# Volumetric Survey of LAKE ARLINGTON

## December 2007 Survey

Prepared by:

The Texas Water Development Board

March 2008

# Texas Water Development Board

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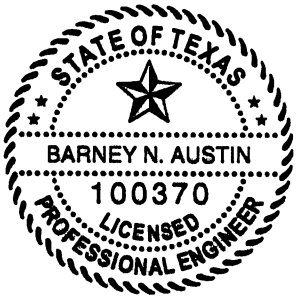


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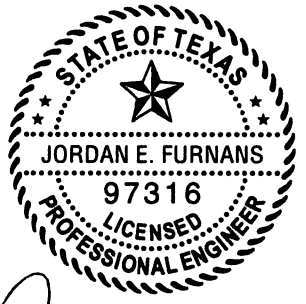


4/1/08

## Executive Summary

In November of 2007, the Texas Water Development Board (TWDB) entered into agreement with the City of Arlington, Texas, for the purpose of performing a volumetric survey of Lake Arlington. This survey was performed using a single-frequency (200 kHz) depth sounder and differential GPS navigation equipment. Data was collected along pre-planned survey lines spaced at approximately 500 foot intervals perpendicular to the submerged river channel. Lines were also located to coincide with those used in the 1994 survey of Lake Arlington, also performed by TWDB.

Lake Arlington is located on Village Creek in Tarrant County approximately seven miles from the western edge of the City of Arlington, Texas. The conservation pool elevation for the lake is 550.0 feet above mean sea level (NGDV 29). Bathymetric data collection occurred December 17$^{th}$ through December 19$^{th}$ 2007 while the daily average water surface elevation of the lake was 548.93 feet, 548.89 feet, and 548.86 feet, above mean sea level (NGVD 29), respectively. Data collected during this survey was used in creating updated area-capacity tables.

**The results of the TWDB 2007 Volumetric Survey indicate Lake Arlington has a total reservoir capacity of 40,188 acre-feet and encompasses 1,926 acres at conservation pool elevation (550.0 feet above mean sea level, NGVD 29).** Due to differences in the methodologies used in calculating areas and capacities from this and previous Lake Arlington surveys, comparison of these values is not recommended. 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 Arlington in approximately 10 years or after a large flood event.

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***Note:*** *References to brand names throughout this report do not imply endorsement by the Texas Water Development Board*

## Lake Arlington General Information

Arlington Dam and Lake Arlington are located on Village Creek, a tributary of the West Fork Trinity River[1], at the western edge of Arlington, Texas[2], in Tarrant County (Figure 1). The City of Arlington, Texas owns and operates Lake Arlington. The city, recognizing the need for an additional water supply[2], began construction of Arlington Dam on May 15, 1956, with deliberate impoundment beginning on March 31, 1957[3]. The project was completed on July 19, 1957.[3] Lake Arlington serves as a municipal and industrial water supply for the city, as well provides recreational opportunities for the local community.[2] Additional pertinent data about Arlington Dam can be found in Table 1.

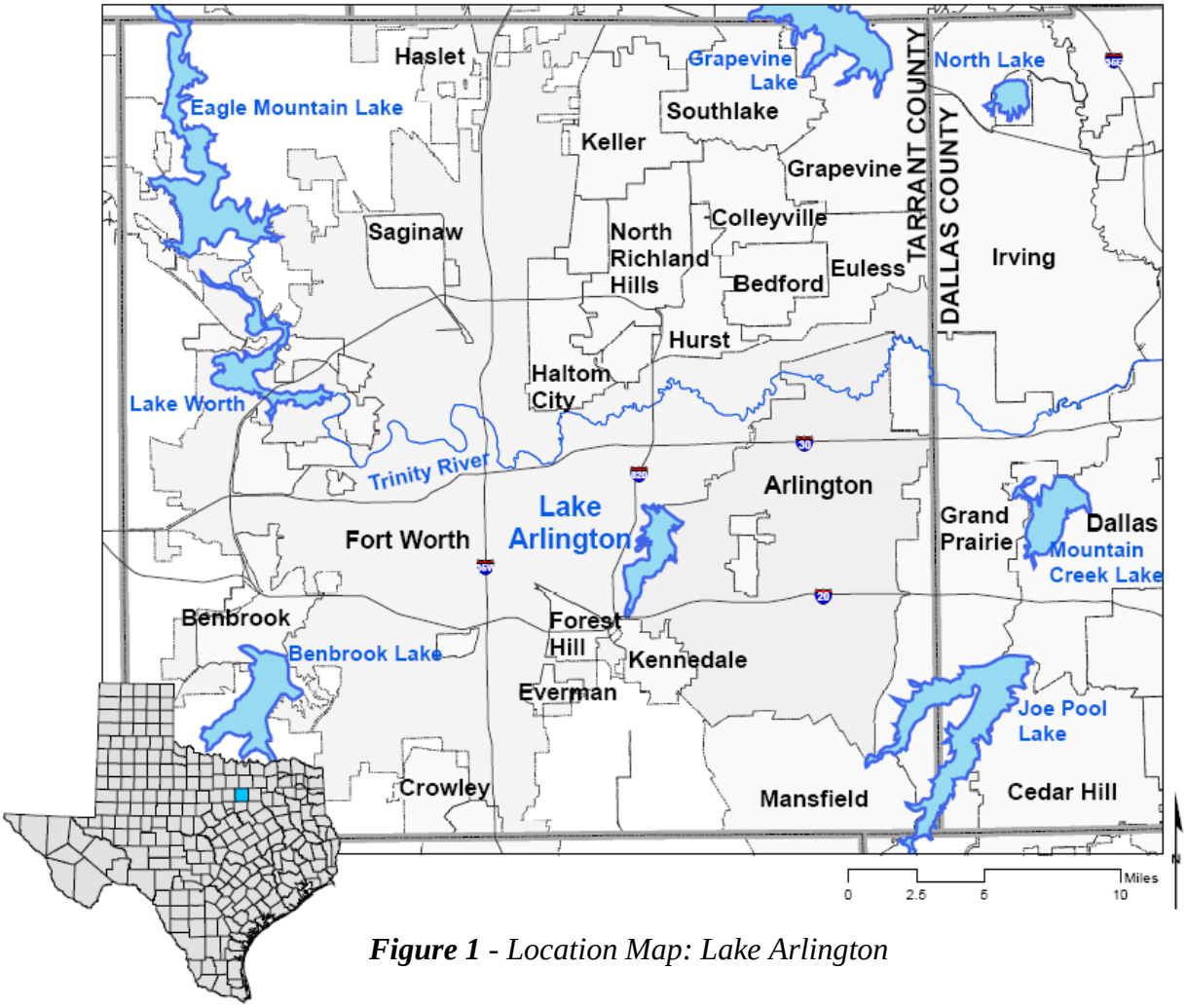


***Figure 1*** *- Location Map: Lake Arlington*

**Table 1. Pertinent Data for Arlington Dam and Lake Arlington**[2,3]

| | |
|---|---|
| **Owner** | |
| City of Arlington | |
| **Engineer (Design)** | |
| Freese and Nichols | |
| **Location of Dam** | |
| On Village Creek in Tarrant County, 7 miles west of downtown Arlington, Texas | |
| **Drainage Area** | |
| 143 square miles | |
| **Dam** | |
| Type | Earthfill |
| Length | 6,482 feet |
| Height | 83 feet |
| Top width | 24 feet |
| Top elevation | 572.0 feet above msl** |
| **Spillway (emergency)** | |
| Type | Cut through natural earth |
| Location | 500 feet upstream on right bank |
| Crest length | 882 feet |
| Crest elevation | 559.7 feet above msl |
| **Spillway (service)** | |
| Type | Circular drop inlet |
| Crest length | 100 feet ± |
| Crest elevation | 550.0 feet above msl |
| Discharge conduit | 10-foot diameter |
| **Outlet Works** | |
| Type | Vertical concrete well |
| Size | 29 by 29 feet |
| Water supply inlet | 2 conduits, 4 by 4 feet |
| Pump discharge pipes | 2 to treating plant |
| Low flow outlet | 24-inch valve controlled pipe |

** Per Chuck Vokes, Assistant Director of Water Utilities/Treatment for the City of Arlington, a concrete parapet wall has been added to Arlington Dam, making its top elevation 577.5 feet. (Personal Communication – 27 March 2008).

