DOCK

A Fixed Dock placed so that no part extends past the Shoreline of the lake is exempt from these Standards provided that no such dock may:

(1) Have any structural members, roofing, decking, flotation or walkways that are not securely attached and could pose an immediate safety or navigation hazard
(2) Be totally or partially submerged
(3) Be floating in a position that is not upright
(4) Have decks or floors below the waterline
(5) Be in a state of disrepair.

DEFINITIONS

Words used in these Standards and not defined in this section shall have their ordinarily accepted meaning. For the purposes of these Standards, the following words and phrases are defined.

Abandoned Dock: A dock that (1) exceeds the maximum distance from shore requirement set forth in these Standards or (2) is adrift.

Design Elevation: The elevation, measured in feet above mean sea level, which is specific for each lake: Lake Buchanan, 1,020 feet; Inks Lake, 888 feet; Lake LBJ, 825 feet; Lake Marble Falls, 738 feet; and Lake Travis, 668 feet.

Dilapidated Dock: A dock that (1) has any structural members, roofing, decking, flotation or walkways that are not securely attached and could pose an immediate safety or navigation hazard, (2) is submerged, (3) is not floating upright, (4) has decks or floors below the waterline, (5) is in a state of disrepair, or (6) is otherwise not in compliance with these Standards.

Effective Date: The Effective Date of these Standards shall be Feb. 18, 2004.

Encased Flotation: Expanded polystyrene fully enclosed by one of these materials:

(a) Treated dimensional wood, 1.5 inches thick (actual) or more
(b) Nontreated dimensional wood 4 inches thick or more
(c) Treated plywood 0.5 inch thick or more
(d) Nontreated marine grade plywood 0.5 inch thick or more
(e) Concrete 1 inch thick or more
(f) Galvanized steel 0.065 inch or 16 gauge thick or more
(g) Liquid coatings, 30 mils thick or more, chemically or securely bonded
(h) Rigid (hard) plastics, 50 mils thick or more
(i) Fiberglass and plastic resins 30 mils thick or more, chemically or securely bonded.

Or these materials which may or may not enclose expanded polystyrene:

(j) Devices using air chambers as flotation designed specifically for marine use
(k) Plastic barrels which contain no hazardous materials or residue
(l) Other materials approved by LCRA.

Expansion: Any increase in the Water Surface Area of a Residential Dock.

Existing Residential Dock: A Residential Dock that, on or before the Effective Date of these Standards, is constructed and located on or over the water surface of the Highland Lakes.

Fixed Dock: A rigid structure or portion of a rigid structure supported by pilings, retaining wall or other materials and associated with a permanent foundation that is either resting or embedded in the lake bottom and is designed to make relocation impracticable.

Floating Dock: A structure or portion of a structure supported by flotation or otherwise designed to make relocation possible.

Flotation: Material such as polystyrene, wood or other material used to support floating Structures on the water surface.

Gangway: A walkway or structure extending from the dock to the shore that, because of its short length, does not require supports by floats or outriggers and which occupies no more than 80 square feet of water surface area.

Highland Lakes: Includes Lake Buchanan, Inks Lake, Lake LBJ, Lake Marble Falls and Lake Travis on the Colorado River within the Lower Colorado River Authority District.

LCRA: Lower Colorado River Authority

Low Lake Levels: The elevation measured in feet above mean sea level for Buchanan (1,012 feet) and Lake Travis (655 feet).

Marina Facility: Any structure or combination of structures, other than a Residential Dock, located on or over the water surface of the Highland Lakes and located on or over a lot, that is designed for the mooring of Watercraft or is a commercial facility, community marina or marine service station.

Modification: Any change, addition or alteration of a Residential Dock or any change, addition or alteration in the location,

configuration, Structure or substructure of a Residential Dock. A Modification does not include routine maintenance and repairs or repairs required by LCRA to bring a Residential Dock that is Dilapidated or Abandoned into compliance with the applicable Safety Standards for Residential Docks on the Highland Lakes.

Navigable Passage: A dedicated space to allow the passage of Watercraft. It is defined as at least 75 feet wide with a minimum depth of eight feet.

New Residential Dock: A Residential Dock constructed after the Effective Date of these Standards.

Residential Dock: A noncommercial dock associated with a single family residence for which no compensation is/will be received by the owner(s) of the dock for its use. This definition also includes swim platforms and piers. A Floating Dock located on Lake Travis or Lake Buchanan that occupies more than 1,500 square feet of Water Surface Area, excluding the square footage occupied by the Gangway, shall be considered a Marina Facility. Any dock structure exceeding 1,500 square feet and not associated with a single family residence may be subject to the Highland Lakes Marina Ordinance.

Shoreline: The line at which the water surface of each Highland Lake intersects the land at any given time. The Shoreline will move as the surface elevation of a lake changes.

Standards: These Safety Standards for Residential Docks on the Highland Lakes, which represent LCRA rules and regulations applicable to Residential Docks.

Structure: Anything constructed or otherwise located on or over the water surface, extended over the water surface, or affixed to something that is/will be located on the ground and covered by water or is located on land and is an essential part of the Residential Dock, such as an electrical system.

Water Surface Area: The area including, but not limited to, the width times the length of the Residential Dock's floating and fixed structures located on or over the water, its open and covered slips and the maximum area covered by Watercraft, including that portion of the Water Surface Area that is used by Watercraft as a courtesy dock and all end tie areas. Gangways are not included in the Water Surface Area measurements.

Watercraft: Any craft, vessel or boat used or capable of being used as means of transportation on or under the water, including vessels such as houseboats and other vessels not used primarily for transportation.

Waterfront Property: Property that adjoins the Shoreline, at lake elevations measured in feet above mean sea level, when the water surface is at or below these lake elevations: Lake Buchanan, 1,020 feet; Inks Lake, 888 feet; Lake LBJ, 825 feet; Lake Marble Falls, 738 feet; and Lake Travis, 681 feet.

SAFETY STANDARDS

ABANDONED DOCKS AND DILAPIDATED DOCKS

No person shall own or control an Abandoned Dock or Dilapidated Dock.

FLOTATION

New Residential Docks using flotation must use Encased Flotation. If Flotation is being replaced in conjunction with the replacement of the Structures of the Residential Dock in its entirety, Encased Flotation must be used.

An Existing Residential Dock using Flotation on the Effective Date of these Standards may continue to use Flotation that is not Encased

Flotation until Feb. 18, 2014. At that time, all Flotation must be Encased Flotation.

Flotation must be kept free of vegetation. Metal barrels or drums are prohibited for new or replacement flotation and must be replaced within three years of the Effective Date of these Standards.

LIGHTING

A Residential Dock must be lighted continuously from sunset to sunrise and during periods of restricted visibility if the dock: (1) extends beyond the maximum distance from the Shoreline, or (2) otherwise poses a navigation hazard.

The minimum safety lighting allowed under these Standards shall adequately define the presence of all Structures located on or over the water surface and be lighted so as to clearly identify the walkway and the entire structure. Lighting shall be so located and configured or shielded so as not to present a hazard to navigation.

A Residential Dock that, due to sudden rises in lake elevation resulting from flooding, can be expected to extend past the maximum distance from the Shoreline allowed under these Standards shall be lighted in accordance with these Standards during the period the dock exceeds the maximum distance from the Shoreline.

A swim platform must be continuously lighted from sunset to sunrise and during periods of restricted visibility if the platform (1) extends beyond the maximum distance from the Shoreline, (2) otherwise poses a navigation hazard, or (3) is located within the maximum distance from the Shoreline, but which, from its furthest extension, is located more than 50 feet from the Shoreline or any other Structure (such as a Residential Dock). The minimum safety lighting shall adequately define the presence of the structure.

ANCHORING

A Residential Dock must be securely attached to the shore, taking into consideration water depth, lake level fluctuation and exposure to wind, fast moving water and wave action. Anchor cables for floating docks shall (1) not create a hazard to navigation or block ingress or egress for Watercraft, (2) be maintained in good condition and have a minimum working load of 1,000 pounds, (3) have thimbles or other chafing protection.

ELECTRICAL

Overhead wiring spans above the open water surface are prohibited. These include electrical conductors and communication cables such as television, telephone, etc.

LAKE ACCESS

(1) With the exceptions noted here, a Residential Dock shall be located within the maximum distance from the Shoreline (measured perpendicular from the Shoreline).

Maximum distance from Shoreline shall be:

Lake Buchanan . . . 150 feet
Lake Inks . . . . . 35 feet
Lake LBJ . . . . . 50 feet
Lake Marble Falls. . 35 feet
Lake Travis . . . . . 100 feet

Exception A: In shallow areas of the Highland Lakes, a Residential Dock may exceed the maximum distance from the Shoreline but in any event shall not:

1. Extend further than 200 feet from the Shoreline
2. Pose a hazard to navigation
3. Extend further than the maximum distance from the Shoreline solely to avoid having to move floating docks to accommodate varying lake levels

4. Extend further from the Shoreline than necessary to allow for boat access to docks in shallow water
5. Violate any other provision of these Standards related to lake access.

Exception B: An Existing Residential Dock so affixed to realty (Fixed Dock) as to make its relocation impractical may exceed the maximum distance from the Shoreline but may not be extended further.

(2) A Residential Dock shall not be constructed, relocated, expanded or modified to further restrict the existing access available for watercraft in areas where the water surface is 40 feet wide or less at the Design Elevation.

Note: A Residential Dock on Lake Travis or Lake Buchanan may further restrict access during periods of Low Lake Levels as long as the access for watercraft is not unreasonably restricted for any dock owner within a cove.

(3) Residential Docks shall not be constructed, located, expanded or modified in any manner that would interfere with the ability of an LCRA permitted Marina Facility to maintain the Navigable Passage required under the Highland Lakes Marina Ordinance where the Navigable Passage is located entirely over property owned, leased or otherwise controlled by the Marina Facility.

(4) A New Residential Dock or Existing Residential Dock that is relocated, modified or expanded and occupies more than 1,500 square feet of the Water Surface Area may not extend a distance of more than 33 percent of the width of the unobstructed open water from Shoreline to Shoreline or from Shoreline to a Structure located on the opposite Shoreline (measured perpendicular from the Shoreline at the Design Elevation). Measurements to Structures located on the opposite Shoreline will include only those Structures so located as permitted by LCRA or otherwise exempt from LCRA rules or regulations.

Note: A Residential Dock temporarily moved due to seasonal lake elevation changes does not constitute a relocation for the purposes of this provision.

VARIANCES

LCRA staff shall have discretion to grant a variance to the provisions of these Standards where strict adherence to one or more of the provisions would, in the judgment of LCRA staff, result in a grave injustice or an unreasonable hardship to the owner of a Residential Dock.

A request for variance should be made in writing prior to placement of any New Residential Dock or the Expansion, relocation or Modification of an Existing Residential Dock.

A variance may be granted under these circumstances:

(1) There is no reasonable alternative to the requested variance that will alleviate the injustice or hardship.
(2) The variance is no greater than the minimum required to alleviate the injustice or hardship.
(3) The variance does not create significant adverse impacts to other Waterfront Property owners within the immediate vicinity or compromise water quality or public safety.

A decision by LCRA staff regarding a variance request shall be made within 15 working days of receipt and is final and unappealable.

ENFORCEMENT

INSPECTIONS

Upon receipt of a report, complaint or suspicion of possible violation of these Standards or at the request of a Residential Dock owner, an agent or employee of LCRA may inspect a Residential Dock. LCRA shall provide advance notification for inspections and owner or owner's representative shall, whenever possible, be present during inspection. Inspections typically will be conducted during normal LCRA business hours unless other arrangements are made.

RIGHT OF ENTRY

LCRA authorized agents and employees shall not enter private property without first notifying, if present on the property, any owner, occupants or other person in charge at the time of the inspection of their presence and exhibiting proper credentials. Authorized agents or LCRA employees shall have the right to enter at all reasonable times in or upon any property, whether public or private, for the purpose of inspecting and investigating conditions relating to the construction, Expansion, Modification or relocation of a Residential Dock. Nothing in this section, however, shall preclude an LCRA peace officer from entering the property without notice to investigate suspected criminal activity as might otherwise be allowed under the laws of this state.

NOTICE OF VIOLATION

Whenever any violation of the Residential Dock Safety Standards occurs, an authorized agent or employee of LCRA shall issue the Notice of Violation (NOV) stating the nature of the violation(s) and shall provide notice of such violation by:

(1) Posting such notice in a prominent location on the Residential Dock and
(2) Sending a copy of the notice via certified mail to the dock owner, if known.

OPPORTUNITY TO CURE VIOLATIONS

The Residential Dock owner shall have 30 working days from the date that the NOV is posted to comply with the Standards. A request for an exception to the time frame shall be in writing and shall explain in detail the need for additional time and what measures are being taken to ensure that the health and safety of the public is not compromised until the violation can be corrected. Staff has discretion to grant a request for extension of time, which shall be approved in writing.

EMERGENCY ORDER

Notwithstanding the notice periods set forth elsewhere in these Standards, LCRA may at any time issue the Emergency Order to address an imminent and substantial endangerment to human health and safety, including an imminent navigation hazard. The Emergency Order shall order the dock owner to immediately isolate the hazard from the public until such time as the hazardous condition can be corrected and order that the condition be corrected within a specified time period. The Emergency Order shall be in writing and shall be posted prominently at the site and mailed via certified mail to the dock owner if known. The Residential Dock owner may appeal the issuance of an Emergency Order to LCRA's general manager by submitting a concise, written statement of the reasons for believing that the Emergency Order should not have been issued and citing the specific rule from which the Residential Dock should be exempt. An appeal of the Emergency Order must

be received in the LCRA general manager's office prior to the expiration of the time for performance prescribed by the emergency order. The general manager may decide the appeal based on the reasons stated in the appeal or may request additional information from the staff or person filing the appeal.

NAVIGATION HAZARDS AND DOCKS ADRIFT

An authorized LCRA agent or employee may immediately relocate or remove from the Highland Lakes any Residential Dock that is adrift or, at the discretion of the LCRA agent or employee, otherwise presents a navigation hazard. If a dock owner can be identified, LCRA shall take reasonable steps to issue a Notice of Violation within three working days after removal or relocation of the Residential Dock has occurred. Such NOV shall inform the dock owner that the dock has been removed or relocated and, if applicable, shall include procedures for recovery of the dock.

INJUNCTION

Nothing in these Standards shall prevent LCRA from seeking injunctive relief or any other remedy in law or equity at any time against any person allegedly violating these Standards.

MISCELLANEOUS

AUTHORITY

These rules are adopted pursuant to in Chapter 8503, Special District Local laws Code (formerly: Chapter 22, Texas Water Code; Section 2 of the Lower Colorado River Authority Act, chapter 74, 1975 Texas General Laws 181, as amended by chapter 484, article IV, 1983 Texas General Laws 2827; and article 8280-107, Vernon's Annotated Texas Civil Statutes): and chapters 26, 49 and 51 of the Texas Water Code; and Chapter 31 of the Texas Parks and Wildlife Code. Those statutes give LCRA authority to adopt such rules and regulations as are necessary to control the surface of the Highland Lakes, to provide for improved water safety on the surface of the Highland Lakes, and to provide for the control of both artificial and natural pollution of the ground and surface water of the Highland Lakes.

RELATIONSHIP TO OTHER LAWS

Whenever regulations or restrictions imposed by these Standards are either more or less restrictive than regulations or restrictions imposed by any governmental authority or other entity that might have authority to regulate Residential Docks, the regulations, rules or restrictions that are more restrictive or which impose higher standards or requirements shall govern.

SEVERABILITY

Should any part of these Standards be declared by the courts to be unconstitutional or invalid, such decision shall not affect the validity of the Standards as a whole or any part thereof other than the part so declared to be unconstitutional or invalid.

AMENDMENT OR SUSPENSION OF THE STANDARDS

These Standards may be amended from time to time by the LCRA Board of Directors after notice and reasonable opportunity for public review. The Board of Directors may suspend these Standards, or any portion thereof, whenever the Board determines such suspension to be in the public interest.

ABOUT LCRA

LCRA is a conservation and reclamation district created by the Texas Legislature in 1934. LCRA provides energy, water and community services to the people of Texas. It cannot levy taxes, but funds its operations with income from the sale of electricity, water and other services.

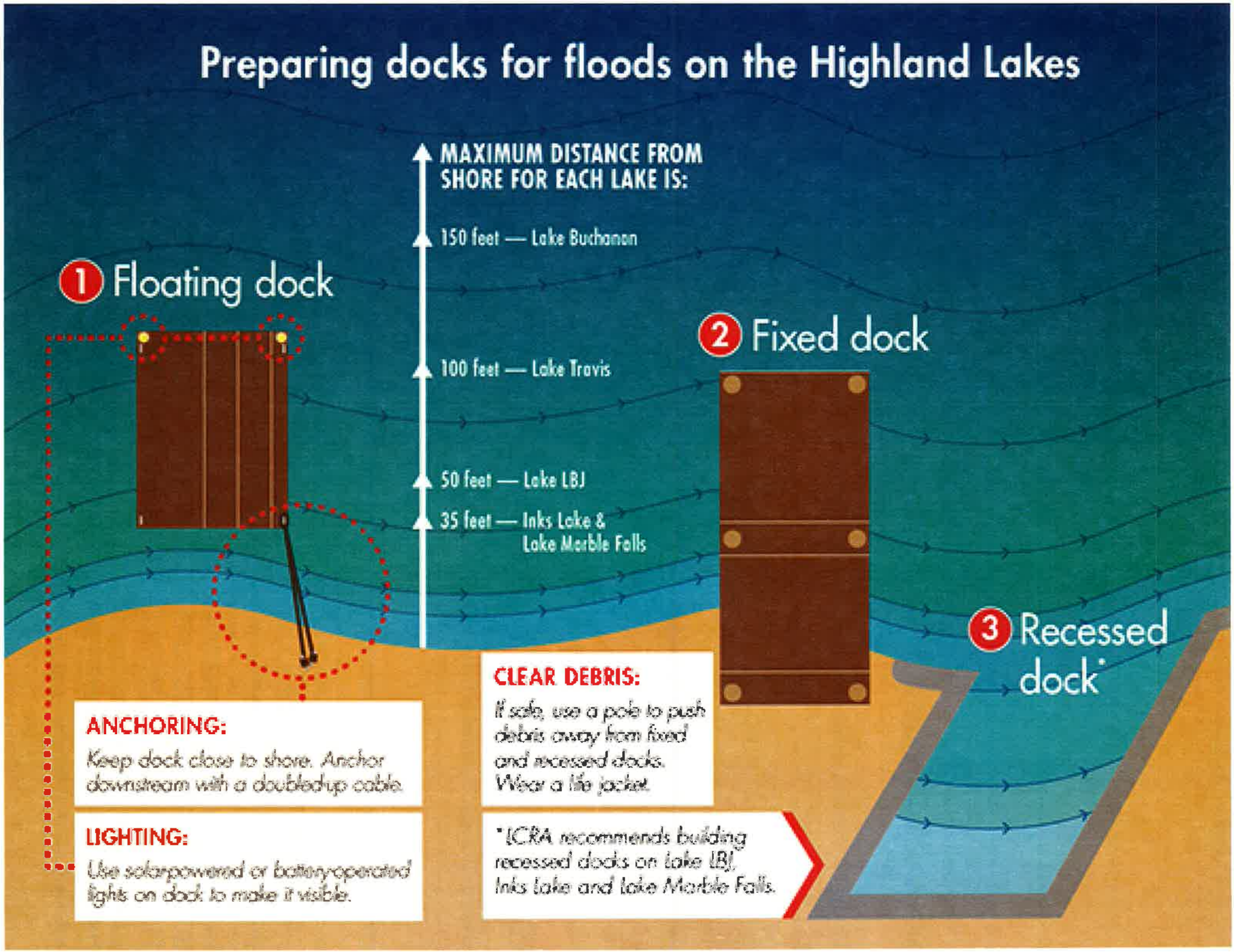
LCRA generates electricity and sells it wholesale to 42 customers, including city-owned utilities and cooperatives that serve more than 1 million people in Texas. LCRA also builds and operates transmission projects through a nonprofit corporation it created, manages and protects the lower Colorado River, provides water and wastewater utilities, owns and operates parks, and offers economic and community development assistance to communities.

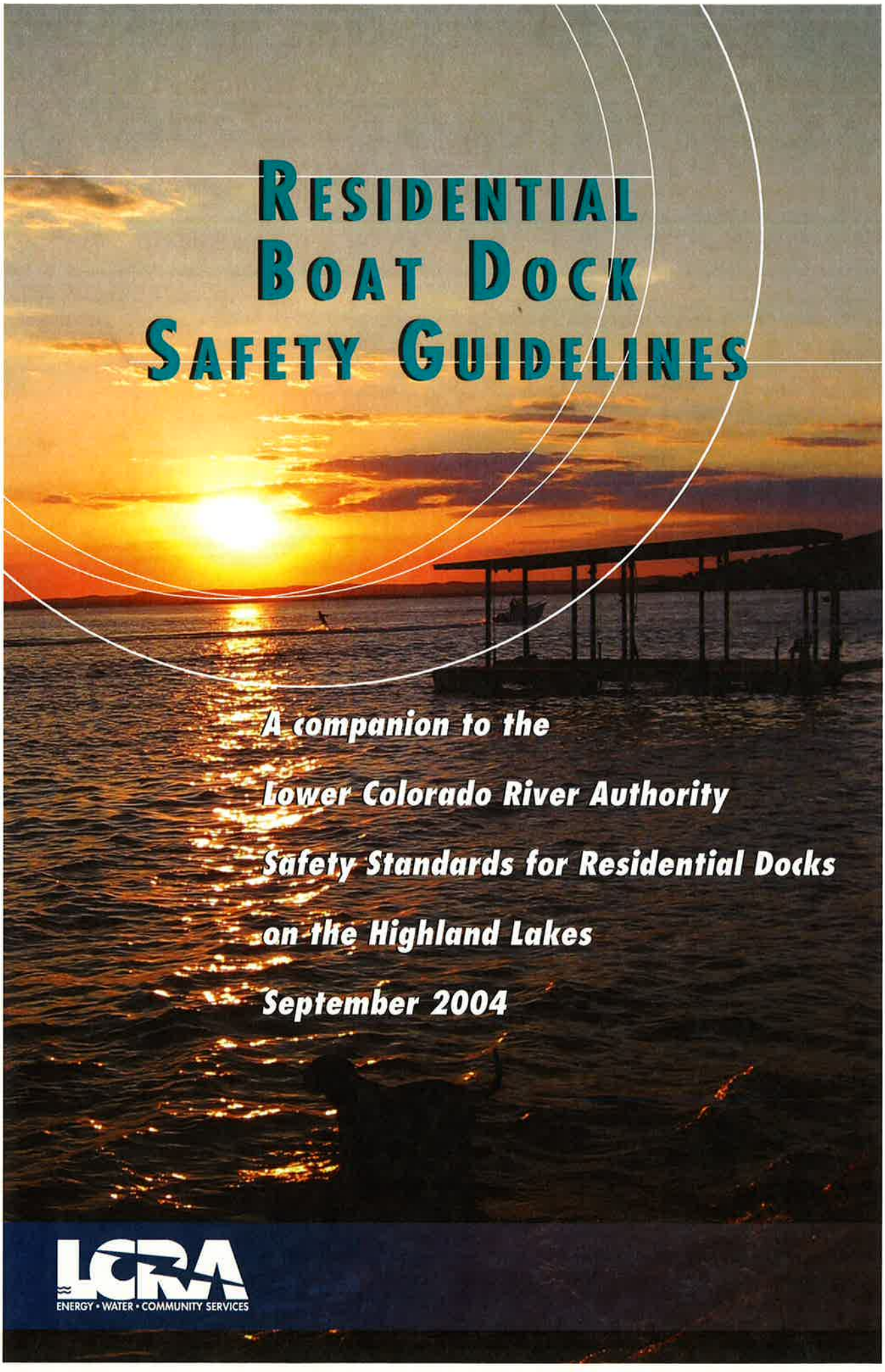
LOWER COLORADO RIVER AUTHORITY
P.O. Box 220
Austin, Texas 78767-0220
1-800-776-5272
(512) 473-3200
www.lcra.org

Printed on recycled paper.

APRIL 2004

Preparing docks for floods on the Highland Lakes





Residential Boat Dock Safety Guidelines

A companion to the

Lower Colorado River Authority

Safety Standards for Residential Docks

on the Highland Lakes

September 2004

LCRA

ENERGY • WATER • COMMUNITY SERVICES

Introduction

LCRA developed these voluntary residential boat dock safety guidelines as a companion to the mandatory safety standards for residential docks on the Highland Lakes. The guidelines were designed to help dock owners, builders and buyers avoid some problems and situations associated with owning a residential dock on the Highland Lakes.

By preventing future problems through compliance with both the mandatory standards and dock safety guidelines, dock owners can help provide a safer and cleaner environment for everyone who wants to enjoy the stark beauty and endless recreational opportunities the Highland Lakes afford.

Table Of Contents

What Are the Rules Regarding...?

Can a Dock Go Here?

Maintaining a Dock

Registration

LCRA does not require a permit or dock registration. However, residential dock owners may voluntarily register the dock with LCRA by contacting Water Surface Management at 1-800-776-5272.

Registration may benefit a dock owner if emergency response or law enforcement are called to the location. LCRA will make the registration data available to those services on request.

In addition, if a dock breaks loose and is found at another location on the lake, registration may help identify its rightful owner and facilitate its return.

All registration information is public information and is subject to the Public Information Act.

Fees

No permit, registration or annual fees are part of the implementation of the Safety Standards for Residential Docks on the Highland Lakes.

A dock owner may be responsible for fees associated with owning or leasing land or fees assessed by other entities with jurisdiction.

LCRA does not repair or recover abandoned or dilapidated docks from the water surface. LCRA may assess a fee for relocating an abandoned dock or swim platform.

A dock owner is responsible for making any improvements necessary to comply with the Safety Standards for Residential Docks on the Highland Lakes.

Because a dock owner may incur significant cost for constructing and locating a dock on the water surface, LCRA recommends reading this document and the Safety Standards for Residential Docks on the Highland Lakes before purchasing or placing a dock on the Highland Lakes.

Applicability

The Safety Standards for Residential Docks on the Highland Lakes apply only to Lakes Buchanan, Inks, LBJ, Marble Falls and Travis.

New Docks

A new dock is one that is placed on the surface of the Highland Lakes after Feb. 18, 2004. These docks are subject to the ***Safety Standards for Residential Docks on the Highland Lakes.***

Existing Docks

An existing dock is one that was in place before Feb. 18, 2004. Requirements for an existing dock are the least restrictive but require some action on the part of the dock owner. See the Safety Standards for Residential Docks on the Highland Lakes.

Owners of floating residential docks that exceed 1,500 square feet on lakes Buchanan and Travis must comply with the Highland Lakes Marina Ordinance (HLMO). The HLMO contains the most stringent regulations regarding engineering requirements, property ownership, setbacks, location and configuration and other measures to ensure water quality and public safety.

Residential docks on Lake Austin are regulated by the City of Austin. Contact the Austin Parks and Recreation Department at (512) 974-6737 for information and regulations.

Other Regulations

Compliance with the Safety Standards for Residential Docks on the Highland Lakes does not ensure compliance with requirements or regulations from other entities. Entities with jurisdiction may include cities, counties, property owners associations and homeowners associations. Compliance may be required with LCRA's Nonpoint-Source Pollution Control Program, Land and Water Use Regulations and On-Site Sewage Facilities Program. In cases where LCRA and another entity have different regulations or requirements, the most stringent regulations apply.

It is the dock owner's responsibility to comply with all applicable regulations or requirements from any other entity with jurisdiction.

Docks in Place

An existing residential dock that was permanently affixed to realty (fixed dock) as of Feb 18, 2004, may remain in place. Any modification, including but not limited to an extension or expansion of an existing fixed dock, must comply with the current standards.

A dock owner may be required to submit an affidavit to swear that a dock was at its current location and configuration on Feb. 18, 2004.

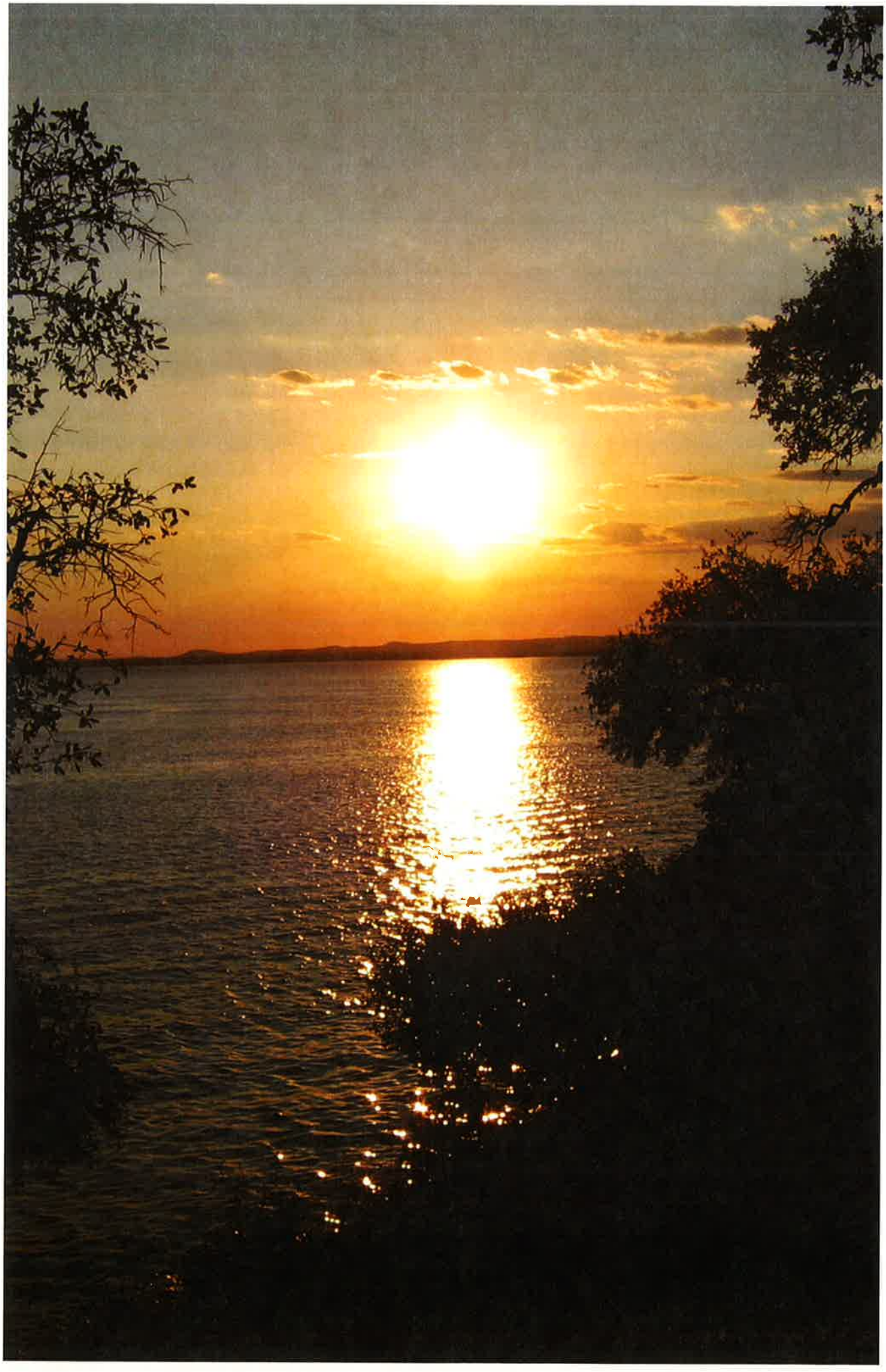
A dock owner may repair or replace a structure on a 1:1 basis and continue to be considered an existing dock. A 1:1 replacement means replacement of the structure with the same location, configuration and size.

Temporarily moving a dock to accommodate the varying lake level will not be considered a relocation.

Docks using flotation may continue to use non-encased flotation until Feb. 18, 2014 (10 years from the effective date of the standards), at which time all flotation will be required to be encased flotation only. If the flotation is being replaced in conjunction with the replacement of the structures of the residential dock in its entirety, encased flotation must be used.

Variances

A dock owner may apply for a variance if it can be demonstrated that compliance with the standards creates an unreasonable hardship or injustice the criteria for which are described in the Dock Safety Standards. The standards were developed considering extensive public input and most circumstances that dock owners on the Highland Lakes may encounter.



Siting Considerations

Proper siting is essential for a dock. Disregard for any of the siting considerations prior to construction may cost dock owners valuable assets and time.

Prospective dock owners should check water depth where the dock will be located to ensure it is adequate for the dock and associated activities. A slip designed for a runabout watercraft may not have adequate depth for swimming or to berth a sailboat. Small shallow coves located on variable level lakes present challenges for mooring a large boat. The dock may have to move frequently to be located in adequate depth to berth the boat, or it may become unusable during periods of low lake levels.

Residential docks are at the mercy of the elements, and at some places on the lakes there are exceptional stress loads. This is the case on Lake Travis and Lake Buchanan, where deep water, long fetches, and high winds may create exceptionally large waves. If a dock is located near a dam, floodgate operations can create swift water which may be released at any time without advance notice.

Recessing a dock is one of the most effective ways to negate the effects of fast moving water and is encouraged wherever possible, particularly on pass-through lakes, such as Lake LBJ, Inks Lake and Lake Marble Falls. Placing a dock on the Llano River on Lake LBJ may prove challenging due to the fast moving water and debris from flood events. The Central Texas area has been dubbed *Flash Flood Alley* because of the river conditions, and recessing a dock is strongly recommended.

Visiting a waterfront location on a cold, cloudy winter day may not provide a dock owner with an accurate picture of the type of usage the location experiences on a summer day. Some coves may be used during the summer for "rafting" watercraft, some are busy commercial locations and others may be dry as water recedes during the summer months. Locations with open water may provide passage for larger watercraft, and some of the watercraft can create significant wakes.

The standards contain rules limiting the maximum size and distance from shore allowed for residential docks. (See Maximum Size/Height require-

This is an example of a recessed dock.

ments.) The standards do not require a setback from adjacent property lines, but the proximity of a dock to such things as neighboring docks, boat ramps, designated swim areas and parks should be considered.

Floating docks on Lake Buchanan and Lake Travis normally go aground or follow the water as it recedes during the summer months. Plan ahead to know where your dock will be sited when the water recedes, and make sure you have permission to place the dock where it will be located during times of low water. If your dock will go aground, ensure it is designed to do so without damaging the dock.

Fixed docks are inherently more stable than floating docks, and are normally the dock of choice on the pass-through lakes (Inks, LBJ and Marble Falls). Floating docks are normally more appropriate on the variable level lakes (Travis and Buchanan). A floating dock generally requires more maintenance than a fixed dock. While a fixed dock remains in place, a floating dock has anchor cables and anchors and usually moves often to follow the water as it fluctuates. Placement of anchors and anchor cables should be considered when evaluating a site for a floating dock.

Property Ownership

The water surface is public domain. LCRA has responsibility for protection of water quality, safety and regulation of the water surface of the Highland Lakes. The right to place a dock on the water surface depends on the ownership of the submerged land under the dock.

The Highland Lakes are unique because the majority of land above and below the surface of the water is privately owned. All submerged property on the Highland Lakes is owned by someone. It may be LCRA, a county, a city, a developer, a property owners' association or other ownership. The property owner has the right to give permission for someone to place a dock over the property. A property owner with property contiguous with submerged property owned by LCRA should contact LCRA Real Estate Services at 1-800-776-5272 about permission to place a dock over LCRA's submerged property.

There are two basic types of land ownership on the Highland Lakes.

Privately Owned Land

The majority of land under the Highland Lakes is owned by individuals or private entities, such as estates, homeowner associations (HOA), property owner associations (POA), subdivisions and developers. Anyone wanting to place a dock over privately owned land should have permission from the landowner. LCRA recommends owning, leasing or otherwise controlling the property under which a dock is located.

Publicly Owned Land

Some of the land under the Highland Lakes is owned by a city, a county, the state or a public entity such as LCRA. Each of these entities may have their own requirements for dock placement over property they own. A prospective dock owner should determine which public entity owns the submerged land and what type of permission is needed before placing a dock. A dock owner is responsible for complying with any applicable requirements imposed by an entity that has jurisdiction over the property. LCRA may allow placement of a residential dock over its property if the

property is adjacent to that of the dock owner. Owners of fixed docks located over LCRA land may be subject to a lease fee. For information about leasing LCRA property, call Real Estate Services.

Dock owners are responsible for determining property ownership. Information can be obtained from a variety of sources, such as county tax records, title companies, POAs and HOAs. It is best to determine ownership of the property under a dock before purchasing and placing the dock. Failure to do so may result in wasting valuable time and assets.

Property lines aren't imaginary lines extended into the water. Property lines under the water surface look very much like those on dry land and may extend in many directions. A tax map or property plat should indicate all property boundaries. A land owner may own property only to a certain elevation or contour line but not own any property that is normally submerged. Owning waterfront property does not entitle the owner to place a dock on property owned by others.

Anchors should be placed only over property that is owned, leased or otherwise controlled by the dock owner. The owner of a floating dock on lakes Travis and Buchanan should have a low water plan. The plan should allow the dock to be located over property that is owned, leased or otherwise controlled by the dock owner. If the dock moves to follow receding water, it may become located over someone else's property.

A dispute over the placement of a dock over property that is not controlled by the dock owner must be settled in a court of competent jurisdiction. LCRA has no jurisdiction over these matters.

Types of Docks

Residential docks on the Highland Lakes primarily consist of two types: fixed or floating. Each type has its own advantages and disadvantages, but a dock's intended location may determine the best type. LCRA recommends consulting with a professional engineer or a qualified dock builder to determine which type may work best in any given location.

This is an example of a fixed dock supported by pilings.

Fixed docks

- Normally are located in the pass-through lakes (Inks, LBJ and Marble Falls) where the water level does not vary significantly on a regular basis.
- Consist of a system of pilings fixed into the lakebed with decking and other structural members attached to the pilings.
- May require less maintenance because the dock does not move.
- Are structurally more stable than floating docks and usually are capable of supporting larger loads.
- Tend to last longer.
- When installed on a variable-level lake, may become submerged at high lake levels or be "high and dry" at low lake levels.

Floating docks

- Normally are located on variable level lakes, such as Travis and Buchanan.
- Require frequent maintenance to stay on location, thereby creating other maintenance issues for the electrical system and any structural components affected by frequent movement.
- Can follow receding water and increase the time the dock is useable.

LCRA recommends specific site engineering for loads, wind and wave action, relocation due to lake level variation, environmental stress and structural stability concerns.

This floating dock can follow receding water levels.

LAKE CHARACTERISTICS

Lake characteristics may be important factors in determining the type of dock structure that will successfully withstand the stress placed on docks on the Highland Lakes.

Here are some unique characteristics of the Highland Lakes that should be considered before placing a dock:

- The levels of lakes Travis and Buchanan fluctuate.
- Lake levels tend to recede slowly but rise rapidly during flood events.

- High winds often create large waves on these deep lakes with wide basins.
- The prevailing wind at certain times of the year can cause some areas of these lakes to be windy and rough. For example, the west and north sides of Lake Buchanan can be very windy in the summer while the south and east sides can be windy creating large waves during the winter.
- The basin on Lake Travis can be windy and have large waves at any time during the year.

Lakes LBJ, Marble Falls and Inks are pass-through lakes and are maintained at or near their normal pool elevation most of the time. Flood events can cause the elevation of these lakes to rise rapidly above normal pool elevation. During a flood event, water rises quickly and often carries debris, such as trees, brush, and docks which have broken loose.

Maximum Historic Lake Levels

	Full	Maximum	Date	Feet above maximum
Buchanan	1020.3	1021.39	12/20/91	+1.04
Inks	888.2	902.8	7/25/38	+14.58
Marble Falls	825	836.16	9/11/52	+11.16
Travis	681	710.44	12/25/91	+29.41

All elevations are feet above normal mean sea level, a point of reference to measure lake elevation. It is the elevation of the ocean halfway between high tide and low tide.

Floodgate operations can cause swift water to move quickly downstream, causing swift currents and higher lake levels. All natural bodies of water may contain many hazards, such as sandbars and rock outcroppings, many of which are near the shore. A dock owner should know what exists under the water over which a dock is placed.

There are high boating traffic areas during certain months of the year. Boating traffic can affect use and enjoyment of a residential dock. Before

placing a dock on the water, it may be a good idea to observe boating activity around the potential site at different times of the year.

Flood debris can accumulate on the upstream side of a dock, causing an increased stress load. Docks located on the Llano, Colorado, and Pedernales rivers should be engineered to be able to withstand the additional stresses created by flood debris and remain on location. Any location may be subject to flood debris.

Lake Access

The water contained in the Highland Lakes is owned by the people of the State of Texas. LCRA is responsible for managing the Highland Lakes and part of that responsibility is to enhance safety, protect water quality, and ensure public access.

Public lake access must be maintained to the canals and coves on the Highland Lakes and navigable passage also must be maintained to get to them.

The Highland Lakes Marina Ordinance requires marinas to provide adequate navigable passage (access for the public into a cove) around a marina. A residential dock may not interfere with this passage if the marina controls the land over which the navigable passage is maintained.

Recessing a dock can be beneficial for both the dock owner and the public. A recessed dock does not remove any water surface area from public use and provides extra protection from damage during flood events.

As the water in Lakes Buchanan and Travis recedes, floating docks in coves often must move close together to remain afloat due to diminished water surface area. This may block access. When this occurs, access must be provided for any dock owner who requests access in the cove. Dock owners generally cooperate with each other during times of low water, and this "rafting" may not cause conflict. Such cooperation has proven to be beneficial and is not a violation of the standards.

A residential dock that exceeds 1,500 square feet in size may not extend a distance that exceeds 33 percent of the width of a cove. If a cove is less than 40 feet wide, a new dock may not be placed that would further restrict

access. Floating docks on Lake Travis and Lake Buchanan that exceed 1,500 square feet may be subject to the more restrictive requirements of the Highland Lakes Marina Ordinance.

LCRA Land and Water Use Regulations prohibit any floating or fixed structure on LCRA water that restricts public access, interferes with safe navigation or normal movement of debris and water currents on the Highland Lakes. For a copy of this document, call 1-800-776-5272.

Size and Height

There are no size or height limits for residential docks contained in the standards, but a floating dock on Lake Travis or Lake Buchanan that exceeds 1,500 square feet is required to obtain a marina permit in compliance with the Highland Lakes Marina Ordinance, which does have a height restriction.

Although there are no limits to the size of a dock, the following factors should be considered:

- Be aware and considerate of existing aesthetic conditions in the area where the dock will be located. While it is not a violation of the standards to locate a dock so that it blocks a neighbor's view or to build a dock that is completely inconsistent with the existing aesthetic conditions, a dock owner may create an adverse relationship with neighbors or community.
- The amount of stress exerted on a dock is proportional to its size and height. Taller and larger docks must be engineered to avoid toppling and accommodate the increased stress loads created by wind and waves. Increased stress loads are created when a large floating dock must absorb both the crest (tallest) side of the wave and the trough (lowest side of the wave) at the same time. This situation is particularly common in areas where the lake is wide and the water is deep. A qualified engineer or dock builder should be consulted to determine the size and height of a dock that is best for the location.
- The standards are minimum safety requirements for the Highland Lakes. Cities, counties, subdivisions, property owners associations and deed restrictions may exist and exceed requirements contained in the standards. Dock owners are responsible for complying with any rules or regulations imposed by other entities.

Dilapidated docks create a hazard to navigation, a pollution concern and become a haven for snakes, rodents and other animals.

Dilapidated Docks

What is a dilapidated dock?

A dock is dilapidated if it has loose structural members or if the decking, roofing, flotation or walkways are not securely attached. A dock that is submerged or partially submerged, not floating upright, has decks or floors below the waterline, is in a state of disrepair or is not otherwise in compliance with the standards is dilapidated.

Dock owners are liable

It is the dock owner's responsibility to maintain his or her dock. Any and all liability issues resulting from damage caused by a dilapidated or abandoned dock is that of the dock owner. For example, an improperly maintained dock may become detached from its moorings and collide with another dock or with other structures on the water. In addition, improperly maintained structural members, roofing and decking that become detached from a dock can enter the water and become a hazard for watercraft, swimmers, skiers and wake board riders.

Importance of regular maintenance

Regular maintenance is essential for maintaining the life expectancy and usefulness of a residential dock. For example, if a dock is not properly anchored and maintained to accommodate the normal stresses created by wind, waves, boat wakes and fluctuating lake levels, it may break loose and become a hazard. Flotation that has vegetation growing in it will break apart and must be replaced prematurely.

Repairs

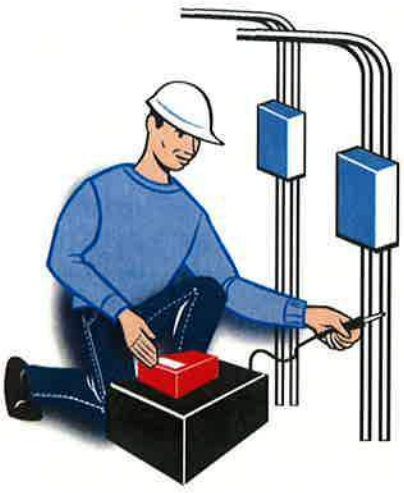
Repairs to docks can be major or minor. Some examples may be as simple as reattaching loose roofing or decking. More extensive repairs involving structural damage and flotation replacement will involve the need to evaluate the cost of repair versus replacement. Dock owners need to consider that major replacement of structural members or flotation may require compliance with the standards for new docks. Buying used or unencased flotation may seem cost effective, but prove to be a more costly option in the long run. The normal life expectancy of unencased flotation is eight to 10 years. Encased flotation may have double the life expectancy of unencased flotation.

REMEMBER:
ALL DOCKS USING FLOTATION MUST USE ONLY ENCASED FLOTATION BY FEB. 18, 2014

If you get a notice of violation

Dock owners will have **30 WORKING DAYS** to correct any violation of the standards. If a dock owner has problems complying with this timeframe, an extension of time can be requested in writing. Once a required repair is complete, the dock owner must contact LCRA to inspect the dock for compliance.

Dock Examination



Before purchasing a dock or a home with a dock, a careful examination of the dock should be performed by qualified individuals. Keep in mind that a prepurchase home inspection may not include inspection of the dock. Often the dock is not on the survey or title policy because it may be located over property that is not owned by the homeowner. Buyers should have a dock examined by a professional engineer or dock builder and consider the expense that may be necessary to bring a dock into compliance with the standards.

At a minimum, examination of a dock should include examination of anchor cables, decking, structural members, electrical fixtures and systems, flotation, and roofing.

Distance From Shore

The maximum distance a dock can extend from shore is different for each of the Highland Lakes. ***The shore is the point at which the water touches the land at any given time and at any given lake level.*** The maximum distance from shore for each lake was determined based on physical characteristics and historical usage of each lake.

The maximum distance from shore for each lake is:

Lake Buchanan	150 feet
Inks Lake	35 feet
Lake LBJ	50 feet
Lake Marble Falls	35 feet
Lake Travis	100 feet

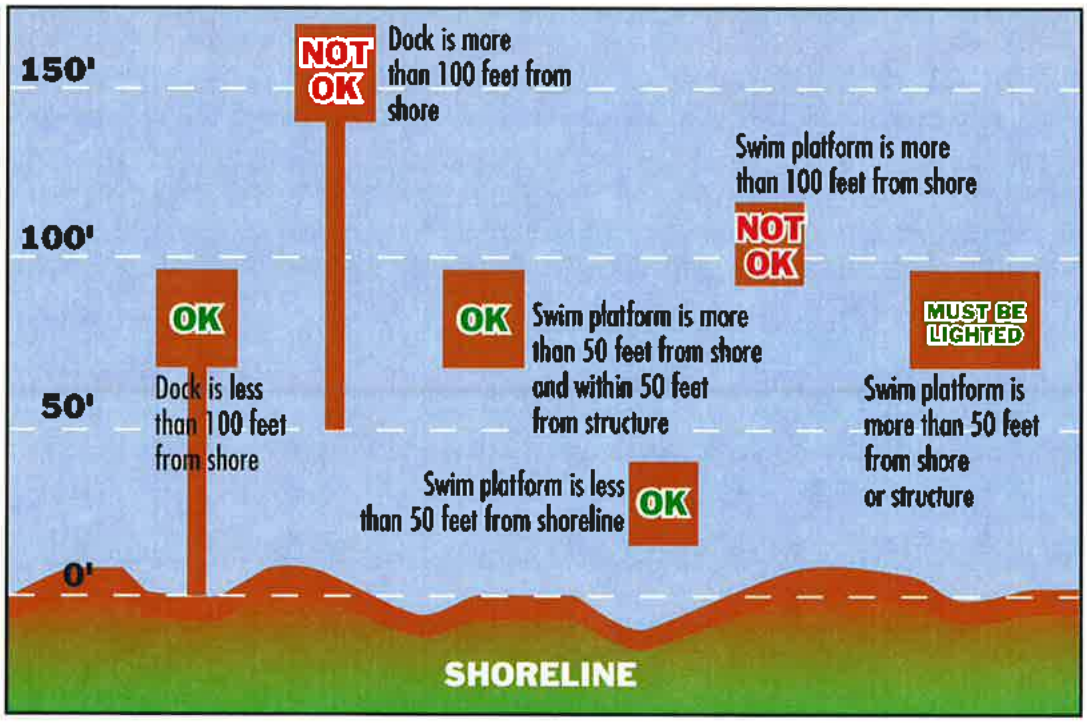
Lakes Inks and Marble Falls are not as long and wide as the other Highland Lakes, and the 35-foot maximum distance from shore reflects the fact that most docks on these lakes tend to be located close to the shore. Most docks on Lake LBJ can easily be located within the 50-foot maximum distance from shore, although in shallow areas, some docks may extend farther than 50 feet.

In shallow areas on each of the lakes, a dock may extend farther than the maximum distance from shore:

- As long as it does not pose a hazard to navigation.
- As long as it does not extend more than 200 feet from the shore.
- If it does not extend past the maximum distance solely to avoid having to move a floating dock to accommodate varying lake levels.
- If it does not extend further from the shoreline than necessary to allow for boat access to docks in shallow water.
- If it does not violate any other provision of the standards.

A dock that extends more than the maximum distance from shore must be lighted so that the presence of the entire structure and walkway is defined from sunset to sunrise and during times of limited visibility.

Docks Exceeding Maximum Distance Requirements



The maximum extension from shoreline on Lake Travis is 100 feet.

Water levels on the Highland Lakes are not constant, and lakes Travis and Buchanan tend to fluctuate more than Inks Lake and Lakes LBJ and Marble Falls. Docks located on lakes Travis and Buchanan are normally moved to accommodate the water level which tends to recede slowly over the summer. When a flood occurs, these lakes fill rapidly and docks that have been moved to accommodate lower lake levels may become abandoned docks because their location exceeds the maximum distance from shore. An abandoned dock in this situation is required immediately to be lighted from sunset to sunrise and during periods of restricted visibility and must remain lighted as long as it exceeds the maximum distance from shore.

If a dock owner knows that his or her dock will exceed the maximum distance from shore when lake elevation rises, the dock should have lighting in place so that it does not pose a navigation hazard when the lake level rises.

There is no grace period for an abandoned dock. It must be moved immediately to a location within the maximum distance from shore.

Dock owners may not locate their docks far out into the lake as a matter of convenience to alleviate the need to move the dock frequently as the water recedes. A dock located more than the maximum distance from shore in anticipation of receding lake levels is in violation of the standards. Docks must always be located within the maximum distance from shore. The dock owner is responsible for properly maintaining a dock on location at all times. An absentee dock owner or an owner who expects to be away should have someone maintain the dock during his/her absence if needed. LCRA maintains a voluntary registration database to help dock owners find their docks. For more information, call 1-800-776-5272.

An unlit swim platform extending far into the lake poses a navigation hazard.

When a dock or swim platform is adrift, it is abandoned. LCRA will attempt to locate the owner of a dock that is found adrift. Any dock or swim platform that is creating a safety hazard will be moved immediately to minimize the hazard. LCRA may assess a fee for relocating a dock or swim platform. ***See illustration on page 21.***

A dock owner who is searching for a dock that may be adrift should call Water Surface Management at 1-800-776-5272.

A dock that appears on property where it does not belong can usually be recovered by its owner. However, a dilapidated dock that washes up on property where it does not belong may be removed from the water surface by the property owner.

The LCRA Web site, www.lcra.org, is a source for weather information and lake levels. During flood events, weather warnings, anticipated lake levels and other pertinent information may be available at this site.

LIGHTING

The only dock required by the standards to be lighted is one that is not located within the maximum distance from shore or a dock that creates a hazard to navigation. Lighting must adequately define the presence of the entire structure all the way to the shoreline so boaters may determine on which side they may safely pass. If a dock is required to be lighted, it must be lighted from sunset to sunrise and during times of restricted visibility.

Most periods of low lake levels are followed by a flood, and docks commonly are not located within the maximum distance from shore. In this situation, the dock is required to be lighted immediately, as it may create a navigation hazard. Plan ahead if a dock will follow the fluctuating lake level.

Several alternatives to standard wiring methods are available for lighting a boat dock. Solar-powered lighting can provide an excellent alternative to extending electrical service to a dock that is temporarily not located within the maximum distance from shore. In addition to solar power, the use of 12-volt lighting may add an extra measure of safety.

LCRA recommends that lighting be directed downward and/or shielded so it clearly identifies the structure to which it is attached. All lights should be designed to illuminate only the structure and/or shielded to prevent "blinding" boat operators as they pass the dock. Ideally, properly shielded lights identify only the structure, and no bulbs are visible to boaters or a neighbor's property. Lights should be fixed (not blinking) so boaters will not confuse them with buoy lights.

White street lights, in addition to blinding boat operators, attract a variety of insects and varmints. When practical, yellow or amber light bulbs

should be installed. Yellow or amber lights are less likely to attract a food source for spiders.

Red and green lights should not be used on docks, as boaters may confuse them with the lighting that marks the deepest part of the river channel.

Using low wattage bulbs (40 watts or less) may reduce the glare from lights and identify the dock. Low wattage fluorescent lights that can be used in incandescent bases are available, and usually have a longer lifespan.

Reflectors used in combination with other lighting can be effective, but reflectors alone are not adequate lighting for docks. For maximum visibility, reflectors should be about 21 square inches and either white or amber. They should be placed on each corner or on all sides of the dock, except the side that faces the shoreline.

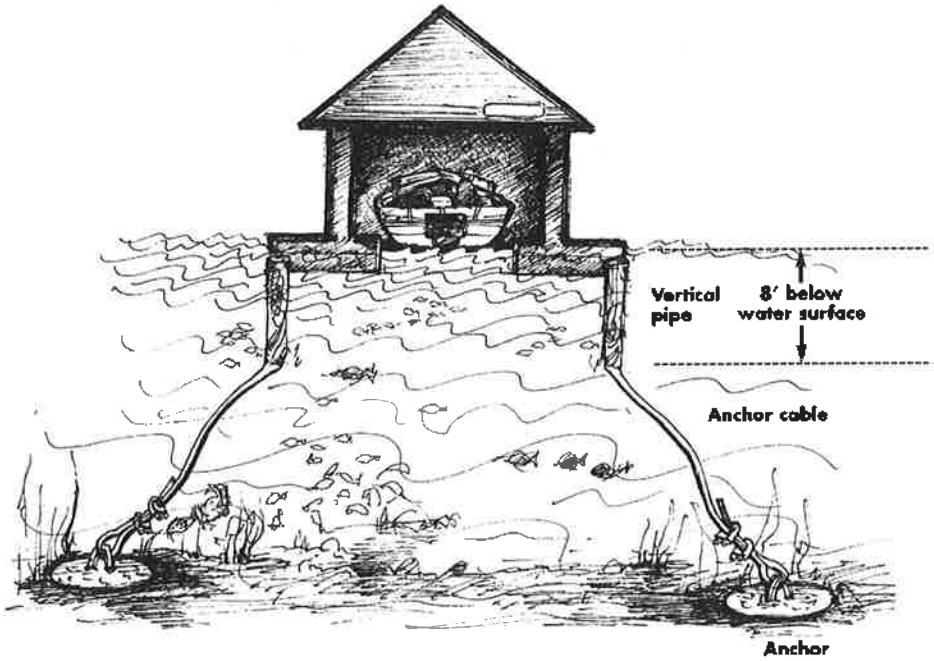
ANCHORING

One of the challenges of maintaining a floating dock is keeping it in its intended location. Boat wakes, wind and wave action, fast-moving water and debris create challenges for owners of floating docks.

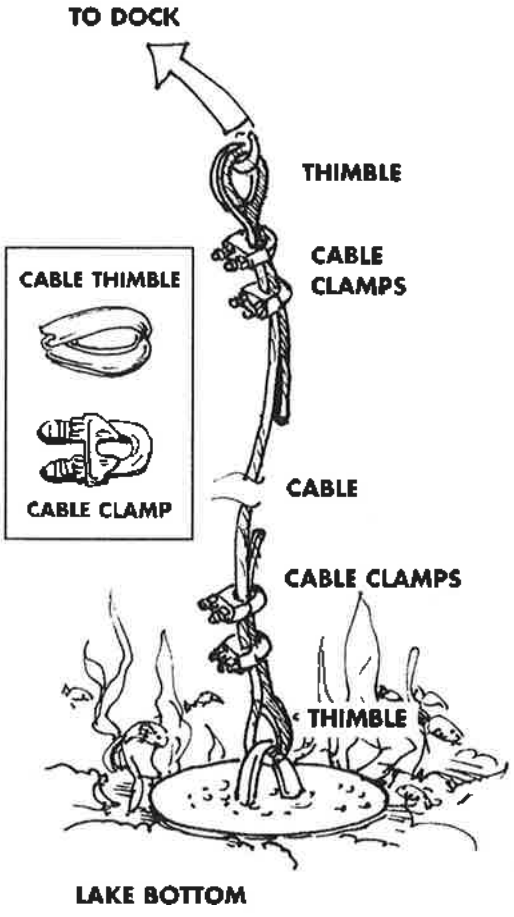
A dock must be maintained so that it is secure under any conditions. In addition, anchor cables must not create a navigation hazard or tripping hazard. Cables that are corroded or have broken strands are weakened and should be replaced. Chafing and corrosion can cause anchor cables to weaken and fail prematurely.

Anchoring a dock to a tree is detrimental to the tree. It is not uncommon for docks anchored to a tree to pull the tree into the water during a storm. Other types of vegetation offer poor anchor points.

Anchors are a part of the dock and should be placed only over property that is owned, leased or otherwise controlled by the owner. Dock owners should plan anchor locations before placing a dock on the water surface, especially in coves where docks have to be moved to accommodate varying lake levels.



Anchor cables should be placed in vertical pipes that extend downward from the dock floor and into the water to prevent them from becoming a tripping hazard or causing hazards for watercraft.



Anchor cables may be made from a variety of materials, such as galvanized or stainless steel. Cable size varies, depending on working load, but at a minimum is required to maintain a working load of 1,000 pounds. A professional engineer should be consulted to determine the type of cable that is best for a dock. Petroleum-coated cables are not recommended.

Cable anchors are usually made of concrete with a pin attached. Submerged concrete loses about 50 percent of dry weight, so a 250-pound anchor may weigh only 125 pounds once submerged.

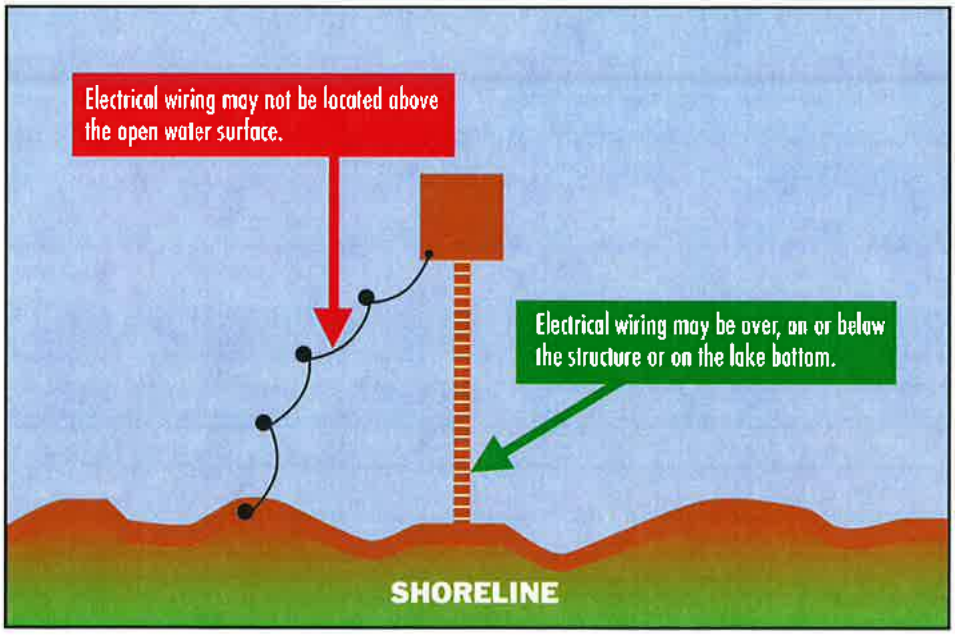
A professional engineer should be consulted to determine the right size, type and weight of an anchor for a dock.

Chafing protection is required for anchor cables because chafing is a common problem. Without thimbles or other protection, anchor cables can fail prematurely.

A thimble is an inexpensive piece of hardware that fits between the anchor cable and anchor point. Anchoring to a rounded object, such as a piling may also provide chafing protection and can extend the life of the cable.

ELECTRICAL

The only electrical requirement included in the standards is the prohibition of electrical wiring over the open water surface. A dock owner is responsible for protecting the safety of family and guests on the dock.



Electrical wiring must be placed correctly.

LCRA recommends that an electrical system on a residential dock be installed and maintained in compliance with the NEC (National Electrical Code, and the NESC (National Electrical Safety Code). In addition, a master electrician should be consulted to determine the requirements for safe electrical systems on a residential dock.

Electrical Systems

LCRA recommends that electrical installations for existing docks comply with the National Electric Code (NEC), with particular attention given to Articles 250, 553 and 555. It is also recommended that National Fire Protection Association (NFPA) 303 Marinas and Boat Yards be used as a guideline. Residential dock electrical systems should be designed and installed by a licensed electrician.

- Wiring methods, equipment, and materials should be listed and approved for use in wet and damp locations.
- Electrical equipment, cables, and conduit should be firmly attached to the surface on which they are mounted to ensure their support and integrity.
- Only copper conductors should be used.
- Enclosures or guards should be installed in locations where electrical equipment, conduit, or cables may be exposed to physical damage.
- Wiring methods should allow flexibility between adjoining walkways and any other structural connection.
- A junction box should be installed at each wiring splice connection point, receptacle, switch or light fixture for the connection of conduit; non-metallic sheathed cable or other cables.
- All unused openings in boxes and conduit should be closed.
- Accidental contact with energized parts and physical damage to parts and insulation should be prevented by installing suitable covers on all boxes and similar enclosures.
- Electrical cables installed in the water should be only Type G, Type W, or Marina and Boatyard Cable. A strain relief device should be installed at all termination points.
- Extension cords should never be used in place of permanently installed electrical wiring or allowed to droop into the water.
- Low-voltage ***(not battery operated)*** and solar-powered systems (photovoltaic) are recommended where installed in accordance with the National Electric Code.

Electrical Service

The service equipment for a dock should be located on shore adjacent to but not in or on the dock. Overhead electrical service is not recommended for use on docks or any structure that is located on or over water. On floating docks an extra hard usage portable power cable such as Type G or W that is listed for both wet locations and sunlight resistance should be used where flexibility is required. Wiring on fixed docks should be installed in conduit, run with the structural components and secured firmly to the structure.

Remember: No docks on the Highland Lakes may have overhead wiring spans over the open water surface.

Dock owners should check with the appropriate electric service power company for any additional requirements. For floating docks, additional "slack" should be provided to allow for changes in lake levels, especially on lakes Travis and Buchanan. The main electrical disconnect should be located at a safe elevation on the shore adjacent to the dock. Such a location will allow supply conductors to be disconnected in an emergency, such as during a storm or flood.

Specific safe elevations for the main electrical service at each lake are:

Lake Buchanan	Above 1,022 feet msl
Inks Lake	Above 903 feet msl
Lake LBJ	Above 837 feet msl
Lake Marble Falls	Above 757 feet msl
Lake Travis	Above 722 feet msl

Grounding

Ground continuity is of utmost importance for docks and other structures that are on or over the surface of the water because of the exposure to water and dampness. Improper grounding may cause stray currents to become introduced to a dock's components.

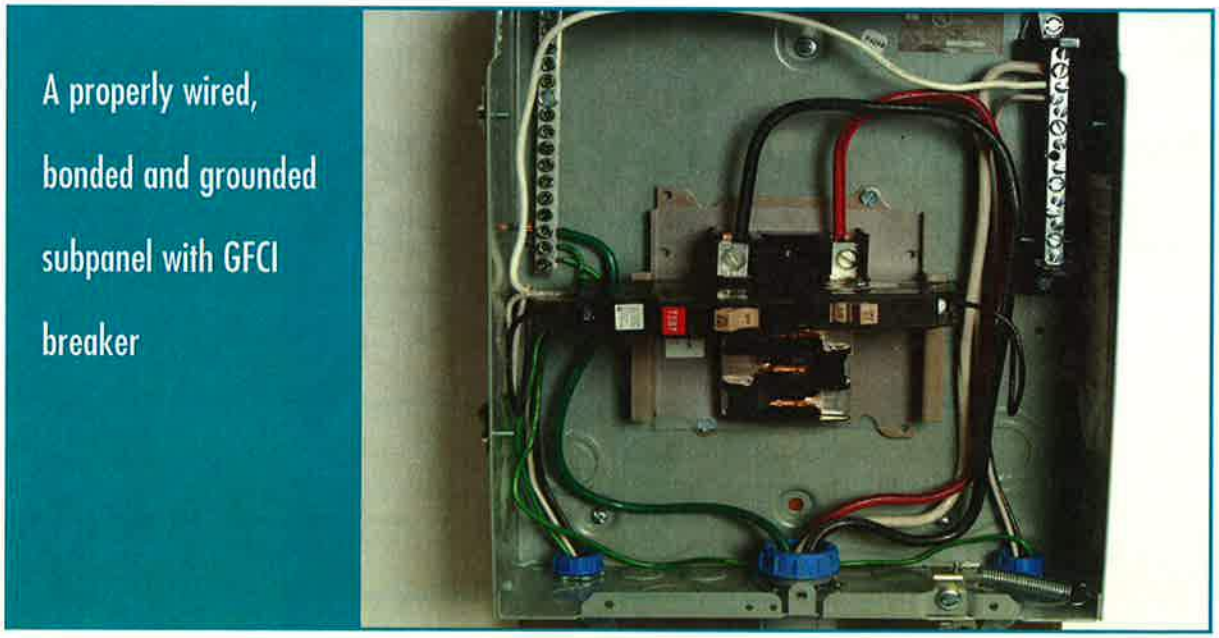
All branch circuits should have an insulated equipment grounding conductor terminated at a grounding terminal in a panel box. The grounding conductor should be no smaller than No. 12 AWG and should have a continuous outer finish that is either solid green or green with one or more yellow stripes.

These items should be connected to an equipment-grounding conductor:

- Metallic boxes, cabinets, and other enclosures.
- Grounding terminals of receptacles.
- Metal frames of equipment (boat lifts, refrigerators, etc.)

For subpanels, an insulated equipment-grounding conductor should extend from a grounding terminal in the main panel box to a grounding terminal in the subpanel.

When metal and nonmetallic equipment (such as metal boxes and PVC conduit) are used together, all metal components should be connected by insulated equipment grounding conductors to the equipment grounding terminal bar located inside the panel box.



A properly wired, bonded and grounded subpanel with GFCI breaker

Electrical system protection (overcurrent protection)

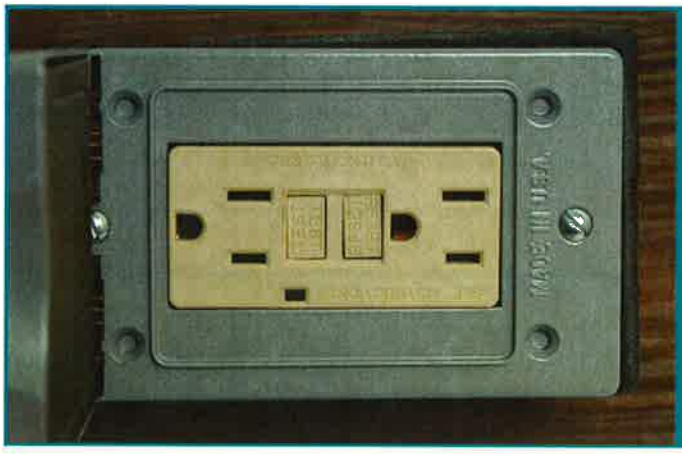
Docks should have overcurrent protection that will open the circuit for conductors and equipment to prevent excessive or dangerous temperature in conductors or insulation.

Circuit breakers or fuses should open all ungrounded conductors of the circuit and should be enclosed in a panel box that is readily accessible. Combustible material should not be located near circuit breakers or fuses. Enclosures or a panel box listed and approved for installation in damp or wet locations should be used for circuit breakers or fuses.

Circuit breakers or fuses for branch circuit copper wiring and equipment should have a rating or setting of not more than 20 AMPs for 12 AWG; 30 AMPs for 10 AWG; 40 AMPs for 8 AWG; and 50 AMPs for 6 AWG. Each circuit breaker should be labeled at the panel box to identify the specific circuit it controls.

Electrical receptacles

Receptacles that provide shore power (conversion of AC current to DC current to power boats while at mooring) for boats should be on individual branch circuits, rated no less than 20 AMPs and of the twist-lock type. All other receptacles should be 15 or 20 AMPs, 125 volts, and protected by ground fault circuit interrupters (GFCI). Receptacle covers and boxes should be the appropriate type suitable for either wet or damp locations. If installed in open, outdoor areas, covers and boxes should be approved for wet locations.



A properly installed GFCI receptacle should be tested monthly to ensure proper operation.

FLOTATION

Flotation is the foundation of a floating dock and must be properly installed and maintained to ensure that the dock performs as intended. Loss or degradation of flotation can result in toppling, submersion, and

Vegetation causes unencased flotation to deteriorate quickly.

increased stress on the structure.

There are many types of flotation, including but not limited to concrete encased, rotomolded and injected floats, wood, fiberglass encased and steel pontoons. The standards require that as of Feb. 18, 2004, all ***new*** docks using flotation use only encased flotation. In addition, if the flotation is being replaced in conjunction with the replacement of the structures of the residential dock in its entirety, encased flotation must be used.

The lifespan of flotation differs from type to type. Careful consideration should be given to the cost effectiveness of the type of replacement flotation used. Exposed foam may be the least expensive initial investment, but would have to be replaced or encased in its entirety by Feb. 18, 2014.

Metal barrels are not allowed for flotation and must be replaced by Feb. 18, 2007. Plastic barrels are allowed if barrels are properly cleaned and the contents were not toxic to the environment.

Facts about flotation:

- At least 25 percent of the flotation should be above the water surface.
- The lifespan of nonencased flotation is approximately eight to 10 years; however, encased flotation may exceed 20 years.
- Caution should be exercised when attaching flotation so that it does not become damaged in the process.
- Flotation should be kept free of vegetation. Vegetation growing in flotation increases the rate of deterioration and encourages the presence of snakes, beavers, nutria and other wildlife.
- Animals may burrow into nonencased flotation, allowing snakes and other animals to live inside.
- Nonencased flotation is very susceptible to damage from petroleum products and once exposed, may deteriorate quickly.
- LCRA recommends consulting with a professional engineer to determine the proper amount and type of flotation for a dock.
- Dispose of old flotation properly so that it can't be reused for another dock or deteriorate and wash ashore forming a "bathtub ring" effect commonly seen around lakes.

INSURANCE

LCRA recommends that a dock owner on the Highland Lakes maintain comprehensive general or public liability insurance providing a minimum coverage of $300,000 per person per occurrence bodily injury and $100,000 of property damage or $300,000 combined single limit.

In many cases, this can be inexpensively accomplished by obtaining a rider to the homeowner's insurance policy. Coverage limits and applicable terms are conditions of individual policies. Having a homeowner's insurance policy without a specific rider most likely will not include any structure located over the water.

The Federal Emergency Management Agency has specific rules regarding structures located in the floodplain. Contact your county floodplain administrator and your insurance agent to discuss these regulations.

POLLUTION

LCRA is committed to keeping the Highland Lakes safe and clean. You can help by becoming environmentally conscious and by minimizing the impact and effect of pollution on the lake.

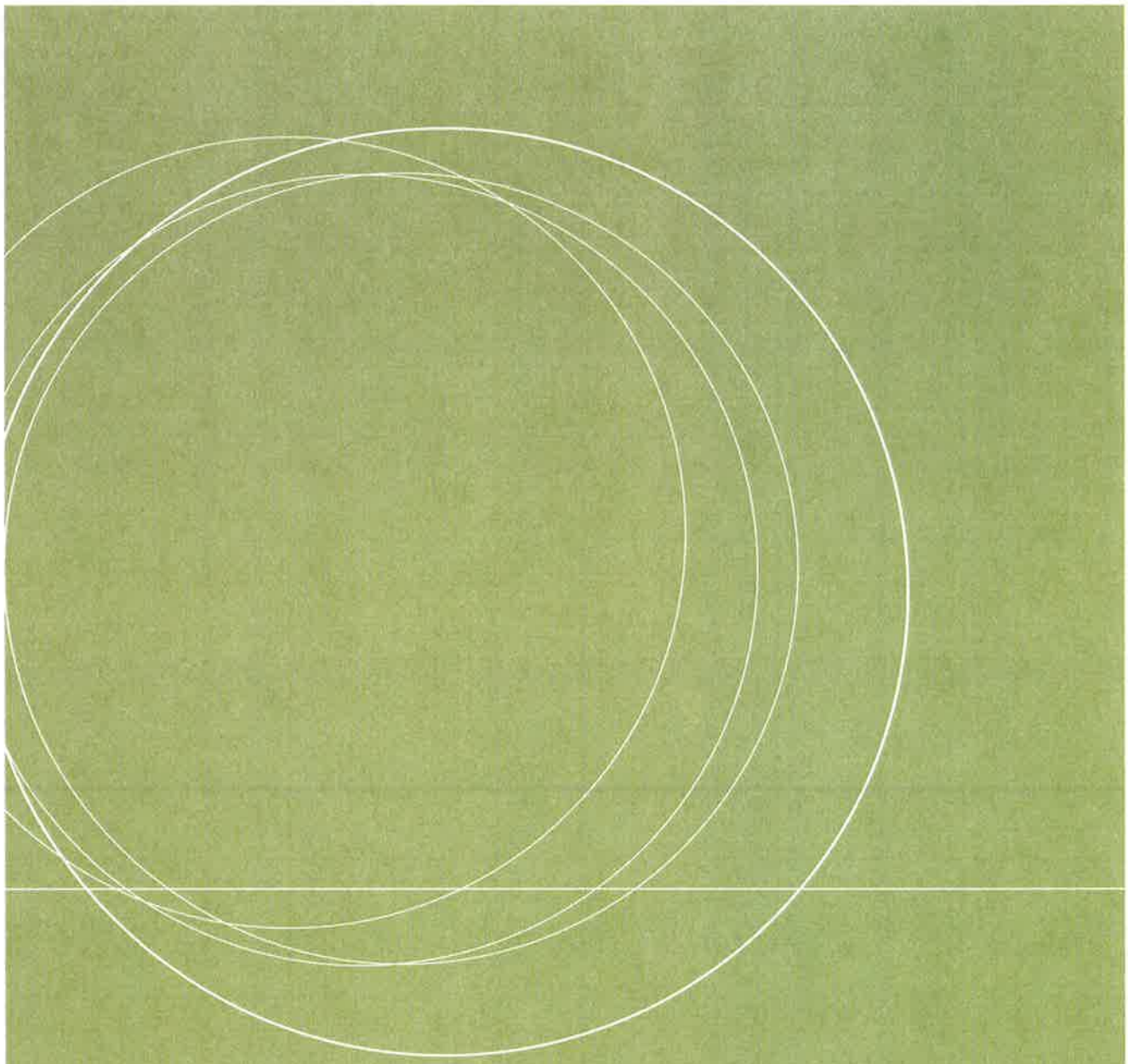
Here are some tips to help keep the lake clean and safe:

- Rest room facilities on a residential dock must comply with the LCRA On-Site Sewage Facility (OSSF) Ordinance or be connected to a sewer tap. For more information, contact LCRA On-Site Sewage Facilities Program at 1-800-776-5272.
- Store fuel in approved containers in vented storage areas. Do not leave fuel containers on an open deck where they could enter the lake by accident and discharge fuel into the water. Hazardous materials, such as batteries, fuel, oil, cleaners, and antifreeze, should not be stored on the dock.
- Boats should be removed from over the water for cleaning below the water line. A minimal amount of cleaning products should be applied and they should be phosphate free and biodegradable.
- Instead of spraying, hand paint or stain a dock so that the product does not enter the water. Use environmentally friendly products.
- Boats with sewage holding tanks must use approved sewage pump out facilities which are available at many marinas on the Highland Lakes.
- A boat which is submerged or partially submerged at a dock may contain gasoline, batteries, oil and other hazardous chemicals. If you notice a submerged boat, call the pollution hotline at 1-800-776-5272, Ext. 6843.
- Any pollution concerns may be reported to the pollution hotline.
- Antifreeze is detrimental to water quality and fish habitat. It should be applied appropriately and disposed of properly.
- Properly dispose of litter and trash. It is unsightly and can pollute the lake.
- Report fuel spills to Texas Commission on Environmental Quality emergency spill hotline at (512) 239-2507.

About LCRA

LCRA is a conservation and reclamation district created by the Texas Legislature in 1934. LCRA provides Energy, Water, and community services to the people of Texas. It cannot levy taxes, but funds its operations with income from the sale of electricity, water and other services.

LCRA generates electricity and sells it wholesale to 42 customers, including city-owned utilities and cooperative that serve more than 1 million people in Texas. LCRA also builds an operates transmission projects through a nonprofit corporation it created, manages and protects the lower Colorado River, provides water and wastewater utilities, owns and operates parks, and offers economic and community development assistance to communities.



LCRA
ENERGY • WATER • COMMUNITY SERVICES

Lower Colorado River Authority
P.O. Box 220
Austin, Texas 78767-0220
1-800-776-5272
(512) 476-3200
www.lcra.org

Printed on recycled paper with soy-based ink.

September 2004

Preparing docks for floods on the Highland Lakes

Floating, fixed and recessed docks need special attention to protect them from damage

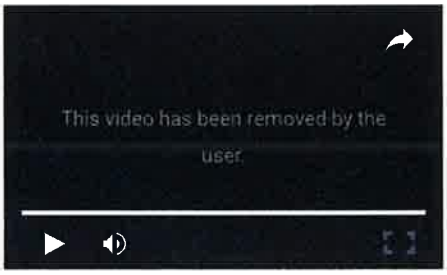
Floating dock

Fixed dock

Recessed dock

Central Texas, dubbed "Flash Flood Alley," is often home to sudden, unexpected rains and flash floods. Regular maintenance is essential to keep the more than 8,300 floating, fixed and recessed boat docks on the Highland Lakes safe during flooding. Flash floods occur with little warning, and a dock can easily break loose and become a hazard if it is not properly maintained to accommodate stresses created by wind, waves, current, boat wakes and fluctuating lake levels.

Dock owners are responsible for damage caused by their docks breaking loose, washing away or presenting a hazard to navigation.



Securing floating docks on lakes Travis, Buchanan and LBJ

Floating docks are at higher risk than fixed and recessed docks during floods. LCRA estimates there are about 2,800 floating docks on lakes Travis and Buchanan, with a few on Lake LBJ.

The easiest way to maintain a boat dock is to hire a qualified boat dock contractor, especially for part-time lake residents who may not be on site as lake levels rise and fall.