The water rights for Lake Arlington are appropriated to the City of Arlington and the Texas Utilities Electric Company through Certificate of Adjudication No. 08-3391. Certificate of Adjudication No. 08-3391 authorizes the City of Arlington and the Texas Utilities Electric Company to impound up to 45,710 acre-feet of water in Lake Arlington. The City of Arlington is authorized to divert and use a maximum of 13,000 acre-feet of water for municipal purposes, while the Texas Electric Utilities Company is authorized to divert and use a maximum of 10,120 acre-feet for industrial purposes. The time priorities for the water rights for impoundment and diversion vary. The complete certificate is on file in the Records Division of the Texas Commission on Environmental Quality.

# Volumetric Survey of Lake Arlington

## Introduction

The Hydrographic Survey Program of the Texas Water Development Board (TWDB) 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 November of 2007, the TWDB entered into agreement[4] with the City of Arlington, Texas, for the purpose of performing a volumetric survey of Lake Arlington. This report describes the methods used in conducting the volumetric survey, including data collection methods and data processing techniques. This report serves as the final contract deliverable from TWDB to the City of Arlington, and contains as deliverables: (1) an elevation-area-capacity table of the lake acceptable to the Texas Commission on Environmental Quality, (2) a bottom contour map, and (3) a shaded relief plot of the lake bottom. These deliverables are updated versions of the same deliverables resulting from the TWDB 1994 volumetric survey of Lake Arlington.

## Datum

The vertical datum used during this survey is that used by the United States Geological Survey (USGS) for the reservoir elevation gauge USGS 08049200 Lk Arlington nr Arlington, TX.[5] The datum for this gauge is reported as National Geodetic Vertical Datum 1929 (NGVD 29) 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 North American Datum of 1983 (NAD83) State Plane Texas North Central Zone (feet).

## TWDB Bathymetric Data Collection

Bathymetric data collection occurred December 17th through December 19th 2007 while the daily average water surface elevation of the lake was 548.93 feet, 548.89 feet, and 548.86 feet above mean sea level (NGVD 29), respectively. For data collection, TWDB used a Knudsen Engineering Ltd. single-frequency (200 kHz) depth sounder

integrated with Differential Global Positioning System (DGPS) equipment. Data collection occurred while navigating along pre-planned range lines oriented perpendicular to the location of the original river channels and spaced approximately 500 feet apart. Data was also collected along some of the survey lines used during the 1994 Lake Arlington survey conducted by TWDB. For all data collection efforts, the depth sounder was calibrated daily using a Solinst pressure transducer, weighted tape, and stadia rod. The Solinst pressure transducer was lowered throughout the water column while collecting depth and temperature readings at 0.1 second intervals. This information was used in calculating the depth-averaged speed of sound in the water column based on standard engineering methods[6]. The weighted tape and stadia rod were used to physically verify the depth readings recorded by the Knudsen echosounder. The average speed of sound through the water column calculated during the survey was 4,857 feet per second. During the 2007 survey, team members collected 37,340 data points over cross-sections totaling nearly 57 miles in length. Figure 2 shows where data points were collected during the TWDB 2007 survey.

As shown in Figure 2, portions of Lake Arlington were not surveyed during the field data collection effort. These areas make up approximately 4.7% of the lake surface area at conservation pool elevation (approximately 92 acres) and were inaccessible by boat during the field data collection effort. Areas labeled #1, #2, and #3 in Figure 2 were cordoned off with permanent fencing that separates the main lake body from areas used by the Texas Electric Utilities Company in their plant operations. Area #4 is separated from the main lake body by a roadway, and water passes between the two water bodies through a small culvert. In order to calculate reservoir capacity and area tables for Lake Arlington, water depths were extrapolated into the un-surveyed areas using a line extrapolation method (see section titled “Line Extrapolation”). Similar data extrapolation was performed by TWDB in developing the 1994 volumetric survey report.

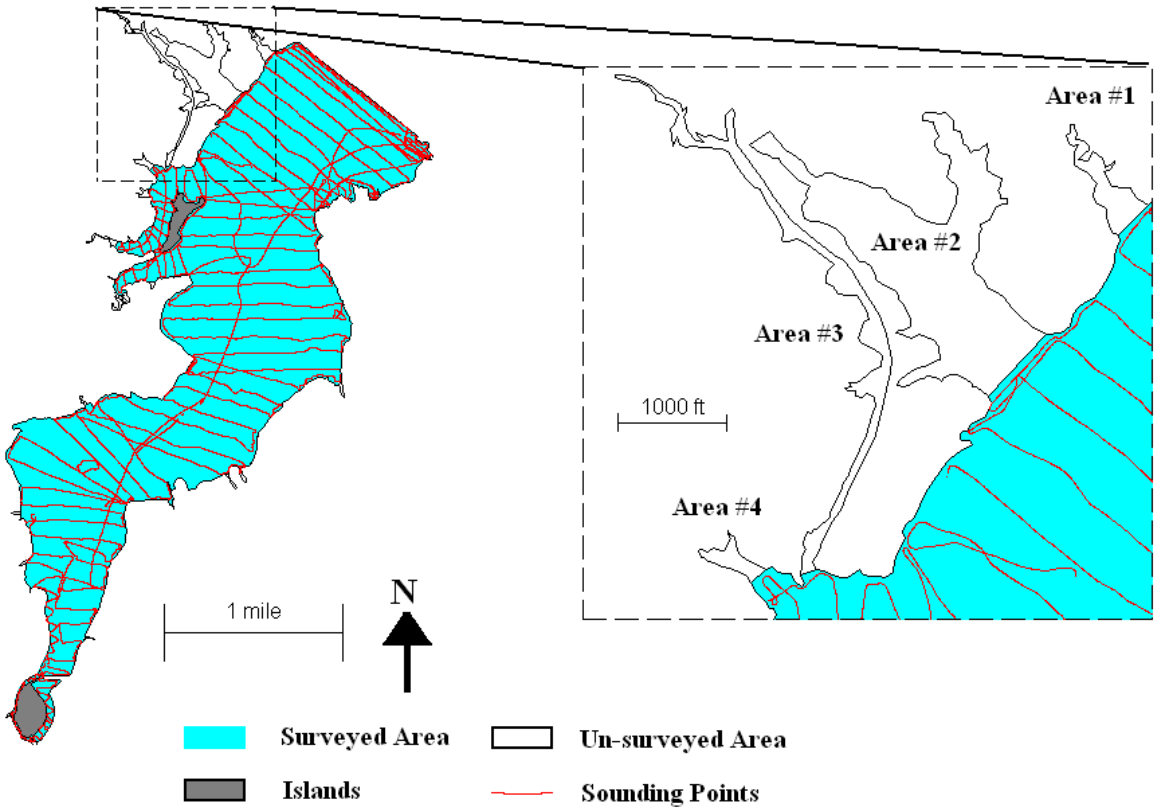


*Figure 2 – TWDB 2007 survey data points for Lake Arlington. Areas labeled #1-#3 were un-surveyed as these portions of the lake belong to the Texas Electric Utilities Company and are inaccessible by boat. Area #4 was un-surveyed as it is separated from the main lake body by a roadway. Water passes from Area #4 to the main lake body through a culvert.*

## Data Processing

### Model Boundaries

The boundary of Lake Arlington was manually digitized from digital ortho quarter quadrangle (DOQQ) aerial photos[7] available from the Texas Natural Resources Information System (TNRIS)[8]. The model boundary at conservation pool elevation (550.0 feet) was digitized from the Kennedale NW and Kennedale SW DOQQs photographed on August 4, 2004 when the water surface elevation in Lake Arlington was 550.3 feet as measured by the United States Geological Survey (USGS) gauge 08049200 at Arlington dam. As the DOQQs used in digitizing the boundary are of 1-meter resolution, the physical boundary of Lake Arlington may be within ± 1 meter of the location derived from the manual delineation. For the purposes of this analysis it was assumed that the boundary of the lake at conservation pool elevation is closely represented by the August 4,

2004 DOQQ. Therefore for the purpose of calculating lake elevation-area-capacity tables, TWDB assigned the digitized boundary an elevation of 550.0 feet.

Additional lake boundary data was derived through digitization of DOQQs derived from aerial photographs taken on August 19, 2006. On this date, the water surface elevation in Lake Arlington averaged 541.1 feet according to the USGS gauge. This additional dataset was used as a supplement to the TWDB survey data in locations where the survey data alone was insufficient to properly represent the reservoir bathymetry.

**Triangular Irregular Network (TIN) Model**

Upon completion of the data collection effort, the raw data files collected by TWDB were edited using customized MATLAB processing scripts and the HydroEdit software package. Specifically, HydroEdit applies a median filter to the raw survey data and removes individual data anomalies or points with incorrect GPS coordinates. HydroEdit also uses the water surface elevations at the times of each sounding to convert sounding depths to corresponding bathymetric elevations. The MATLAB processing scripts are then used to visually inspect each of the filtered cross-sections to indentify and rectify any series of data anomalies that were not edited using the HydroEdit filters. For processing outside of MATLAB 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 sections entitled “Self-Similar Interpolation” and “Line-Extrapolation.”

To create a surface representation of the Lake Arlington bathymetry, the 3D Analyst Extension of ArcGIS (ESRI, Inc.) is used. This extension creates a triangulated irregular network (TIN) model of the bathymetry, where each MASS point and boundary node becomes the vertex of a triangular portion of the reservoir bottom surface.[9] From the TIN model, reservoir capacities and areas are calculated at one-tenth of a foot (0.1 foot) intervals, from elevation 500.0 feet to elevation 550.0 feet.

The Elevation-Capacity and Elevation-Area Tables, updated for 2007, are presented in Appendices A and B, respectively. Tables are provided with elevations referenced to the NGVD 29 datum. An Elevation-Area-Capacity graph is presented in Appendix C.

The Lake Arlington 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 an Elevation Relief Map representing the topography of the reservoir bottom (Figure 3), a map showing shaded depth ranges for Lake Arlington (Figure 4), and a 5-foot contour map (Figure 5 - attached). The reservoir extent depicted in these figures is that corresponding to the conservation-pool elevation (550.0 feet).

**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.[10] In the case of Lake Arlington, 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 Arlington where a high probability of change between cross-sections exists.[10] Figure 6 illustrates typical results of the application of the Self-Similar Interpolation routine in Lake Arlington, and the bathymetry shown in Figure 6C was used in computing reservoir capacity and area tables (Appendix A, B).

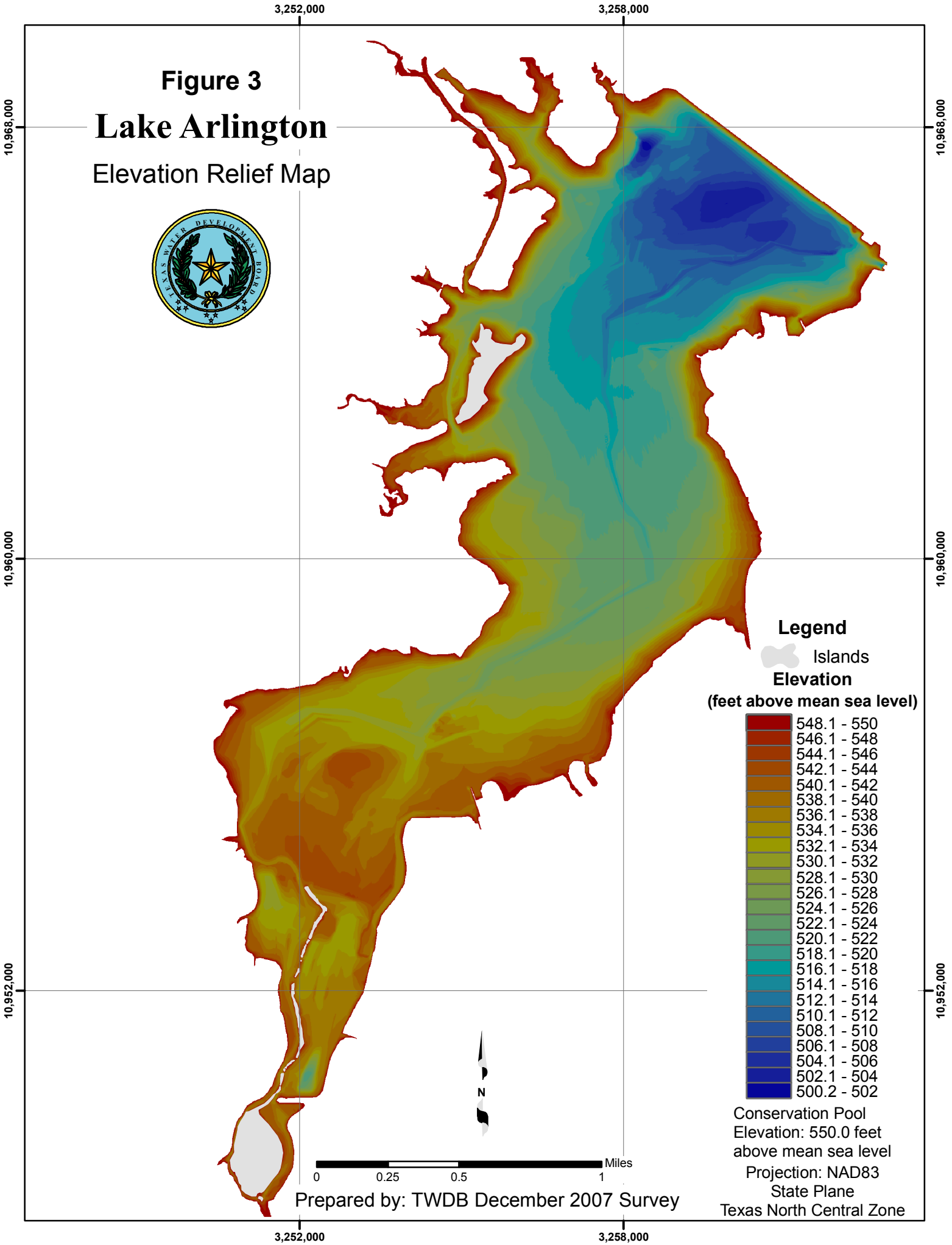
Figure 3
Lake Arlington
Elevation Relief Map
3,252,000
3,258,000
10,968,000
10,960,000
10,952,000
Legend
Islands
Elevation
(feet above mean sea level)
548.1 - 550
546.1 - 548
544.1 - 546
542.1 - 544
540.1 - 542
538.1 - 540
536.1 - 538
534.1 - 536
532.1 - 534
530.1 - 532
528.1 - 530
526.1 - 528
524.1 - 526
522.1 - 524
520.1 - 522
518.1 - 520
516.1 - 518
514.1 - 516
512.1 - 514
510.1 - 512
508.1 - 510
506.1 - 508
504.1 - 506
502.1 - 504
500.2 - 502
Conservation Pool Elevation: 550.0 feet above mean sea level
Projection: NAD83 State Plane Texas North Central Zone
N
0
0.25
0.5
1
Miles
Prepared by: TWDB December 2007 Survey