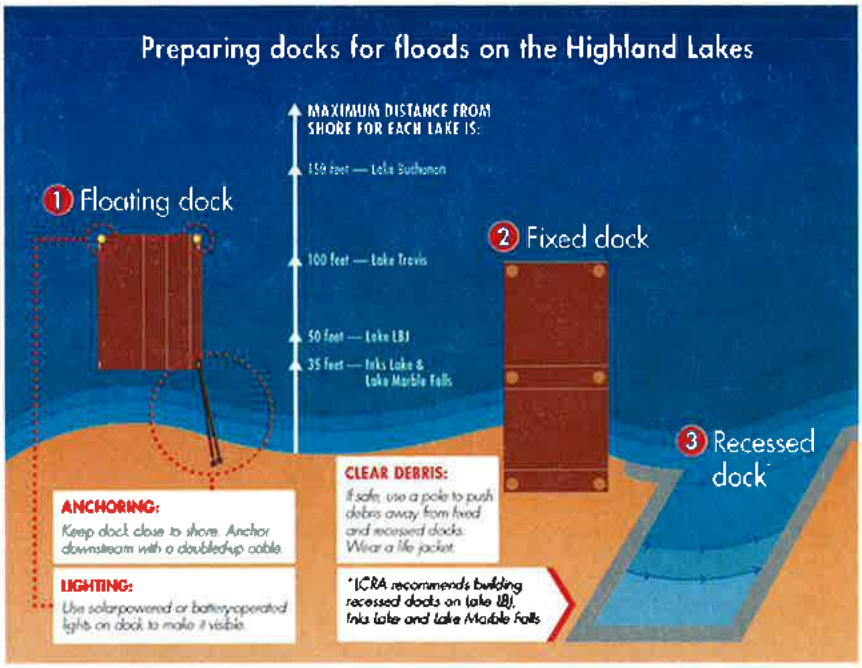
LCRA recommends all dock owners on the Highland Lakes take the following steps:

Position the anchors: Keep docks close to shore. Most floating docks have four anchor points — two on shore and two off shore. To prepare for a flood, dock owners should double-up cables and anchor downstream, closest to the shoreline. No anchors should be upstream. When water comes down the river, docks will then pivot close to shore and away from fast-moving water, debris, logs or loose docks. Docks anchored on all four sides are vulnerable to the brunt of the fast-moving water and can break loose and become a safety hazard.

Anchors and docks should be placed only over property that is owned, leased or controlled by the dock owner. Owners choosing to move their docks to follow receding water during a drought should ensure the docks are not placed on someone else's property. In addition, owners should understand that moving a dock to follow receding lake levels may result in the dock being more vulnerable to fast-moving flood waters and flood debris.

Stay within the maximum distance from shore: LCRA's Safety Standards for Residential Docks on the Highland Lakes sets out maximum distances docks may be from shores. The standards apply even when lake levels are low. The shoreline is wherever the water meets the land. Boat docks should never be moved so far that they extend into the middle of the river channel or pose a threat to other boaters. Under the safety standards, the maximum distance docks may be from the shoreline is:

- **Lake Buchanan** — 150 feet
- **Inks Lake** — 35 feet
- **Lake LBJ** — 50 feet
- **Lake Marble Falls** — 35 feet
- **Lake Travis** — 100 feet



Higher resolution available here.

Install proper lighting: Place solar-powered or battery-operated lights on the dock to make it visible at night. This is especially helpful if the dock has been moved further out in the lake to follow receding lake levels.

Conduct routine maintenance: Inspect the dock's structure to make sure there are no cracks or other issues that would weaken the dock. This help the dock stay together in the event of a flood.

Check cables: Make sure cables are in good shape and are not frayed or corroded. Damaged cables should be replaced.

Encase flotation: Make sure dock's flotation foam is encased as required by the Safety Standards for Residential Docks on the Highland Lakes. Encased flotation will help keep sections of the foam from breaking off and will keep the dock from sinking or turning upside down.

Limit loose items: Keep dock free of items such as unsecured lawn chairs, toys and other material that could be swept away by a flood.

There is no guarantee docks won't be damaged by a flood, but these recommendations will help minimize the risk. LCRA will issue a notice of violation if docks do not meet the Residential Boat Dock Safety Standards and Guidelines by being too far from the shore, unanchored or adrift.

Maintaining fixed and recessed docks on lakes Inks, LBJ and Marble Falls
About 5,500 fixed and recessed docks are on the pass-through lakes (Inks, LBJ and Marble Falls). Floods, however, can cause the elevation of these lakes to rise rapidly.

Fast-moving water often carries debris such as trees, brush and other docks that have broken loose. Flood debris can accumulate on the upstream side of a fixed dock, causing an increased stress load. If there is a safe opportunity between rain events, dock owners should use a pole to push debris away from the pilings. Dock owners should only do this when conditions are safe and when wearing a life jacket.

Docks on the Llano, Colorado, and Pedernales rivers should be engineered to withstand additional stresses created by flood debris. Where practical, owners should consider installing recessed docks, which offer one of the most effective ways to negate the effects of fast-moving water and provide extra protection from damage during flood events. It is important to keep these slips free of debris as well.

After the flood
After a flood, clean-up can take a few weeks to a few months, depending on the impact of the flood. LCRA urges dock owners to keep safety a priority when working on their docks. Owners should make sure electricity is shut off and wear a life jacket. Drowning is always a potential danger when working near water. LCRA also suggests dock owners consider using professional dock service companies to recover, relocate and repair docks.

Floodgate operations
Floodgate operations along the Highland Lakes can cause water to move quickly downstream, causing swift currents and higher lake levels. Natural bodies of water may contain sandbars and rock outcroppings and other hazards, many of which are near the shore. A dock owner should know what is under their dock.

See the estimated time it takes for water to flow to Mansfield Dam from upper basin locations, and how long it takes to reach downstream locations from Mansfield.

Register your dock

Residential dock owners may voluntarily register their docks with LCRA by contacting Mike Newhouse, Water Surface Management, at 800-776-5272. If a dock breaks loose and is found at another location on the lake, registration may help identify its rightful owner and facilitate its return. All registration information is public information and is subject to the Public Information Act.

Dock owners also can mark their docks with their name, address and contact information, or paint a symbol on their docks. This will help identify docks and locate owners if docks break loose.

Residential docks on Lake Austin are regulated by the City of Austin. Contact the Austin Parks and Recreation Department at 512-974-6737 for information and regulations.

LAKE TRAVIS VIEW

Floating structures: Residents ask LCRA for prohibition, not regulation

Wednesday, April 20, 2011 | Devin Monk | 2

Lake Travis residents and developers and Lower Colorado River Authority representatives are wrestling with the definition of a floating habitable structure and whether or not to regulate their influx into the Highland Lakes.

LCRA officials hosted a public hearing April 13 on floating habitable structures on the Highland Lakes to collect comments from the public on houseboats, floating condos and structures in-between.

The majority of the 130-person audience at the West Travis County Service Center near Mansfield Dam voiced its opposition to LCRA lifting the moratorium on floating habitable structures it imposed on lakes Travis, Buchanan, Inks and Marble Falls last October that will expire Oct. 31 this year. The moratorium does not apply to fixed docks.

LCRA is working off a proposed definition of a floating habitable structure as: "a structure used or designed as a dwelling, abode, domicile or sleeping unit that is supported by floatation; usually containing cooking, eating, living, sleeping and/or sanitary facilities. This structure may be capable of navigation, but is not designed primarily for navigation."

The authority would deem any structure at 691 feet or below in Lake Travis to be floating.

Many audience members at the hearing spoke directly against a proposed development of more than 100 floating condos with boat slips at a marina in Cypress Creek Cove of Lake Travis.

Comanche Trail Community Association members said they support the moratorium and fear potential fire hazards and raw sewage spills from the development.

"We urge that the LCRA prohibit, not merely regulate, these floating structures," association President Lin Swanner said.

As developers reportedly are planning to build 120 floating condos with boat slips at a marina in Cypress Creek Cove of Lake Travis that would add structures to both the north and south sides of the lake.

Development representative Brian George said he wished to offer an amenity that would invite more people to make use of the natural resource.

"It's a beautiful part of the lake. I just want people to be able to enjoy it," George said.

Some participants at the hearing voiced their concerns about structural integrity of these large-scale developments.

"Engineers built the nuclear plant in Japan. Engineers built the platform out in the Gulf that is still leaking. There's one engineer, and no matter what our plans are there's something else that we can't control," one audience member said. "I'm not going to say 'if a spill happens' because it's not an if, it's a when."

Brock Evans was the youngest resident to address the audience and LCRA members at the April 13 meeting.

Protect Lake Travis Association representatives also backed the moratorium.

"Our board is in opposition to allowing these floating habitable structures on Lake Travis primarily because of the potential impact of spills or leakage of raw sewage and other pollutants. This could occur anytime, but the potential would be particularly high during a flood or storm event," wrote PLTA President Lonnie Moore in an email to Richardson.

LCRA issued the moratorium as development on the Highland Lakes has accelerated and diversified beyond the typical houseboat or marina.

Texas Parks and Wildlife Department statistics show Lake Travis' estimated 7,000 public boat slips rank it second among Texas lakes behind the Clear Lake-Galveston area. Lake Travis also has more than 7,000 private boat docks.

Public marina docks increased by 1,900 from 1990 to 2010. Private docks increased by 1,800, or 32 percent, from 1996 to 2008.

"With that growth come the challenges of balancing competing uses of the water surface," said Jim Richardson, LCRA water surface manager.

Graveyard Point resident Diane Crumley Dee, who has battled a proposed marina development there, feared the direction lake development is taking.

"This lake cannot keep going the way it is," Dee said.

Unlike other state lakes with publicly and privately owned shorelines, most Lake Travis land is privately owned.

Richardson emphasized that staff members have not finalized their recommendation to board members on floating habitable structures, but he said the authority's options are to regulate them, do nothing or prohibit them or a combination of those choices.

LCRA is taking public comments through Wednesday via an online survey at www.surveymonkey.com/s/floatinghabitablestructures2011 or by mail to: LCRA, Attn: Ferrell Fields, Mail Stop H322, P.O. Box 220, Austin, TX 78767.

Richardson said LCRA staff members would prepare its final recommendation to go before the authority's board in May or June.

Comments

1. *Cindy Schlapper* says:
April 26, 2011 at 6:13 pm

   Texas Parks and Wildlife Code, numero uno, says that: All the beds and bottoms of the public rivers, bayous, lagoons, creeks, lakes, bays and inlets in this state are the property of this state…. Any public freshwater lake, river, creek, or bayou in this state contained in any survey of private land may not be sold but shall remain open to the public.
   In the article, LCRA appears to have extended its "authority" to making "laws" that exempt Lake Travis from state law. Who gave them that authority? LCRA, the keeper of this lake for the people of this state, should take a strong stand and prohibit ANY STRUCTURES ANYWHERE in this lake.

   Lake Travis is for the use and enjoyment of ALL the people of Texas, not a select few. The People of Texas must stand up and fight for their rights: to fish, to ski, to swim, to boat, to sail and to have fun. Instead of enjoying our rights and having fun, we find ourselves continually fighting LCRA "permits" in order to preserve our lawful, legal rights to use ALL the open waters of Lake Travis.

2. *BOB JOHNSON* says:
May 24, 2011 at 1:26 pm

   We who live on the shores of Lake Travis strongly oppose the building of housing in the Lake. This is third world use of our drinking water supply just to enrich developers who do not live here. We are joining together to remove any politician who allows this insult to our water source and bring suit against any bureaucrat who benefits himself at the hands of the developers. We are following the connections and money. Thank You Lord for the internet.

Leave a Reply

Name (required)

Mail (will not be published) (required)

Website

Submit Comment

- ## More in News

  - This page is the archive of the Lake Travis View prior to May 2012
  - State Sen.'s 5-month-old grandson dies in Lakeway
  - Red Cross training institute braces volunteers for disaster
  - Road failure shuts down Lakeway Blvd. section
  - Some in Bee Cave ETJ harbor reservations over home rule

- ## Photos: Browse & Buy

  More Photos »

APPENDIX 3 – SJRA

SAN JACINTO RIVER AUTHORITY
LAKE CONROE RULES FOR THE FOLLOWING

Structure on Lake Conroe (dock/pier/cut in) the following must be followed:

1. 40' out from bulkhead
2. If on a canal must keep 30' center channel for navigational purpose
3. May have upper deck but, no enclosures (no walls, may have small storage closet)
4. Must use licensed contractor
5. Must have POA/HOA approval if required by POA/HOA
6. Wooden structures

Bulkhead repair/new: See attached. No charge for this
Dredging: See attached. No charge for this.

Lawn Irrigation: Residential customers who wish to pull water from the lake to water their personal lawn.

This is an annual fee of $150.00 and the contract runs thru May 1st. to April 31st.
The resident must purchase and maintain their own system.
If for some reason they wish to no longer continue with this service then they must remove either the entire system or cut the pipe that protrudes in the water. (Depending on when they discontinue service if there is a refund of partial or all of funds.

Encroachments: This is for a resident who want to do any of the following:

1. Pool
2. Fence
3. Portable building(no permanent structure)
4. Some cases bulkhead work if they need to push out the bulkhead for structural reasons
5. Deck

No fees for encroachments
Must complete application
Have a survey
The resident may also purchase the property that SJRA owns

Events are also done with an approval process. These events may include swim races, boat parades, etc. They must complete application and have a General Liability policy with SJRA listed as additionally insured for 1 million dollars.

Licensed contractors: must complete application, 1 million dollar general liability policy w/SJRA listed as additionally insured. The annual fee is 375.00 and If they have a barge its $250 per barge additionally a year.

Fishing Guides: must complete application, $300,000 general liability w/SJRA listed as additionally insured. The annual fee is $375 and If they have more than one fishing guide boat then it is an additionally $100 per boat after the first boat.

Purposefully removed to shorten

See TM No. 1 - Engineering Recommendations for Lakefront Structures:

Retaining Walls, Dredging, and Fill Works

for the SJRA Rules and Regulations

License My Residential Structure

Pursuant to Section IV, Letter A of the San Jacinto River Authority (SJRA) Rules and Regulations:

No person shall construct, operate or maintain any pier, wharf, floating boathouse, dock, barge, building or other facility of any kind or character on or over the Reservoir or any lands owned or controlled by the Authority unless the Authority has granted a permit authorizing such construction, operation and maintenance. An application for such permit shall be submitted to the Authority on forms provided by the Authority. A legible copy of the construction permit (license) shall be posted at the job site and be visible from the water until construction is complete and has been inspected and tagged by SJRA staff. It is the responsibility of the licensee to see that the construction permit is protected from the elements and remains posted and legible. Identification furnished by the Authority must be posted and maintained on all permitted facilities.

Instructions

Instruction to submit an application for the construction, placement, operation and maintenance of piers, wharfs, floating boathouses, docks, barges, buildings, or other facilities on the reservoir as described in section IV of SJRA's Rules and Regulation for Lake Conroe.

Please submit the following documents to the SJRA permitting office prior to beginning construction on your structure:

1. Applicant must complete the application as thoroughly as possible (Residential Application MUST be filled out as the owner of the property)
2. A set of plans (drawn to scale) and specifications of the structures location and measurements (please see the Drawing Examples page)
3. HOA/POA/ACC approval if required by the homeowner's subdivision and SJRA

If application and plans are in order, and all other requirements have been met, an approval letter and

If application and plans are in order, and all other requirements have been met, an approval letter and invoice will be forwarded to the homeowner. Upon receipt of the prescribed fee, a construction permit will be issued to the homeowner to begin construction of their structure. The construction permit must be displayed at all times during construction.

* No new construction or alterations to facilities may be made without authorization from SJRA

For a printable version of the How Do I License My Residential Structure instructions above, click here.

Lake Conroe Division Links

- SJRA's Licensing Program
  - How Do I
    - License My Commercial Operation
    - License My On Site Septic Facility
    - License My Lawn Irrigation System
    - License My Residential Structure
    - Pay My Annual Fees
    - Permit My Bulkhead Construction
    - Permit My Dredging Project
- Current Lake and River Conditions
- History of Lake Conroe
- Lake Conroe Quick Facts
- Important Documents
- Public Boat Ramps on Lake Conroe
- SwIM – Stormwater Inlet Marking Program
- Zebra Mussels
- Drought Information
- WPP Stakeholder Group
- Watersheds of the Upper San Jacinto River Basin
- Meet the Team
- Contact the SJRA Lake Conroe Division
- Lake Conroe Division Home

Lake Conroe Division Links

- Texas Aquatic Plant Management Society, Inc.
- Water Data For Texas

-
-
-
-
-

1577 Dam Site Road
Conroe, Texas 77304
936.588.3111

Receive email updates

Go

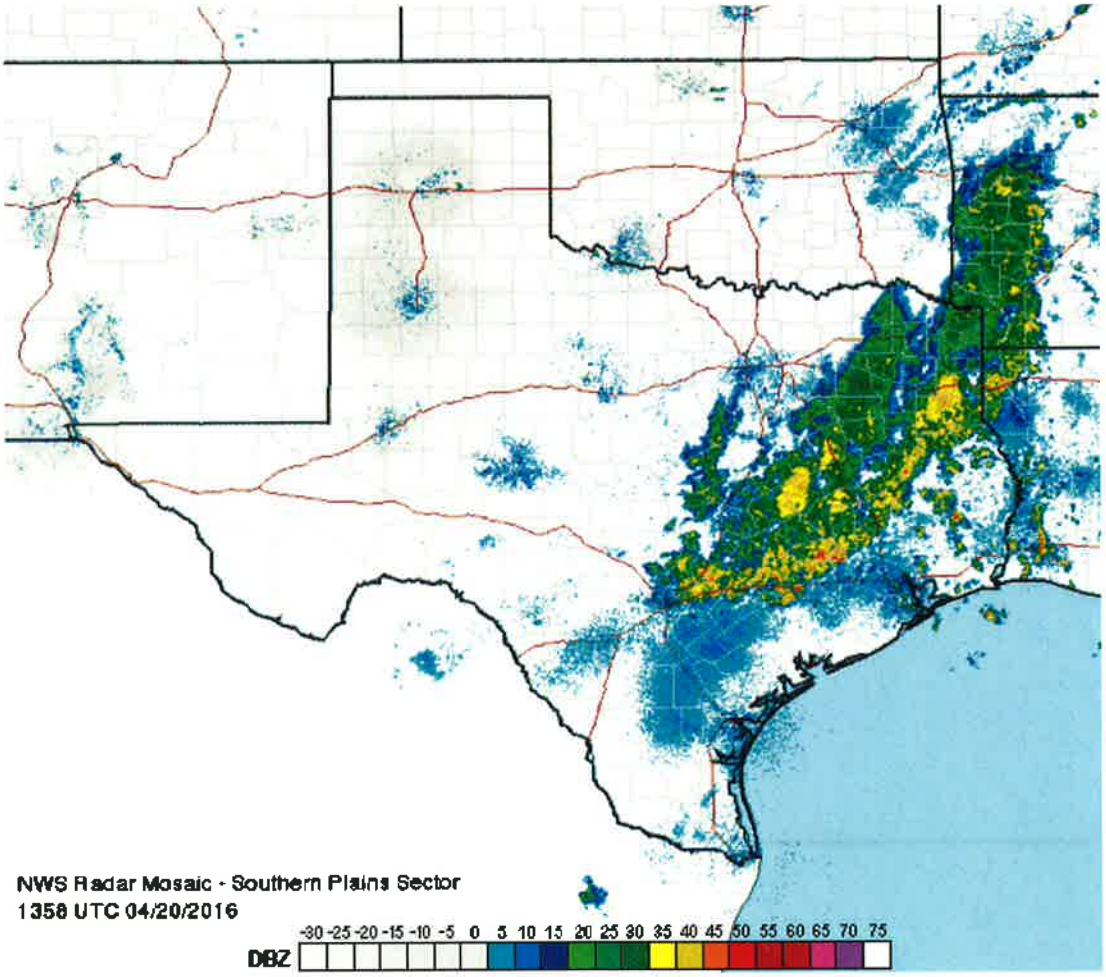
SJRA Divisions

- G & A Division
- GRR Division

- GRP Division
- Lake Conroe Division
- Woodlands Division
- Highlands Division

Latest Photos via Flickr

- 
- 
- 
- 
- 
- 



Back to Top

San Jacinto River Authority

Lake Conroe Office
P.O. Box 329 · Conroe, Texas 77305
(T) 936.588.1111 · (F) 936.588.1114

License No. _____

LICENSE AGREEMENT – RESIDENTIAL

Name of Applicant: _____

Mailing Address: _____

City: _____ State: _____ Zip: _____

Phone: _____ Email Address: _____

Boat Slip Dimensions: _____ Constructed By: _____

Please check all that apply: ☐ Residential Structure ☐ Lawn Irrigation ☐ Other

Explain If Other: _____

Land/Subdivision: _____ Lot: _____ Block: _____ Section: _____

Site Address: _____

City: _____ State: _____ Zip: _____

Type of Construction: ☐ Wood ☐ Concrete ☐ Metal ☐ Other

Explain If Other: _____

Does Applicant own land or lease land abutting Authority owned Reservoir? ☐ Own ☐ Lease

If leased, give name and address of owner: _____

I CERTIFY THAT THE INFORMATION PROVIDED IS TRUE AND CORRECT. I FURTHER CONFIRM THAT I HAVE CAREFULLY READ THE TERMS AND CONDITIONS ON THE REVERSE SIDE OF THIS LICENSE AGREEMENT AND THAT I HAVE AUTHORITY TO BIND THE PROPOSED LICENSEE. I UNDERSTAND THAT, IF A LICENSE ISSUED, THOSE TERMS AND CONDITIONS ARE CONTRACTUAL IN NATURE AND SHALL BE BINDING UPON THE LICENSEE, I FULLY UNDERSTAND THE TERMS AND I AGREE TO THOSE TERMS AND CONDITIONS IN THEIR ENTIRETY IN MAKING THIS APPLICATION.

_____
Signature of Applicant (Licensee) Date

TERMS AND CONDITIONS

When accepted by the San Jacinto River Authority ("SJRA") in writing, this document shall constitute an agreement that is a contract with legal and binding consequences. The Company or individual applicant, who shall be referred to as the Licensee, hereby represents, covenants, and agrees, on behalf of Licensee and Licensee's heirs, assigns, and any other person claiming by, under, or through Licensee, as follows:

Licensee represents and warrants that the proposed/existing structure or permitted or licensed activity described in this License Agreement is not in violation of or contrary to any deed restriction or covenant running with the land, if any, in which the herein described lot, tract or parcel of land is situated, and agrees that, should such construction or use be in violation of any deed restrictions or covenants running with the land, this license shall automatically become void and of no effect without the necessity of any action on the part of the San Jacinto River Authority.

Licensee agrees to conduct the licensed and/or permitted activities in the manner and in accordance with the rules and regulations of the San Jacinto River Authority pertaining to such activities which are available for inspection at the SJRA headquarters or upon request. Any breach of any rules and regulations shall automatically void this License and Licensee shall be subject to penalties as provided under SJRA Rules and Regulations. If Licensee allows this License Agreement to lapse, and later seeks to renew or reinstate this License Agreement, Licensee will be solely responsible for paying a reinstatement fee established by SJRA.

Applicant/Licensee agrees Licensee is required to timely pay SJRA annual license fees to maintain the Licensee's structures and facilities on SJRA property. The residential license fees are calculated according to an annual license rate which is set by SJRA. Licensee must pay all fees, regardless of the level or condition of Lake Conroe or any adjoining land or facilities.

Applicant/Licensee agrees that, if Licensee fails to timely pay all annual license fees owed under this License Agreement, Licensee will be in breach of this Agreement, this License will be considered revoked, and Licensee's unlicensed structure and/or facility will constitute a purpresture and trespass subject to penalties, as well as immediate removal by SJRA, at the trespassing person's or entity's expense. If Licensee fails to pay all required annual license fees when due, Licensee authorizes SJRA, without the necessity of any further notice, to remove any and all previously licensed structures and/or facilities at Licensee's own expense.

Licensee agrees to observe and abide by all applicable federal, state, and local laws, ordinances and regulations pertaining to the licensed activity herein permitted and nothing contained herein shall be construed as alleviating the Licensee of any responsibility to obtain any permit, license, or any other approval required by any agency in connection with the activities herein permitted.

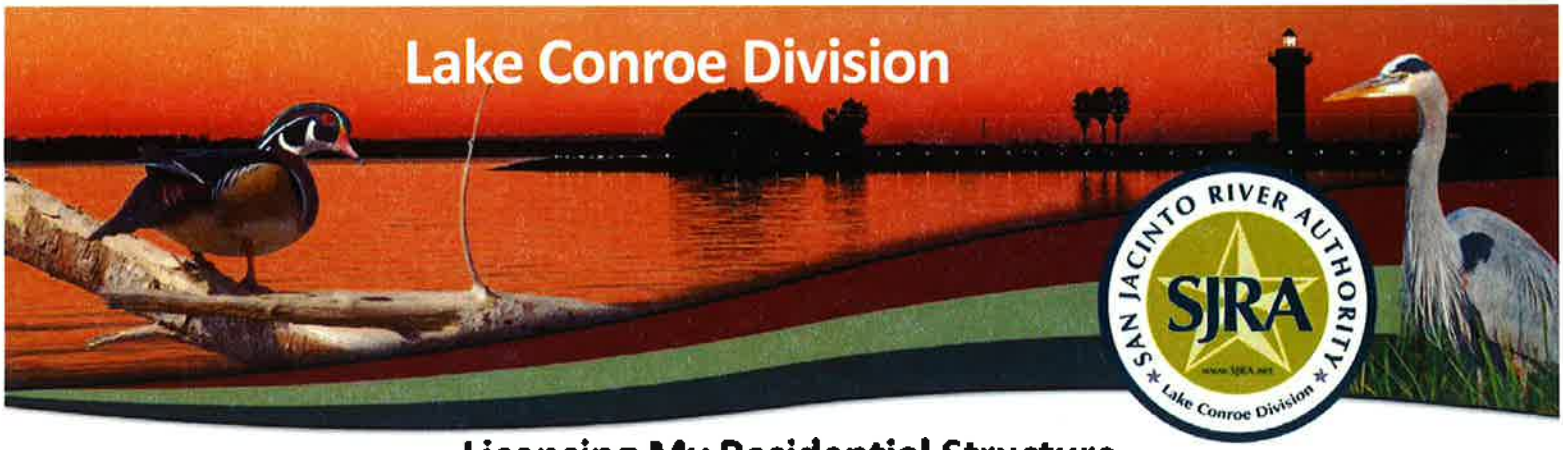
LICENSEE HEREBY AGREES TO INDEMNIFY, DEFEND, AND HOLD HARMLESS SJRA AND ITS EMPLOYEES AND AGENTS FROM ALL CLAIMS, LOSSES, LIABILITIES, DAMAGES, COSTS, OR EXPENSES, INCLUDING CLAIMS FOR ATTORNEYS' FEES, INCURRED BY SJRA, ITS EMPLOYEES, OR AGENTS AS A RESULT OF ANY CLAIMS OR SUITS THAT ANYONE, INCLUDING LICENSEE, OR ANYONE CLAIMING BY, UNDER, OR THROUGH LICENSEE, MAY BRING AGAINST SJRA, ITS EMPLOYEES, OR AGENTS TO RECOVER ANY ALLEGED LOSSES, LIABILITIES, COSTS, OR EXPENSES, WHICH ARISE DURING OR RESULT FROM LICENSEE'S OPERATIONS, OR FROM ANY LICENSED STRUCTURE OR FACILITY, REGARDLESS OF WHETHER CAUSED IN WHOLE OR IN PART BY ANY ACT, ACTION, OR FAILURE TO ACT, INCLUDING BUT NOT LIMITED TO ALLEGED NEGLIGENCE, GROSS NEGLIGENCE, OR OTHER FAULT OF SJRA AND/OR EMPLOYEES AND AGENTS.

Licensee accepts and voluntarily incurs all risk of, and intentionally waives all claims against SJRA and/or its employees and agents for, death and/or any injuries, claims, losses, liabilities, damages, costs, or expenses, whether known or unknown, which arise during or result from Licensee's operations or from any licensed structure or facility, regardless of whether caused in whole or in part by any act, action, or failure to act, **INCLUDING BUT NOT LIMITED TO ALLEGED NEGLIGENCE, GROSS NEGLIGENCE, OR OTHER FAULT OF SJRA AND/OR EMPLOYEES AND AGENTS.**

Licensee has been informed and understands that SJRA has secured flowage or flood easements, and in some cases waiver and release of damages agreements, around the perimeter of the Lake Conroe reservoir at or above 201 feet above mean sea level. Licensee agrees and shall at all times comply with and be subject to the provisions, requirements, limitations, restrictions, and relinquishments of rights as contained in such flowage or flood easements and waiver and release of damage agreements.

Licensee agrees, for Licensee, its agents, employees and/or affiliates that these representations are contractually binding, and are not mere recitals, and that Licensee shall reimburse SJRA for all costs and expenses, including but not limited to attorney's fees and other costs and expenses, incurred by SJRA in enforcing any provision(s) of this Agreement.

Every term and provision of this contract is intended to be severable. If any one or more of them is found to be unenforceable or invalid, that shall not affect the other terms and provisions which shall remain binding and enforceable.



Licensing My Residential Structure

Pursuant to Section IV, Letter A of the San Jacinto River Authority (SJRA) Rules and Regulations:

No person shall construct, operate or maintain any pier, wharf, floating boathouse, dock, barge, building or other facility of any kind or character on or over the Reservoir or any lands owned or controlled by the Authority unless the Authority has granted a permit authorizing such construction, operation and maintenance. An application for such permit shall be submitted to the Authority on forms provided by the Authority. A legible copy of the construction permit (license) shall be posted at the job site and be visible from the water until construction is complete and has been inspected and tagged by SJRA staff. It is the responsibility of the licensee to see that the construction permit is protected from the elements and remains posted and legible. Identification furnished by the Authority must be posted and maintained on all permitted facilities.

Instructions

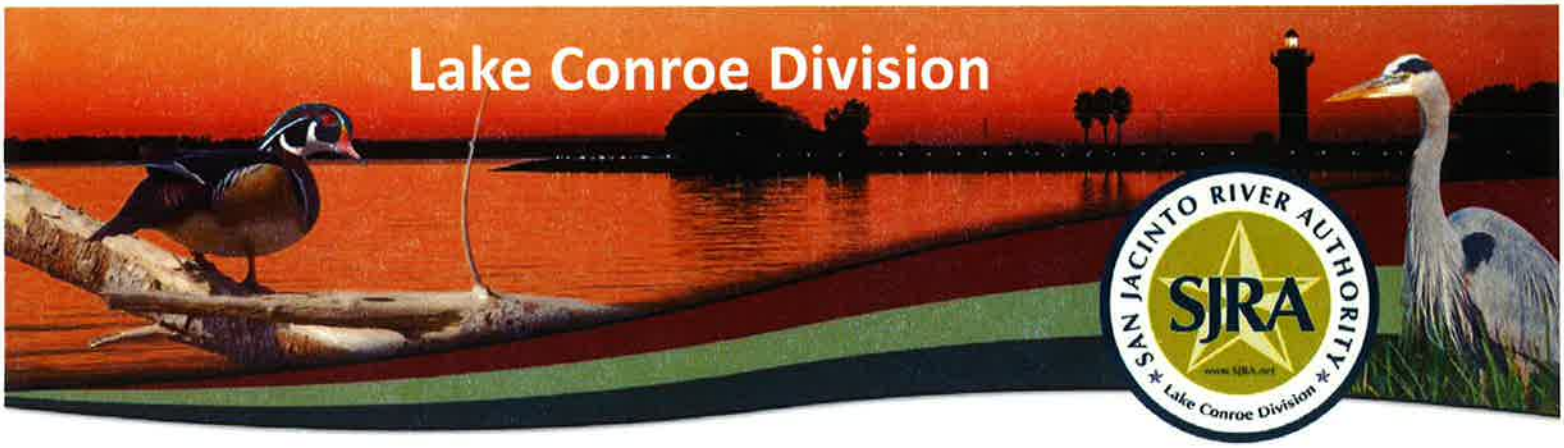
Instruction to submit an application for the construction, placement, operation and maintenance of piers, wharfs, floating boathouses, docks, barges, buildings, or other facilities on the reservoir as described in section IV of SJRA's Rules and Regulation for Lake Conroe.

Please submit the following documents to the SJRA permitting office prior to beginning construction on your structure:

1. Applicant must complete the application as thoroughly as possible (Residential Application MUST be filled out as the owner of the property)
2. A set of plans (drawn to scale) and specifications of the structures location and measurements (please see the Drawing Examples page)
3. HOA/POA/ACC approval if required by the homeowner's subdivision and SJRA

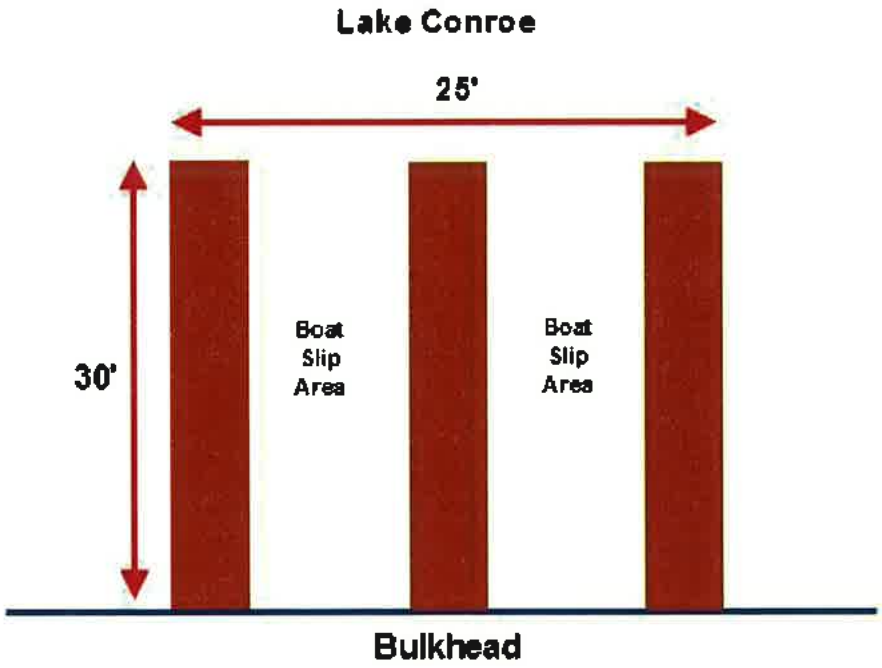
If application and plans are in order, and all other requirements have been met, an approval letter and invoice will be forwarded to the homeowner. Upon receipt of the prescribed fee, a construction permit will be issued to the homeowner to begin construction of their structure. The construction permit must be dis- played at all times during construction.

** No new construction or alterations to facilities may be made without authorization from SJRA.*

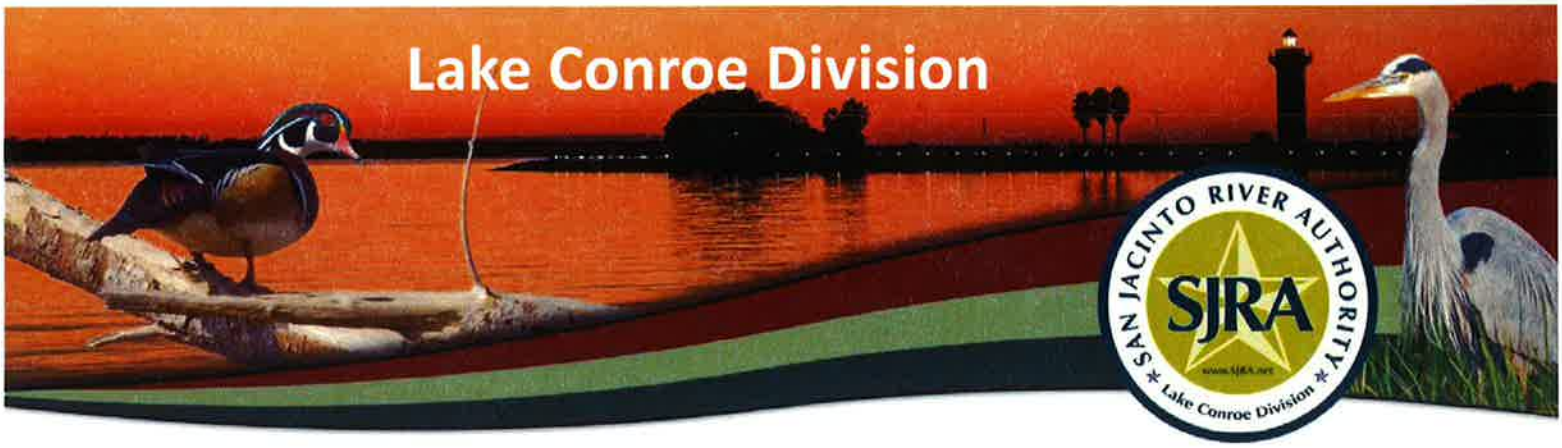


Measuring My Structure

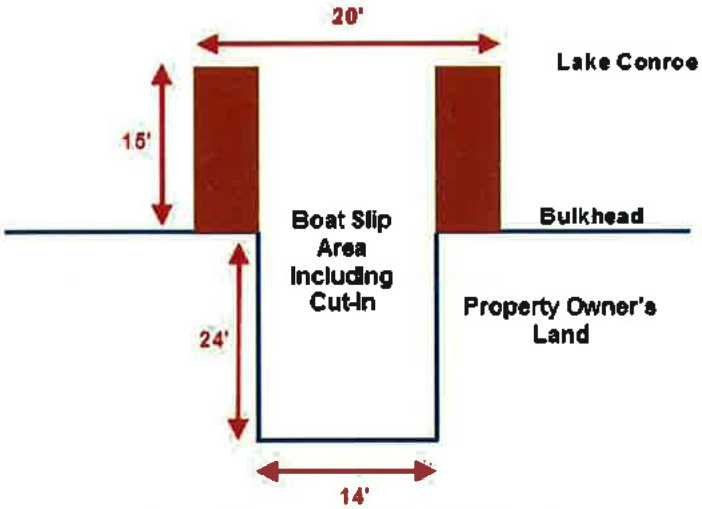
The first type of structure extends out over the water, past the bulkhead; this includes the vessel area's themselves, even though there is no decking covering the area. This measurement is taken at full pool level, regardless of the level of the lake. In the example below, the yearly fee for this license holder would be $141.00 annually. It is the total square footage of the dock footprint multiplied by our current annual rate per year of $0.188.



Total Area = 25' X 30' = 750 sqft



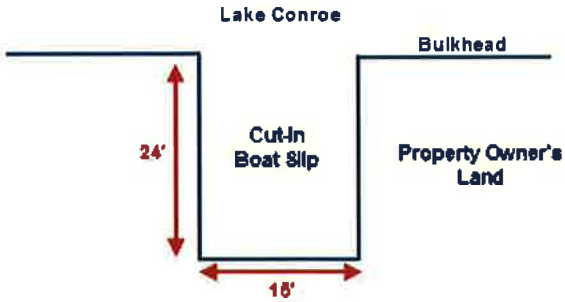
The second type of structure may be partially "cut-in" and partially extend out. This measurement is also taken at full pool level, regardless of the lake level. In the example below, the yearly fee for this license holder would be $116.40 annually. It is the extension square footage multiplied by our current annual rate per year of $0.188.



Area of Extension = (15'X20') 300 sqft
Cut-In Boat Slip = Minimum Fee
Total Area = Minimum Fee + 300 sqft

(Minimum Fee = Area of Cut-In ≥ 319 sqft w/extension)
*Area of Cut-In < 319 sqft w/extension to be calculated at $0.188/sqft

The final type of structure is completely "cut-in" to the homeowner's property. We define "cut-in" as being surrounded by 3 sides of land. SJRA does not use a measurement for a "cut-in" structure. A minimum fee of $60.00 is applied to this structure as shown in the example below.



Cut-In Boat Slip = Minimum Fee

APPENDIX 4 – TCFWSD

Purposefully removed to shorten

See TM No. 1 - Engineering Recommendations for Lakefront Structures:

Retaining Walls, Dredging, and Fill Works

for the TCFWSD Rules and Regulations

APPENDIX 5 – TRWD

Purposefully removed to shorten

See TM No. 1 - Engineering Recommendations for Lakefront Structures:

Retaining Walls, Dredging, and Fill Works

for the TRWD Rules and Regulations

APPENDIX 6 – USACE

Purposefully removed to shorten

See TM No. 1 - Engineering Recommendations for Lakefront Structures:

Retaining Walls, Dredging, and Fill Works

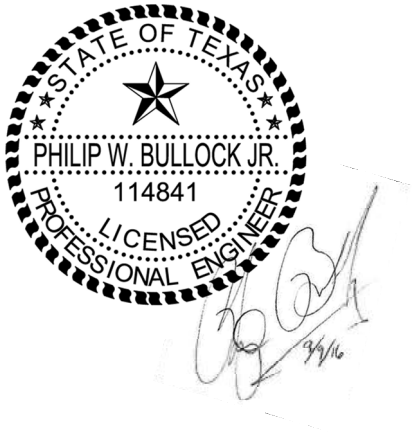
for the USACE Rules and Regulations

APPENDIX 7 – FCWD

Purposefully removed to shorten

See TM No. 1 - Engineering Recommendations for Lakefront Structures

for the FCWD Rules and Regulations



LLOYD GOSSELINK ROCHELLE & TOWNSEND, P.C.

ASSESSMENT OF REGULATORY FLOOD DAMAGE MINIMIZATION ALTERNATIVES

TECHNICAL MEMORANDUM NO. 3
LAKE CLOSURES

FINAL
September 2016

10375 RICHMOND AVENUE, SUITE 1625 • HOUSTON, TEXAS 77042 • P. 281.872.4512 • F. 281.872.4505

Lloyd Gosselink Rochelle & Townsend, P.C.

Assessment of Regulatory Flood Damage Minimization Alternatives

TECHNICAL MEMORANDUM
NO. 3
LAKE CLOSURES

TABLE OF CONTENTS

Page No.

1.0 BACKGROUND INFORMATION

The Franklin County Water District (FCWD) is a water conservation and reclamation district that owns and operates Lake Cypress Springs in Northeast Texas. FCWD maintains water rights for the purposes of municipal and industrial water supply and public recreation. The stored water supply in Lake Cypress Springs is used to provide firm supplies to the customers of the District.

Carollo Engineers, Inc. (Carollo) was tasked by Lloyd Gosselink (LG) on behalf of FCWD to perform an assessment of (A) at what water surface elevation the FCWD should close the lake to recreational traffic, and (B) investigate the guidelines surrounding the FCWD's capacity to make a closure call. The information herein summarizes the performed assessments and provides the engineering recommendations for when and how the district should close Lake Cypress Springs to recreational traffic.

1.1 Dam and Spillway Functionality

Lake Cypress Springs is a man-made lake located in Franklin County with a watershed of approximately 75 square miles. The dam is located on Big Cypress Creek, a tributary of the Cypress Bayou. Authorization for the construction of the Franklin County Dam and the impoundment of up to 72,800 acre-feet of water was granted on November 10, 1966. Construction began in July 1968 and was completed in February 1971. The dam is an earth-fill embankment that is 5,230 feet long with a top crest elevation at 395 feet above mean sea level (msl). The dam operates with a morning-glory spillway located at the right end of the main embankment at an elevation of 378 feet above msl. The morning-glory spillway has a rectangular drop inlet that is 23 feet by 23 feet. Water flows from the inlet into a 10 feet by 10 feet box culvert that discharges into Lake Bob Sandlin downstream. There is also an emergency spillway located left (north) of the dam. The emergency spillway is a graded and excavated area at an elevation of 385 feet above msl with a crest length of 1,000 feet. The only controlled releases of water occur with a low-flow 18-inch service spillway to meet requirements for a downstream water-right owner, Mount Pleasant.

1.2 December 2015 Flood Event

On December 27, 2015, the Lake Cypress Springs watershed experienced a historic rain event that resulted in record lake elevation levels and caused significant damage to waterfront properties and recreational areas along the shoreline. The elevation of Lake Cypress springs rose to 383.92 feet above msl. The district also closed all access to Lake Cypress Springs (i.e. closing of recreational areas and prohibiting the operation of watercraft on the lake).

2.0 DATA COLLECTION

In preparing a recommendation for lake closures, it was important to research and understand the different entities and the reservoirs they manage. These entities have different uses and purposes for their reservoirs. Furthermore, each reservoir is different in its design and storage capacity. It was important to compare each of these reservoirs to Lake Cypress Springs to formulate a fitting alternative to minimize flood damage in future events.

2.1 Entity and Reservoir Description

The following water districts and river authorities were important to discuss regarding the use of their reservoirs and dealing with flooding events. The information for the size and primary use of these lakes was found on the TWDB website and/or the websites of each of these entities. A description of the dam and its operations was also provided.

2.1.1 Brazos River Authority (BRA)

The Brazos River Authority currently manages three reservoirs along the Brazos River basin. These three reservoirs are Possum Kingdom Lake, Lake Granbury, and Lake Limestone. According to the BRA, these lakes are primarily used for water supply. They are not designed to hold floodwater and are not capable of holding a significant amount of water above their conservation pool levels.

2.1.1.1 Possum Kingdom Lake

Possum Kingdom Lake is on the Brazos River located in Palo Pinto County Texas. It is the first water supply reservoir constructed in the Brazos River basin. The reservoir is designed to store 540,340 acre-feet of water. The conservation pool elevation is 999 feet above msl. The Morris Sheppard Dam, which creates Possum Kingdom Lake consists of crest type gates. Each gate discharges approximately 9,600 cfs of water when open. The top elevation of the dam is 1024 feet above msl.

2.1.1.2 Lake Granbury

Lake Granbury is the next reservoir downstream on the Brazos River. It is located near Granbury, Texas. According to the 2003 TWDB volumetric survey, the reservoir has a capacity of 129,011 acre-feet. The conservation pool elevation is 692.7 feet above msl. The De Cordova Bend Dam, which creates Lake Granbury, has 16 tainter gates each 36 by 35 feet with a crest elevation of 658 feet above msl. The top elevation of the dam is 706.2 feet above msl.

2.1.1.3 Lake Limestone

Lake Limestone is the third reservoir managed by BRA located near Thornton. According to the TWDB 2012 Survey, it has a capacity of 203,780 acre-feet. The conservation pool

elevation is 363 feet above msl. Sterling Robertson Dam, which impounds Lake Limestone, is a zoned earthfill and concrete embankment. It has an uncontrolled emergence spillway at an elevation of 370 feet above msl. The dam's primary service spillway is a gate-controlled ogee made up of 5 gates that each measure 40 by 28 feet. The crest of this primary spillway is 337 feet above msl. The top elevation of the dam is 380 feet above msl.

2.1.2 Lower Colorado River Authority (LCRA)

The Lower Colorado River Authority (LCRA) manages what are known as the Highland Lakes System built on the Lower Colorado River in Central Texas. These lakes are used for flood management, water supply, electricity, and recreational use. The five lakes managed by the LCRA are Lake Buchanan, Inks Lake, Lake Lyndon B. Johnson (LBJ), Lake Marble Falls, Lake Travis, and Lake Austin. Only Mansfield Dam, which creates Lake Travis is designed to contain floodwater and help manage flooding downstream.

2.1.2.1 Lake Buchanan

Lake Buchanan is the northernmost of the Highland Lakes in the Lower Colorado River Basin located in Burnet and Llano Counties. The lake provides water supply and hydroelectric power to LCRA customers. According to the 2006 TWDB survey, the reservoir has a capacity of 886,626 acre-feet of water. The original conservation pool elevation was 1020.5 feet above mean level. Currently, it operates with two conservation pool levels: 1,018 feet above msl from May to October and 1020 feet above msl from November to April. The Buchanan dam is a multiple concrete arch and gravity structure. It has an emergency spillway at an elevation of 1020.5 feet above msl. There are 3 gate-controlled spillways with top elevations of 1021 feet above msl. The top elevation of the dam is 1025 feet above msl.

2.1.2.2 Inks Lake

Inks Lake is the next reservoir on the Lower Colorado River located about three miles downstream of Lake Buchanan. It was designed to work in tandem with Lake Buchanan in flooding events. According to the 2007 TWDB survey, Inks Lake has a storage of 14,047 acre-feet and a conservation pool elevation of 888.5 feet above msl. The Inks Dam is a concrete gravity structure with an uncontrolled emergence spillway at 888.3 feet above msl. The top elevation of the dam is at 922 feet above msl.

2.1.2.3 Lake LBJ

Lake Lyndon B. Johnson (LBJ) is located 4 miles west of Marble Falls and is impounded by the Wirtz Dam. The dam is a concrete and earthfill structure with a top crest at 838.68 feet above msl. The spillway is comprised of 9 tainter gates which are each 50 by 30 feet with a crest elevation of 796 feet above msl. According to the 2007 TWDB survey, Lake LBJ has a storage capacity of 133,090 acre-feet and a conservation pool elevation of 825.4 feet above msl.

2.1.2.4 Lake Travis

Lake Travis is impounded by Mansfield Dam located in western Austin. It is the only reservoir in the Highland Lakes system that provides flood control and management. The dam is an earth, rockfill, and concrete structure which also provides hydroelectric power to LCRA customers. According to the 2008 TWDB survey, Lake Travis has a storage capacity of 1,134,956 acre-feet. The conservation pool elevation is 681 feet above msl along with a flood pool elevation beginning at 714.6 feet above msl. The dam has 24 floodgates. The top of the dam is 750 feet above msl. In flood situations, the LCRA operates Lake Travis and Mansfield Dam under USACE regulations and protocols.

2.1.2.5 Lake Austin

Lake Austin and the Tom Miller Dam are directly downstream of Lake Travis in western Austin. The lake is owned by the city of Austin and is leased to the LCRA. The Tom Miller Dam is comprised of a gravity overflow section, with a gated spillway, powerhouse, and earth and rockfill sections. The top elevation of the dam is 519 feet above mean sea level. The conservation pool and emergency spillway elevations are 492.8 feet above msl. According to the 2008 TWDB survey, Lake Austin has a capacity of 24,644 acre-feet of water.

2.1.3 Titus County Fresh Water Supply District No. 1 (TCFWSD)

The Titus County Fresh Water Supply District (TCFWSD) is the main entity that maintains and manages Lake Bob Sandlin in Titus and Camp County. TCFWSD provides water for the nearby town of Mount Pleasant.

2.1.3.1 Lake Bob Sandlin

Lake Bob Sandlin and the Fort Sherman Dam are located directly downstream of Lake Cypress Springs near Mount Pleasant. The Fort Sherman Dam is an earth-fill dam with a top elevation of 349 feet above msl. There is an uncontrolled emergence spillway at 341.3 feet above msl. The service spillway is controlled by tainter gates with a top elevation of 339 feet above msl. According to the 2008 TWDB survey, Lake Bob Sandlin has a storage of 201,733 acre-feet of water. The conservation pool elevation is 337.5 feet above mean sea level.

2.1.4 Tarrant Regional Water District (TRWD)

The Tarrant Regional Water District (TRWD) owns and operates four reservoirs throughout Tarrant County in the North Central Texas area. These four reservoirs are Lake Bridgeport, Eagle Mountain Lake, Cedar Creek Reservoir, and Richland-Chambers Reservoirs. The main purpose of these reservoirs is to provide water to TRWD customers and flood control along the Trinity River.

2.1.4.1 Lake Bridgeport

Lake Bridgeport is located in Wise County on the West Fork Trinity River. The Bridgeport Dam has a top elevation of 874 feet above msl. There is an uncontrolled emergence spillway at 866 feet above mean sea level. The top of the flood control pool is at 851 feet above msl. A new spillway was built with 8 vertical gates with a top elevation of 842 feet above msl. There is a 60-inch diameter steel pipe located in part of the spillway wall. According to the 2010 TWDB survey, Lake Bridgeport has a capacity of 361,875 acre-feet at the conservation pool elevation of 836 feet above msl.

2.1.4.2 Eagle Mountain Lake

Eagle Mountain Dam and Lake are located northwest of Fort Worth on the West Fork Trinity River. The dam has a top elevation of 682 feet above msl. The top of the flood control pool is at 668 feet above msl. There is an emergence spillway on natural ground between the dam and concrete spillway at 676 feet above msl. A new service spillway constructed in 1971 added a concrete side channel with a discharge through a 25 square foot conduit. There is also a 6 roller gate controlled service spillway at 637 feet above msl. Eagle Mountain Lake has a storage capacity of 179,880 acre-feet at the conservation pool elevation of 649.1 feet above msl.

2.1.4.3 Cedar Creek Reservoir

Cedar Creek Reservoir and the Hogsett Dam are located in Henderson and Kaufman Counties, on Cedar Creek, a tributary of the Trinity River. The dam is a rolled earth-fill embankment with a top elevation of 340 feet above msl. The emergence spillway has 8 tainter gates. There are also 2 bascule automatic gates for service purposes. According to the 2005 TWDB survey, Cedar Creek Reservoir has a capacity of 644,785 acre-feet at the conservation pool elevation of 322 feet above msl.

2.1.4.4 Richland-Chambers Reservoir

The Richland-Chambers Dam and Reservoir are located on Chambers and Richland Creek, which are tributaries of the Trinity River. The dam is an earthen embankment with a soil cement upstream face. The top of the dam is 330 feet above msl. The spillway is a concrete ogee weir with a crest elevation of 290 feet above msl. On the crest, there are 4 tainter gates. The reservoir has a storage of 1,112,763 acre-feet. The conservation pool elevation is 315 feet above msl. The reservoir does not have a flood control pool but is allowed 2 feet above conservation pool elevation.

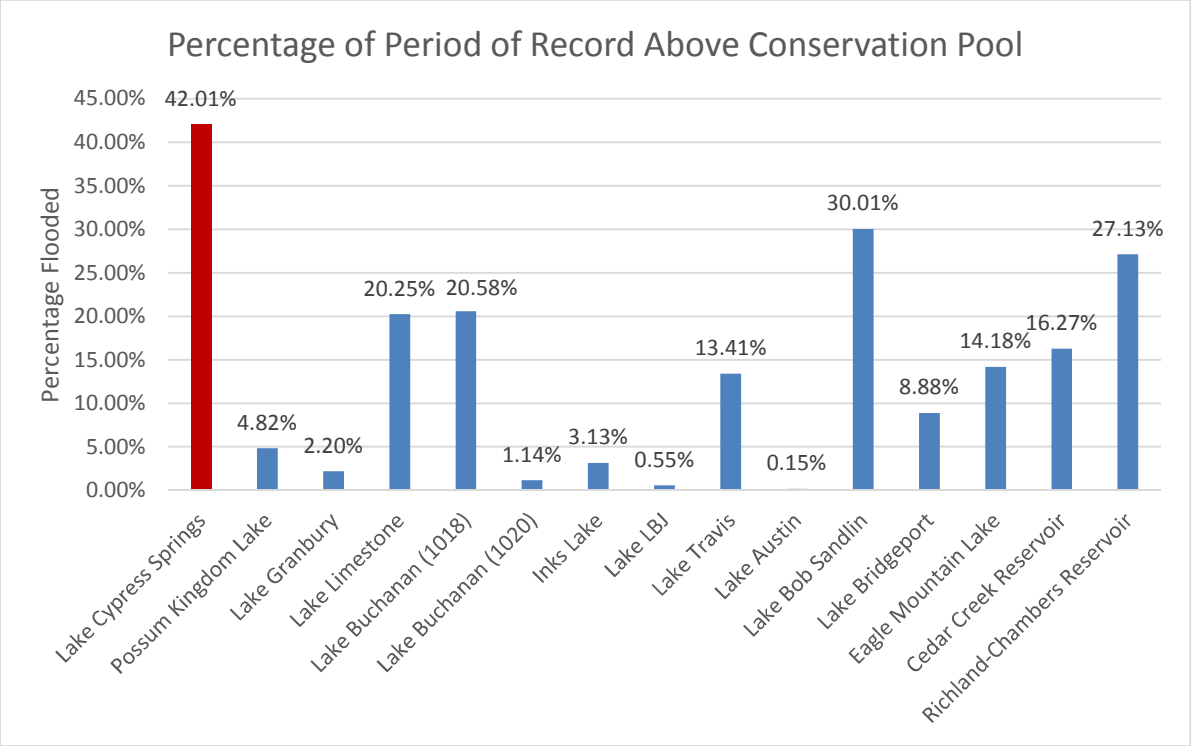
3.0 LAKE LEVEL ANALYSIS

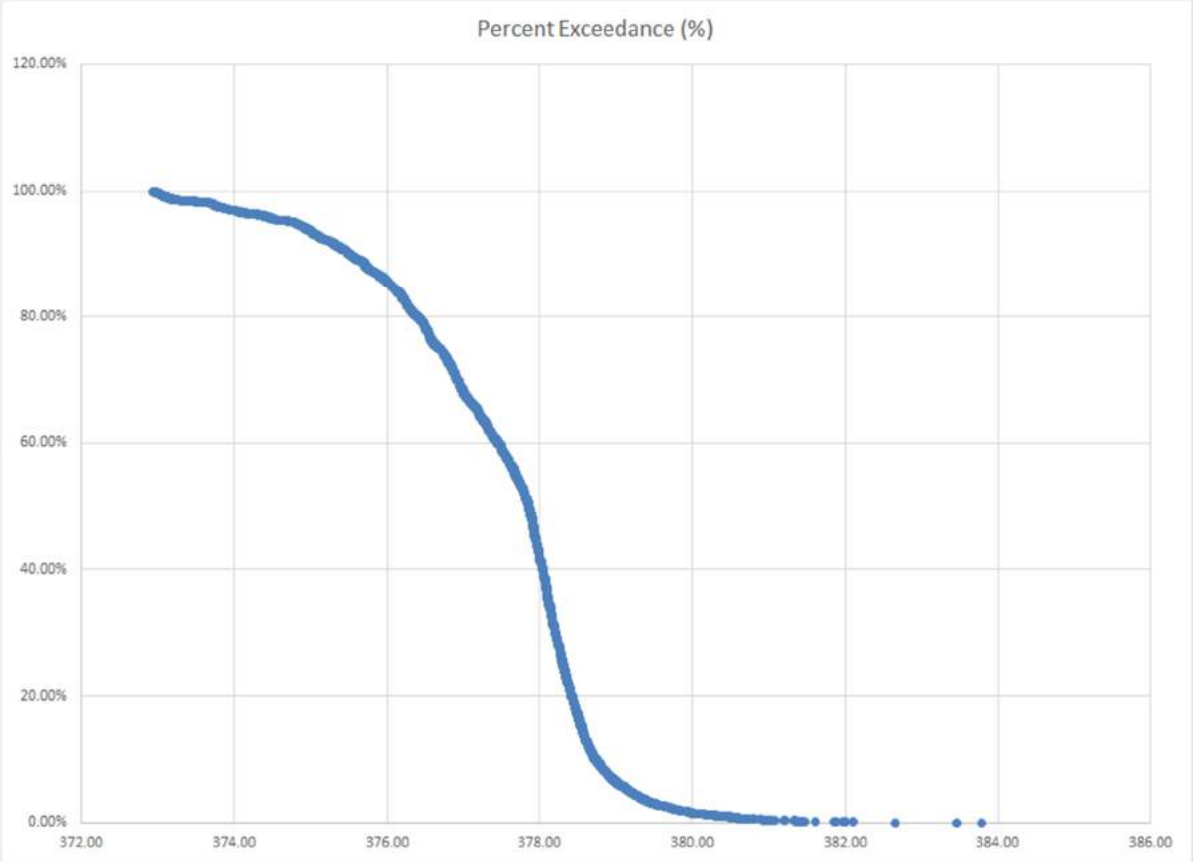
In recommending changes for the District's guidelines and regulations, it was important to analyze the historical data for each the reservoirs. The way in which a reservoir and its watershed behave during an event provides guidance on what can be done to decrease or prevent flood damage. This historical data was obtained from the Water Data for Texas

website, which compiles lake data from the USGS gauge in each reservoir. The graphs for the historical elevations for each lake are located in Appendix A for reference.

3.1.1 Percentage of Days Flooded

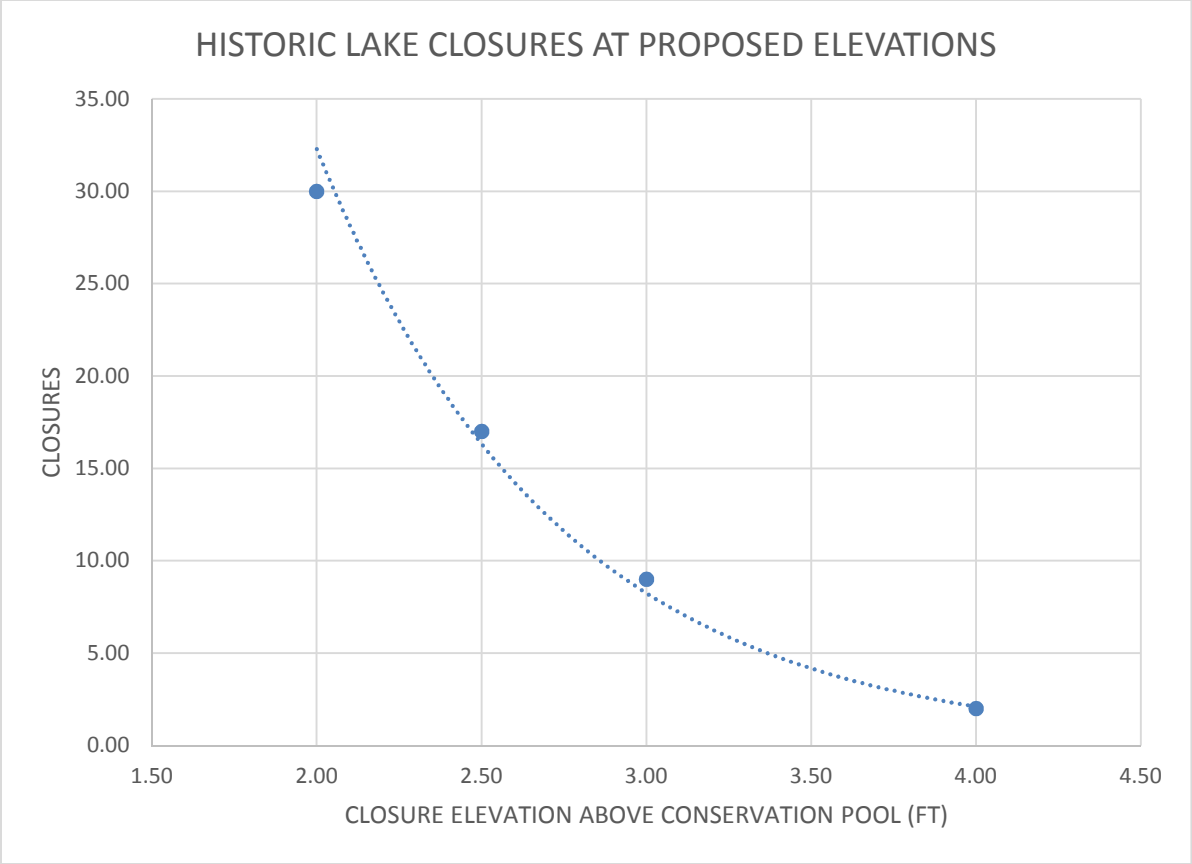
The data for historical lake elevations was imported from the Water Data for Texas website. The number of total days of record and total days above conservation pool was calculated for each reservoir. Dividing the days above conservation pool by total days of record yields the percentage of the total days of record that each reservoir was above conservation pool. The following bar graph shows the percentage for which each reservoir was flooded in the time of record.





Looking at the data, Lake Cypress Springs has the highest percentage of days above conservation pool at 42.01%. This is also shown in the Percent Exceedance Graph above. Lake Bob Sandlin, which is directly downstream of Lake Cypress Springs has been above conservation pool 30.01% of the total days of record.

Carollo analyzed the effect of lake closures at specific elevations from historic water surface elevation data. The graph below presents this information. A closure, for example of 2.0 ft (elevation 380 ft m.s.l.) above conservation pool would have resulted in 30 lake closures over the period of record (1972 - 2016). Similarly, a 4.0 ft closure (elevation 382 ft m.s.l.) would have resulted in only 2 closures.



3.1.2 Normal Distribution (Lake Volatility)

The normal distribution for flooding was calculated using the total days above conservation pool for each reservoir. This diagram of this analysis is shown below. Each bell curve represents the amount of time that each reservoir was held at a specific elevation above conservation pool (the y-axis). Said another way, this diagram represents the over-conservation pool volatility comparison for each of the analyzed lakes.

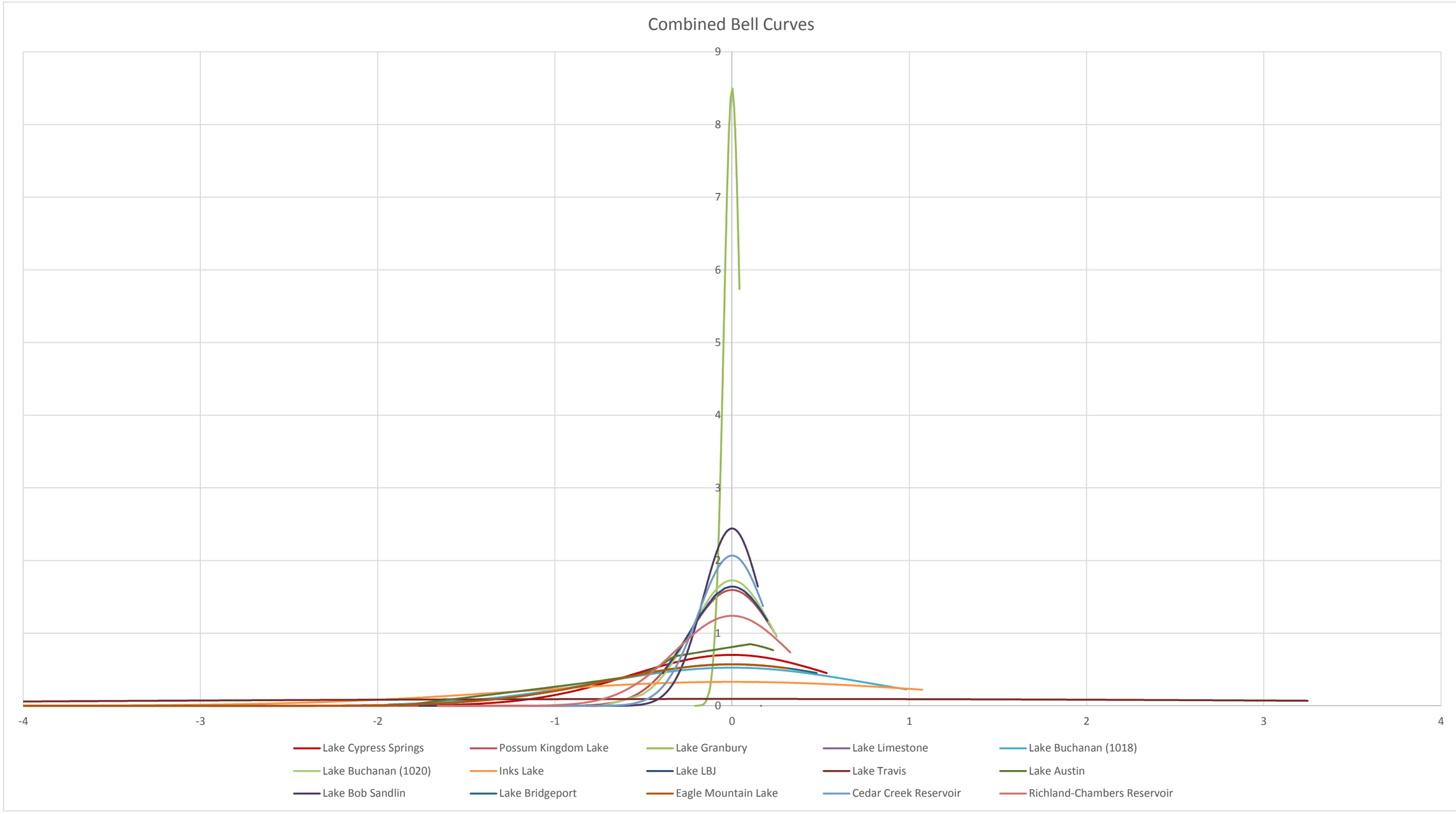
The most volatile lake, when compared to other Texas lakes, was Lake Granbury with an 8.5 ft. average water surface elevation and a low bell curve spread. This indicates that, comparatively speaking, Lake Granbury, throughout the period of record, flooded less often, but when it did flood, the elevation in the reservoir rose considerably.

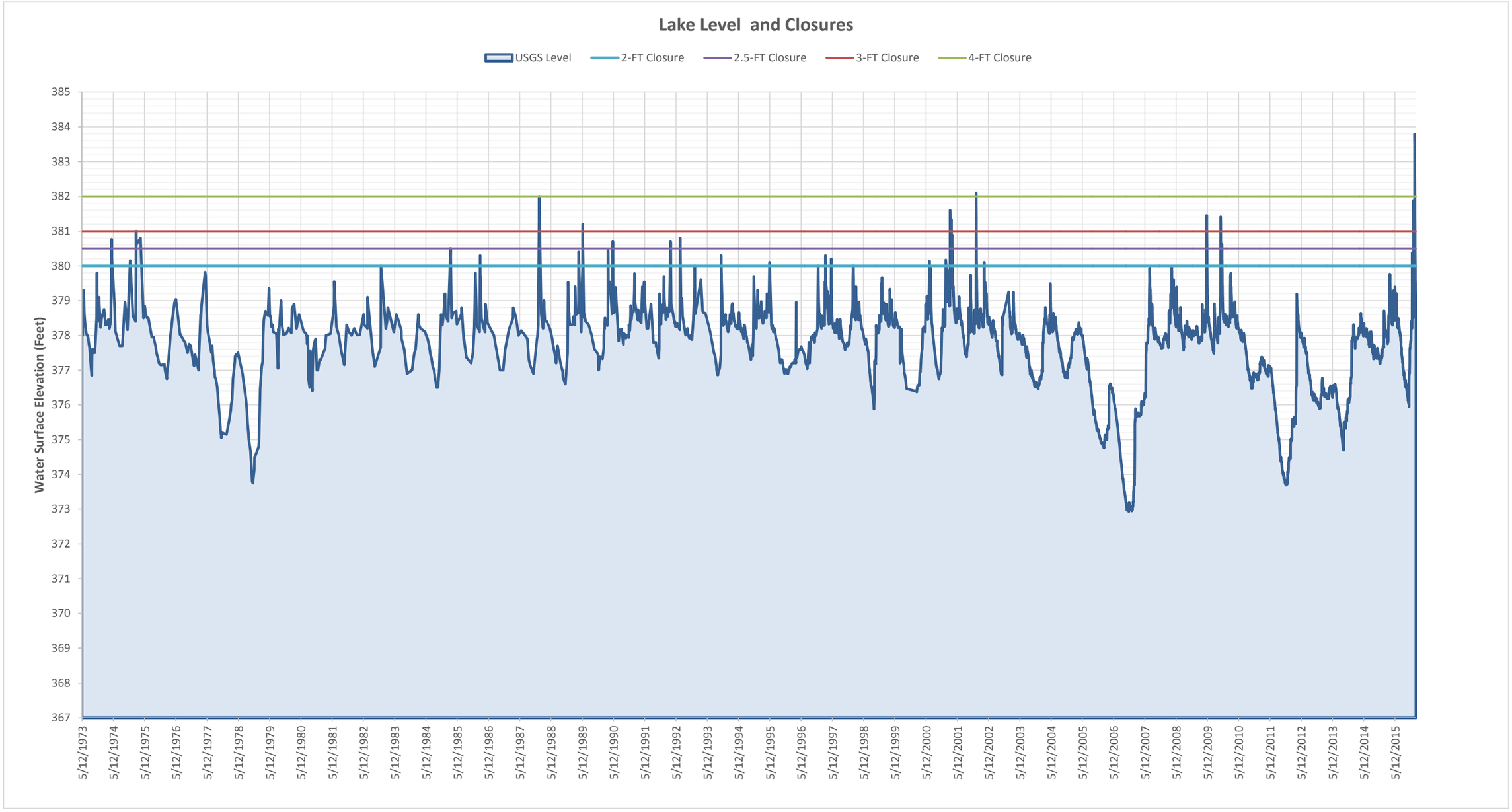
Inks Lake, on the other hand, is considered a constant level lake maintained by LCRA's fluctuation of Lake Travis and Lake Buchanan. Inks Lake shows an average rise in water surface elevation of less than 0.5 ft. when flooded with a wide bell curve spread. This indicates that, comparatively speaking, Inks Lake, throughout the period of record, was held just above conservation pool for a longer period of time. The LCRA's operation of this lake is evident by the curve.

Carollo expected Lake Travis to exhibit a curve similar to Lake Granbury, however it appears that Mansfield Dam effectively regulates flows from rising above conservation pool.

Although there are examples of severe flooding, the average on the curve is pulled down drastically by the flooding events that were held right above conservation pool by the LCRA (+681).

Lake Cypress Springs shows a 0.7 ft. average water surface elevation during times of flooding (above conservation pool). Comparatively, the water surface elevation shows average volatility (bell curve spread) when compared with the other lakes.


Combined Bell Curves
9
8
7
6
5
4
3
2
1
0
-4
-3
-2
-1
0
1
2
3
4
Lake Cypress Springs
Possum Kingdom Lake
Lake Granbury
Lake Limestone
Lake Buchanan (1018)
Lake Buchanan (1020)
Inks Lake
Lake LBJ
Lake Travis
Lake Austin
Lake Bob Sandlin
Lake Bridgeport
Eagle Mountain Lake
Cedar Creek Reservoir
Richland-Chambers Reservoir


Lake Level and Closures
USGS Level
2-FT Closure
2.5-FT Closure
3-FT Closure
4-FT Closure
Water Surface Elevation (Feet)
385
384
383
382
381
380
379
378
377
376
375
374
373
372
371
370
369
368
367
5/12/1973
5/12/1974
5/12/1975
5/12/1976
5/12/1977
5/12/1978
5/12/1979
5/12/1980
5/12/1981
5/12/1982
5/12/1983
5/12/1984
5/12/1985
5/12/1986
5/12/1987
5/12/1988
5/12/1989
5/12/1990
5/12/1991
5/12/1992
5/12/1993
5/12/1994
5/12/1995
5/12/1996
5/12/1997
5/12/1998
5/12/1999
5/12/2000
5/12/2001
5/12/2002
5/12/2003
5/12/2004
5/12/2005
5/12/2006
5/12/2007
5/12/2008
5/12/2009
5/12/2010
5/12/2011
5/12/2012
5/12/2013
5/12/2014
5/12/2015

3.2 Entity Lake Closures

Carollo contacted the entities requesting information on guidelines that state elevations which require they close lakes to boat traffic and recreational use. Press releases and news articles of recent lake closures were found and documented. The dates for these closures were then compared with the historical lake data to see what elevation the lake was on the day it was closed. The summary information is presented in the table below.

Entity	Lake/Reservoir	Cons. Pool	Closed Conditions	Ft above Cons.	Date Closed:	Note:
FCWD	Lake Cypress Springs (LCS)	378	383.85	5.85	12/28/2015	
BRA	Possum Kingdom Lake (PKL)	999				No found closures
	Lake Granbury (LG)	692.7				No found closures
	Lake Limestone (LL)	363				No found closures
LCRA	Lake Buchanan (LBU)	1020				No found closures
	Inks Lake (IL)	888.5	891.41	2.91	6/2/2016	
	Lake LBJ (LLBJ)	825.4	824.49	-0.91	5/31/2016	Closed due to opening of floodgates upstream
	Lake Marble Falls (LMF)	738				No Historical Data on TWDB, Started recording lake levels Mar 2016
	Lake Travis (LT)	681	692.60	11.60	6/6/2016	
	Lake Austin (LA)	492.8	492.36	-0.44	5/30/2016	Closed due to opening of floodgates upstream
TCFWSD	Lake Bob Sandlin (LBS)	337.5				No found closures
TRWD	Lake Bridgeport (LBP)	836	837.49	1.49	6/3/2016	
	Eagle Mountain Lake (EML)	649.1	650.86	1.76	6/1/2015	
	Cedar Creek Reservoir (CCR)	322				No found closures
	Richland-Chambers Reservoir (RCR)	315				No found closures

3.2.1 Brazos River Authority (BRA)

Jeff Osbourne, Asistant Public Information Officer of the BRA, states that the three reservoirs they manage are primarily for water supply and are not designed to hold floodwater. These lakes cannot get much above the conservation pool. As the water level rises the lakes, BRA has controlled releases of water to reduce flooding and damage along the Brazos River. According to BRA, none of the BRA parks or lakes were closed due to recent flooding.

3.2.2 Lower Colorado River Authority (LCRA)

According to Krista Umscheid-Ramirez of LCRA, there are no set guidelines in determining when to close a lake to the public. She states, "LCRA makes decisions about lake closures based on real-time assessment of potentially hazardous conditions, including factors such as swift currents and debris." There were lake closures in the Highland Lakes in late May and early June of 2016. Lake Austin and Lady Bird Lake were closed on May 30, 2016 in response to the opening of floodgates upstream at the Mansfield Dam. Even though Lake Austin was not above conservation pool, it was closed due to the water flow and currents caused by the opening dam's floodgates. Lake Austin's water surface elevation on May 30 was 492.36 feet above msl. With the exception of Lake Buchanan, boating bans were issued on all the Highland Lakes on June 6, 2016. On June 6 the elevation of Inks Lake was 892.16 feet above msl approximately 3.5 feet above conservation pool. Lake LBJ's elevation was 824.76 feet above msl. The water surface elevation of Lake Travis was 692.60 approximately 11 feet above conservation pool. It is important to note that Lake Travis is the only flood control reservoir in the Highland Lakes system. It was specifically designed to hold water up to 722 feet above msl to prevent as much flood damage as possible downstream.

3.2.3 Titus County Fresh Water Supply District No. 1 (TCFWSD)

TCFWSD does not have set protocol on when Lake Bob Sandlin should be closed. There is also no recent record of closures on Lake Bob Sandlin. According to Darrell Grubbs, the executive director, the highest elevation Lake Bob Sandlin reached was 339.91 feet above msl on December 28, 2015. This occurred at the same time Lake Cypress Springs experience its flooding event. Mr. Grubbs did state that if the elevation approached 342.0 feet, the district would start to have concerns.

3.2.4 Tarrant Regional Water District (TRWD)

The TRWD was contacted but did not provide information on guidelines as when lakes should be closed during flooding events. There was record of recent closings to Lake Bridgeport and Eagle Mountain Lake on the TRWD websites lake level blog. Both lakes were closed to recreational activities on May 29, 2015. The water surface elevation for Lake Bridgeport rose its highest to 840.29 feet above msl on June 1, 2015. This was 4 feet above conservation pool. Eagle Mountain Lake rose to 651.4 feet above msl on June 4, 2015. This

was 2 feet above conservation pool. Lake Bridgeport was closed on June 3, 2016 at a water surface elevation of 837.49 feet above msl. The elevation rose to as high as 838.4 feet above msl on June 6, 2016.

4.0 OTHER CONSIDERATIONS

4.1 Texas Parks and Wildlife Department (TPWD)

It has been questioned whether the Texas Parks and Wildlife Department (TPWD) has authority or jurisdiction in deciding to close lakes and recreational areas to the public. First, it was necessary to research and understand the primary responsibilities of the TPWD and the authority it is given. According to their website, the TPWD provides outdoor recreational opportunities by managing and protecting wildlife and wildlife habitat and acquiring and managing parklands and historic areas. The Wildlife Conservation Act in 1983 gave authority for managing fish and wildlife resources to the TPWD. In the case of Lake Cypress Springs, the parks, boat ramps, and recreational areas are on district property. TPWD does not maintain or manage these areas. The FCWD is listed as the reservoir controlling authority on the TPWD website. However, the TPWD does have authority to manage and protect the fish population within Lake Cypress Springs. There is a letter of opinion dated August 18, 1998 written by the Assistant Attorney General of Texas, Kymberly Oltrogge, which provides the State's opinion on the distribution of certain authorities for Lake Cypress Springs. The letter states, "The Parks and Wildlife Department has exclusive authority to regulate the taking and possession of fish. The Franklin County Water District, on the other hand, is authorized to regulate recreational and business privileges on the lakes within the district's jurisdiction, such as Lake Cypress Springs." The district is also granted this authority because of its creation under article XVI, section 59 of the Texas Constitution. This means the district, not the TPWD, has the authority and discretion in the decisions to close the lake and recreational areas to the public under certain circumstances.

4.2 Lake Safety

Statistical analysis and/or comparative analysis to other reservoirs is important in understanding how the reservoir responds to a particular flood event. With that said, a lake closure is primarily about lake safety for recreational users during a time of flooding. Because lake safety is difficult to "scientifically engineer," Carollo worked with FCWD to confirm that the engineering recommendation for lake closures will bolster a safe recreational use of the lake by users.

5.0 ENGINEERING RECOMMENDATIONS

Lake Cypress Spring is a reservoir that remains above conservation pool more than any other lakes analyzed. Additionally, the lake is determined to be, in comparison with the

other reservoirs studied, to be moderately volatile above conservation pool. When coupled with anecdotally evidence of other lake closures in Texas, Carollo recommends a lake closure elevation of 2.50 ft. m.s.l. above conservation pool of 378.00 ft. m.s.l. (or an elevation of 380.5 ft. m.s.l.