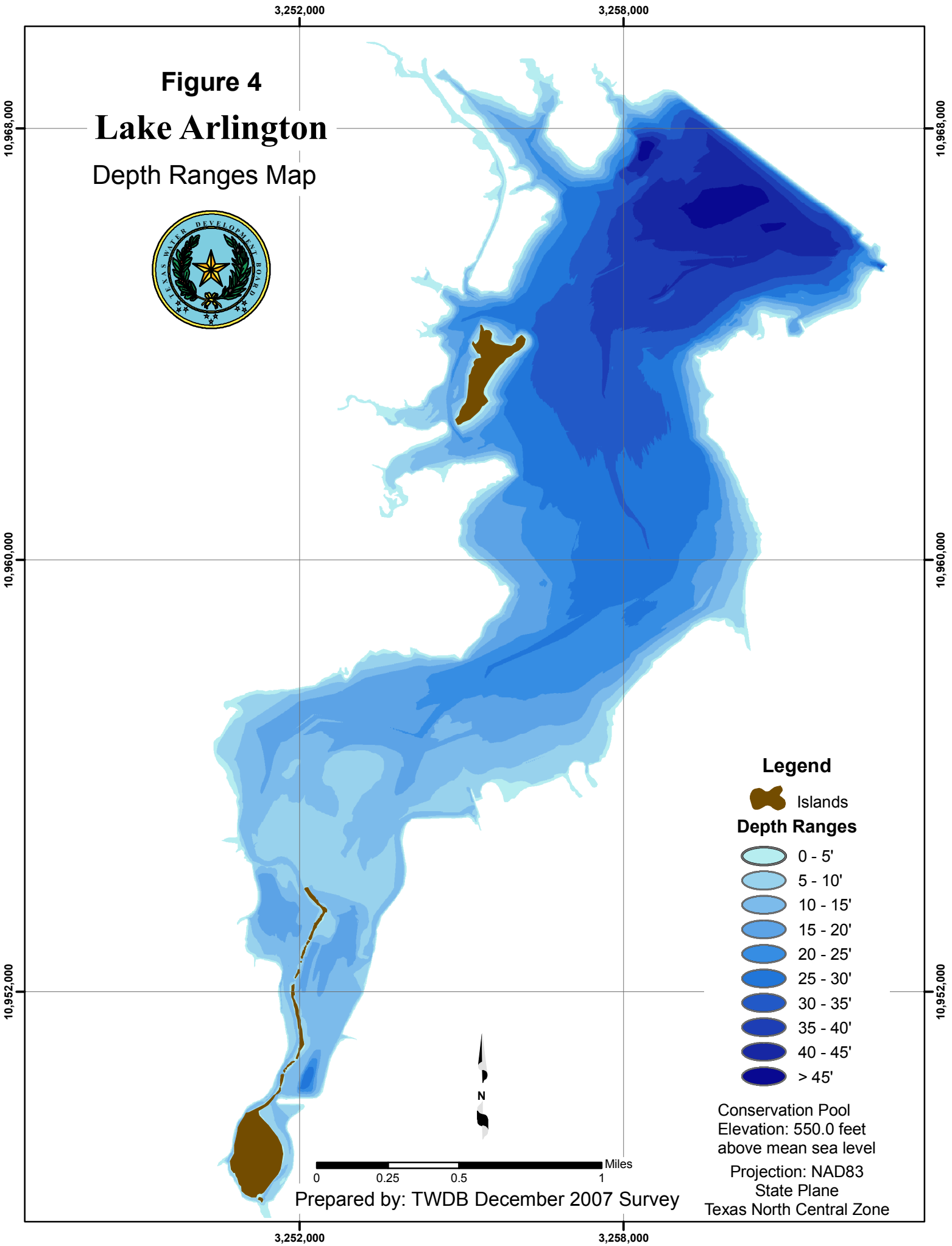
Figure 4
Lake Arlington
Depth Ranges Map
3,252,000
3,258,000
10,968,000
10,960,000
10,952,000
Legend
Islands
Depth Ranges
0 - 5'
5 - 10'
10 - 15'
15 - 20'
20 - 25'
25 - 30'
30 - 35'
35 - 40'
40 - 45'
> 45'
N
0
0.25
0.5
1
Miles
Conservation Pool Elevation: 550.0 feet above mean sea level
Projection: NAD83 State Plane Texas North Central Zone
Prepared by: TWDB December 2007 Survey

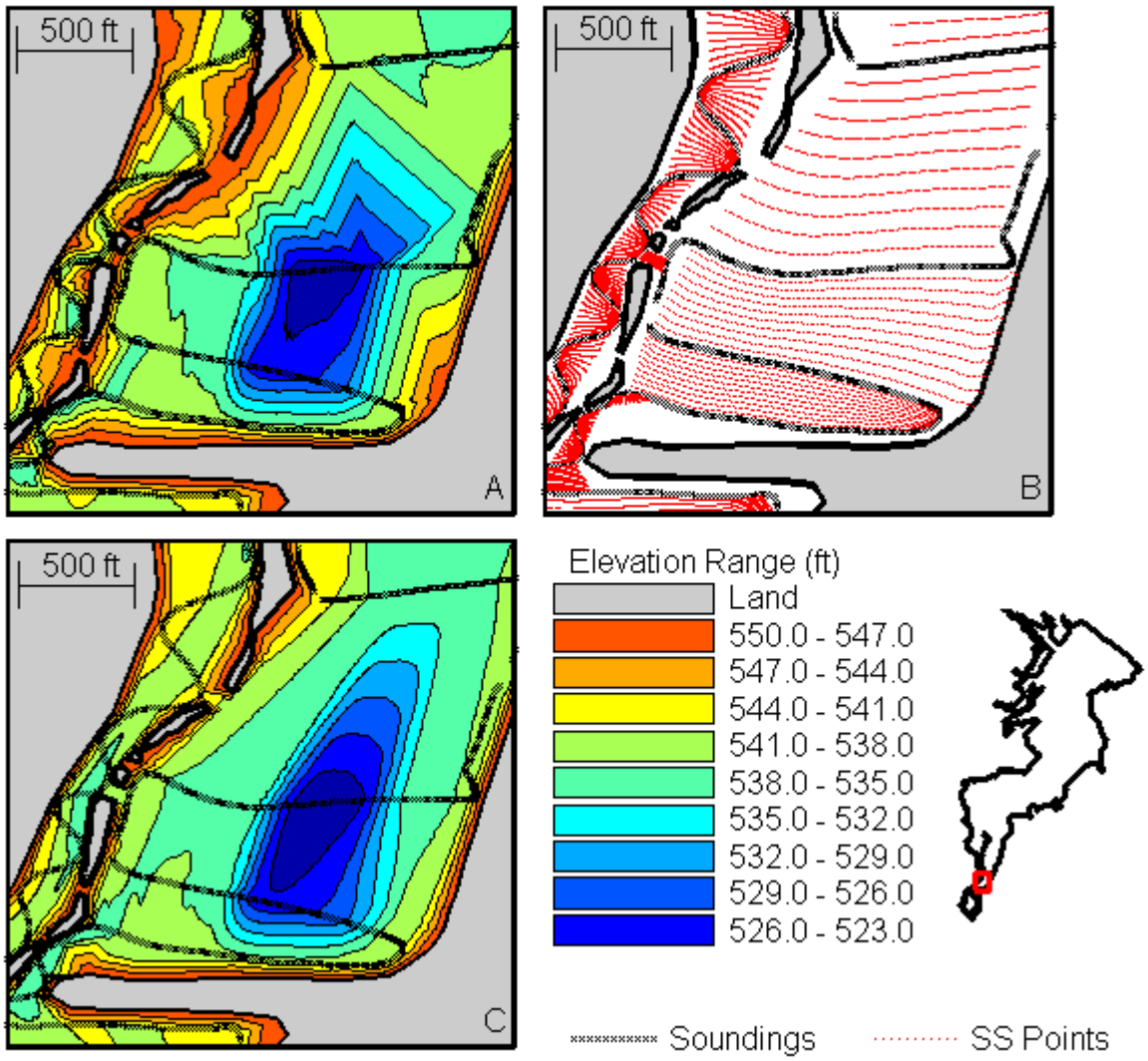


***Figure 6*** *- Application of the Self-Similar Interpolation technique to Lake Arlington sounding data – A) bathymetric contours without interpolated points, B) Sounding points (black) and interpolated points (red) with reservoir boundary shown at elevation 550.0 feet (black), C) bathymetric contours 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.*

**Line Extrapolation**

In order to estimate the bathymetry within the un-surveyed portions of Lake Arlington, TWDB applied a line extrapolation technique[10] similar to the Self-Similar interpolation technique discussed above. The line extrapolation method is often used by TWDB in extrapolating bathymetries in shallow coves near the upstream ends of reservoirs, where the water is often too shallow to allow boat passage. The method assumes that cross-sections within the "extrapolation area" have a "V-shaped" profile, with the deepest section located along a line drawn along the longitudinal axis of the area. Elevations along this "longitudinal line" are interpolated linearly based on the distance along the line from the line's start (nearest the reservoir interior) to the line's end (where the line crosses the reservoir boundary). The elevations at points along each extrapolated cross-section are linearly interpolated from an elevation on the longitudinal line (at the intersection with the cross-section) and the elevation at the extrapolation area boundary. The line extrapolation method requires that the user specify the position of the longitudinal line and the elevation at the beginning of the longitudinal line. This elevation is usually assumed equivalent to the elevation of the TIN model near the beginning of the longitudinal line. Figure 7 illustrates the line extrapolation technique as applied to Lake Arlington for Area #2 from Figure 2.