APPENDIX 5 – FCWD

Office of the Attorney General
State of Texas

DAN MORALES
ATTORNEY GENERAL

August 18, 1998

Mr. Andrew Sansom
Executive Director
Texas Parks and Wildlife Department
4200 Smith School Road
Austin, Texas 78744

Letter Opinion No. 98-064

Re: Whether the Franklin County Water District may require a fishing guide licensed by the Texas Parks and Wildlife Department to pay a fee and obtain a permit from the district before operating as a fishing guide on Lake Cypress Springs, and related questions (RQ-947)

Dear Mr. Sansom:

The Parks and Wildlife Department ("department") has exclusive authority to regulate the taking and possession of fish. The Franklin County Water District ("district"), on the other hand, is authorized to regulate recreational and business privileges on the lakes within the district's jurisdiction, such as Lake Cypress Springs ("lake"). You raise questions about the department's and the district's authority over the lake and its piscatory inhabitants. We conclude generally that the district's attempts to regulate the taking and possession of fish infringe upon the department's jurisdiction. We also conclude that the district may not charge a fee to fishing guides or fishing tournament organizers for the use of the lake. On the other hand, we conclude that the remaining district regulations about which you ask do not appear to infringe upon the department's jurisdiction. In reaching these conclusions, we assume Lake Cypress Springs was formed by damming a navigable waterway.[1]

You specifically question the district's regulations relating to fishing guides, fishing tournaments, and fishing in general. The district requires all fishing guides on the lake, in addition to carrying a valid state fishing-guide license and to following applicable state and local fishing and water-safety laws, to obtain a permit from the district and to pay an annual fee to the district, the amount of which is set by the district. With respect to tournaments, the district requires tournament organizers to obtain the district's express permission. As part of the permit process, the district requires the applicant to remit a fee. The district further limits the number of boats participating in a tournament to fifty per day. State law makes no such requirements of fishing tournaments. Also, the district has adopted various rules stipulating the means and methods by which fish may be caught, and portions of these rules apparently differ from rules the department has promulgated. We note, for example, that both the district and the department purport to regulate the type of fishing

---

[1]Lake Cypress Springs was formed, we understand, by damming Big Cypress Creek. Big Cypress Creek apparently is navigable, and the district has not asserted to the contrary.

equipment that may be used. You believe that, with the possible exception of the district's limitation on the number of boats that participate in a fishing tournament, the district's regulations are *ultra vires*.[2]

Because the powers of both the district and the department are limited by law,[3] we begin our analysis of the issues you raise by examining each entity's constitutional and statutory authority. We will look first at the district's authority. The district, which was created in 1965 as a water conservation and reclamation district under article XVI, section 59 of the Texas Constitution,[4] generally draws its authority from the constitution, its enabling act,[5] and Water Code chapter 51.[6] In particular, Water Code section 51.127(4) authorizes the district to regulate fishing, and "all recreational and business privileges" on a body of water within the district's jurisdiction.[7]

On the other hand, the legislature has delegated to the department primary responsibility for protecting the state's fish.[8] The department alone administers laws relating to fish.[9] Furthermore,

---

[2]You also indicate that a district rule establishing a closed season is invalid. Because we did not find in the materials you submitted any district rule establishing closed or open fishing seasons, we do not consider the issue here. *But see infra* text accompanying notes 15 and 35 (stating that department is authorized to dictate open and closed seasons for conservation purposes).

[3]The district is a creature of the legislature and has only those powers delegated to it. *See Franklin County Water Dist. v. Majors*, 476 S.W.2d 371, 373 (Tex. Civ. App.--Texarkana 1972, writ ref'd n.r.e.); *Lower Nueces River Water Supply Dist. v. Cartwright*, 274 S.W.2d 199, 207 (Tex. Civ. App.--San Antonio 1954, writ ref'd n.r.e.). Likewise, as an administrative agency of the state, *see* Parks & Wild. Code § 11.011, the department has only those powers the legislature has bestowed upon it. *See State v. Jackson*, 376 S.W.2d 341, 344 (Tex. 1964).

[4]*See* Act of May 26, 1965, 59th Leg., R.S., ch. 719, § 1, 1965 Tex. Gen. Laws 1668, 1669. The district is coextensive with Franklin County. *Id.*

[5]*Id.* § 4, 1965 Tex. Gen. Laws 1668, 1671-72. With the exception of the district's power to exact fees, the enabling act generally is irrelevant to the regulations about which you ask. We will briefly discuss it where it is relevant. *See infra* text accompanying notes 40 and 42.

[6]The district is given the powers of a water control and improvement district. *See* Act of May 26, 1965, 59th Leg., R.S., ch. 719, § 4, 1965 Tex. Gen. Laws 1668, 1671.

[7]Water Code section 51.127(4) also authorizes a water district to regulate boating. We note that the Water Safety Act, Parks & Wild. Code ch. 31, establishes numerous requirements with which boats and boaters must comply, *e.g.*, numbering and necessary equipment. None of the district's regulations about which you ask concern any of these matters. We need not consider, therefore, whether the Water Safety Act supersedes the district's authority to regulate boating under Water Code section 51.127(4).

[8]Parks & Wild. Code § 12.0011(a).

[9]*Id.* § 12.001(a).

the Wildlife Conservation Act of 1983 ("act"),[10] to which Franklin County is subject,[11] provides the department with jurisdiction of certain piscatorial matters. The act generally equips the department to ensure "the conservation of an ample supply of" fish and other "wildlife resources."[12] More specifically, the act forbids anyone to catch or possess fish except as the Parks and Wildlife Commission ("commission"), which sets policies for the department,[13] permits by proclamation.[14] The commission must regulate the time periods during which, as well as the "means, methods, manners, and places" by or in which, an individual may take or possess wildlife resources.[15] If the commission finds that an open season on a particular species may be safely provided or if an open season is required to prevent waste of a particular species, the commission must provide an open season.[16]

You believe the department's regulations, promulgated under the act, conflict with the district's regulations. The district apparently premised its regulations upon what the district calls its "private ownership" of the lake and its statutory authority. You ask whether the department's or the district's regulations prevail where they are inconsistent. Ultimately, because the act and Water Code section 51.127(4) give the authority to regulate fishing to different entities (the act gives the power to the department, while Water Code section 51.127(4) authorizes the district), we must consider which statute prevails. Before we reach that issue, however, we wish to consider two of the district's contentions: that it is the private owner of the lake and that it may exact fees. Each of these issues must be resolved before reconciling the district's regulatory power with that of the department.

Initially, we conclude that the district's belief that it is the private owner of the lake is misguided. The district cites, in support of its contention, the fact that it built the lake by, we assume, damming a navigable river that runs through the district. Furthermore, the district states in its letter to this office, it "owns or controls all of the land upon which Lake Cypress Springs is situated. In addition, [it] owns . . . most of the land adjacent to [the lake]." The district also has

---

[10]*Id.* ch. 61; *see id.* § 61.001. An earlier version of the act, the Uniform Wildlife Regulatory Act, was enacted in 1967. *See* Act of May 27, 1967, 60th Leg., R.S., ch. 730, 1967 Tex. Gen. Laws 1959, 1959.

[11]*See* Parks & Wild. Code § 61.003.

[12]*Id.* § 61.002. The term "wildlife resources" is defined to include fish. *See id.* § 61.005.

[13]*See id.* § 11.011.

[14]*Id.* § 61.054. We understand that the commission's proclamations are codified in title 31 of the Texas Administrative Code.

[15]*Id.* § 61.052.

[16]*Id.* §§ 62.052, .053.

managed the lake since it was built. Consequently, the district believes, its "private property rights" authorize it to promulgate the regulations about which you ask.

The district is not private. Rather, it is a political subdivision of the State[17] and therefore a public entity. Moreover, the district only holds the lake waters, lake bed, and the lake's piscatory inhabitants in trust for the people of the State, who are the lake's true owners. The citizens of this state own the waters and beds of navigable streams and lakes.[18] Likewise, the citizens of this state own all fish contained in freshwater lakes in this State.[19] Even if the district owns the soil underneath the lake bed or owns the land surrounding the lake, the lake is a public body of water subject to all applicable state laws.[20] As the Texas Supreme Court has stated, a permit to dam a navigable stream does not provide the permit holder title to the water or the fish in the water, nor does it provide a right to interfere with the public's use of the water for lawful purposes, except to the extent necessary to maintain the dam and the lake.[21]

Next, we conclude that the district may not enact regulations requiring a fee of fishing guides or fishing tournament organizers. A public entity, other than a home-rule municipality, may impose a fee only if the law specifically authorizes it.[22] Moreover, we may not construe a statute to imply authority to collect a fee.[23] While the district's enabling act authorizes it to assess ad valorem taxes to pay off bonds and annual taxes to fund its operations,[24] it does not authorize the district to collect any fees. Furthermore, the district's authority to regulate does not translate to the authority to levy a fee.[25] In addition, Water Code section 49.212(a), which authorizes the district to assess a fee "for providing or making available any district facility or service," does not apply to the fishing-guide

---

[17]Act of May 26, 1965, 59th Leg., R.S., ch. 719, § 1, 1965 Tex. Gen. Laws 1668, 1669; *see also Lewis Cox & Son, Inc. v. High Plains Underground Water Conservation Dist. No. 1*, 538 S.W.2d 659, 662 (Tex. Civ. App.--Amarillo 1976, writ ref'd n.r.e.).

[18]Parks & Wild. Code § 1.011(b); *see also Carrithers v. Terramar Beach Community Improvement Ass'n*, 645 S.W.2d 772, 775 (Tex. 1983); *State v. Bradford*, 50 S.W.2d 1065, 1076 (Tex. 1932).

[19]Parks & Wild. Code § 1.011(c).

[20]In Attorney General Opinion M-1210, this office distinguished between public and private waters, although the waterways discussed in that opinion were owned by private entities, in contrast to the situation before us here. *See* Attorney General Opinion M-1210 (1972) at 3; *cf.* Attorney General Opinion JM-572 (1986) at 3 (stating that while municipality leases privately owned land for use as park, lake is public water).

[21]*See Diversion Lake Club v. Heath*, 86 S.W.2d 441, 443 (Tex. 1935).

[22]*See* Attorney General Opinion DM-22 (1991) at 1, 2 (and sources cited therein).

[23]*See id.*

[24]*See* Act of May 26, 1965, 59th Leg., R.S., ch. 719, §§ 6, 11, 1965 Tex. Gen. Laws 1668, 1672-73, 1676.

[25]*See* Attorney General Opinions DM-22 (1991) at 2-3, JM-345 (1985) at 1-3.

and tournament-organizer fees. The lake is not a facility as that term is commonly understood;[26] nor do we understand the water district to provide fishing guides or tournament organizers any service beyond that available to the nonpaying general public.[27] Parks and Wildlife Code section 25.004(2) also does not apply. It authorizes the district to collect a fee for "entry to and use of water-related park areas and their facilities," but it does not authorize a fee for the use of the water itself.

We turn now to the issues you raise about the district's fishing regulations: to the extent they are inconsistent, which entity's regulations regarding the taking and possession of fish prevail. As we have stated, resolution of this issue will depend in part upon whether the act supersedes that portion of Water Code section 51.127(4) that authorizes the district to regulate fishing. In this regard, we note that the legislature last substantively amended section 51.127(4) or its statutory predecessor in 1935.[28] By contrast, the act's statutory predecessor was enacted in 1967,[29] and various substantive amendments have been made since then.

For two reasons we conclude the act supersedes Water Code section 51.127(4) to the extent the two are inconsistent. First, because the act was enacted and substantively amended after the last substantive amendment to Water Code section 51.127 or its statutory predecessor, we believe the legislature intended the act to supersede Water Code section 51.127. The legislature has directed us to construe inconsistent statutes so that the latest in date of enactment prevails.[30]

Second, we believe the legislature intended the act to reduce a myriad of game and fish statutes to one that applied nearly statewide. This office noted in 1951 the presence of numerous fish laws, each applicable only to a particular county.[31] In its 1967 enactment, the legislature expressed its intent: "to 'codify' all previous Acts of the Legislature of a similar nature into a single Act and thereby reduce the bulk of such legislation and to produce a greater degree of uniformity . . . ."[32] Similarly, the emergency clause of the 1967 enactment notes a "great need" to reduce the number

---

[26]*See* Gov't Code § 311.011(a).

[27]This office has construed the statutory predecessor to Water Code section 49.212 to authorize a water district to collect a fee to provide garbage-collection service. *See* Attorney General Opinion H-632 (1975) at 2.

[28]*See* Act of May 11, 1935, 44th Leg., R.S., ch. 340, sec. 3, § 7(a), 1935 Tex. Gen. Laws 792, 795. Section 51.127 was nonsubstantively codified in 1971. *See* Act of Mar. 29, 1971, 62d Leg., R.S., ch. 58, sec. 1, § 1.001(a), (c), 1971 Tex. Gen. Laws 110, 110 (stating that codification is nonsubstantive).

[29]*See* Act of May 27, 1967, 60th Leg., R.S., ch. 730, 1967 Tex. Gen. Laws 1959, 1959-69.

[30]*See* Gov't Code § 311.025(a).

[31]*See* Attorney General Opinion V-1229 (1951) at 1.

[32]Act of May 27, 1967, 60th Leg., R.S., ch. 730, § 15, 1967 Tex. Gen. Laws 1959, 1967.

of game and fish laws from seventy-two separate acts to one.[33] To this end, the 1967 enactment specifically repeals, to the extent of the inconsistency, all general and special laws not expressly saved that conflict with the act.[34]

Thus, that portion of Water Code section 51.127(4) authorizing a water control and improvement district to regulate fishing is repealed because it is inconsistent with the department's exclusive authority under the act. The act gives the department sole jurisdiction of the taking and possession of fish in Franklin County, which jurisdiction includes the periods of time when fish may be taken or possessed;[35] the means, methods, and places in and by which one may take or possess fish;[36] and the establishment of open and closed seasons for fishing.[37] The district may not attempt to regulate any of the matters over which the act gives the department exclusive jurisdiction.

The district's enabling act, which prevails over any inconsistent provisions of general state law,[38] is in fact consistent with our conclusion. That enabling act gives the district numerous powers related to the purpose of managing waters within the district, but none related to fish.[39] We need not, therefore, consider whether the act has repealed any portion of the district's enabling act.

But we also conclude that the remaining district regulations about which you ask, with the possible exception of the district's limitation on the number of boats that may participate in a fishing tournament, are within the district's jurisdiction. We believe the district's requirement that fishing guides and fishing tournament organizers obtain permits from the district are within the district's authority to regulate recreational and business privileges on the lake.[40] Water Code section 51.127(4) expressly empowers the district to regulate recreational and business privileges on the lake, and we know of no other statute that supersedes the district's authority by bestowing the same

---

[33]*Id.* § 19, 1967 Tex. Gen. Laws 1959, 1969.

[34]*Id.* § 15, 1967 Tex. Gen. Laws 1959, 1968.

[35]*See* Parks & Wild. Code § 61.052(a); *see also id.* § 61.054(b).

[36]*See id.* § 61.052(b); *see also id.* § 61.054(b)(2), (3).

[37]*See id.* §§ 61.052(a), .053.

[38]Act of May 26, 1965, 59th Leg., R.S., ch. 719, § 4, 1965 Tex. Gen. Laws 1668, 1671.

[39]*See id.* § 4, 1965 Tex. Gen. Laws 1668, 1671-72.

[40]The district may not, of course, exact a fee for the permit. *See supra* text accompanying notes 22-25 (determining that district has no authority to collect fees). We presume that the fishing guides and fishing tournaments are business enterprises, as the district suggests. This opinion does not address noncommercial guiding or informal tournaments or contests where no money is involved.

power on another entity. Neither the act nor the Water Safety Act,[41] for example, gives the department conflicting authority.

Similarly, we believe Parks and Wildlife Code section 31.092(c) authorizes the district to limit the number of boats that may participate in a fishing tournament, but only if the district has found that the limitation is necessary to protect the public safety. Section 31.092(c) authorizes the district to regulate "the operation . . . of boats" if the district deems the regulation "necessary for the public safety." In our opinion, the district's limitation on the number of boats that may participate in a fishing tournament does not conflict with any other provisions of the Water Safety Act,[42] nor with any other statute of which we are aware. The limitation does not, for instance, infringe upon the statutory specifications of requisite equipment, speed limits, or age requirements for motor-boat operators. We emphasize, however, that the district must find the limitation necessary for the public safety. Whether the district reasonably has made that determination is beyond the scope of the opinion process, but the issue is appropriate for judicial review.

---

[41]Parks & Wild. Code ch. 31.

[42]*Id.*

SUMMARY

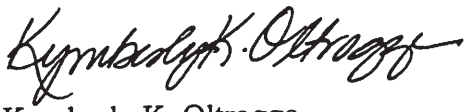
A water conservation and reclamation district holds the waters, bed, and piscatorial inhabitants of a lake created by damming a navigable waterway in trust for the people of Texas.

The Franklin County Water District is unauthorized to collect a fee for the privilege of operating as a fishing guide on Lake Cypress Springs or for holding a fishing tournament on the lake.

To the extent of inconsistency between the Wildlife Conservation Act, Parks and Wildlife Code chapter 61, and Water Code section 51.127(4), the Wildlife Conservation Act prevails. Thus, the Texas Parks and Wildlife Department has sole authority to regulate the taking and possession of fish, such as the periods of time when one may take or possess fish and the means, methods, and places for taking or possessing fish. Water District rules that purport to regulate the means of taking fish are *ultra vires*.

Nevertheless, the Franklin County Water District may regulate business privileges on the lake. Accordingly, district rules that require fishing guides and the organizers of a fishing tournament to obtain a permit are, on their face, within the district's jurisdiction (although the district may not exact a fee for the permit). Finally, the district may limit the number of boats that participate in a fishing tournament if the district has found that the limitation is necessary to protect the public safety.

Yours very truly,



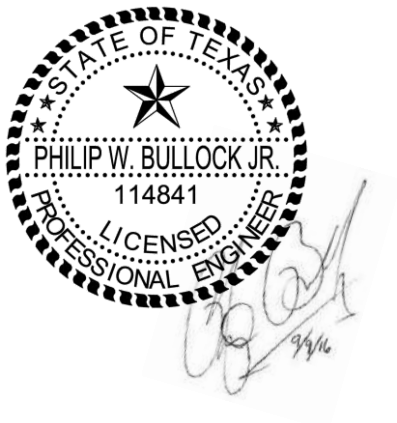
Kymberly K. Oltrogge
Assistant Attorney General
Opinion Committee

LLOYD GOSSELINK ROCHELLE & TOWNSEND, P.C.

ASSESSMENT OF REGULATORY FLOOD DAMAGE MINIMIZATION ALTERNATIVES

TECHNICAL MEMORANDUM NO. 5
RESIDENTIAL STRUCTURES

DRAFT
September 2016



10375 RICHMOND AVENUE, SUITE 1625 • HOUSTON, TEXAS 77042 • P. 281.872.4512 • F. 281.872.4505

Lloyd Gosselink Rochelle & Townsend, P.C.

Assessment of Regulatory Flood Damage Minimization Alternatives

TECHNICAL MEMORANDUM
NO. 5
RESIDENTIAL STRUCTURES

TABLE OF CONTENTS

Page No.

RESIDENTIAL STRUCTURES

1.0 BACKGROUND INFORMATION

The Franklin County Water District (FCWD) is a water conservation and reclamation district that owns and operates Lake Cypress Springs in Northeast Texas. FCWD maintains water rights for the purposes of municipal and industrial water supply and public recreation. The stored water supply in Lake Cypress Springs is used to provide firm supplies to the customers of the District.

Carollo Engineers, Inc. (Carollo) was tasked by Lloyd Gosselink (LG) on behalf of FCWD to perform a technical evaluation of the District's permitting practices as they relate to residential structures, and to submit engineering recommendations relating to this evaluation. The information presented herein summarizes the evaluations performed, and provides engineering recommendations for the permitting of residential structures, particularly relating to the requirement of a minimum floor slab elevation, grandfathering of existing non-conforming structures, and the definition and rectification of requirements for other structures (garages, storage areas, guest houses, etc.). Carollo also recommends grandfathering language for allowed improvements on boathouses.

2.0 DAM AND SPILLWAY FUNCTIONALITY

Lake Cypress Springs is a man-made lake located in Franklin County with a watershed of approximately 75 square miles. The dam is located on Big Cypress Creek, a tributary of the Cypress Bayou. Authorization for the construction of the Franklin County Dam and the impoundment of up to 72,800 acre-feet of water was granted on November 10, 1966. Construction began in July 1968 and was completed in February 1971.

The dam is an earth-fill embankment that is 5,230 feet long with a top crest elevation at 395 feet above mean sea level (msl). The dam operates with a morning-glory spillway located at the right end of the main embankment at an elevation of 378 feet above msl. The morning-glory spillway has a rectangular drop inlet that is 23 feet by 23 feet. Water flows from the inlet into a 10 feet by 10 feet box culvert that discharges into Lake Bob Sandlin downstream. The only controlled releases of water occur with a low-flow 18-inch service spillway to meet requirements for a downstream water-right owner, Mount Pleasant.

An emergency spillway exists and is located left (north) of the dam. Although Carollo recognizes that a storm of any magnitude could occur, the emergency spillway is particularly important because it establishes a reasonable maximum water surface elevation for a 500 year event in the reservoir (see Table 1.2). The designed emergency spillway is a graded and excavated area near the dam at an elevation of 385 feet above msl with a crest length of 1,000 feet.

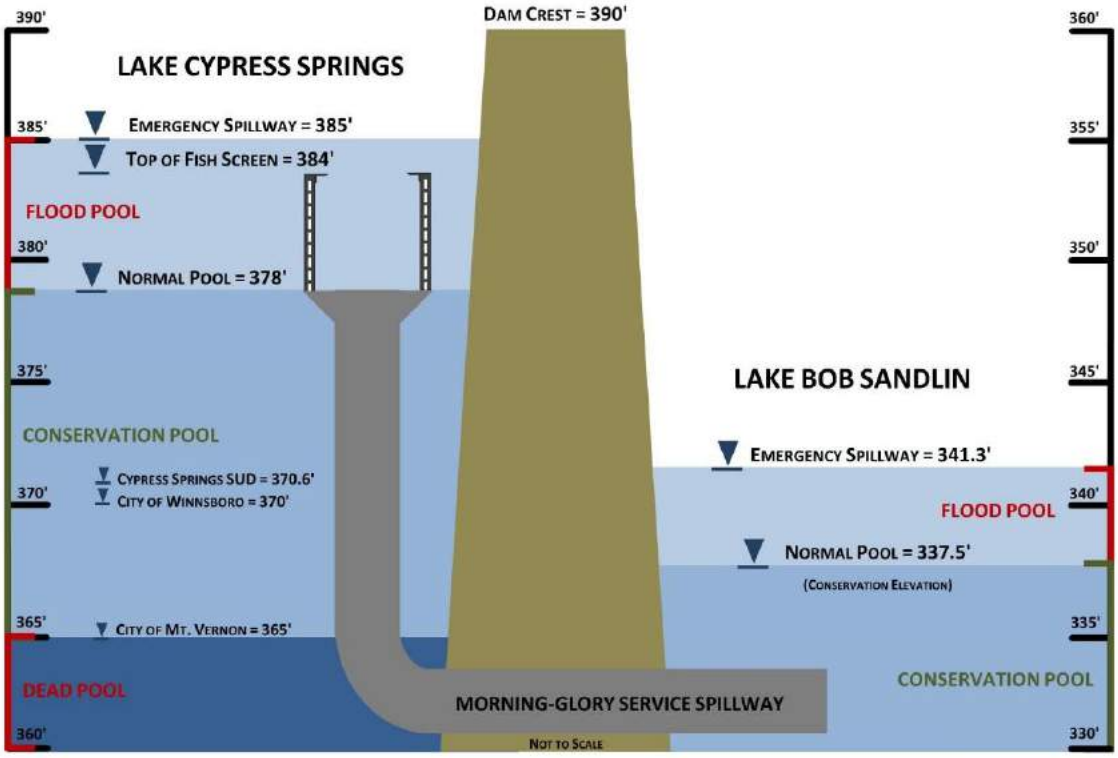


Figure 0.1 Important Lake Elevations

A September 22, 2009 frequency analysis completed by Freese Nichols Inc. (FNI) calculated predicted lake elevations for a given storm event, as presented in Table 1.1 below.

Table 0.2 Summary Lake Elevations
Engineering Recommendations for Lakefront Structures
Lloyd Gosselink

Event	Elevation
2-year	379.20
5-year	379.57
10-year	379.98
25-year	380.62
50-year	381.40
100-year	382.35
500-year	384.77

As shown in the table above, a 500-year storm event would cause a rise in the surface-water to 384.77 or 0.23 feet from engaging the emergency spillway.

2.1 December 2015 Flood Event

On December 27, 2015, the Lake Cypress Springs watershed experienced a historic rain event that resulted in record lake elevation levels and caused significant damage to waterfront properties and recreational areas along the shoreline. The elevation of Lake Cypress springs rose to 383.92 feet above msl. This event did not engage the emergency spillway. No historic event on the reservoir has engaged the emergency spillway.

3.0 ENGINEERING RECOMMENDATIONS

After careful review of FCWD's existing regulations coupled with an understanding of the Lake hydraulics and frequency analysis, it is recommended that LG implement the following or similar language into the FCWD rules and regulations considerations related to the permitting of residential construction.

Added Definitions:

- Finished Areas - square-footage with enclosed walls, floors, or ceilings of materials generally accepted for interior residential construction (e.g., windows, drywall/sheet rock, insulated walls, carpet, etc.) or any building that is climate controlled.

Major Recommended Additions:

- Residential structures must be elevated on pilings or columns so that: (i) the bottom of the lowest horizontal structural member of the lowest floor (excluding pilings or columns) is elevated to or above 385.50 ft. m.s.l.; and (ii) the pile or column foundation and the structure attached thereto is anchored to resist flotation, collapse, and lateral movement due to the combined effects of wind and water loads acting simultaneously on all building components. Loading values used shall be those required by applicable State or local building standards. A registered professional engineer or architect shall develop or review the structural design, specifications, and plans for the construction, and shall certify that the design and methods of construction to be used are in accordance with accepted standards of practice. This requirement also applies to all buildings containing finished areas (guest houses, workshops, offices, etc.).

- Detached garages, storage buildings, decks, and patios are permitted to be constructed in whole or in part at any elevation. However, all materials, fixtures, and assets positioned at or below 385.5 ft. m.s.l. shall be able to withstand periodic temporary inundation of flood waters. Decks and patios must be designed to remain intact, in place, and must be supported to resist flood loads. In some cases, attached decks can be cantilevered but, in most cases, attached decks must be supported on piles, posts, or columns embedded into the ground and capable of surviving anticipated erosion and scour.

- The space below the lowest floor is required to either be free of obstruction or constructed with open wood lattice-work, non-load-bearing solid breakaway walls, or insect screening intended to convey flood flows without causing collapse, displacement, or other structural damage to the elevated portion of the building or supporting foundation system. Such enclosed space shall be useable solely for parking of vehicles, building access, or storage. All materials, fixtures, and assets located in these areas must be able to withstand periodic temporary inundation of flood waters. Enclosed areas must not be used for habitable or recreational purposes. Swimming pool or spa to be placed beneath an elevated building only if the space around the pool/spa remains unenclosed. Access stairs and ramps that are attached to or beneath an elevated building also must remain unenclosed.

- All mechanical, HVAC, electrical, and plumbing equipment and fixtures are required to be able to withstand periodic temporary inundation of flood waters or be elevated at or above elevation 385.5 ft. m.s.l. The elements must not be attached to or penetrate through breakaway walls. The elements should be located on the sides of piles and columns that are opposite from the anticipated direction of wave approach, where possible.

- OSSF systems must not be structurally attached to building foundations. Plumbing and piping components must not be attached to or pass through breakaway wall panels.

Recommended Grandfathering Language:

Residential structures not conforming to the minimum floor slab elevation requirement of 385.5 ft. m.s.l. can be repaired and improved, so long as there is no increased of finished areas. Any addition of finished area must conform to all rules herein.

Boathouses not conforming to the requirements of internal range can be repaired but shall not be improved, per the definitions herein. Variances to this rule will be granted for these listed improvements to boathouses, but limited to the addition of:

- Handrails or other safety improvements

- Stairs, overhead walkways, walkways, and ramps for boathouse access

- Uncovered decking areas
- Swimming ladders, dock cleats, tie downs, bumpers, slides, diving boards, or other recreational amenities requiring installation
- Storage areas
- Sinks, fixtures, cabinets, and countertops
- Cupola/weather vanes or flags
- Ceiling fans and overhead lighting
- Screened in areas

APPENDIX D
REPORTS

Volumetric and Sedimentation Survey of LAKE CYPRESS SPRINGS

July 2007 Survey

Prepared by:

The Texas Water Development Board

October 2008

Texas Water Development Board

J. Kevin Ward, Executive Administrator

Texas Water Development Board

James E. Herring, Chairman
Jack Hunt, Vice Chairman
Lewis H. McMahan, Member
Thomas Weir Labatt III, Member
Edward G. Vaughan, Member
Joe M. Crutcher, Member

Prepared for:

Franklin County Water District

With Support Provided by:

U.S. Army Corps of Engineers, Fort Worth District

This report was prepared by staff of the Surface Water Resources Division:

Barney Austin, Ph.D., P.E.
Jordan Furnans, Ph.D., P.E.
Jason Kemp, Team Leader
Randall Burns
Tony Connell
Holly Weyant

Published and Distributed by the
Texas Water Development Board
P.O. Box 13231
Austin, TX 78711-3231

Executive Summary

In 2007, the Texas Water Development Board entered into agreement with the U.S. Army Corps of Engineers, Fort Worth District, for the purpose of performing a volumetric and sediment survey of Lake Cypress Springs. This survey was performed using a multi-frequency (200 kHz, 50 kHz, and 24 kHz) sub-bottom profiling depth sounder. In addition, sediment core samples were collected in selected locations and were used in interpreting the multi-frequency depth sounder signal returns to derive sediment accumulation estimates.

Franklin County Dam and Lake Cypress Springs are located on Big Cypress Creek in the Cypress River Basin 8 miles southeast of Mount Vernon in Franklin County, Texas. Bathymetric data collection for Lake Cypress Springs occurred on June 21st, June 27th-June 29th, July 10th, and July 11th of 2007, while the water surface elevation ranged between 378.22 feet and 379.42 feet above mean sea level (NGVD29). The conservation pool elevation of Lake Cypress Springs is 378.0 feet above mean sea level (NGVD 29).

The results of the TWDB 2007 Volumetric Survey indicate Lake Cypress Springs has a total reservoir capacity of 66,756 acre-feet and encompasses 3,252 acres at conservation pool elevation (378.0 feet above mean sea level, NGVD29). In 1998 TWDB estimated the capacity of Lake Cypress Springs (at conservation pool elevation) at 67,690 acre-feet.[1] Due to differences in the methodologies used in calculating areas and capacities from this and previous Lake Cypress Springs surveys, comparison of these values is not recommended.[2] The TWDB considers the 2007 survey to be a significant improvement over previous methods and recommends that a similar methodology be used to resurvey Lake Cypress Springs in 10 to 20 years or after a major flood event.

The results of the TWDB 2007 Sediment Survey indicate Lake Cypress Springs has accumulated 3,807 acre-feet of sediment since impoundment in 1970. Based on this measured sediment volume and assuming a constant sediment accumulation rate, Lake Cypress Springs loses approximately 100 acre-feet of capacity per year. The majority of the sediment accumulation has occurred within the main body of the lake, with the thickest deposits in the submerged Big Cypress Creek channel. The maximum sediment thickness observed in Lake Cypress Springs was 7.2 feet.

Table of Contents

List of Tables

List of Figures

Appendices

Lake Cypress Springs General Information

Franklin County Dam and Lake Cypress Springs are located on Big Cypress Creek in the Cypress River Basin 8 miles southeast of Mount Vernon in Franklin County, Texas.[3] (Figure 1) Lake Cypress Springs is maintained and operated by the Franklin County Water District.[4] Construction on Franklin County Dam began in July of 1968, with deliberate impoundment beginning on July 7, 1970. The project was completed on February 15, 1971.[3] Lake Cypress Springs serves mainly as water supply storage for municipal and industrial uses. Additional pertinent data about Franklin County Dam and Lake Cypress Springs can be found in Table 1.

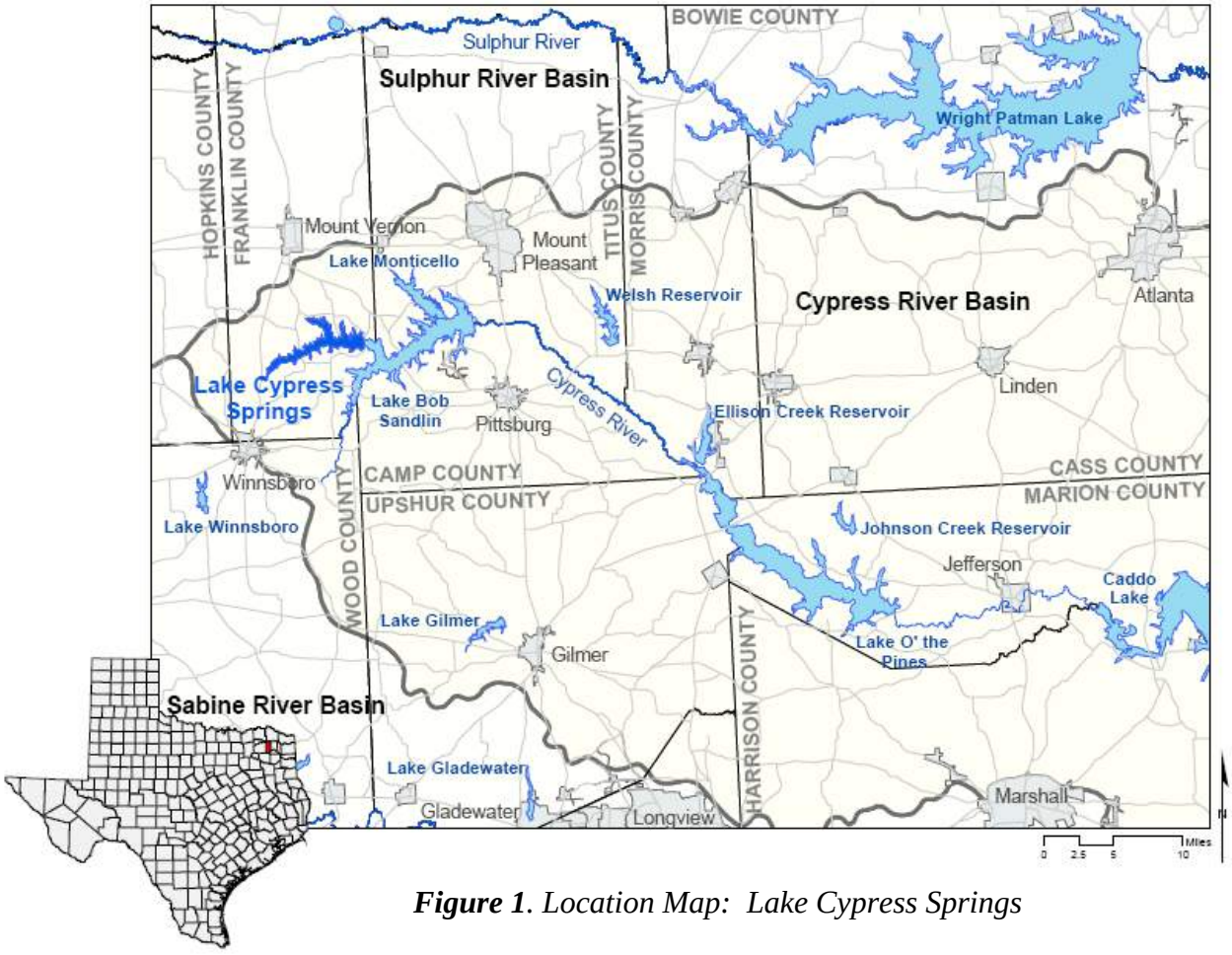


Figure 1. *Location Map: Lake Cypress Springs*

Table 1. Pertinent Data for Franklin County Dam and Lake Cypress Springs[3]

Owner	
Franklin County Water District	
Engineer (Design)	
Wisenbaker, Fix, and Associates	
Location of Dam	
On Big Cypress Creek in Franklin County, 8 miles southeast of Mount Vernon	
Drainage Area	
75 square miles	
Dam	
Type	Earthfill
Length	5,230 feet
Maximum Height	74 feet
Top Width	44 feet
Top elevation (varies)	395.0 to 397.0± feet above mean sea level
Spillway (emergency)	
Location	To left of the dam
Type	Excavated and graded area
Crest length	1,000 feet
Crest elevation	385.0 feet above mean sea level (NGVD29)
Spillway (service)	
Location	Right end of main embankment
Type	Rectangular drop inlet, 23 by 23 feet
Control	None
Crest elevation	378.0 feet above mean sea level (NGVD29)
Outlet	Box culvert, 10 by 10 feet
Discharge	To stilling basin
Outlet Works	
Type	Concrete pipe, 18-inch diameter
Invert elevation	317.75 feet above mean sea level (NGVD29)
Control	Duplicate valves with vertical stems
Discharge	To service spillway conduit

Water Rights

The water rights for Lake Cypress Springs have been appropriated to the Franklin County Water District through Certificate of Adjudication No. 04-4560 and its amendments. A brief summary of the certificate and each amendment follows. The complete certificates are on file in the Records Division of the Texas Commission on Environmental Quality.

Certificate of Adjudication No. 04-4560
Issued: October 13, 1986

Authorizes the Franklin County Water District to maintain an existing dam and reservoir (Lake Cypress Springs) and impound therein a maximum of 72,800 acre-feet of water. Franklin County Water District is authorized to divert and use up to 9,300 acre-feet of water per year for municipal purposes, of which 5,000 acre-feet of water may be diverted

into the Sabine River Basin and 2,185 acre-feet into the Sulphur River Basin, 5,940 acre-feet of water per year for industrial purposes, and up to 60 acre-feet per year for irrigation purposes. The impounded water may also be used for recreational purposes. The priority dates of the owners' rights are January 31, 1966 for Lake Cypress Springs and the transbasin diversion of 1,000 acre-feet of water directed to the City of Mount Vernon for municipal purposes; July 20, 1970 for the diversion and use of 60 acre-feet of water per year for irrigation purposes, 8,300 acre-feet per year for municipal purposes, of which 4,173 acre-feet per year relates to transbasin diversion, and 5,940 acre-feet per year for industrial purposes; October 6, 1980 for an increase of the diversion rate from 27.0 cubic feet per second to 40.4 cubic feet per second and to transfer 2,012 acre-feet for municipal use from the Cypress Creek Basin to the Sabine River Basin; and April 18, 1983 for the increase of the diversion rate from 40.4 cubic feet per second to 161.5 cubic feet per second.

Amendment to Certificate of Adjudication No. 04-4560A
Granted: December 12, 1989

Authorizes a change in purpose of use of 300 acre-feet of the 5,940 acre-feet of water per annum for industrial use to irrigation use; thereby authorizing the Franklin County Water District to divert and use a maximum of 5,640 acre-feet of water per year for industrial purposes and 360 acre-feet per year for irrigation purposes. The time priority for these diversions remains July 20, 1970.

Amendment to Certificate of Adjudication No. 04-4560B
Granted: June 5, 1998

In lieu of the Franklin County Water District's authorization to divert and use from Lake Cypress Springs a maximum 2,050 acre-feet of water per year for industrial use, 360 acre-feet per year for irrigation use, and 9,300 acre-feet of water per year for municipal purposes (of which 2,185 acre-feet may be used in the Sulphur River Basin), Franklin County Water District is authorized to divert and use a maximum 11,500 acre-feet of water per year for municipal purposes (of which 4,385 acre-feet of water per year may be used in the Sulphur River Basin) and 210 acre-feet of water per year for irrigation purposes.

Volumetric and Sediment Survey of Lake Cypress Springs

Introduction

The Texas Water Development Board's (TWDB) Hydrographic Survey Program was authorized by the state legislature in 1991. The Texas Water Code authorizes TWDB to perform surveys to determine reservoir storage capacity, sedimentation levels, rates of sedimentation, and projected water supply availability.

In 2007, TWDB entered into agreement with the U.S. Army Corps of Engineers, Fort Worth District, for the purpose of performing a volumetric and sediment survey of Lake Cypress Springs. This survey was performed using a single-beam multi-frequency (200 kHz, 50 kHz, and 24 kHz) sub-bottom profiling depth sounder. The 200 kHz return indicates the current bathymetric surface, while the combination of the three frequencies is analyzed for evidence of sediment accumulation throughout the reservoir. Sediment core samples are collected in order to validate the interpretation of the multi-frequency acoustic signals and to verify the identification of the reservoir bathymetric surface at the time of initial impoundment.

Datum

The vertical datum used during this survey is that used by the United States Geological Survey (USGS) for the reservoir elevation gauge USGS 07344484 Lk Cypress Spgs nr Mount Vernon, TX.[5] The datum for this gauge is reported as National Geodetic Vertical Datum 1929 (NGVD29) or mean sea level, thus elevations reported here are in feet above mean sea level. Volume and area calculations in this report are referenced to water levels provided by the USGS gauge. The horizontal datum used for this report is NAD83 State Plane Texas North Central Zone.

TWDB Bathymetric Data Collection

Bathymetric data collection for Lake Cypress Springs occurred on June 21st, June 27th-June 29th, July 10th, and July 11th of 2007, while the water surface elevation ranged between 378.22 feet and 379.42 feet above mean sea level (NGVD29). For data collection, TWDB used a Specialty Devices, Inc., multi-frequency (200 kHz, 50 kHz, and 24 kHz)

sub-bottom profiling depth sounder integrated with Differential Global Positioning System (DGPS) equipment. Data collection occurred while navigating along pre-planned range lines oriented perpendicular to the assumed location of the original river channels and spaced approximately 500 feet apart. The depth sounder was calibrated daily using a velocity profiler to measure the speed of sound in the water column and a weighted tape or stadia rod for depth reading verification. During the 2007 survey, team members collected 70,445 data points over cross-sections totaling nearly 72 miles in length. Figure 2 shows where data points were collected during the TWDB 2007 survey.

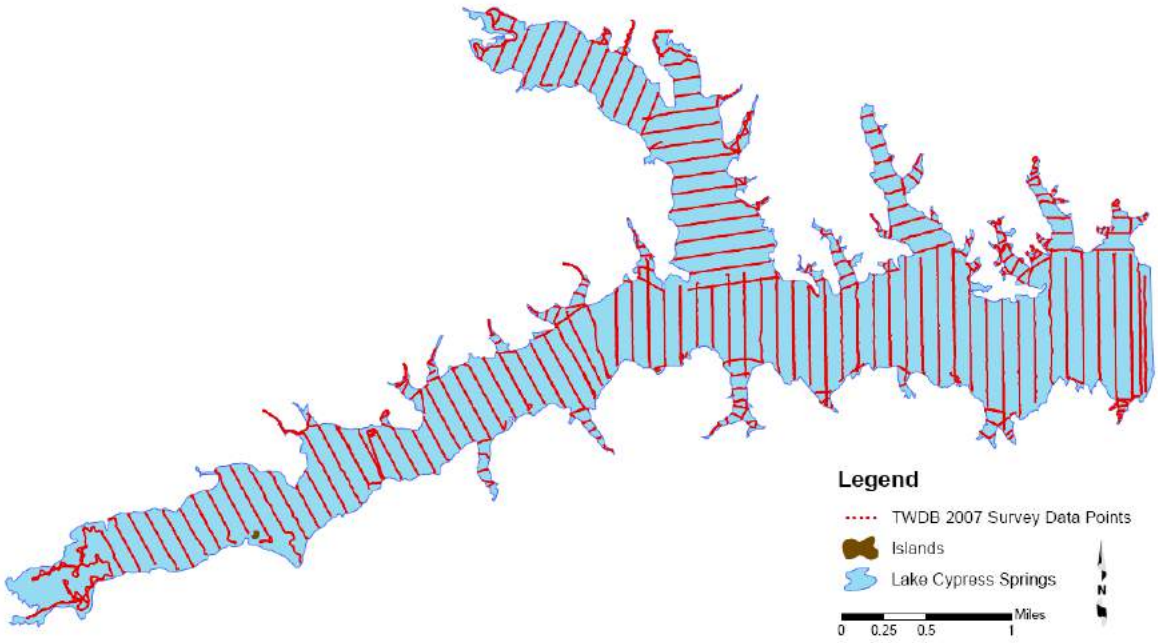


Figure 2. *Data points collected during TWDB 2007 Survey*

Data Processing

Model Boundaries

The reservoir boundary was digitized from aerial photographs, or digital orthophoto quarter-quadrangle images (DOQQs)[6,7], using Environmental Systems Research Institute's (ESRI) ArcGIS 9.1 software. The quarter-quadrangles that cover Lake Cypress Springs are Purley SE, New Hope NW, New Hope NE, New Hope SW, and New Hope SE. These images were photographed on September 30, 2004, during which time the water surface elevation at Lake Cypress Springs measured 376.98 feet above mean sea level (NGVD29). Although the water surface elevation measured approximately one foot below conservation pool elevation at the time of the photos, TWDB determined that there was not a significant

difference in lake area between 376.98 feet and 378.00 feet, as discernable from the photographs and given the photographs have a 1-meter resolution. Therefore, the Lake Cypress Springs boundary was digitized from the land water interface in the aerial photos and labeled 378.00 feet to allow area and volume to be calculated to the conservation pool elevation.

Triangulated Irregular Network (TIN) Model

Upon completion of data collection, the raw data files collected by TWDB were edited using DepthPic and HydroEdit to remove any data anomalies. DepthPic is used to display, interpret, and manually-edit the multi-frequency data, while HydroEdit is used to automatically edit the multi-frequency data and to convert the depth measurements to bathymetric elevations using the known water surface elevation at the time of each sounding. For processing outside of DepthPic and HydroEdit, the sounding coordinates (X,Y,Z) are exported as a MASS points file. TWDB also created a MASS points file of interpolated data located in-between surveyed cross sections. This points file is described in the section entitled "Self-Similar Interpolation."

To create a surface representation of the Lake Cypress Springs bathymetry, the 3D Analyst Extension[8] of ArcGIS (ESRI, Inc.) is used. With this extension, a triangulated irregular network (TIN) model of the bathymetry is created following the Delaunay[8] criteria, where each MASS point and boundary node becomes the vertex of a triangular portion of the reservoir bottom surface. From the TIN model, reservoir capacities and areas are calculated at one-tenth of a foot (0.1 foot) intervals, from elevation 325.0 feet to elevation 378.0 feet.

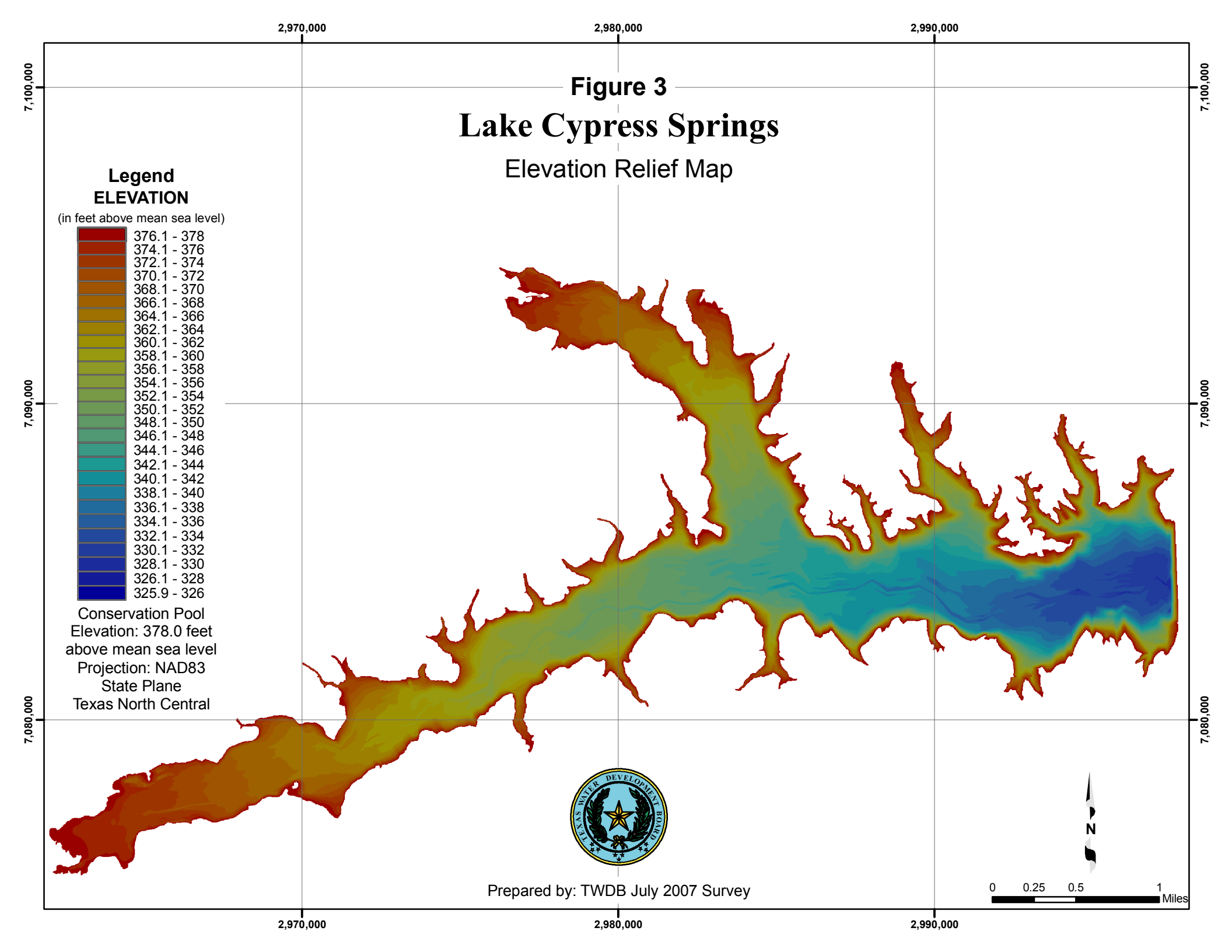
The Elevation-Capacity and Elevation-Area Tables, updated for 2007, are presented in Appendices A and B, respectively. An Elevation-Area-Capacity graph is presented in Appendix C.

The TIN model was interpolated and averaged using a cell size of 1 foot by 1 foot and converted to a raster. The raster was used to produce Figure 3, an Elevation Relief Map representing the topography of the reservoir bottom, Figure 4, a map showing shaded depth ranges for Lake Cypress Springs, and Figure 5, a 5-foot contour map (attached).

Figure 3

Lake Cypress Springs

Elevation Relief Map

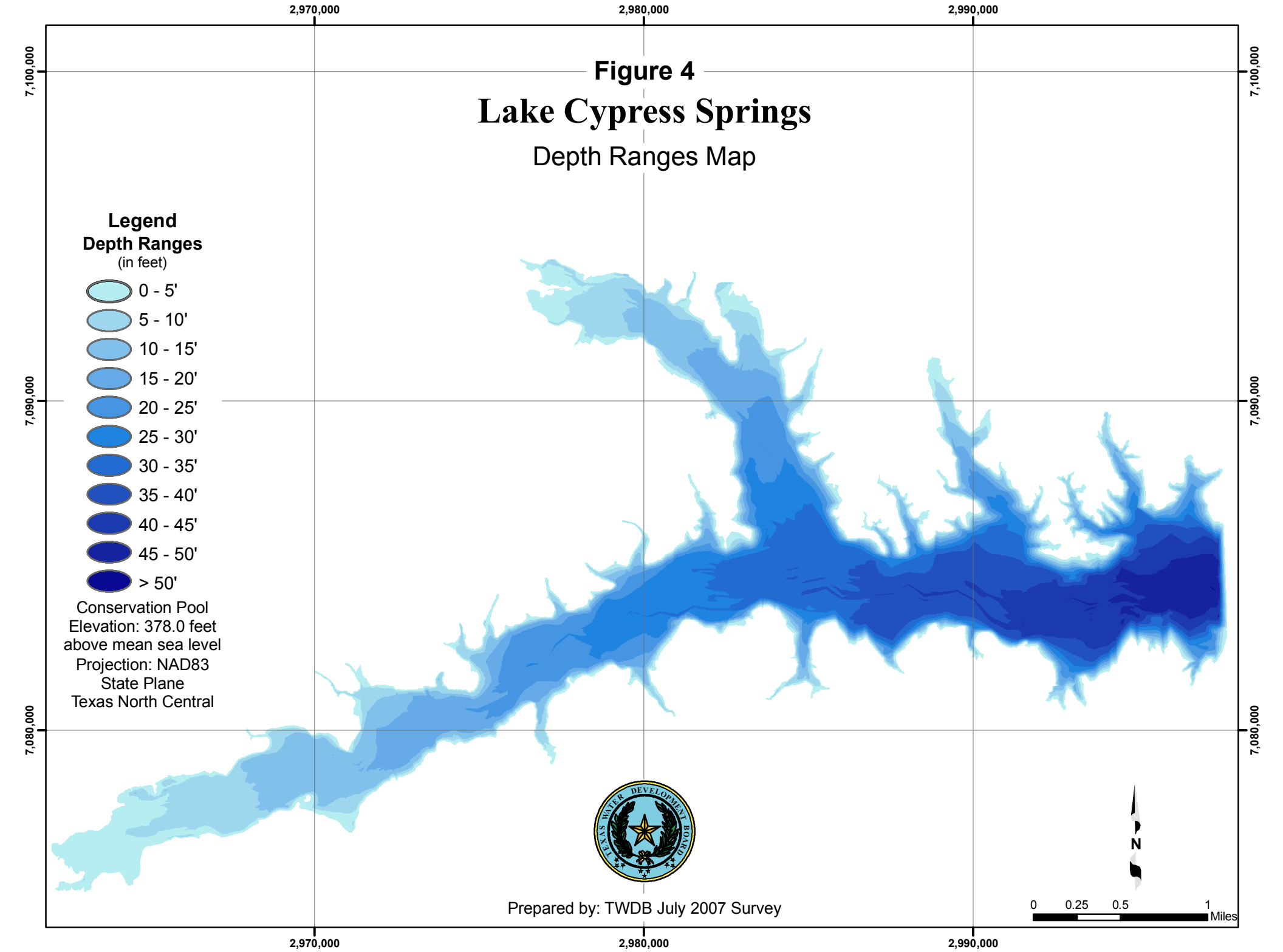


Prepared by: TWDB July 2007 Survey

Figure 4

Lake Cypress Springs

Depth Ranges Map



Prepared by: TWDB July 2007 Survey

Self-Similar Interpolation

A limitation of the Delaunay method for triangulation when creating TIN models results in artificially-curved contour lines extending into the reservoir where the reservoir walls are steep and the reservoir is relatively narrow. These curved contours are likely a poor representation of the true reservoir bathymetry in these areas. Also, if the surveyed cross sections are not perpendicular to the centerline of submerged river channel (the location of which is often unknown until after the survey), then the TIN model is not likely to well-represent the true channel bathymetry.

To ameliorate these problems, a self-similar interpolation routine (developed by TWDB) was used to interpolate the bathymetry in between many 500 foot-spaced survey lines. The self-similar interpolation technique effectively increases the density of points input into the TIN model, and directs the TIN interpolation to better represent the reservoir topography.[9] In the case of Lake Cypress Springs, the application of self-similar interpolation helped represent the lake morphology near the banks and improved the representation of the submerged river channel (Figure 6). In areas where obvious geomorphic features indicate a high-probability of cross-section shape changes (e.g. incoming tributaries, significant widening/narrowing of channel, etc.), the assumptions used in applying the self-similar interpolation technique are not likely to be valid; therefore, self-similar interpolation was not used in areas of Lake Cypress Springs where a high probability of change between cross-sections exists.[9] Figure 6 illustrates typical results of the application of the self-similar interpolation technique in Lake Cypress Springs, and the bathymetry shown in Figure 6C was used in computing reservoir capacity and area tables (Appendix A, B).

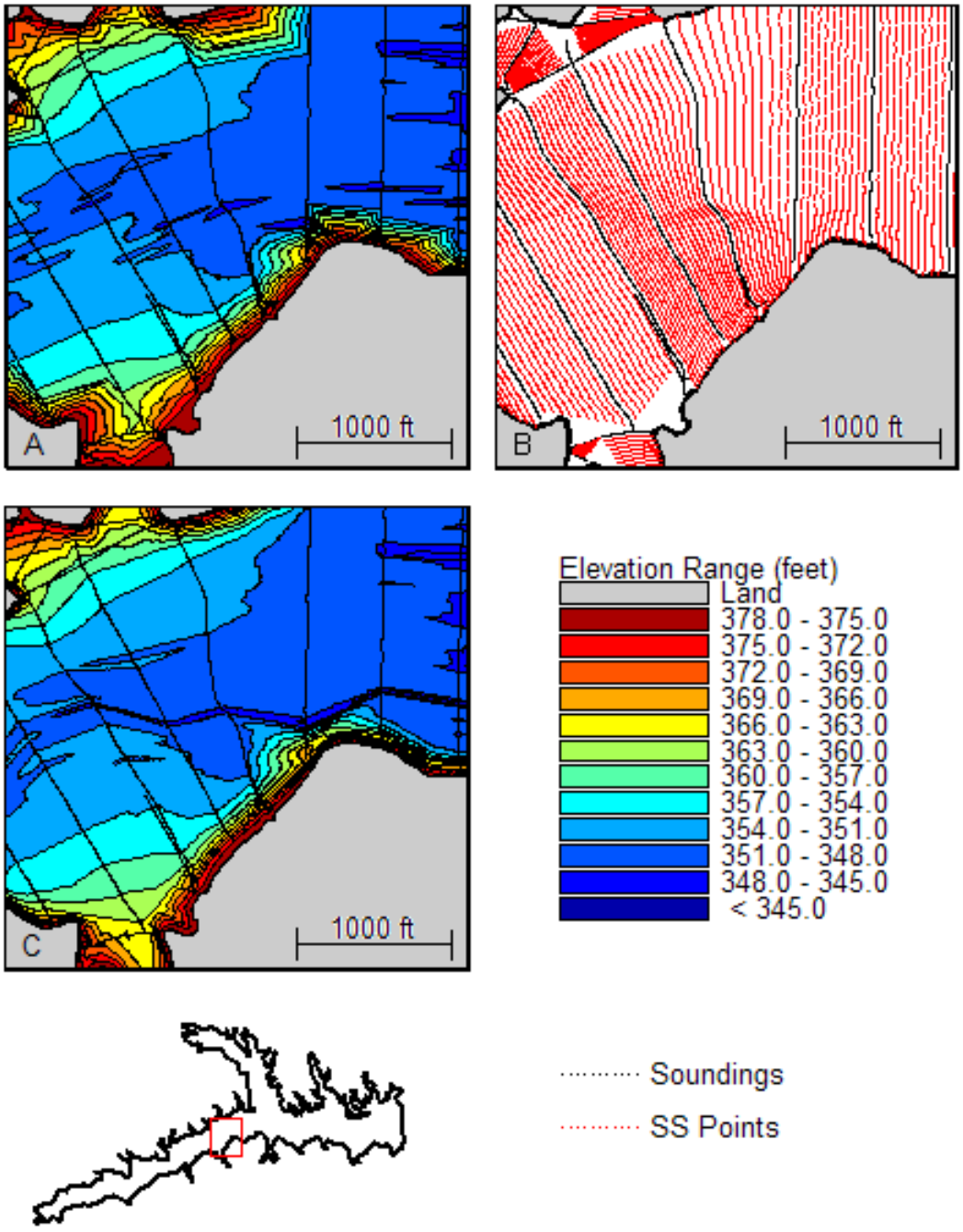


Figure 6 *Application of the Self-Similar Interpolation technique to Lake Cypress Springs 2007 sounding data – A) bathymetric contours without interpolated points, B) Sounding points (black) and interpolated points (red) with reservoir boundary shown at elevation 378.0 feet (black), C) bathymetric contours with the interpolated points. Note: In 6A the steep banks indicated by the surveyed cross sections are not represented for the areas in-between the cross sections. This is an artifact of the TIN generation routine when data points are too far apart. Inclusion of the interpolated points (6C) corrects this and smoothes the bathymetric contours. The submerged river channel is also apparent in 6C where it is discontinuous in 6A.*

Volumetric Survey Results - 2007

The results of the TWDB 2007 Volumetric Survey indicate Lake Cypress Springs has a total reservoir capacity of 66,756 acre-feet and encompasses 3,252 acres at conservation pool elevation (378.0 feet above mean sea level, NGVD29). In 1998 TWDB estimated the capacity of Lake Cypress Springs (at conservation pool elevation) at 67,690 acre-feet.[1] Due to differences in the methodologies used in calculating areas and capacities from this and previous Lake Cypress Springs surveys, comparison of these values is not recommended.[2] The TWDB considers the 2007 survey to be a significant improvement over previous methods and recommends that a similar methodology be used to resurvey Lake Cypress Springs in 10 to 20 years or after a major flood event.

Sediment Survey Results - 2007

The 200 kHz, 50 kHz, and 24 kHz frequency data were used to interpret sediment distribution and accumulation throughout Lake Cypress Springs. Figure 7 shows the thickness of sediment throughout the lake. To assist in the interpretation of post-impoundment sediment accumulation, ancillary data was collected in the form of five core samples. Sediment cores were collected on May 20, 2008 using a Specialty Devices, Inc. VibeCore system.

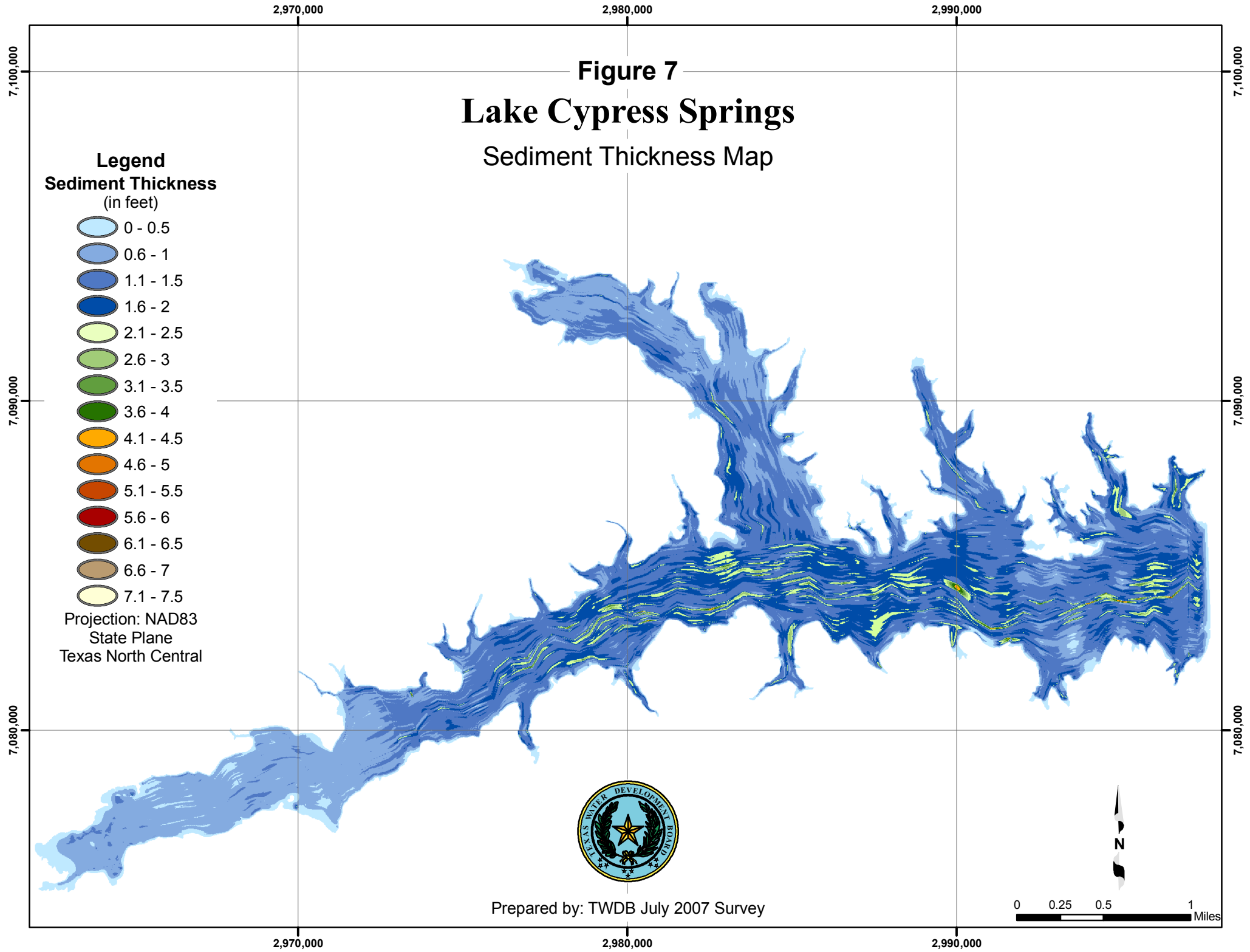
The results of the TWDB 2007 Sediment Survey indicate Lake Cypress Springs has accumulated 3,807 acre-feet of sediment since impoundment in 1970. Based on this measured sediment volume and assuming a constant sediment accumulation rate, Lake Cypress Springs loses approximately 100 acre-feet of capacity per year. The majority of the sediment accumulation has occurred within the main body of the lake, with the thickest deposits in the submerged Big Cypress Creek channel. The maximum sediment thickness observed in Lake Cypress Springs was 7.2 feet.

A complete description of the sediment measurement methodology and sample results is presented in Appendix D.

Figure 7

Lake Cypress Springs

Sediment Thickness Map



Prepared by: TWDB July 2007 Survey

TWDB Contact Information

More information about the Hydrographic Survey Program can be found at:

http://www.twdb.state.tx.us/assistance/lakesurveys/volumetricindex.asp

Any questions regarding the TWDB Hydrographic Survey Program may be addressed to:

Barney Austin, Ph.D., P.E.
Director of the Surface Water Resources Division
Phone: (512) 463-8856
Email: Barney.Austin@twdb.state.tx.us

Or

Jason Kemp
Team Leader, TWDB Hydrographic Survey Program
Phone: (512) 463-2465
Email: Jason.Kemp@twdb.state.tx.us

References

1. Texas Water Development Board (1998) “Volumetric Survey of Lake Cypress Springs”

2. United States Department of Agriculture, Natural Resource Conservation Service, National Engineering Handbook, Section 3, Sedimentation, Chapter 7, Field Investigations and Surveys, December 1983.

3. Texas Water Development Board, Report 126, Engineering Data on Dams and Reservoirs in Texas, Part I, October 1974.

4. Franklin County Water District, viewed March 18, 2008, http://www.fcwd.com/.

5. United States Geological Survey, http://tx.usgs.gov/ 07 June 2006.

6. Texas Natural Resources Information System (TNRIS), viewed 31 October 2007, http://www.tnris.state.tx.us/.

7. U.S Department of Agriculture, Farm Service Agency, Aerial Photography Field Office, National Agriculture Imagery Program, viewed February 10, 2006 http://www.apfo.usda.gov/NAIP.html.

8. ESRI, Environmental Systems Research Institute. 1995. ARC/INFO Surface Modeling and Display, TIN Users Guide.

9. Furnans, Jordan. Texas Water Development Board. 2006. “HydroEdit User’s Manual.”

Appendix A

Lake Cypress Springs

RESERVOIR CAPACITY TABLE

TEXAS WATER DEVELOPMENT BOARD — JULY 2007 SURVEY

CAPACITY IN ACRE-FEET — Conservation Pool Elevation 378.0 Feet NGVD29

ELEVATION INCREMENT IS ONE TENTH FOOT

ELEVATION in Feet	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
325	0	0	0	0	0	0	0	0	0	0
326	0	0	0	0	0	0	0	0	0	0
327	0	0	0	0	0	0	0	0	0	0
328	0	0	0	0	0	0	0	0	0	0
329	0	1	1	1	1	1	1	1	1	1
330	2	2	2	2	3	3	4	5	6	7
331	9	10	12	14	16	19	22	25	29	33
332	37	42	47	53	59	66	74	82	90	99
333	109	119	130	141	153	165	178	191	205	219
334	233	249	264	280	296	313	330	348	366	384
335	403	422	441	461	481	502	523	545	567	589
336	613	636	660	684	708	733	759	784	810	836
337	863	890	917	945	974	1,003	1,032	1,062	1,092	1,122
338	1,153	1,184	1,216	1,248	1,280	1,313	1,346	1,380	1,414	1,449
339	1,484	1,520	1,556	1,592	1,629	1,667	1,705	1,744	1,783	1,823
340	1,863	1,904	1,946	1,989	2,032	2,077	2,122	2,168	2,215	2,262
341	2,310	2,359	2,408	2,458	2,508	2,559	2,611	2,662	2,715	2,768
342	2,821	2,875	2,930	2,985	3,040	3,097	3,153	3,211	3,269	3,327
343	3,386	3,445	3,505	3,566	3,627	3,689	3,751	3,814	3,877	3,942
344	4,006	4,072	4,138	4,204	4,271	4,338	4,406	4,475	4,544	4,613
345	4,683	4,753	4,824	4,896	4,968	5,041	5,115	5,190	5,265	5,341
346	5,418	5,496	5,574	5,653	5,733	5,813	5,895	5,977	6,059	6,142
347	6,226	6,311	6,396	6,482	6,569	6,656	6,744	6,833	6,922	7,012
348	7,103	7,194	7,287	7,380	7,474	7,569	7,664	7,760	7,857	7,954
349	8,052	8,150	8,249	8,349	8,449	8,550	8,651	8,753	8,855	8,958
350	9,062	9,166	9,270	9,375	9,481	9,587	9,694	9,801	9,910	10,019
351	10,128	10,239	10,349	10,461	10,573	10,686	10,799	10,913	11,028	11,143
352	11,259	11,376	11,493	11,611	11,729	11,848	11,968	12,088	12,209	12,331
353	12,453	12,576	12,700	12,824	12,949	13,075	13,201	13,328	13,456	13,584
354	13,712	13,842	13,972	14,102	14,233	14,365	14,497	14,630	14,764	14,898
355	15,033	15,168	15,305	15,442	15,580	15,719	15,858	15,998	16,139	16,280
356	16,422	16,565	16,708	16,852	16,997	17,143	17,289	17,436	17,583	17,732
357	17,881	18,031	18,181	18,332	18,484	18,636	18,789	18,943	19,097	19,251
358	19,407	19,563	19,720	19,877	20,035	20,194	20,353	20,513	20,673	20,835
359	20,997	21,159	21,322	21,486	21,650	21,816	21,981	22,148	22,315	22,482
360	22,651	22,820	22,990	23,160	23,331	23,503	23,676	23,850	24,024	24,199
361	24,374	24,551	24,728	24,906	25,084	25,264	25,444	25,625	25,807	25,990
362	26,174	26,358	26,543	26,729	26,915	27,102	27,290	27,478	27,667	27,857
363	28,047	28,238	28,430	28,623	28,816	29,010	29,205	29,400	29,597	29,794
364	29,992	30,191	30,391	30,591	30,793	30,995	31,198	31,402	31,606	31,812
365	32,018	32,225	32,433	32,642	32,852	33,063	33,275	33,488	33,702	33,917
366	34,133	34,350	34,568	34,786	35,006	35,226	35,447	35,669	35,892	36,116
367	36,342	36,568	36,795	37,023	37,253	37,483	37,714	37,947	38,180	38,414
368	38,649	38,885	39,123	39,360	39,599	39,839	40,080	40,321	40,563	40,807
369	41,051	41,296	41,542	41,788	42,036	42,284	42,534	42,784	43,035	43,287
370	43,540	43,794	44,048	44,304	44,560	44,817	45,076	45,335	45,594	45,855
371	46,116	46,379	46,642	46,906	47,171	47,437	47,704	47,972	48,240	48,510
372	48,781	49,053	49,325	49,599	49,874	50,150	50,426	50,704	50,983	51,262
373	51,543	51,825	52,107	52,391	52,675	52,961	53,248	53,536	53,824	54,114
374	54,405	54,698	54,991	55,285	55,580	55,876	56,173	56,472	56,772	57,072
375	57,374	57,676	57,980	58,284	58,589	58,895	59,201	59,508	59,816	60,124
376	60,433	60,743	61,053	61,364	61,676	61,988	62,301	62,615	62,929	63,244
377	63,560	63,876	64,193	64,511	64,829	65,148	65,468	65,789	66,110	66,433
378	66,756									

Appendix B

Lake Cypress Springs

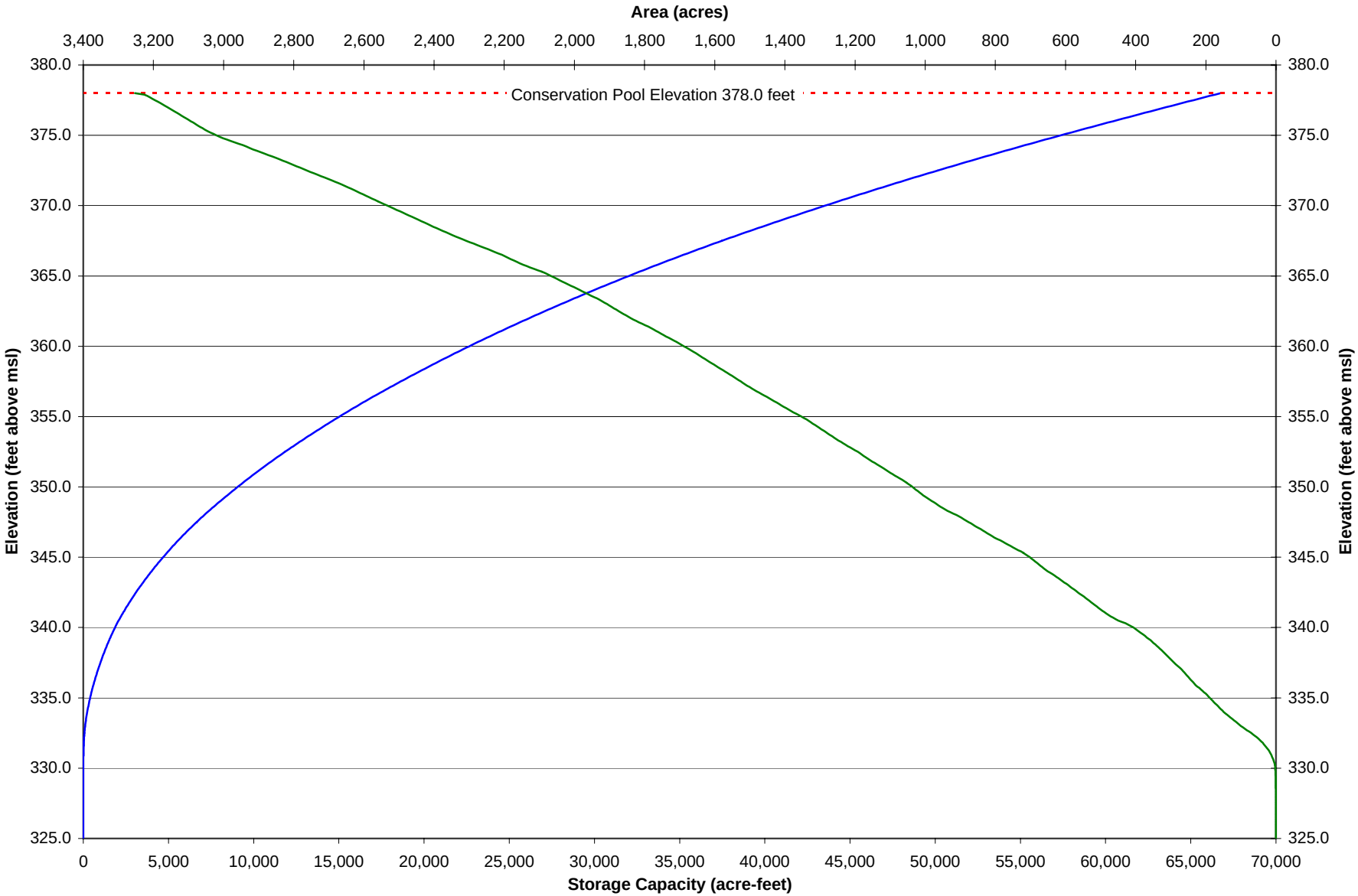
RESERVOIR AREA TABLE

TEXAS WATER DEVELOPMENT BOARD — JULY 2007 SURVEY

AREA IN ACRES — Conservation Pool Elevation 378.0 Feet NGVD29

ELEVATION INCREMENT IS ONE TENTH FOOT

ELEVATION in Feet	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
325	0	0	0	0	0	0	0	0	0	0
326	0	0	0	0	0	0	0	0	0	0
327	0	0	0	0	0	0	0	0	0	0
328	0	0	0	0	0	0	0	0	0	1
329	1	1	1	1	1	1	1	1	2	2
330	2	2	3	4	5	6	8	9	11	13
331	15	17	19	21	25	28	31	35	38	42
332	46	51	55	60	66	71	77	83	88	94
333	100	105	109	114	119	125	130	135	139	144
334	149	153	157	161	165	169	173	177	181	185
335	189	193	196	200	205	209	214	219	224	229
336	233	236	240	243	247	250	254	257	261	265
337	268	273	277	282	286	290	294	298	302	306
338	310	314	318	322	327	331	335	340	345	349
339	353	358	364	369	373	378	385	390	395	401
340	407	413	421	429	441	449	457	465	472	478
341	484	489	495	501	506	511	516	522	527	532
342	537	542	548	553	560	565	570	575	581	586
343	592	597	603	609	615	620	626	631	638	645
344	650	656	662	667	672	677	682	687	692	697
345	702	707	713	720	726	734	742	750	757	764
346	772	779	786	795	803	809	816	822	829	836
347	842	849	856	863	870	876	883	890	897	903
348	911	920	929	937	944	950	957	963	969	975
349	981	988	994	1,000	1,005	1,011	1,016	1,021	1,026	1,031
350	1,037	1,042	1,048	1,053	1,059	1,065	1,072	1,079	1,086	1,093
351	1,099	1,105	1,111	1,118	1,124	1,131	1,137	1,144	1,151	1,157
352	1,163	1,170	1,175	1,181	1,186	1,193	1,200	1,207	1,213	1,220
353	1,227	1,234	1,240	1,247	1,253	1,260	1,266	1,272	1,278	1,284
354	1,290	1,296	1,302	1,308	1,314	1,320	1,326	1,332	1,339	1,346
355	1,353	1,360	1,368	1,375	1,383	1,390	1,397	1,404	1,410	1,417
356	1,424	1,431	1,438	1,445	1,452	1,459	1,466	1,473	1,480	1,487
357	1,495	1,501	1,507	1,514	1,520	1,526	1,532	1,538	1,544	1,551
358	1,557	1,564	1,570	1,577	1,583	1,590	1,596	1,602	1,609	1,616
359	1,622	1,629	1,635	1,641	1,647	1,654	1,660	1,667	1,674	1,680
360	1,688	1,695	1,702	1,709	1,716	1,723	1,731	1,739	1,746	1,753
361	1,760	1,767	1,775	1,782	1,790	1,798	1,807	1,816	1,824	1,832
362	1,839	1,847	1,854	1,861	1,867	1,874	1,881	1,887	1,894	1,900
363	1,907	1,914	1,921	1,928	1,936	1,944	1,953	1,961	1,969	1,977
364	1,985	1,993	2,002	2,010	2,018	2,026	2,034	2,042	2,050	2,058
365	2,066	2,075	2,083	2,093	2,103	2,115	2,126	2,136	2,146	2,155
366	2,164	2,173	2,182	2,190	2,198	2,207	2,216	2,227	2,237	2,247
367	2,256	2,267	2,278	2,288	2,298	2,308	2,318	2,329	2,338	2,347
368	2,356	2,366	2,375	2,384	2,393	2,402	2,411	2,419	2,428	2,436
369	2,445	2,454	2,463	2,471	2,480	2,489	2,498	2,507	2,515	2,524
370	2,533	2,542	2,551	2,560	2,568	2,577	2,585	2,594	2,602	2,611
371	2,619	2,628	2,637	2,645	2,654	2,664	2,673	2,682	2,692	2,702
372	2,713	2,723	2,733	2,743	2,753	2,762	2,772	2,782	2,792	2,801
373	2,811	2,821	2,831	2,840	2,851	2,862	2,873	2,883	2,894	2,906
374	2,916	2,926	2,935	2,945	2,957	2,969	2,980	2,992	3,002	3,011
375	3,021	3,030	3,038	3,046	3,053	3,060	3,067	3,074	3,080	3,087
376	3,093	3,100	3,107	3,113	3,120	3,126	3,133	3,140	3,147	3,153
377	3,160	3,167	3,174	3,181	3,188	3,195	3,203	3,210	3,218	3,226
378	3,252									



Lake Cypress Springs
July 2007 Survey
Prepared by: TWDB

Appendix C: Area and Capacity Curves

Appendix D

Analysis of Sediment Accumulation Data from Lake Cypress Springs

Executive Summary

The results of the TWDB 2007 Sedimentation Survey indicate Lake Cypress Springs has accumulated 3,807 acre-feet of sediment since impoundment in 1970. Based on this measured sediment volume and assuming a constant rate of sediment accumulation, Lake Cypress Springs loses approximately 100 acre-feet of capacity per year. The majority of the sediment accumulation has occurred within the main body of the lake, with the thickest deposits in the submerged Big Cypress Creek channel. The maximum sediment thickness observed in Lake Cypress Springs was 7.2 feet.