As shown in Figure 7, the line extrapolation method for Lake Arlington was implemented using the 541.1-foot contour (derived from the 2006 DOQQs) as the bounding extent of the extrapolation areas. This was possible only for areas #1, #2, and #3 from Figure 2, as these areas were large enough to contain the 541.1 foot contour. For other un-surveyed areas within Lake Arlington, the reservoir boundary (at elevation 550.0 feet) was used as the bounding extent of the extrapolation areas. It should also be noted that the extrapolated points shown in Figure 7b were manually edited to assure that the resulting bathymetry was smooth. This editing process involved the deletion of points on extrapolated cross-sections that cross one-another, as well as inserting points to establish a connection between the main extrapolation area and the area sidearm entering the main area from the north-east.

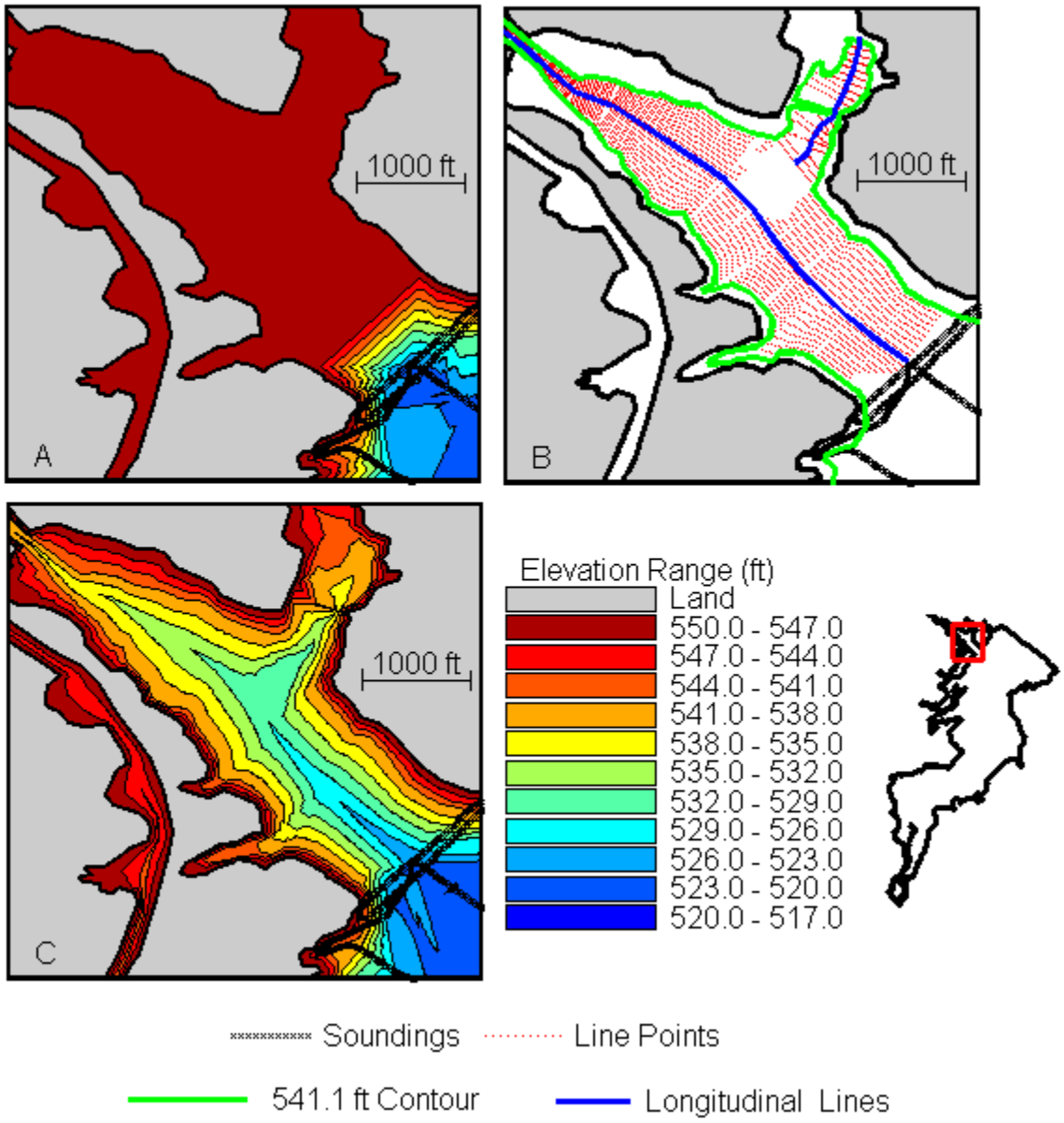


*Figure 7 - Application of the Line Extrapolation technique to Lake Arlington sounding data – A) bathymetric contours without extrapolated points, B) Sounding points (black) and extrapolated points (red) with reservoir boundary shown at elevation 550.0 feet (black) and the 541.1-foot contour (green), C) bathymetric contours with the extrapolated points. Note: In 7A the bathymetric contours do not extend into the un-surveyed area and "flat" triangles are formed connecting the nodes of the reservoir boundary. This is an artifact of the TIN generation routine when data points are too far apart or are absent from portions of the reservoir. Inclusion of the extrapolated points (7C) corrects this and smoothes the bathymetric contours.*

The assumption inherent in the line extrapolation method is that a V-shaped cross section is a reasonable approximation of the actual unknown cross-section within the extrapolated area. As of yet, TWDB has been unable to test this assumption, and therefore can only assume that the results of the usage of the line extrapolation method are "more

accurate" than those derived without line extrapolation. For the purpose of estimating the volume of water within Lake Arlington, the line extrapolation method is justified in that it produces a reasonable representation of reservoir bathymetry in the un-surveyed areas. The use of a V-shaped extrapolated cross-section likely provides a conservative estimate of the water volume in un-surveyed areas, as most surveyed cross-sections within Lake Arlington had shapes more similar to U-profiles than to V-profiles. The V-profiles are thus conservative in that a greater volume of water is implied by a U-profile than a V-profile. Further information on the line extrapolation method is provided in the HydroEdit User's Manual.[10]

## Volumetric Survey Results

The results of the TWDB 2007 Volumetric Survey indicate Lake Arlington has a total reservoir capacity of 40,188 acre-feet and encompasses 1,926 acres at conservation pool elevation (550.0 feet above mean sea level, NGVD 29).

Due to differences in the methodologies used in calculating areas and capacities from this and previous Lake Arlington surveys, comparison of these values is not recommended.[11] 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 Arlington in approximately 10 years or after a flood event.

## 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, Director of Surface Water Resources, at 512-463-8856, or by email at: Barney.Austin@twdb.state.tx.us.

## References


1. Texas Parks and Wildlife Department, Fishing Lake Arlington, 27 September 2007, http://www.tpwd.state.tx.us/fishboat/fish/recreational/lakes/arlington/ viewed 8 January 2008.