Introduction

This appendix includes the results of the sediment investigation using multi-frequency depth sounder data collected on June 21st, June 27th-June 29th, July 10th, and July 11th of 2007 by the Texas Water Development Board (TWDB). Through careful analysis and interpretation of the multi-frequency signal returns, it is possible to discern the pre-impoundment bathymetric surface, as well as the current surface and sediment thickness. Such interpretations are aided and validated through comparisons with sediment core samples which provide independent measurements of sediment thickness. On May 20, 2008 TWDB collected five core samples of the impoundment bottom throughout the reservoir. The remainder of this appendix presents a discussion of the results from and methodology used in the core sampling and multi-frequency data collection efforts, followed by a composite analysis of sediment measured in Lake Cypress Springs.

Data Collection & Processing Methodology

TWDB conducted the Lake Cypress Springs bathymetric survey on June 21st, June 27th-June 29th, July 10th, and July 11th of 2007, while the water surface elevation ranged between 378.22 feet and 379.42 feet above mean sea level (NGVD29). For all data collection efforts, TWDB used a Specialty Devices, Inc., multi-frequency (200 kHz, 50 kHz, and 24 kHz) sub-bottom profiling depth sounder integrated with Differential Global Positioning System (DGPS) equipment. Data collection occurred while navigating along pre-planned range lines oriented perpendicular to the assumed location of the original river channels and spaced approximately 500 feet apart. For all data collection efforts, the depth sounder was calibrated daily using a velocity profiler to measure the speed of sound in the water column and a weighted tape or stadia rod for depth reading verification. During the 2007 survey, team members collected 70,445 data points over cross-sections totaling nearly 72 miles in length. Figure E1 shows where data points were collected during the TWDB 2007 survey. The coordinates and a description of each core sample are provided in Table E1.

Core samples collected by TWDB were collected at locations where sounding data had been previously collected (Figure E1). All cores were collected with a custom-coring boat and SDI VibraCore system. Cores were analyzed by TWDB, and both the sediment thickness and the distance the core penetrated the pre-impoundment boundary were recorded. Figure E2 shows the cross-section of sediment core #1. At this location, TWDB collected 18” of sediment, with the upper sediment layers (Figure E2) having a high water content, consisting of clay material and lacking in vegetation. The pre-impoundment boundary was evident from this core at a distance of 10” above the core base; above this location, the moisture content in the sediment greatly increases (Figure E2).

Table D1 – Core Sampling Analysis Data

Core	Easting** (ft)	Northing** (ft)	Description
1	2984546.46	7083312.15	18” of muddy sediment with plant material visible.
2	2972427.51	7079991.96	18” of alternating muddy and sandy sediment, dry clay found 32” below pre-impoundment boundary
3	2968465.25	7077895.17	15” of clay sediment, dark color with orange spots.
4	2983536.81	7089095.45	12” of wet, fine grained sediment (clay)
5	2995017.84	7086446.74	16” of sediment with little plant material visible.

** Coordinates are based on NAD 1983 State Plane Texas North Central system

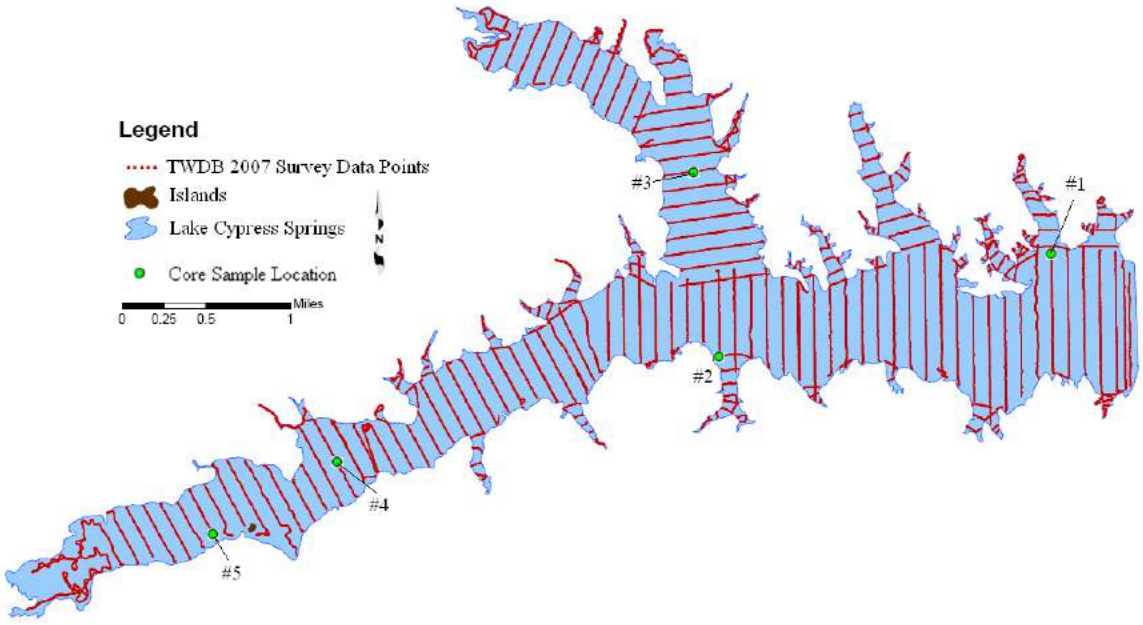


Figure E1 – TWDB 2007 survey data points for Lake Cypress Springs

Figure E2 – Upper portion of core #1 from Lake Cypress Springs, showing the pre-impoundment boundary 10" above the base of the core (left).

All sounding data is processed using the DepthPic software, within which both the pre-impoundment and current bathymetric surfaces are identified and digitized manually. These surfaces are first identified along cross-sections for which core samples have been collected – thereby allowing the user to identify color bands in the DepthPic display that correspond to the sediment layer(s) observed in the core samples. This process is illustrated in Figure E3 where core sample #1 is shown with its corresponding sounding data. Core sample #1 contained 18" of sediment above the pre-impoundment bathymetry, as indicated by the yellow & green boxes, respectively, representing the core sample in Figure E3. The pre-impoundment surface is usually identified within the core sample by one of the following methods: (1) a visual examination of the core for in-place terrestrial materials, such as leaf litter, tree bark, twigs, intact roots, etc., concentrations of which tend to occur on or just below the pre-impoundment surface, (2) changes in texture from well sorted, relatively fine-grained sediment to poorly sorted mixtures of coarse and fine-grained materials, and (3) variations in the physical properties of the sediment, particularly sediment water content and penetration resistance with depth.

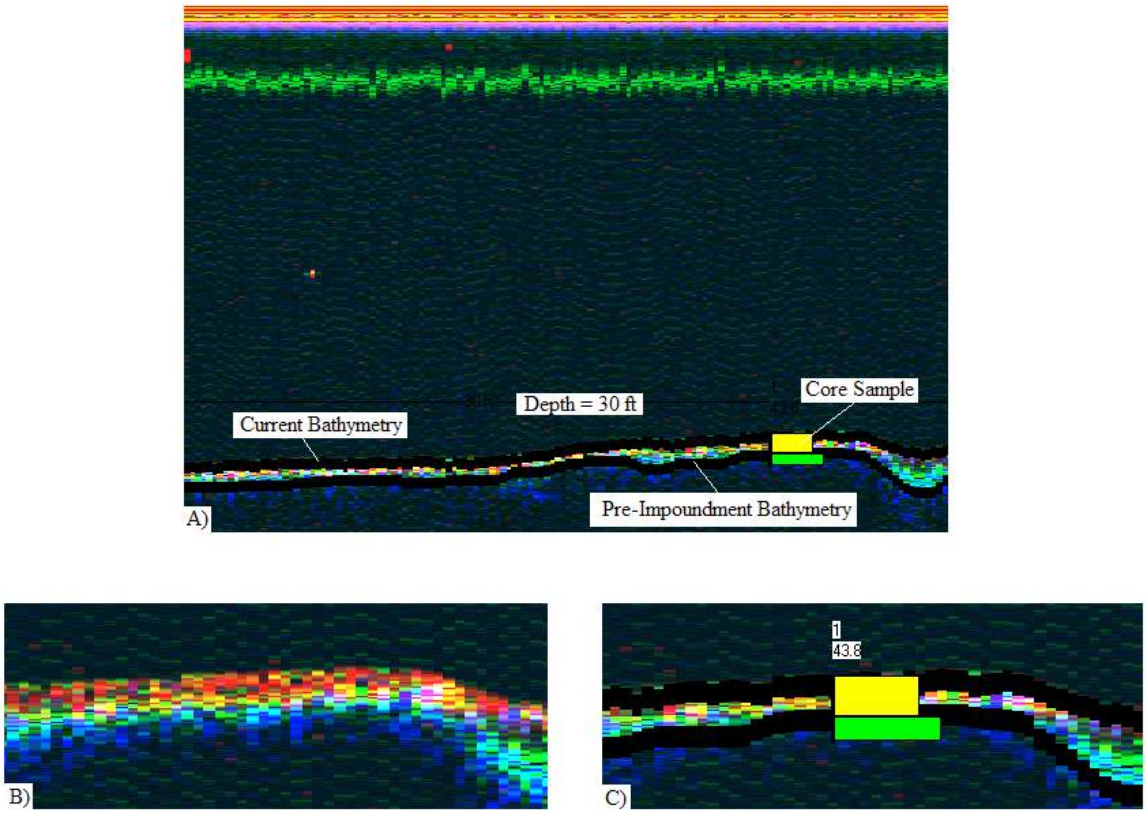


Figure E3 – DepthPic & core sample use in identifying the pre-impoundment bathymetry.

Within DepthPic, the current surface is automatically determined based on the signal returns from the 200 kHz transducer. The pre-impoundment surface must be determined visually based on the pixel color display and any available core sample data. Based on core sample #1, it is clear that the pre-impoundment bathymetric surface for this cross-section may be identified as the base of the bright-colored blue pixels in the DepthPic display. The top of the sediment layer is also clearly identifiable as the band of red and green pixels (Figure E3).

In analyzing data from cross-sections where core samples were not collected, the assumption is made that sediment layers may be identified in a similar manner as when core sample data is available. To improve the validity of this assumption, core samples are collected at regularly spaced intervals within the lake, or at locations where interpretation of the DepthPic display would be difficult without site-specific core data. For this reason, all sounding data is collected and reviewed before core sites are selected and cores are collected.

After manually digitizing the pre-impoundment surface from all cross-sections, both the pre-impoundment and current bathymetric surfaces are exported as X-,Y-,Z-coordinates from DepthPic into text files suitable for use in ArcGIS. Within ArcGIS, the sounding points are then processed into TIN models following standard GIS techniques[1].

Results

The results of the TWDB 2007 Sediment Survey indicate Lake Cypress Springs has accumulated 3,807 acre-feet of sediment since impoundment in 1970. Based on this measured sediment volume and assuming a constant sediment accumulation rate, Lake Cypress Springs loses approximately 100 acre-feet of capacity per year. The majority of the sediment accumulation has occurred within the main body of the lake, with the thickest deposits in the submerged Big Cypress Creek channel. The maximum sediment thickness observed in Lake Cypress Springs was 7.2 feet.

The accumulated sediment volume for Lake Cypress Springs was calculated from a sediment thickness TIN model created in ArcGIS. Sediment thicknesses were computed as the difference in elevations between the current and pre-impoundment bathymetric surfaces as determined with the DepthPic software. Sediment thicknesses were interpolated for locations between surveyed cross-sections using the TWDB self-similar interpolation technique[2]. For the purposes of the TIN model creation, TWDB assumed 0-feet sediment thicknesses at the model boundaries (defined as the 378.0 foot NGVD29 elevation contour). Figure E4 depicts the sediment thickness in Lake Cypress Springs.

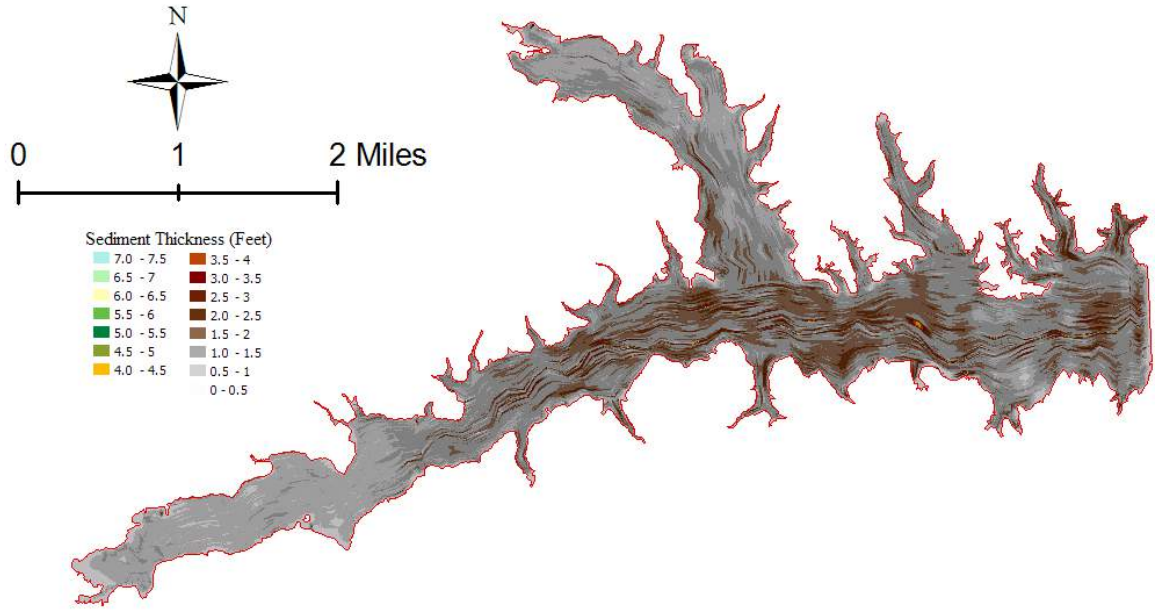


Figure E4 - Sediment thicknesses in Lake Cypress Springs derived from multi-frequency sounding data.

References

1. Furnans, J., Austin, B., Hydrographic survey methods for determining reservoir volume, Environmental Modelling & Software (2007), doi: 10.1016/j.envsoft.2007.05.011
2. Furnans, Jordan. Texas Water Development Board. 2006. "HydroEdit User's Manual."

Figure 5

Lake Cypress Springs - 5' Contour Map

CONTOURS
(in feet above mean sea level)

- 375
- 370
- 365
- 360
- 355
- 350
- 345
- 340
- 335
- 330

Islands

Lake Cypress Springs

Conservation Pool Elevation:
378 feet above mean seal level

Projection: NAD83
State Plane
Texas North Central

This map is the product of a survey conducted by the Texas Water Development Board's Hydrographic Survey Program to determine the capacity of Lake Cypress Springs. The Texas Water Development Board makes no representation or assumes any liability.

2,970,000 2,980,000 2,990,000

7,080,000

N

0 0.25 0.5 1 Miles

Prepared by: TEXAS WATER DEVELOPMENT BOARD July 2007 Survey

Franklin County

September 22, 2009

Mr. David Weidman
General Manager
Franklin County Water District
P.O. Box 559
Mount Vernon, Texas 75457

RE: Franklin County Dam
Emergency Spillway
FCW06129

Dear Mr. Weidman:

As we discussed at your August Board Meeting, we have performed a frequency analysis for Lake Cypress Springs (Franklin County Dam). The primary purpose of the frequency analysis is to determine at what level the emergency spillway for the dam engages.

We used the hydrologic model we developed for the Probable Maximum Flood analysis which was used in the Breach Analysis for the Dam.

Franklin County Dam has a drainage area of 75 square miles. The dam is a compacted earthfill structure with a top of dam elevation between 395 and 397 feet msl. The service spillway consists of a rectangular drop inlet structure which discharges through a 10-foot by 10-foot conduit downstream into Lake Bob Sandlin. The normal pool elevation is maintained at the crest of the spillway at elevation 378 feet msl. The emergency spillway is located on the north side of the reservoir and has a crest elevation of 385 feet msl.

The rainfall runoff model which was used in the analysis was HEC-HMS, which was developed by the Corps of Engineers to simulate the precipitation runoff process.

Rainfall data for the various frequency events was obtained from Hydro-35 for the 5-, 15-, and 60-minute durations and from TP-40 for the 2-, 3-, 6-, 12-, and 24-hour durations. Data were generated for the 2-, 5-, 10-, 25-, 50-, 100-, and 500-year events.

Runoff hydrographs were developed using the rainfall data. These hydrographs are used to determine the peak lake level during the various frequency events.

The following table summarizes the results of the analyses.

Event	Peak Elevation (feet msl)
2-year	379.2
5-year	379.57
10-year	379.98
25-year	380.62
50-year	381.40
100-year	382.35
500-year	384.77

Since the crest of your emergency spillway is located at 385 feet msl, a flood event in excess of a 500-year event would be needed before the emergency spillway will engage.

As we discussed at the Board Meeting this is the first step in looking at the possibility of lowering the emergency spillway. As I mentioned, when the emergency spillway does engage, there will very likely be some required repairs effort. If the spillway discharges too frequently, this effort can be costly and is something that is not intended to be done on a frequent basis. In general a discharge through the emergency spillway should be set to occur at a frequency in excess of the 100-year event.

Some of the key points regarding changing the elevation of the spillway we discussed are as follows:

- A survey of the structures around the lake is needed to determine which elevation the most houses would benefit from lowering the spillway for the cost.
- Lowering the spillway will involve the reconstruction of the county road which crosses the emergency spillway.
- Depending on the configuration, additional property between the emergency spillway and Lake Bob Sandlin may need to be either purchased or have a flow easement obtained.

Any modifications to the emergency spillway will need to be submitted to and approved by the Texas Commission on Environmental Quality.

Please feel free to contact us if you have any questions. You can reach me at 817-735-7345 or jcm@freese.com.

Yours Very Truly,

Janis C. Murphy, P.E.

[FCW06129] T:\LET\letter DWeidman 092109.docx

FREESE AND NICHOLS, INC.
TEXAS REGISTERED
ENGINEERING FIRM
F-2144

APPENDIX E

DETAILED OPCC

Lake Cypress Springs Structural Alternatives Costs
DRAFT Opinion of Probable Construction Cost (OPCC)
ALTERNATIVE 1
Project Number: 10070A.00

PROPOSED COSTS	
OPTION 1A	
Invert Elevation of Culvert Pipes	378.0 ft
Culvert Opening (W)	10.0 ft
Culvert Opening (L)	4.0 ft
Culvert Length	100.0 ft
Number of Barrels	71 barrels
Canal Length	2000.0 LF

Item #		Description	Est. Qu. #	Unit	Estimated Unit Price $	Estimated Cost
START-UP & SW3P ITEMS						
1		**Mobilization, Security, and SW3P Items**				
	A	Mobilization. Shown as a percentage of total construction minus mobilization	3	%	$21,050,881	$631,526.43
	B	Installation of filter fabric fence, complete in place, maintained during entire project and removed at final completion of project.	2,000	LF	$3	$6,000
	C	Installation of stabilized construction entrance and access road, complete in place and maintained during entire project.	1	LS	$5,000	$5,000
					START-UP & SW3P ITEMS SUBTOTAL	**$642,526**
CANAL ITEMS*						
1		**Canal within emergency spillway boundary**				
	A	Excavation of proposed canal. Includes necessary site preparation and proper disposal onsite at identified portion of the emergency spillway that can likely receive fill (pending hydraulic modeling).	591,667	CY	$6.50	$3,845,833
	B	Site preparation for concrete canal slope pavement. Includes necessary cofferdam system and dewatering for dry excavation. Includes placement of compacted subgrade material, aggregate, and erosion protection, with geotextile installation, and rip-rap or concrete toe. Includes backslope drainage system.	79,302	SY	$15	$1,189,537
	C	Canal concrete slope pavement lining. Assumed 6" thick and 3:1 slope.	26,296	CY	$80.00	$2,103,704
	F	Installation of 18-inch thick limestone rip-rap for erosion protection including, geotextile, placement of material, and any backfill necessary, complete in place.	36	CY	$1,000.00	$35,500
					CANAL ITEMS* SUBTOTAL	**$7,174,574**
ROAD CROSSING ITEMS						
1		**Culvert Crossing of Co Rd SE 3122**				
	A	Demolition, removal and proper disposal offsite of existing asphalt roadway, fencing, culvert pipe, and existing appurtenant structures for preparation of bridge crossing construction.	1	ALLOW	$25,000.00	$25,000
	B	Installation of pre-cast culvert pipes, including, but not limited to excavation, shoring, backfill, bedding, grouting, pipeline connections, post- installation inspection, and all other incidentals, complete in place.	71	BARRELS	$134,200.00	$9,528,200
	C	Installation of reinforced concrete headwalls, wingwalls and floor slabs for culvert pipes including all site preparation, excavation, reinforcing steel, temporary forms, water stops, placement of concrete, toe walls, footings, any backfill necessary, and all other incidentals, complete in place.	1	LS	$250,000.00	$250,000
	D	Installation of 18-inch thick limestone rip-rap for all structures, and culverts including, geotextile, placement of material, and any backfill necessary, complete in place.	7	CY	$1,000.00	$7,407
	E	Repair of roadway, including all site preparation, placement of asphalt, and any backfill necessary, and all other incidentals, complete in place.	126,500	SF	$11.00	$1,391,500
	F	Guard Rail Fabrication & Installation as shown on Drawings, including all fastening hardware, complete in place	2,330	LF	$40.00	$93,200
					ROAD CROSSING ITEMS SUBTOTAL	**$11,295,307**
CLOSEOUT ITEMS AND OTHER ITEMS						
1		Installation, maintenance and removal dewatering system. (Includes water control inside cofferdam and trench, well points, and all other related incidentals necessary to achieve installation in the dry.)	760	LF	$1,000	$760,000
2		Grass carp metal screening device material and installation, including placement and installation of support system on culverts	71	BARRELS	$25,000.00	$1,775,000
3		Hydro mulch revegetation and restoration.	10	AC	$3,500.00	$35,000
					CLOSEOUT ITEMS AND OTHER ITEMS SUBTOTAL	**$2,570,000**
DESIGN FEES (SURVEY, GEOTECH, ENGINEERING, ETC.)						
1		**Engineering Design**				
	A	ENGINEERING DESIGN. Shown as a percentage of total construction cost.	8	%	$21,682,408	$1,734,592.60
	B	CONSTRUCTION MANAGEMENT. Shown as a percentage of total construction cost.	4	%	$21,682,408	$867,296.30
	C	SURVEY. Shown as a percentage of total construction cost.	2	%	$21,682,408	$433,648.15
	D	ENGINEERING TESTING. Shown as a percentage of total construction cost.	1	%	$21,682,408	$216,824.08
2		**Environmental Permitting**				
	A	Wetland Determination and Delineation	1	LS	$22,500.00	$22,500
	B	Threatened and Endangered Species Critical Habitat Surveys	1	LS	$75,000	$75,000
	C	Stream Assessment	1	LS	$50,000	$50,000
3		**Other Analysis**				
	A	Hydrologic and hydrauilic analysis (H&H) for downstream impacts	1	LS	$250,000	$250,000
	B	Water quality assessment for downstream impacts	1	LS	$85,000	$85,000
					DESIGN SUBTOTAL:	**$3,734,861**

MAJOR ITEMS		
	START-UP & SW3P ITEMS	$642,526
	CANAL ITEMS*	$7,174,574
	ROAD CROSSING ITEMS	$11,295,307
	CLOSEOUT ITEMS AND OTHER ITEMS	$2,570,000
	DESIGN FEES (SURVEY, GEOTECH, ENGINEERING, ETC.)	$3,734,861
	CONTINGENCY	**20%** $5,083,453.74
	PROPOSED OPINION OF TOTAL ESTIMATED COST:	**$30,501,000**

PROPOSED COSTS FOR: OPTION 1A

Table of Qualifiers	
*	Canal modifications assumed to only be necessary on LCS Side of Dam. Andy's Creek modifications are likely required for hydrauilics but are not computed here.
	On-site haul was assumed to mean fill from areas needing excavation and placed within the existing emergency spillway boundary.
1	Costs were derived from previous bid amounts and engineering judgment. Some of the construction costs were derived from the average low-bid unit prices from TxDOT statewide on a 3-month moving average. Some costs are based on best engineering knowledge of historical pricing.
2	Carollo is not responsible for fluctuation in cost of material, labor components or unforeseen contingencies. The cost estimate has been prepared at the request of the client prior to the finalization of plans and specifications and, therefore is subject to change.
3	This statement of probability of costs are made on the basis of professional experience and qualifications. This represents Carollo's best judgment as a professional design consultant familiar with the construction industry.
4	This is a cost estimate only. These figures are supplied as a guide only. Experience indicates that a fewer number of bidders may result in higher bids, conversely an increased number of bidders may result in more competitive bids.
5	In examining tasks with regard to cost, because this estimate is for the purpose of planning, estimated tasks are based on engineering judgment and historical knowledge. Also, the cost to complete each task should be considered high-level and subject to change as detailed information (survey, environmental, permitting, funding, etc.) is developed. Methods of analysis used in the development of this cost estimate are consistent with a planning level of this detail. The cost required to complete these tasks is intended only as 1) a guide for preliminary and follow-on detailed engineering and 2) a basis for preliminary estimate of time to complete the intended modifications. While procedures consistent with this cost estimate are generally employed, approximations and engineering judgment was used because of the planning level nature of this exercise and the unpredictability of specific cost items.

Lake Cypress Springs Structural Alternatives Costs
DRAFT Opinion of Probable Construction Cost (OPCC)
ALTERNATIVE 1
Project Number: 10070A.00

PROPOSED COSTS	
OPTION 1B	
Invert Elevation of Culvert Pipes	378.0 ft
Culvert Opening (W)	10.0 ft
Culvert Opening (L)	4.0 ft
Culvert Length	100.0 ft
Number of Barrels	203 barrels
Canal Length	2000.0 LF

Item #		Description	Est. Qu. #	Unit	Estimated Unit Price $	Estimated Cost
START-UP & SW3P ITEMS						
1		**Mobilization, Security, and SW3P Items**				
	A	Mobilization. Shown as a percentage of total construction minus mobilization	3	%	$59,054,792	$1,771,643.77
	B	Installation of filter fabric fence, complete in place, maintained during entire project and removed at final completion of project.	6,000	LF	$2	$12,000
	C	Installation of stabilized construction entrance and access road, complete in place and maintained during entire project.	1	LS	$5,000	$5,000
					START-UP & SW3P ITEMS SUBTOTAL	**$1,788,644**
CANAL ITEMS*						
1		**Canal within emergency spillway boundary**				
	A	Excavation of proposed canal. Includes necessary site preparation and proper disposal onsite at identified portion of the emergency spillway that can likely receive fill (pending hydraulic modeling).	1,691,667	CY	$6.50	$10,995,833
	B	Site preparation for concrete canal slope pavement. Includes necessary cofferdam system and dewatering for dry excavation. Includes placement of compacted subgrade material, aggregate, and erosion protection, with geotextile installation, and rip-rap or concrete toe. Includes backslope drainage system.	225,969	SY	$15	$3,389,537
	C	Canal concrete slope pavement lining. Assumed 6" thick and 3:1 slope.	75,185	CY	$80.00	$6,014,815
	F	Installation of 18-inch thick limestone rip-rap for erosion protection including, geotextile, placement of material, and any backfill necessary, complete in place.	102	CY	$1,000.00	$101,500
					CANAL ITEMS* SUBTOTAL	**$20,501,685**
ROAD CROSSING ITEMS						
1		**Culvert Crossing of Co Rd SE 3122**				
	A	Demolition, removal and proper disposal offsite of existing asphalt roadway, fencing, culvert pipe, and existing appurtenant structures for preparation of bridge crossing construction.	1	ALLOW	$25,000.00	$25,000
	B	Installation of pre-cast culvert pipes, including, but not limited to excavation, shoring, backfill, bedding, grouting, pipeline connections, post- installation inspection, and all other incidentals, complete in place.	203	BARRELS	$134,200.00	$27,242,600
	C	Installation of reinforced concrete headwalls, wingwalls and floor slabs for culvert pipes including all site preparation, excavation, reinforcing steel, temporary forms, water stops, placement of concrete, toe walls, footings, any backfill necessary, and all other incidentals, complete in place.	1	LS	$250,000.00	$250,000
	D	Installation of 18-inch thick limestone rip-rap for all structures, and culverts including, geotextile, placement of material, and any backfill necessary, complete in place.	7	CY	$1,000.00	$7,407
	E	Repair of roadway, including all site preparation, placement of asphalt, and any backfill necessary, and all other incidentals, complete in place.	324,500	SF	$11.00	$3,569,500
	F	Guard Rail Fabrication & Installation as shown on Drawings, including all fastening hardware, complete in place	6,290	LF	$40.00	$251,600
					ROAD CROSSING ITEMS SUBTOTAL	**$31,346,107**
CLOSEOUT ITEMS AND OTHER ITEMS						
1		Installation, maintenance and removal dewatering system. (Includes water control inside cofferdam and trench, well points, and all other related incidentals necessary to achieve installation in the dry.)	2,080	LF	$1,000	$2,080,000
2		Grass carp metal screening device material and installation, including placement and installation of support system on culverts	203	BARRELS	$25,000.00	$5,075,000
3		Hydro mulch revegetation and restoration.	10	AC	$3,500.00	$35,000
					CLOSEOUT ITEMS AND OTHER ITEMS SUBTOTAL	**$7,190,000**
DESIGN FEES (SURVEY, GEOTECH, ENGINEERING, ETC.)						
1		**Engineering Design**				
	A	ENGINEERING DESIGN. Shown as a percentage of total construction cost.	8	%	$60,826,436	$4,866,114.88
	B	CONSTRUCTION MANAGEMENT. Shown as a percentage of total construction cost.	4	%	$60,826,436	$2,433,057.44
	C	SURVEY. Shown as a percentage of total construction cost.	2	%	$60,826,436	$1,216,528.72
	D	ENGINEERING TESTING. Shown as a percentage of total construction cost.	1	%	$60,826,436	$608,264.36
2		**Environmental Permitting**				
	A	Wetland Determination and Delineation	1	%	$2,021,644	$20,216.44
	B	Threatened and Endangered Species Critical Habitat Surveys	1	%	$2,021,644	$20,216.44
	C	Stream Assessment	1	%	$2,021,644	$20,216.44
3		**Other Analysis**				
	A	Hydrologic and hydrauilic analysis (H&H) for downstream impacts	1	%	$2,021,644	$20,216.44
	B	Water quality assessment for downstream impacts	1	%	$2,021,644	$20,216.44
					DESIGN SUBTOTAL:	**$9,225,048**

MAJOR ITEMS		PROPOSED COSTS FOR: OPTION 1B	
	START-UP & SW3P ITEMS		$1,788,644
	CANAL ITEMS*		$20,501,685
	ROAD CROSSING ITEMS		$31,346,107
	CLOSEOUT ITEMS AND OTHER ITEMS		$7,190,000
	DESIGN FEES (SURVEY, GEOTECH, ENGINEERING, ETC.)		$9,225,048
	CONTINGENCY		**20%** $14,010,296.72
	PROPOSED OPINION OF TOTAL ESTIMATED COST:		**$84,062,000**

Table of Qualifiers	
*	Canal modifications assumed to only be necessary on LCS Side of Dam. Andy's Creek modifications are likely required for hydrauilics but are not computed here.
	On-site haul was assumed to mean fill from areas needing excavation and placed within the existing emergency spillway boundary.
1	Costs were derived from previous bid amounts and engineering judgment. Some of the construction costs were derived from the average low-bid unit prices from TxDOT statewide on a 3-month moving average. Some costs are based on best engineering knowledge of historical pricing.
2	Carollo is not responsible for fluctuation in cost of material, labor components or unforeseen contingencies. The cost estimate has been prepared at the request of the client prior to the finalization of plans and specifications and, therefore is subject to change.
3	This statement of probability of costs are made on the basis of professional experience and qualifications. This represents Carollo's best judgment as a professional design consultant familiar with the construction industry.
4	This is a cost estimate only. These figures are supplied as a guide only. Experience indicates that a fewer number of bidders may result in higher bids, conversely an increased number of bidders may result in more competitive bids.
5	In examining tasks with regard to cost, because this estimate is for the purpose of planning, estimated tasks are based on engineering judgment and historical knowledge. Also, the cost to complete each task should be considered high-level and subject to change as detailed information (survey, environmental, permitting, funding, etc.) is developed. Methods of analysis used in the development of this cost estimate are consistent with a planning level of this detail. The cost required to complete these tasks is intended only as 1) a guide for preliminary and follow-on detailed engineering and 2) a basis for preliminary estimate of time to complete the intended modifications. While procedures consistent with this cost estimate are generally employed, approximations and engineering judgment was used because of the planning level nature of this exercise and the unpredictability of specific cost items.

Lake Cypress Springs Structural Alternatives Costs
DRAFT Opinion of Probable Construction Cost (OPCC)
ALTERNATIVE 1
Project Number: 10070A.00

PROPOSED COSTS	
OPTION 1C	
Invert Elevation of Culvert Pipes	378.0 ft
Culvert Opening (W)	10.0 ft
Culvert Opening (L)	4.0 ft
Culvert Length	100.0 ft
Number of Barrels	243 barrels
Canal Length	2000.0 LF

Item #		Description	Est. Qu. #	Unit	Estimated Unit Price $	Estimated Cost
START-UP & SW3P ITEMS						
1		**Mobilization, Security, and SW3P Items**				
	A	Mobilization. Shown as a percentage of total construction minus mobilization	3	%	$70,571,311	$2,117,139.32
	B	Installation of filter fabric fence, complete in place, maintained during entire project and removed at final completion of project.	7,000	LF	$2	$14,000
	C	Installation of stabilized construction entrance and access road, complete in place and maintained during entire project.	1	LS	$5,000	$5,000
					START-UP & SW3P ITEMS SUBTOTAL	**$2,136,139**
CANAL ITEMS*						
1		**Canal within emergency spillway boundary**				
	A	Excavation of proposed canal. Includes necessary site preparation and proper disposal onsite at identified portion of the emergency spillway that can likely receive fill (pending hydraulic modeling).	2,025,000	CY	$6.50	$13,162,500
	B	Site preparation for concrete canal slope pavement. Includes necessary cofferdam system and dewatering for dry excavation. Includes placement of compacted subgrade material, aggregate, and erosion protection, with geotextile installation, and rip-rap or concrete toe. Includes backslope drainage system.	270,414	SY	$15	$4,056,203
	C	Canal concrete slope pavement lining. Assumed 6" thick and 3:1 slope.	90,000	CY	$80.00	$7,200,000
	F	Installation of 18-inch thick limestone rip-rap for erosion protection including, geotextile, placement of material, and any backfill necessary, complete in place.	122	CY	$1,000.00	$121,500
					CANAL ITEMS* SUBTOTAL	**$24,540,203**
ROAD CROSSING ITEMS						
1		**Culvert Crossing of Co Rd SE 3122**				
	A	Demolition, removal and proper disposal offsite of existing asphalt roadway, fencing, culvert pipe, and existing appurtenant structures for preparation of bridge crossing construction.	1	ALLOW	$25,000.00	$25,000
	B	Installation of pre-cast culvert pipes, including, but not limited to excavation, shoring, backfill, bedding, grouting, pipeline connections, post- installation inspection, and all other incidentals, complete in place.	243	BARRELS	$134,200.00	$32,610,600
	C	Installation of reinforced concrete headwalls, wingwalls and floor slabs for culvert pipes including all site preparation, excavation, reinforcing steel, temporary forms, water stops, placement of concrete, toe walls, footings, any backfill necessary, and all other incidentals, complete in place.	1	LS	$250,000.00	$250,000
	D	Installation of 18-inch thick limestone rip-rap for all structures, and culverts including, geotextile, placement of material, and any backfill necessary, complete in place.	7	CY	$1,000.00	$7,407
	E	Repair of roadway, including all site preparation, placement of asphalt, and any backfill necessary, and all other incidentals, complete in place.	384,500	SF	$11.00	$4,229,500
	F	Guard Rail Fabrication & Installation as shown on Drawings, including all fastening hardware, complete in place	7,490	LF	$40.00	$299,600
					ROAD CROSSING ITEMS SUBTOTAL	**$37,422,107**
CLOSEOUT ITEMS AND OTHER ITEMS						
1		Installation, maintenance and removal dewatering system. (Includes water control inside cofferdam and trench, well points, and all other related incidentals necessary to achieve installation in the dry.)	2,480	LF	$1,000	$2,480,000
2		Grass carp metal screening device material and installation, including placement and installation of support system on culverts	243	BARRELS	$25,000.00	$6,075,000
3		Hydro mulch revegetation and restoration.	10	AC	$3,500.00	$35,000
					CLOSEOUT ITEMS AND OTHER ITEMS SUBTOTAL	**$8,590,000**
DESIGN FEES (SURVEY, GEOTECH, ENGINEERING, ETC.)						
1		**Engineering Design**				
	A	ENGINEERING DESIGN. Shown as a percentage of total construction cost.	8	%	$72,688,450	$5,815,076.01
	B	CONSTRUCTION MANAGEMENT. Shown as a percentage of total construction cost.	4	%	$72,688,450	$2,907,538.00
	C	SURVEY. Shown as a percentage of total construction cost.	2	%	$72,688,450	$1,453,769.00
	D	ENGINEERING TESTING. Shown as a percentage of total construction cost.	1	%	$72,688,450	$726,884.50
2		**Environmental Permitting**				
	A	Wetland Determination and Delineation	1	%	$2,367,139	$23,671.39
	B	Threatened and Endangered Species Critical Habitat Surveys	1	%	$2,367,139	$23,671.39
	C	Stream Assessment	1	%	$2,367,139	$23,671.39
3		**Other Analysis**				
	A	Hydrologic and hydrauilic analysis (H&H) for downstream impacts	1	%	$2,367,139	$23,671.39
	B	Water quality assessment for downstream impacts	1	%	$2,367,139	$23,671.39
					DESIGN SUBTOTAL:	**$11,021,624**

MAJOR ITEMS		
START-UP & SW3P ITEMS	**PROPOSED COSTS FOR: OPTION 1C**	$2,136,139
CANAL ITEMS*		$24,540,203
ROAD CROSSING ITEMS		$37,422,107
CLOSEOUT ITEMS AND OTHER ITEMS		$8,590,000
DESIGN FEES (SURVEY, GEOTECH, ENGINEERING, ETC.)		$11,021,624
CONTINGENCY		**20%** $16,742,014.91
PROPOSED OPINION OF TOTAL ESTIMATED COST:		**$100,452,000**

Table of Qualifiers	
*	Canal modifications assumed to only be necessary on LCS Side of Dam. Andy's Creek modifications are likely required for hydrauilics but are not computed here.
	On-site haul was assumed to mean fill from areas needing excavation and placed within the existing emergency spillway boundary.
1	Costs were derived from previous bid amounts and engineering judgment. Some of the construction costs were derived from the average low-bid unit prices from TxDOT statewide on a 3-month moving average. Some costs are based on best engineering knowledge of historical pricing.
2	Carollo is not responsible for fluctuation in cost of material, labor components or unforeseen contingencies. The cost estimate has been prepared at the request of the client prior to the finalization of plans and specifications and, therefore is subject to change.
3	This statement of probability of costs are made on the basis of professional experience and qualifications. This represents Carollo's best judgment as a professional design consultant familiar with the construction industry.
4	This is a cost estimate only. These figures are supplied as a guide only. Experience indicates that a fewer number of bidders may result in higher bids, conversely an increased number of bidders may result in more competitive bids.
5	In examining tasks with regard to cost, because this estimate is for the purpose of planning, estimated tasks are based on engineering judgment and historical knowledge. Also, the cost to complete each task should be considered high-level and subject to change as detailed information (survey, environmental, permitting, funding, etc.) is developed. Methods of analysis used in the development of this cost estimate are consistent with a planning level of this detail. The cost required to complete these tasks is intended only as 1) a guide for preliminary and follow-on detailed engineering and 2) a basis for preliminary estimate of time to complete the intended modifications. While procedures consistent with this cost estimate are generally employed, approximations and engineering judgment was used because of the planning level nature of this exercise and the unpredictability of specific cost items.

Lake Cypress Springs Structural Alternatives Costs
DRAFT Opinion of Probable Construction Cost (OPCC)
ALTERNATIVE 2
Project Number: 10070A.00

PROPOSED COSTS	
OPTION 2A	
Invert Elevation of Culvert Pipes	378.0 ft
Culvert Opening (W)	10.0 ft
Culvert Opening (L)	10.0 ft
Culvert Length	100.0 ft
Crossing Length	250.0 ft
Number of Barrels	72 barrels
Canal Length	2000.0 LF

Item #		Description	Est. Qu. #	Unit	Estimated Unit Price $	Estimated Cost
START-UP & SW3P ITEMS						
1		**Mobilization, Security, and SW3P Items**				
	A	Mobilization. Shown as a percentage of total construction minus mobilization	3	%	$15,808,648	$474,259.45
	B	Installation of filter fabric fence, complete in place, maintained during entire project and removed at final completion of project.	2,000	LF	$3	$6,000
	C	Installation of stabilized construction entrance and access road, complete in place and maintained during entire project.	1	LS	$5,000	$5,000
					START-UP & SW3P ITEMS SUBTOTAL	**$485,259**
EMERGENCY SPILLWAY ITEMS						
1		**Return emergency spillway to former design**				
	A	Excavation of emergency spillway to return spillway to former engineering design. Includes necessary site preparation and proper disposal onsite at identified portion of the emergency spillway that can likely receive fill (pending additional hydraulic modeling).	53,829	CY	$6.50	$349,885
					EMERGENCY SPILLWAY ITEMS SUBTOTAL	**$349,885**
DAM CROSSING ITEMS						
1		**Culvert Crossing of Co Rd SE 3122**				
	A	Demolition, removal and proper disposal offsite of existing asphalt roadway, fencing, culvert pipe, and existing appurtenant structures for preparation of bridge crossing construction.	1	ALLOW	$25,000.00	$25,000
	B	Installation of pre-cast culvert pipes, including, but not limited to excavation, shoring, backfill, bedding, grouting, pipeline connections, post- installation inspection, and all other incidentals, complete in place.	72	BARRELS	$134,200.00	$9,662,400
	C	Installation of reinforced concrete headwalls, wingwalls and floor slabs for culvert pipes including all site preparation, excavation, reinforcing steel, temporary forms, water stops, placement of concrete, toe walls, footings, any backfill necessary, and all other incidentals, complete in place.	1	LS	$250,000.00	$250,000
	D	Dam backslope paving including all site preparation, excavation, reinforcing steel, temporary forms, water stops, placement of concrete, toe walls, footings, any backfill necessary, and all other incidentals, complete in place.	8,556	CY	$80.00	$684,444
	E	Installation of 18-inch thick limestone rip-rap for all structures, and culverts including, geotextile, placement of material, and any backfill necessary, complete in place.	19	CY	$1,000.00	$18,519
	F	Repair of roadway, including all site preparation, placement of asphalt, and any backfill necessary, and all other incidentals, complete in place.	128,000	SF	$11.00	$1,408,000
	G	Guard Rail Fabrication & Installation as shown on Drawings, including all fastening hardware, complete in place	2,360	LF	$40.00	$94,400
					DAM CROSSING ITEMS SUBTOTAL	**$12,142,763**
CLOSEOUT ITEMS AND OTHER ITEMS						
1		Installation, maintenance and removal dewatering system. (Includes water control inside cofferdam and trench, well points, and all other related incidentals necessary to achieve installation in the dry.)	770	LF	$1,000	$770,000
2		Grass carp metal screening device material and installation, including placement and installation of support system on culverts	100	BARRELS	$25,000.00	$2,500,000
2		Hydro mulch revegetation and restoration.	10	AC	$3,500.00	$35,000
					CLOSEOUT ITEMS AND OTHER ITEMS SUBTOTAL	**$3,305,000**
DESIGN FEES (SURVEY, GEOTECH, ENGINEERING, ETC.)						
1		**Engineering Design**				
	A	ENGINEERING DESIGN. Shown as a percentage of total construction cost.	8	%	$16,282,908	$1,302,632.61
	B	CONSTRUCTION MANAGEMENT. Shown as a percentage of total construction cost.	4	%	$16,282,908	$651,316.31
	C	SURVEY. Shown as a percentage of total construction cost.	2	%	$16,282,908	$325,658.15
	D	ENGINEERING TESTING. Shown as a percentage of total construction cost.	1	%	$16,282,908	$162,829.08
2		**Environmental Permitting**				
	A	Wetland Determination and Delineation	1	LS	$22,500.00	$22,500
	B	Threatened and Endangered Species Critical Habitat Surveys	1	LS	$75,000	$75,000
	C	Stream Assessment	1	LS	$50,000	$50,000
3		**Other Analysis**				
	A	Hydrologic and hydrauilic analysis (H&H) for downstream impacts	1	LS	$250,000	$250,000
	B	Water quality assessment for downstream impacts	1	LS	$85,000	$85,000
					DESIGN SUBTOTAL:	**$2,924,936**

MAJOR ITEMS		
START-UP & SW3P ITEMS	$485,259	
EMERGENCY SPILLWAY ITEMS	$349,885	
DAM CROSSING ITEMS	$12,142,763	
CLOSEOUT ITEMS AND OTHER ITEMS	$3,305,000	
DESIGN FEES (SURVEY, GEOTECH, ENGINEERING, ETC.)	$2,924,936	
CONTINGENCY	**20%**	$3,841,568.76

PROPOSED COSTS FOR: OPTION 2A	
	$485,259
	$349,885
	$12,142,763
	$3,305,000
	$2,924,936
20%	$3,841,568.76

PROPOSED OPINION OF TOTAL ESTIMATED COST: **$23,049,000**

Table of Qualifiers	
1	Costs were derived from previous bid amounts and engineering judgment. Some of the construction costs were derived from the average low-bid unit prices from TxDOT statewide on a 3-month moving average. Some costs are based on best engineering knowledge of historical pricing.
2	Carollo is not responsible for fluctuation in cost of material, labor components or unforeseen contingencies. The cost estimate has been prepared at the request of the client prior to the finalization of plans and specifications and, therefore is subject to change.
3	This statement of probability of costs are made on the basis of professional experience and qualifications. This represents Carollo's best judgment as a professional design consultant familiar with the construction industry.
4	This is a cost estimate only. These figures are supplied as a guide only. Experience indicates that a fewer number of bidders may result in higher bids, conversely an increased number of bidders may result in more competitive bids.
5	In examining tasks with regard to cost, because this estimate is for the purpose of planning, estimated tasks are based on engineering judgment and historical knowledge. Also, the cost to complete each task should be considered high-level and subject to change as detailed information (survey, environmental, permitting, funding, etc.) is developed. Methods of analysis used in the development of this cost estimate are consistent with a planning level of this detail. The cost required to complete these tasks is intended only as 1) a guide for preliminary and follow-on detailed engineering and 2) a basis for preliminary estimate of time to complete the intended modifications. While procedures consistent with this cost estimate are generally employed, approximations and engineering judgment was used because of the planning level nature of this exercise and the unpredictability of specific cost items.

Lake Cypress Springs Structural Alternatives Costs
DRAFT Opinion of Probable Construction Cost (OPCC)
ALTERNATIVE 2
Project Number: 10070A.00

PROPOSED COSTS	
OPTION 2B	
Invert Elevation of Culvert Pipes	378.0 ft
Culvert Opening (W)	10.0 ft
Culvert Opening (L)	10.0 ft
Culvert Length	100.0 ft
Crossing Length	250.0 ft
Number of Barrels	204 barrels
Canal Length	2000.0 LF

Item #		Description	Est. Qu. #	Unit	Estimated Unit Price $	Estimated Cost
START-UP & SW3P ITEMS						
1		**Mobilization, Security, and SW3P Items**				
	A	Mobilization. Shown as a percentage of total construction minus mobilization	3	%	$38,364,782	$1,150,943.45
	B	Installation of filter fabric fence, complete in place, maintained during entire project and removed at final completion of project.	6,000	LF	$3	$18,000
	C	Installation of stabilized construction entrance and access road, complete in place and maintained during entire project.	1	LS	$5,000	$5,000
					START-UP & SW3P ITEMS SUBTOTAL	**$1,173,943**
EMERGENCY SPILLWAY ITEMS						
1		**Return emergency spillway to former design**				
	A	Excavation of emergency spillway to return spillway to former engineering design. Includes necessary site preparation and proper disposal onsite at identified portion of the emergency spillway that can likely receive fill (pending additional hydraulic modeling).	53,829	CY	$6.50	$349,885
					EMERGENCY SPILLWAY ITEMS SUBTOTAL	**$349,885**
DAM CROSSING ITEMS						
1		**Culvert Crossing of Co Rd SE 3122**				
	A	Demolition, removal and proper disposal offsite of existing asphalt roadway, fencing, culvert pipe, and existing appurtenant structures for preparation of bridge crossing construction.	1	ALLOW	$25,000.00	$25,000
	B	Installation of pre-cast culvert pipes, including, but not limited to excavation, shoring, backfill, bedding, grouting, pipeline connections, post- installation inspection, and all other incidentals, complete in place.	204	BARRELS	$134,200.00	$27,376,800
	C	Installation of reinforced concrete headwalls, wingwalls and floor slabs for culvert pipes including all site preparation, excavation, reinforcing steel, temporary forms, water stops, placement of concrete, toe walls, footings, any backfill necessary, and all other incidentals, complete in place.	1	LS	$250,000.00	$250,000
	D	Dam backslope paving including all site preparation, excavation, reinforcing steel, temporary forms, water stops, placement of concrete, toe walls, footings, any backfill necessary, and all other incidentals, complete in place.	23,222	CY	$80.00	$1,857,778
	E	Installation of 18-inch thick limestone rip-rap for all structures, and culverts including, geotextile, placement of material, and any backfill necessary, complete in place.	19	CY	$1,000.00	$18,519
	F	Repair of roadway, including all site preparation, placement of asphalt, and any backfill necessary, and all other incidentals, complete in place.	326,000	SF	$11.00	$3,586,000
	G	Guard Rail Fabrication & Installation as shown on Drawings, including all fastening hardware, complete in place	6,320	LF	$40.00	$252,800
					DAM CROSSING ITEMS SUBTOTAL	**$33,366,896**
CLOSEOUT ITEMS AND OTHER ITEMS						
1		Installation, maintenance and removal dewatering system. (Includes water control inside cofferdam and trench, well points, and all other related incidentals necessary to achieve installation in the dry.)	2,090	LF	$1,000	$2,090,000
2		Grass carp metal screening device material and installation, including placement and installation of support system on culverts	100	BARRELS	$25,000.00	$2,500,000
2		Hydro mulch revegetation and restoration.	10	AC	$3,500.00	$35,000
					CLOSEOUT ITEMS AND OTHER ITEMS SUBTOTAL	**$4,625,000**
DESIGN FEES (SURVEY, GEOTECH, ENGINEERING, ETC.)						
1		**Engineering Design**				
	A	ENGINEERING DESIGN. Shown as a percentage of total construction cost.	8	%	$39,515,725	$3,161,258.00
	B	CONSTRUCTION MANAGEMENT. Shown as a percentage of total construction cost.	4	%	$39,515,725	$1,580,629.00
	C	SURVEY. Shown as a percentage of total construction cost.	2	%	$39,515,725	$790,314.50
	D	ENGINEERING TESTING. Shown as a percentage of total construction cost.	1	%	$39,515,725	$395,157.25
2		**Environmental Permitting**				
	A	Wetland Determination and Delineation	1	%	$18,519	$185.19
	B	Threatened and Endangered Species Critical Habitat Surveys	1	%	$18,519	$185.19
	C	Stream Assessment	1	%	$18,519	$185.19
3		**Other Analysis**				
	A	Hydrologic and hydrauilic analysis (H&H) for downstream impacts	1	%	$18,519	$185.19
	B	Water quality assessment for downstream impacts	1	%	$18,519	$185.19
					DESIGN SUBTOTAL:	**$5,928,285**

MAJOR ITEMS		
START-UP & SW3P ITEMS	$1,173,943	
EMERGENCY SPILLWAY ITEMS	$349,885	
DAM CROSSING ITEMS	$33,366,896	
CLOSEOUT ITEMS AND OTHER ITEMS	$4,625,000	
DESIGN FEES (SURVEY, GEOTECH, ENGINEERING, ETC.)	$5,928,285	
CONTINGENCY	**20%**	$9,088,801.93

PROPOSED COSTS FOR: OPTION 2B

PROPOSED OPINION OF TOTAL ESTIMATED COST: **$54,533,000**

Table of Qualifiers	
1	Costs were derived from previous bid amounts and engineering judgment. Some of the construction costs were derived from the average low-bid unit prices from TxDOT statewide on a 3-month moving average. Some costs are based on best engineering knowledge of historical pricing.
2	Carollo is not responsible for fluctuation in cost of material, labor components or unforeseen contingencies. The cost estimate has been prepared at the request of the client prior to the finalization of plans and specifications and, therefore is subject to change.
3	This statement of probability of costs are made on the basis of professional experience and qualifications. This represents Carollo's best judgment as a professional design consultant familiar with the construction industry.
4	This is a cost estimate only. These figures are supplied as a guide only. Experience indicates that a fewer number of bidders may result in higher bids, conversely an increased number of bidders may result in more competitive bids.
5	In examining tasks with regard to cost, because this estimate is for the purpose of planning, estimated tasks are based on engineering judgment and historical knowledge. Also, the cost to complete each task should be considered high-level and subject to change as detailed information (survey, environmental, permitting, funding, etc.) is developed. Methods of analysis used in the development of this cost estimate are consistent with a planning level of this detail. The cost required to complete these tasks is intended only as 1) a guide for preliminary and follow-on detailed engineering and 2) a basis for preliminary estimate of time to complete the intended modifications. While procedures consistent with this cost estimate are generally employed, approximations and engineering judgment was used because of the planning level nature of this exercise and the unpredictability of specific cost items.

Lake Cypress Springs Structural Alternatives Costs
DRAFT Opinion of Probable Construction Cost (OPCC)
ALTERNATIVE 2
Project Number: 10070A.00

PROPOSED COSTS	
OPTION 2C	
Invert Elevation of Culvert Pipes	378.0 ft
Culvert Opening (W)	10.0 ft
Culvert Opening (L)	10.0 ft
Culvert Length	100.0 ft
Crossing Length	250.0 ft
Number of Barrels	244 barrels
Canal Length	2000.0 LF

Item #		Description	Est. Qu. #	Unit	Estimated Unit Price $	Estimated Cost
START-UP & SW3P ITEMS						
1		**Mobilization, Security, and SW3P Items**				
	A	Mobilization. Shown as a percentage of total construction minus mobilization	3	%	$45,199,337	$1,355,980.11
	B	Installation of filter fabric fence, complete in place, maintained during entire project and removed at final completion of project.	7,000	LF	$3	$21,000
	C	Installation of stabilized construction entrance and access road, complete in place and maintained during entire project.	1	LS	$5,000	$5,000
					START-UP & SW3P ITEMS SUBTOTAL	**$1,381,980**
EMERGENCY SPILLWAY ITEMS						
1		**Return emergency spillway to former design**				
	A	Excavation of emergency spillway to return spillway to former engineering design. Includes necessary site preparation and proper disposal onsite at identified portion of the emergency spillway that can likely receive fill (pending additional hydraulic modeling).	53,829	CY	$6.50	$349,885
					EMERGENCY SPILLWAY ITEMS SUBTOTAL	**$349,885**
DAM CROSSING ITEMS						
1		**Culvert Crossing of Co Rd SE 3122**				
	A	Demolition, removal and proper disposal offsite of existing asphalt roadway, fencing, culvert pipe, and existing appurtenant structures for preparation of bridge crossing construction.	1	ALLOW	$25,000.00	$25,000
	B	Installation of pre-cast culvert pipes, including, but not limited to excavation, shoring, backfill, bedding, grouting, pipeline connections, post- installation inspection, and all other incidentals, complete in place.	244	BARRELS	$134,200.00	$32,744,800
	C	Installation of reinforced concrete headwalls, wingwalls and floor slabs for culvert pipes including all site preparation, excavation, reinforcing steel, temporary forms, water stops, placement of concrete, toe walls, footings, any backfill necessary, and all other incidentals, complete in place.	1	LS	$250,000.00	$250,000
	D	Dam backslope paving including all site preparation, excavation, reinforcing steel, temporary forms, water stops, placement of concrete, toe walls, footings, any backfill necessary, and all other incidentals, complete in place.	27,667	CY	$80.00	$2,213,333
	E	Installation of 18-inch thick limestone rip-rap for all structures, and culverts including, geotextile, placement of material, and any backfill necessary, complete in place.	19	CY	$1,000.00	$18,519
	F	Repair of roadway, including all site preparation, placement of asphalt, and any backfill necessary, and all other incidentals, complete in place.	386,000	SF	$11.00	$4,246,000
	G	Guard Rail Fabrication & Installation as shown on Drawings, including all fastening hardware, complete in place	7,520	LF	$40.00	$300,800
					DAM CROSSING ITEMS SUBTOTAL	**$39,798,452**
CLOSEOUT ITEMS AND OTHER ITEMS						
1		Installation, maintenance and removal dewatering system. (Includes water control inside cofferdam and trench, well points, and all other related incidentals necessary to achieve installation in the dry.)	2,490	LF	$1,000	$2,490,000
2		Grass carp metal screening device material and installation, including placement and installation of support system on culverts	100	BARRELS	$25,000.00	$2,500,000
2		Hydro mulch revegetation and restoration.	10	AC	$3,500.00	$35,000
					CLOSEOUT ITEMS AND OTHER ITEMS SUBTOTAL	**$5,025,000**
DESIGN FEES (SURVEY, GEOTECH, ENGINEERING, ETC.)						
1		**Engineering Design**				
	A	ENGINEERING DESIGN. Shown as a percentage of total construction cost.	8	%	$46,555,317	$3,724,425.38
	B	CONSTRUCTION MANAGEMENT. Shown as a percentage of total construction cost.	4	%	$46,555,317	$1,862,212.69
	C	SURVEY. Shown as a percentage of total construction cost.	2	%	$46,555,317	$931,106.34
	D	ENGINEERING TESTING. Shown as a percentage of total construction cost.	1	%	$46,555,317	$465,553.17
2		**Environmental Permitting**				
	A	Wetland Determination and Delineation	1	%	$18,519	$185.19
	B	Threatened and Endangered Species Critical Habitat Surveys	1	%	$18,519	$185.19
	C	Stream Assessment	1	%	$18,519	$185.19
3		**Other Analysis**				
	A	Hydrologic and hydrauilic analysis (H&H) for downstream impacts	1	%	$18,519	$185.19
	B	Water quality assessment for downstream impacts	1	%	$18,519	$185.19
					DESIGN SUBTOTAL:	**$6,984,224**

MAJOR ITEMS		
START-UP & SW3P ITEMS	$1,381,980	
EMERGENCY SPILLWAY ITEMS	$349,885	
DAM CROSSING ITEMS	$39,798,452	
CLOSEOUT ITEMS AND OTHER ITEMS	$5,025,000	
DESIGN FEES (SURVEY, GEOTECH, ENGINEERING, ETC.)	$6,984,224	
CONTINGENCY	**20%**	$10,707,908.14

PROPOSED COSTS FOR: OPTION 2C

PROPOSED OPINION OF TOTAL ESTIMATED COST: **$64,247,000**

Table of Qualifiers	
1	Costs were derived from previous bid amounts and engineering judgment. Some of the construction costs were derived from the average low-bid unit prices from TxDOT statewide on a 3-month moving average. Some costs are based on best engineering knowledge of historical pricing.
2	Carollo is not responsible for fluctuation in cost of material, labor components or unforeseen contingencies. The cost estimate has been prepared at the request of the client prior to the finalization of plans and specifications and, therefore is subject to change.
3	This statement of probability of costs are made on the basis of professional experience and qualifications. This represents Carollo's best judgment as a professional design consultant familiar with the construction industry.
4	This is a cost estimate only. These figures are supplied as a guide only. Experience indicates that a fewer number of bidders may result in higher bids, conversely an increased number of bidders may result in more competitive bids.
5	In examining tasks with regard to cost, because this estimate is for the purpose of planning, estimated tasks are based on engineering judgment and historical knowledge. Also, the cost to complete each task should be considered high-level and subject to change as detailed information (survey, environmental, permitting, funding, etc.) is developed. Methods of analysis used in the development of this cost estimate are consistent with a planning level of this detail. The cost required to complete these tasks is intended only as 1) a guide for preliminary and follow-on detailed engineering and 2) a basis for preliminary estimate of time to complete the intended modifications. While procedures consistent with this cost estimate are generally employed, approximations and engineering judgment was used because of the planning level nature of this exercise and the unpredictability of specific cost items.

Lake Cypress Springs Structural Alternatives Costs
DRAFT Opinion of Probable Construction Cost (OPCC)
ALTERNATIVE 3
Project Number: 10070A.00

PROPOSED COSTS	
OPTION 3A	
Invert Elevation of Tainter Gates	364.0 ft
Gate Length	40.0 ft
Gate Count	1 gates

Item #	Description	Est. Qu. #	Unit	Estimated Unit Price $	Estimated Cost
START-UP					
1	**Mobilization**	1.0	LS	$40,000	$40,000.00
2	**General Conditions**				
A	Supervision	14	mo	$7,500	$105,000
B	Communications	14	mo	$500	$7,000
C	Trailer	14	mo	$600	$8,400
				START-UP SUBTOTAL	**$120,400**
STRUCTURE COSTS					
1	**Reservoir Work**				
A	Sheet Pile Cofferdam (install & removal)	1,170	Ton	$2,100.00	$2,457,000
B	Cellular Fill (on-site material	23,400	CY	$20.00	$468,000
C	Pumping	9	mo	$10,000.00	$90,000
D	Excavation & Off-haul	7,875	CY	$18.00	$141,750
E	Temporary Bypass Road	1,600	CY	$25.00	$40,000
A	Crushed Rock Subbase	225	CY	$25.00	$5,625
B	Rip Rap	7,575	CY	$75.00	$568,125
C	Concrete Slab	1,350	CY	$500.00	$675,000
D	Concrete Walls	1,050	CY	$750.00	$787,500
1	**Spillway**				
A	Excavation & Off-haul	4,950	CY	$18.00	$89,100
B	Crushed Rock Subbase	300	CY	$25.00	$7,500
C	Concrete Slab	1,650	CY	$500.00	$825,000
D	Concrete Walls	900	CY	$750.00	$675,000
E	Gates & Hoists	2	LS	$400,000.00	$800,000
A	Bridge	2,850	SF	$150.00	$427,500
1	**Stilling Basin**				
A	Excavation & Off-haul	6,075	CY	$15.00	$91,125
B	Crushed Rock Subbase	300	CY	$25.00	$7,500
C	Concrete Slab	1,650	CY	$500.00	$825,000
D	Concrete Walls	1,275	CY	$750.00	$956,250
1	**Spillway Channel**				
A	Excavation & On-site Disposal	125,250	CY	$12.00	$1,503,000
B	Rip Rap Filter Blanket	12,000	CY	$25.00	$300,000
C	Rip Rap	36,000	CY	$75.00	$2,700,000
				STRUCTURE COSTS SUBTOTAL	**$14,439,975**
CLOSEOUT ITEMS AND OTHER ITEMS					
1	Contractors Overhead & Profit (12%)				$1,747,245
2	Insurance (3%)				$489,229
				CLOSEOUT ITEMS AND OTHER ITEMS SUBTOTAL	**$2,236,474**
DESIGN FEES (SURVEY, GEOTECH, ENGINEERING, ETC.) AND ANALYSIS					
1	**Engineering Design**				
A	ENGINEERING DESIGN. Shown as a percentage of total construction cost.	8	%	$16,796,849	$1,343,747.89
B	CONSTRUCTION MANAGEMENT. Shown as a percentage of total construction cost.	4	%	$16,796,849	$671,873.94
C	SURVEY. Shown as a percentage of total construction cost.	2	%	$16,796,849	$335,936.97
D	ENGINEERING TESTING. Shown as a percentage of total construction cost.	1	%	$16,796,849	$167,968.49
2	**Environmental Permitting**				
A	Wetland Determination and Delineation	1	LS	$22,500.00	$22,500
B	Threatened and Endangered Species Critical Habitat Surveys	1	LS	$75,000	$75,000
C	Stream Assessment	1	LS	$50,000	$50,000
3	**Other Analysis**				
A	Hydrologic and hydrauilic analysis (H&H) for downstream impacts	1	LS	$250,000	$250,000
B	Tainter gate hydrauilc analysis w/ comparision to other gate systems	1	LS	$25,000	$25,000
C	Water quality assessment for downstream impacts	1	LS	$85,000	$85,000
				DESIGN SUBTOTAL:	**$3,027,027**

MAJOR ITEMS		
	START-UP	$120,400
	STRUCTURE COSTS	$14,439,975
	CLOSEOUT ITEMS AND OTHER ITEMS	$2,236,474
	DESIGN FEES (SURVEY, GEOTECH, ENGINEERING, ETC.) AND ANALYSIS	$3,027,027
	CONTINGENCY	**20%** $3,964,775.18

PROPOSED COSTS FOR: OPTION 3A	
	$120,400
	$14,439,975
	$2,236,474
	$3,027,027
20%	$3,964,775.18

PROPOSED OPINION OF TOTAL ESTIMATED COST:	**$23,789,000**

Table of Qualifiers	
1	Costs were derived with the support of a Subconsultant Ray Eldridge, P.E. Deere & Ault Consultants, Inc. 420 W. Main St., Suite 202 Boise, Idaho 83702
2	Carollo is not responsible for fluctuation in cost of material, labor components or unforeseen contingencies. The cost estimate has been prepared at the request of the client prior to the finalization of plans and specifications and, therefore is subject to change.
3	This statement of probability of costs are made on the basis of professional experience and qualifications. This represents Carollo's best judgment as a professional design consultant familiar with the construction industry.
4	This is a cost estimate only. These figures are supplied as a guide only. Experience indicates that a fewer number of bidders may result in higher bids, conversely an increased number of bidders may result in more competitive bids.
5	In examining tasks with regard to cost, because this estimate is for the purpose of planning, estimated tasks are based on engineering judgment and historical knowledge. Also, the cost to complete each task should be considered high-level and subject to change as detailed information (survey, environmental, permitting, funding, etc.) is developed. Methods of analysis used in the development of this cost estimate are consistent with a planning level of this detail. The cost required to complete these tasks is intended only as 1) a guide for preliminary and follow-on detailed engineering and 2) a basis for preliminary estimate of time to complete the intended modifications. While procedures consistent with this cost estimate are generally employed, approximations and engineering judgment was used because of the planning level nature of this exercise and the unpredictability of specific cost items.

Lake Cypress Springs Structural Alternatives Costs
DRAFT Opinion of Probable Construction Cost (OPCC)
ALTERNATIVE 3
Project Number: 10070A.00

PROPOSED COSTS	
OPTION 3B	
Invert Elevation of Culvert Pipes	364.0 ft
Gate Length	40.0 ft
Gate Count	2 gates

Item #	Description	Est. Qu. #	Unit	Estimated Unit Price $	Estimated Cost
START-UP					
1	**Mobilization**	1.0	LS	$40,000	$40,000.00
2	**General Conditions**				
A	Supervision	18	mo	$7,500	$135,000
B	Communications	18	mo	$500	$9,000
C	Trailer	18	mo	$600	$10,800
				START-UP SUBTOTAL	**$154,800**
STRUCTURE COSTS					
1	**Reservoir Work**				
A	Sheet Pile Cofferdam (install & removal)	1,560	Ton	$2,100.00	$3,276,000
B	Cellular Fill (on-site material	31,200	CY	$20.00	$624,000
C	Pumping	12	mo	$10,000.00	$120,000
D	Excavation & Off-haul	10,500	CY	$18.00	$189,000
E	Temporary Bypass Road	1,600	CY	$25.00	$40,000
A	Crushed Rock Subbase	300	CY	$25.00	$7,500
B	Rip Rap	10,100	CY	$75.00	$757,500
C	Concrete Slab	1,800	CY	$500.00	$900,000
D	Concrete Walls	1,400	CY	$750.00	$1,050,000
1	**Spillway**				
A	Excavation & Off-haul	6,600	CY	$18.00	$118,800
B	Crushed Rock Subbase	400	CY	$25.00	$10,000
C	Concrete Slab	2,200	CY	$500.00	$1,100,000
D	Concrete Walls	1,200	CY	$750.00	$900,000
E	Gates & Hoists	2	LS	$400,000.00	$800,000
A	Bridge	3,800	SF	$150.00	$570,000
1	**Stilling Basin**				
A	Excavation & Off-haul	8,100	CY	$15.00	$121,500
B	Crushed Rock Subbase	400	CY	$25.00	$10,000
C	Concrete Slab	2,200	CY	$500.00	$1,100,000
D	Concrete Walls	1,700	CY	$750.00	$1,275,000
1	**Spillway Channel**				
A	Excavation & On-site Disposal	167,000	CY	$12.00	$2,004,000
B	Rip Rap Filter Blanket	16,000	CY	$25.00	$400,000
C	Rip Rap	48,000	CY	$75.00	$3,600,000
				STRUCTURE COSTS SUBTOTAL	**$18,973,300**
CLOSEOUT ITEMS AND OTHER ITEMS					
1	Contractors Overhead & Profit (12%)				$2,295,372
2	Insurance (3%)				$642,704
				CLOSEOUT ITEMS AND OTHER ITEMS SUBTOTAL	**$2,938,076**
DESIGN FEES (SURVEY, GEOTECH, ENGINEERING, ETC.) AND ANALYSIS					
1	**Engineering Design**				
A	ENGINEERING DESIGN. Shown as a percentage of total construction cost.	8	%	$22,066,176	$1,765,294.09
B	CONSTRUCTION MANAGEMENT. Shown as a percentage of total construction cost.	4	%	$22,066,176	$882,647.05
C	SURVEY. Shown as a percentage of total construction cost.	2	%	$22,066,176	$441,323.52
D	ENGINEERING TESTING. Shown as a percentage of total construction cost.	1	%	$22,066,176	$220,661.76
2	**Environmental Permitting**				
A	Wetland Determination and Delineation	1	LS	$22,500.00	$22,500
B	Threatened and Endangered Species Critical Habitat Surveys	1	LS	$75,000	$75,000
C	Stream Assessment	1	LS	$50,000	$50,000
3	**Other Analysis**				
A	Hydrologic and hydrauilic analysis (H&H) for downstream impacts	1	LS	$250,000	$250,000
B	Tainter gate hydrauilc analysis w/ comparision to other gate systems	1	LS	$25,000	$25,000
C	Water quality assessment for downstream impacts	1	LS	$85,000	$85,000
				DESIGN SUBTOTAL:	**$3,817,426**

MAJOR ITEMS		PROPOSED COSTS FOR: OPTION 3B	
	START-UP		$154,800
	STRUCTURE COSTS		$18,973,300
	CLOSEOUT ITEMS AND OTHER ITEMS		$2,938,076
	DESIGN FEES (SURVEY, GEOTECH, ENGINEERING, ETC.) AND ANALYSIS		$3,817,426
	CONTINGENCY	**20%**	$5,176,720.52
	PROPOSED OPINION OF TOTAL ESTIMATED COST:		**$31,060,000**

Table of Qualifiers	
1	Costs were derived with the support of a Subconsultant Ray Eldridge, P.E. Deere & Ault Consultants, Inc. 420 W. Main St., Suite 202 Boise, Idaho 83702
2	Carollo is not responsible for fluctuation in cost of material, labor components or unforeseen contingencies. The cost estimate has been prepared at the request of the client prior to the finalization of plans and specifications and, therefore is subject to change.
3	This statement of probability of costs are made on the basis of professional experience and qualifications. This represents Carollo's best judgment as a professional design consultant familiar with the construction industry.
4	This is a cost estimate only. These figures are supplied as a guide only. Experience indicates that a fewer number of bidders may result in higher bids, conversely an increased number of bidders may result in more competitive bids.
5	In examining tasks with regard to cost, because this estimate is for the purpose of planning, estimated tasks are based on engineering judgment and historical knowledge. Also, the cost to complete each task should be considered high-level and subject to change as detailed information (survey, environmental, permitting, funding, etc.) is developed. Methods of analysis used in the development of this cost estimate are consistent with a planning level of this detail. The cost required to complete these tasks is intended only as 1) a guide for preliminary and follow-on detailed engineering and 2) a basis for preliminary estimate of time to complete the intended modifications. While procedures consistent with this cost estimate are generally employed, approximations and engineering judgment was used because of the planning level nature of this exercise and the unpredictability of specific cost items.

Lake Cypress Springs Structural Alternatives Costs
DRAFT Opinion of Probable Construction Cost (OPCC)
ALTERNATIVE 3
Project Number: 10070A.00

PROPOSED COSTS	
OPTION 3C	
Invert Elevation of Culvert Pipes	364.0 ft
Gate Length	40.0 ft
Gate Count	3 gates

Item #		Description	Est. Qu. #	Unit	Estimated Unit Price $	Estimated Cost
START-UP						
1		**Mobilization**	1.0	LS	$40,000	$40,000.00
2		**General Conditions**				
	A	Supervision	23	mo	$7,500	$172,500
	B	Communications	23	mo	$500	$11,500
	C	Trailer	23	mo	$600	$13,800
					START-UP SUBTOTAL	**$197,800**
STRUCTURE COSTS						
1		**Reservoir Work**				
	A	Sheet Pile Cofferdam (install & removal)	1,950	Ton	$2,100.00	$4,095,000
	B	Cellular Fill (on-site material	39,000	CY	$20.00	$780,000
	C	Pumping	15	mo	$10,000.00	$150,000
	D	Excavation & Off-haul	13,125	CY	$18.00	$236,250
	E	Temporary Bypass Road	1,600	CY	$25.00	$40,000
	A	Crushed Rock Subbase	375	CY	$25.00	$9,375
	B	Rip Rap	12,625	CY	$75.00	$946,875
	C	Concrete Slab	2,250	CY	$500.00	$1,125,000
	D	Concrete Walls	1,750	CY	$750.00	$1,312,500
1		**Spillway**				
	A	Excavation & Off-haul	8,250	CY	$18.00	$148,500
	B	Crushed Rock Subbase	500	CY	$25.00	$12,500
	C	Concrete Slab	2,750	CY	$500.00	$1,375,000
	D	Concrete Walls	1,500	CY	$750.00	$1,125,000
	E	Gates & Hoists	3	LS	$400,000.00	$1,200,000
	A	Bridge	4,750	SF	$150.00	$712,500
1		**Stilling Basin**				
	A	Excavation & Off-haul	10,125	CY	$15.00	$151,875
	B	Crushed Rock Subbase	500	CY	$25.00	$12,500
	C	Concrete Slab	2,750	CY	$500.00	$1,375,000
	D	Concrete Walls	2,125	CY	$750.00	$1,593,750
1		**Spillway Channel**				
	A	Excavation & On-site Disposal	208,750	CY	$12.00	$2,505,000
	B	Rip Rap Filter Blanket	20,000	CY	$25.00	$500,000
	C	Rip Rap	60,000	CY	$75.00	$4,500,000
					STRUCTURE COSTS SUBTOTAL	**$23,906,625**
CLOSEOUT ITEMS AND OTHER ITEMS						
1		Contractors Overhead & Profit (12%)				$2,892,531
2		Insurance (3%)				$809,909
					CLOSEOUT ITEMS AND OTHER ITEMS SUBTOTAL	**$3,702,440**
DESIGN FEES (SURVEY, GEOTECH, ENGINEERING, ETC.) AND ANALYSIS						
1		**Engineering Design**				
	A	ENGINEERING DESIGN. Shown as a percentage of total construction cost.	8	%	$27,806,865	$2,224,549.17
	B	CONSTRUCTION MANAGEMENT. Shown as a percentage of total construction cost.	4	%	$27,806,865	$1,112,274.59
	C	SURVEY. Shown as a percentage of total construction cost.	2	%	$27,806,865	$556,137.29
	D	ENGINEERING TESTING. Shown as a percentage of total construction cost.	1	%	$27,806,865	$278,068.65
2		**Environmental Permitting**				
	A	Wetland Determination and Delineation	1	LS	$22,500.00	$22,500
	B	Threatened and Endangered Species Critical Habitat Surveys	1	LS	$75,000	$75,000
	C	Stream Assessment	1	LS	$50,000	$50,000
3		**Other Analysis**				
	A	Hydrologic and hydrauilic analysis (H&H) for downstream impacts	1	LS	$250,000	$250,000
	B	Tainter gate hydrauilc analysis w/ comparision to other gate systems	1	LS	$25,000	$25,000
	C	Water quality assessment for downstream impacts	1	LS	$85,000	$85,000
					DESIGN SUBTOTAL:	**$4,678,530**

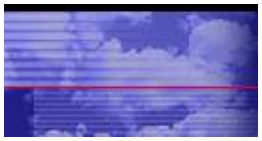
MAJOR ITEMS		
	START-UP	$197,800
	STRUCTURE COSTS	$23,906,625
	CLOSEOUT ITEMS AND OTHER ITEMS	$3,702,440
	DESIGN FEES (SURVEY, GEOTECH, ENGINEERING, ETC.) AND ANALYSIS	$4,678,530
	CONTINGENCY	**20%** $6,497,078.88

PROPOSED COSTS FOR: OPTION 3C

PROPOSED OPINION OF TOTAL ESTIMATED COST: **$38,982,000**

Table of Qualifiers	
1	Costs were derived with the support of a Subconsultant Ray Eldridge, P.E. Deere & Ault Consultants, Inc. 420 W. Main St., Suite 202 Boise, Idaho 83702
2	Carollo is not responsible for fluctuation in cost of material, labor components or unforeseen contingencies. The cost estimate has been prepared at the request of the client prior to the finalization of plans and specifications and, therefore is subject to change.
3	This statement of probability of costs are made on the basis of professional experience and qualifications. This represents Carollo's best judgment as a professional design consultant familiar with the construction industry.
4	This is a cost estimate only. These figures are supplied as a guide only. Experience indicates that a fewer number of bidders may result in higher bids, conversely an increased number of bidders may result in more competitive bids.
5	In examining tasks with regard to cost, because this estimate is for the purpose of planning, estimated tasks are based on engineering judgment and historical knowledge. Also, the cost to complete each task should be considered high-level and subject to change as detailed information (survey, environmental, permitting, funding, etc.) is developed. Methods of analysis used in the development of this cost estimate are consistent with a planning level of this detail. The cost required to complete these tasks is intended only as 1) a guide for preliminary and follow-on detailed engineering and 2) a basis for preliminary estimate of time to complete the intended modifications. While procedures consistent with this cost estimate are generally employed, approximations and engineering judgment was used because of the planning level nature of this exercise and the unpredictability of specific cost items.

APPENDIX F
OTHER



Community Information System

Release 4.08.01.02, 08/19/2016 -- Build 009, Skip Navigation Logged in as: manuelrazo [Session expires in 20 mins]

Home
Search
Previous Search
Community
CRS
CAC/CAV
Maps
SOS
Insurance
CAP-SSSE
CAV Selection

CIS Reports
Links
Request/Feedback

FAMS

Log Out

Community Overview

Community:	FRANKLIN COUNTY*	**State:**	TEXAS
County:	FRANKLIN COUNTY	**CID:**	480235

Program:	Emergency	**Emergency Entry:**	07/28/2000	**Regular Entry:**	
Status:	PARTICIPATING			**Status Effective:**	07/28/2000
Current Map:		**Study Underway:**	YES	**Level of Regs:**	
FIRM Status:	NEVER MAPPED			**Initial FIRM:**	
FHBM Status:	NEVER MAPPED			**Initial FHBM:**	

Probation Status:			
Probation Effective:		**Probation Ended:**	
Suspension Effective:		**Reinstated Effective:**	
Withdrawal Effective:		**Reinstated Effective:**	

CRS Class / Discount:				**Policies in Force:**	22
Effective Date:				**Insurance in Force:**	$962,500.00
CAV Date:		**Workshop Date:**	11/16/2010	**No. of Paid Losses:**	10
CAC Date:	06/01/2007	**GTA Date:**	09/17/2013	**Total Losses Paid:**	$364,440.45
☐ **Tribal Community**		**Community Website:**		**Sub. Damage Claims Since 1978:**	0
☐ **Upton Jones Claims**			☐ **HMGP Projects**		
☐ **ICC Claims**			☐ **FMA Projects**		

APPENDIX G

MODELS (DIGITAL VERSION ONLY)