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5. United States Geological Survey, http://tx.usgs.gov/ viewed on 26 March 2008.

6. Eaton, A.D., Clesceri, L.S., and Greenberg, A.E. "Standard Methods for the Examination of Water and Wastewater." 19th Editions (1995). American Public Health Association. Washington D.C.

7. U.S Department of Agriculture, Farm Service Agency, Aerial Photography Field Office, National Agriculture Imagery Program, http://www.apfo.usda.gov/NAIP.html viewed 10 February 2006.

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9. ESRI, Environmental Systems Research Institute. 1995. ARC/INFO Surface Modeling and Display, TIN Users Guide.

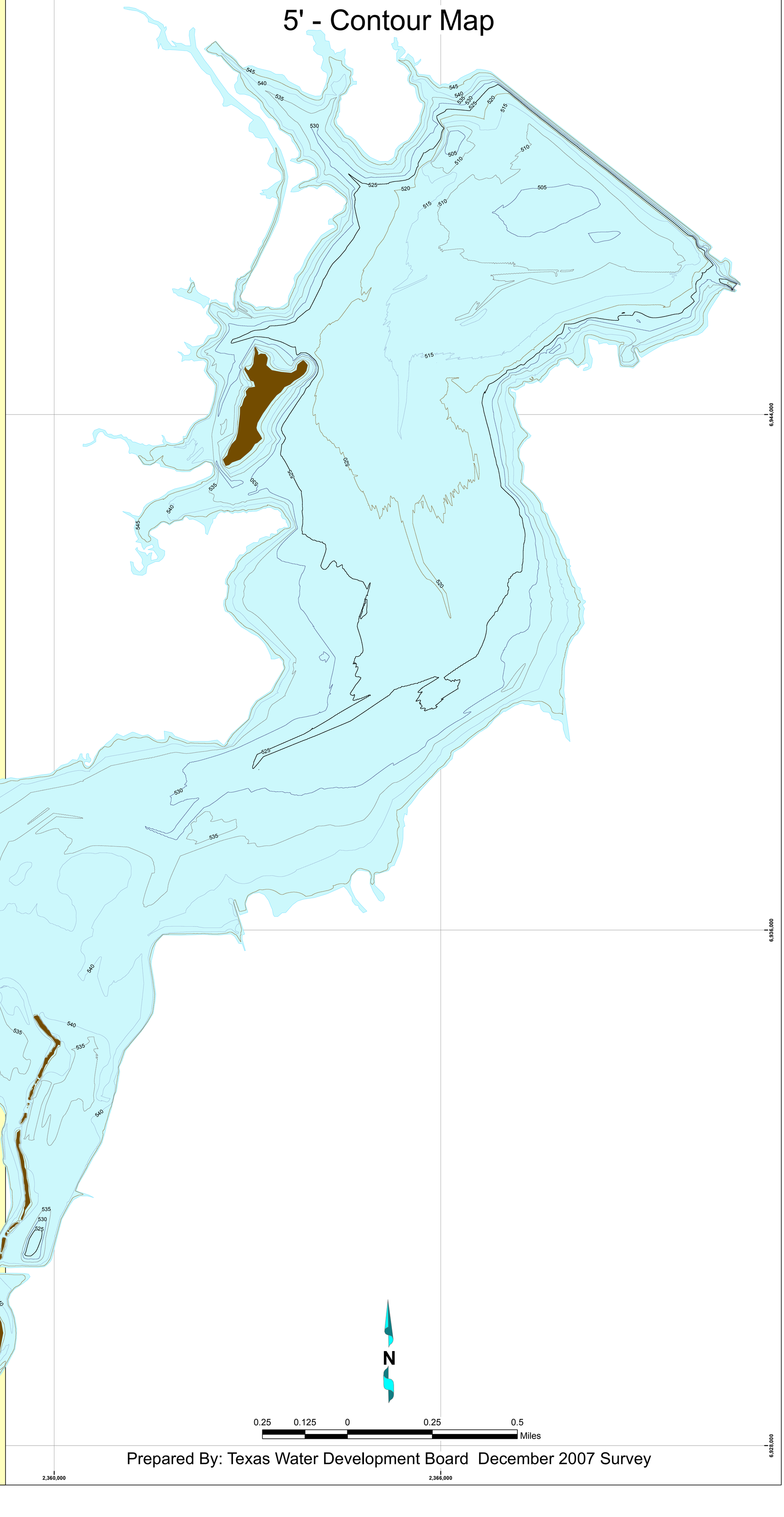
10. Furnans, Jordan. Texas Water Development Board. 2006. "HydroEdit User's Manual."

11. United States Department of Agriculture, Natural Resource Conservation Service, National Engineering Handbook, Section 3, Sedimentation, Chapter 7, Field Investigations and Surveys, December 1983.

# Figure 5

# Lake Arlington

## 5' - Contour Map




### Legend

**CONTOURS**

(in feet above mean sea level)

545
540
535
530
525
520
515
510
505

Islands

Lake Arlington

Conservation Pool
Elevation: 550.0 feet
above mean sea level

Projection: NAD83
State Plane
Texas North Central Zone

Tarrant County

N

0.25 0.125 0 0.25 0.5
Miles

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 Arlington. The Texas Water Development Board makes no representation or assumes any liability.

Prepared By: Texas Water Development Board December 2007 Survey

# Lake Arlington

## RESERVOIR VOLUME TABLE - NGVD29 DATUM

TEXAS WATER DEVELOPMENT BOARD — December 2007 SURVEY

Conservation Pool Elevation 550.0 feet

VOLUME IN ACRE-FEET — 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 |
|---|---|---|---|---|---|---|---|---|---|---|
| 500 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 501 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 502 | 0 | 0 | 1 | 1 | 1 | 1 | 2 | 2 | 3 | 3 |
| 503 | 4 | 5 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 13 |
| 504 | 14 | 15 | 17 | 18 | 20 | 22 | 23 | 25 | 27 | 29 |
| 505 | 32 | 34 | 36 | 39 | 41 | 44 | 47 | 50 | 53 | 57 |
| 506 | 60 | 64 | 67 | 71 | 75 | 80 | 84 | 89 | 93 | 98 |
| 507 | 103 | 109 | 114 | 120 | 125 | 131 | 138 | 144 | 151 | 157 |
| 508 | 165 | 172 | 179 | 187 | 195 | 203 | 211 | 219 | 228 | 237 |
| 509 | 247 | 256 | 266 | 276 | 287 | 298 | 309 | 320 | 332 | 343 |
| 510 | 355 | 367 | 380 | 392 | 405 | 418 | 432 | 446 | 459 | 474 |
| 511 | 488 | 503 | 518 | 533 | 549 | 564 | 580 | 597 | 613 | 630 |
| 512 | 648 | 665 | 683 | 701 | 719 | 738 | 757 | 777 | 796 | 816 |
| 513 | 836 | 857 | 877 | 898 | 920 | 941 | 963 | 985 | 1,007 | 1,030 |
| 514 | 1,053 | 1,076 | 1,099 | 1,123 | 1,147 | 1,171 | 1,196 | 1,220 | 1,246 | 1,271 |
| 515 | 1,297 | 1,323 | 1,350 | 1,376 | 1,404 | 1,431 | 1,459 | 1,487 | 1,516 | 1,545 |
| 516 | 1,574 | 1,603 | 1,633 | 1,663 | 1,693 | 1,724 | 1,754 | 1,786 | 1,817 | 1,849 |
| 517 | 1,880 | 1,913 | 1,945 | 1,978 | 2,011 | 2,044 | 2,078 | 2,112 | 2,146 | 2,181 |
| 518 | 2,216 | 2,251 | 2,287 | 2,323 | 2,360 | 2,397 | 2,434 | 2,472 | 2,510 | 2,549 |
| 519 | 2,587 | 2,627 | 2,667 | 2,707 | 2,748 | 2,789 | 2,831 | 2,873 | 2,916 | 2,959 |
| 520 | 3,003 | 3,047 | 3,093 | 3,138 | 3,184 | 3,231 | 3,279 | 3,328 | 3,377 | 3,427 |
| 521 | 3,478 | 3,529 | 3,581 | 3,634 | 3,687 | 3,741 | 3,796 | 3,851 | 3,906 | 3,962 |
| 522 | 4,019 | 4,076 | 4,134 | 4,192 | 4,251 | 4,310 | 4,369 | 4,430 | 4,490 | 4,552 |
| 523 | 4,613 | 4,676 | 4,739 | 4,802 | 4,866 | 4,930 | 4,995 | 5,061 | 5,127 | 5,193 |
| 524 | 5,260 | 5,328 | 5,396 | 5,464 | 5,533 | 5,602 | 5,671 | 5,741 | 5,811 | 5,882 |
| 525 | 5,953 | 6,025 | 6,097 | 6,169 | 6,242 | 6,316 | 6,390 | 6,465 | 6,539 | 6,615 |
| 526 | 6,691 | 6,767 | 6,844 | 6,921 | 6,998 | 7,076 | 7,155 | 7,234 | 7,313 | 7,393 |
| 527 | 7,473 | 7,553 | 7,634 | 7,715 | 7,797 | 7,879 | 7,962 | 8,045 | 8,129 | 8,213 |
| 528 | 8,297 | 8,382 | 8,467 | 8,552 | 8,638 | 8,724 | 8,811 | 8,898 | 8,986 | 9,074 |
| 529 | 9,162 | 9,251 | 9,340 | 9,429 | 9,519 | 9,610 | 9,700 | 9,792 | 9,883 | 9,976 |
| 530 | 10,068 | 10,161 | 10,255 | 10,349 | 10,443 | 10,538 | 10,634 | 10,730 | 10,826 | 10,923 |
| 531 | 11,021 | 11,118 | 11,217 | 11,316 | 11,415 | 11,515 | 11,616 | 11,717 | 11,818 | 11,920 |
| 532 | 12,022 | 12,126 | 12,230 | 12,334 | 12,439 | 12,545 | 12,652 | 12,759 | 12,866 | 12,975 |
| 533 | 13,084 | 13,194 | 13,304 | 13,415 | 13,527 | 13,639 | 13,752 | 13,866 | 13,980 | 14,095 |
| 534 | 14,210 | 14,326 | 14,442 | 14,559 | 14,677 | 14,795 | 14,913 | 15,032 | 15,152 | 15,272 |
| 535 | 15,392 | 15,513 | 15,635 | 15,757 | 15,880 | 16,003 | 16,127 | 16,251 | 16,376 | 16,502 |
| 536 | 16,628 | 16,754 | 16,882 | 17,010 | 17,138 | 17,268 | 17,398 | 17,528 | 17,660 | 17,792 |
| 537 | 17,924 | 18,058 | 18,192 | 18,327 | 18,462 | 18,599 | 18,736 | 18,874 | 19,012 | 19,152 |
| 538 | 19,292 | 19,433 | 19,574 | 19,717 | 19,860 | 20,004 | 20,149 | 20,294 | 20,440 | 20,587 |
| 539 | 20,734 | 20,882 | 21,031 | 21,180 | 21,330 | 21,480 | 21,631 | 21,783 | 21,936 | 22,089 |
| 540 | 22,243 | 22,398 | 22,554 | 22,710 | 22,868 | 23,026 | 23,185 | 23,344 | 23,505 | 23,666 |
| 541 | 23,829 | 23,992 | 24,158 | 24,324 | 24,492 | 24,659 | 24,828 | 24,997 | 25,167 | 25,338 |
| 542 | 25,509 | 25,681 | 25,853 | 26,026 | 26,200 | 26,374 | 26,548 | 26,723 | 26,898 | 27,075 |
| 543 | 27,251 | 27,428 | 27,605 | 27,783 | 27,961 | 28,140 | 28,318 | 28,498 | 28,677 | 28,857 |
| 544 | 29,037 | 29,217 | 29,397 | 29,578 | 29,759 | 29,940 | 30,121 | 30,303 | 30,484 | 30,666 |
| 545 | 30,848 | 31,030 | 31,213 | 31,395 | 31,578 | 31,761 | 31,944 | 32,127 | 32,311 | 32,495 |
| 546 | 32,678 | 32,862 | 33,046 | 33,231 | 33,415 | 33,600 | 33,785 | 33,970 | 34,155 | 34,341 |
| 547 | 34,526 | 34,712 | 34,898 | 35,084 | 35,270 | 35,457 | 35,643 | 35,830 | 36,017 | 36,205 |
| 548 | 36,392 | 36,580 | 36,768 | 36,956 | 37,144 | 37,333 | 37,521 | 37,710 | 37,899 | 38,089 |
| 549 | 38,278 | 38,468 | 38,658 | 38,849 | 39,039 | 39,230 | 39,421 | 39,612 | 39,804 | 39,996 |
| 550 | 40,188 | | | | | | | | | |

# Lake Arlington

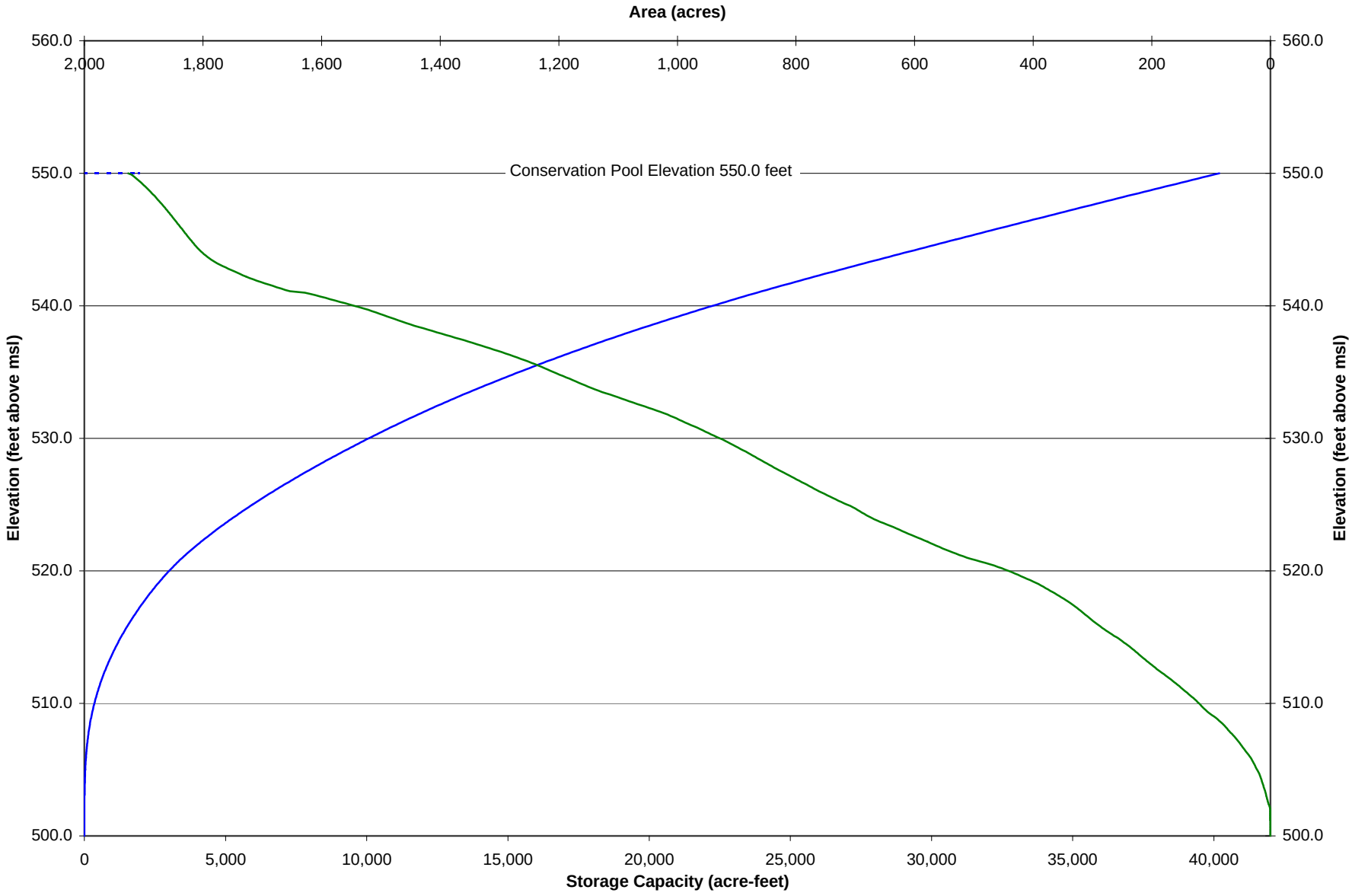
## RESERVOIR AREA TABLE - NGVD29 DATUM

TEXAS WATER DEVELOPMENT BOARD — December 2007 SURVEY

Conservation Pool Elevation 550.00 feet

AREA IN ACRES — 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 |
|---|---|---|---|---|---|---|---|---|---|---|
| 500 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 501 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 502 | 1 | 1 | 1 | 2 | 3 | 4 | 4 | 5 | 6 | 6 |
| 503 | 7 | 7 | 8 | 9 | 9 | 10 | 11 | 11 | 12 | 13 |
| 504 | 14 | 14 | 15 | 16 | 17 | 17 | 18 | 19 | 20 | 21 |
| 505 | 22 | 24 | 25 | 26 | 27 | 28 | 30 | 31 | 32 | 33 |
| 506 | 35 | 36 | 38 | 40 | 42 | 43 | 45 | 47 | 48 | 50 |
| 507 | 52 | 53 | 55 | 57 | 59 | 61 | 63 | 65 | 67 | 69 |
| 508 | 71 | 73 | 75 | 77 | 79 | 81 | 84 | 87 | 89 | 92 |
| 509 | 95 | 98 | 101 | 104 | 107 | 109 | 112 | 114 | 116 | 118 |
| 510 | 120 | 123 | 125 | 127 | 130 | 133 | 135 | 138 | 141 | 143 |
| 511 | 146 | 149 | 151 | 154 | 156 | 159 | 162 | 165 | 168 | 171 |
| 512 | 174 | 177 | 180 | 183 | 186 | 189 | 192 | 194 | 197 | 200 |
| 513 | 203 | 206 | 209 | 211 | 214 | 217 | 219 | 222 | 224 | 227 |
| 514 | 230 | 232 | 235 | 238 | 241 | 244 | 247 | 250 | 253 | 256 |
| 515 | 259 | 264 | 267 | 270 | 274 | 277 | 281 | 284 | 287 | 290 |
| 516 | 293 | 296 | 298 | 301 | 304 | 307 | 309 | 312 | 315 | 318 |
| 517 | 321 | 323 | 326 | 329 | 332 | 335 | 338 | 342 | 345 | 349 |
| 518 | 352 | 356 | 360 | 364 | 367 | 371 | 375 | 379 | 383 | 387 |
| 519 | 391 | 395 | 400 | 405 | 410 | 416 | 421 | 426 | 431 | 436 |
| 520 | 442 | 447 | 453 | 460 | 466 | 473 | 481 | 489 | 497 | 505 |
| 521 | 512 | 518 | 525 | 530 | 536 | 542 | 548 | 553 | 558 | 563 |
| 522 | 569 | 574 | 579 | 584 | 589 | 594 | 599 | 605 | 610 | 616 |
| 523 | 621 | 626 | 631 | 636 | 641 | 647 | 652 | 658 | 663 | 668 |
| 524 | 673 | 677 | 681 | 685 | 689 | 692 | 696 | 700 | 704 | 709 |
| 525 | 714 | 719 | 724 | 729 | 733 | 738 | 743 | 747 | 752 | 756 |
| 526 | 761 | 765 | 769 | 774 | 778 | 782 | 786 | 790 | 794 | 799 |
| 527 | 803 | 807 | 812 | 816 | 820 | 824 | 829 | 833 | 837 | 841 |
| 528 | 845 | 849 | 853 | 857 | 861 | 865 | 869 | 873 | 877 | 881 |
| 529 | 885 | 889 | 893 | 898 | 902 | 906 | 910 | 915 | 919 | 923 |
| 530 | 928 | 933 | 938 | 943 | 948 | 952 | 957 | 962 | 967 | 972 |
| 531 | 977 | 982 | 987 | 992 | 997 | 1,002 | 1,007 | 1,012 | 1,017 | 1,022 |
| 532 | 1,029 | 1,035 | 1,042 | 1,048 | 1,055 | 1,062 | 1,068 | 1,075 | 1,081 | 1,088 |
| 533 | 1,094 | 1,100 | 1,107 | 1,114 | 1,120 | 1,127 | 1,133 | 1,139 | 1,145 | 1,151 |
| 534 | 1,156 | 1,161 | 1,166 | 1,171 | 1,177 | 1,182 | 1,187 | 1,193 | 1,199 | 1,204 |
| 535 | 1,209 | 1,214 | 1,219 | 1,224 | 1,230 | 1,235 | 1,240 | 1,246 | 1,252 | 1,258 |
| 536 | 1,264 | 1,270 | 1,276 | 1,283 | 1,289 | 1,296 | 1,302 | 1,310 | 1,317 | 1,324 |
| 537 | 1,331 | 1,338 | 1,345 | 1,352 | 1,360 | 1,367 | 1,375 | 1,382 | 1,390 | 1,398 |
| 538 | 1,406 | 1,413 | 1,421 | 1,428 | 1,436 | 1,443 | 1,450 | 1,457 | 1,464 | 1,470 |
| 539 | 1,477 | 1,483 | 1,489 | 1,496 | 1,502 | 1,508 | 1,515 | 1,522 | 1,529 | 1,537 |
| 540 | 1,545 | 1,552 | 1,560 | 1,569 | 1,577 | 1,585 | 1,593 | 1,602 | 1,610 | 1,619 |
| 541 | 1,628 | 1,653 | 1,661 | 1,668 | 1,675 | 1,682 | 1,689 | 1,696 | 1,703 | 1,709 |
| 542 | 1,715 | 1,721 | 1,727 | 1,733 | 1,737 | 1,742 | 1,747 | 1,752 | 1,757 | 1,762 |
| 543 | 1,767 | 1,771 | 1,776 | 1,780 | 1,783 | 1,787 | 1,790 | 1,793 | 1,795 | 1,798 |
| 544 | 1,801 | 1,803 | 1,805 | 1,808 | 1,810 | 1,812 | 1,814 | 1,816 | 1,818 | 1,819 |
| 545 | 1,821 | 1,823 | 1,825 | 1,827 | 1,828 | 1,830 | 1,832 | 1,834 | 1,835 | 1,837 |
| 546 | 1,839 | 1,841 | 1,843 | 1,844 | 1,846 | 1,848 | 1,850 | 1,851 | 1,853 | 1,855 |
| 547 | 1,857 | 1,859 | 1,860 | 1,862 | 1,864 | 1,866 | 1,868 | 1,870 | 1,872 | 1,874 |
| 548 | 1,876 | 1,878 | 1,880 | 1,882 | 1,884 | 1,886 | 1,888 | 1,890 | 1,893 | 1,895 |
| 549 | 1,897 | 1,900 | 1,902 | 1,904 | 1,907 | 1,909 | 1,912 | 1,915 | 1,918 | 1,921 |
| 550 | 1,926 | | | | | | | | | |




**Lake Arlington**
2007 Survey
Prepared by: TWDB

# *Mission*

***To provide leadership, planning, financial assistance, information, and education for the conservation and responsible development of water for Texas.***

# *Vision*

***Sustainable, Affordable, Quality Water for Texans, our Economy, and our Environment***

## EQUAL OPPORTUNITY EMPLOYER

*The Texas Water Development Board does not discriminate in the basis of race, color, natural origin, sex, religion, age, or disability or the provision of services, programs, or activities.*

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