Volumetric Survey of Lake Georgetown

May 2005 Survey

Prepared by:

The Texas Water Development Board

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Texas Water Development Board

J. Kevin Ward, Executive Administrator

Texas Water Development Board

Prepared for:

Brazos River Authority

In cooperation with the

United States Army Corps of Engineers

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Executive Summary

In 2005, the Texas Water Development Board (TWDB) entered into agreement with the Brazos River Authority (BRA), for the purpose of performing a volumetric survey of Lake Georgetown. The survey was performed while the reservoir was near the top of the conservation pool elevation and this information was converted into updated Elevation-Volume and Elevation-Area Tables. Secondarily, the data was compared to the 1995 TWDB survey of Lake Georgetown to determine changes in volume and surface area. Additionally, cross-sections of the 1995 data and 2005 data are compared to the pre-impoundment sediment range lines established in 1978 by the United States Army Corp of Engineers (USACE).

The results for the TWDB 2005 Survey indicate Lake Georgetown currently has a volume of 36,904 acre-feet and a surface area of 1,287 acres, at conservation pool elevation, 791.0 ft. To directly compare the TWDB 2005 Survey with the TWDB 1995 Survey, the 1995 survey was revised using the boundary created from aerial photographs for the 2005 survey. The results are presented in the report. Comparison of the TWDB 2005 Survey to the original design capacity of 37,100 acre-feet and a surface area of 1,310 acres[1], results in a 0.5% loss in volume, and a 1.8% loss in surface area in 2005.

A cross-sectional comparison of eleven of the seventeen USACE 1978 sediment range lines with the TWDB 2005 Survey and the TWDB 1995 Revised Survey was conducted. Sediment Range Lines SR01 through SR03 compare the TWDB 2005 Survey data with the TWDB 1995 Revised Survey data only, as the 1978 data for these lines is unavailable. The results of the cross-sectional comparisons are variable and significant differences are most likely due to the interpolation routine of the Triangular Irregular Network (TIN) Model.

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Lake Georgetown General Information

Lake Georgetown and the North San Gabriel Dam were built by the USACE to control flooding and provide a water supply to the cities of Round Rock and Georgetown. The reservoir is also a popular recreation destination. See Table 1 on the following page for pertinent data about Lake Georgetown and the North San Gabriel Dam.

History[1]

- October 23, 1962 Flood Control Act of 1962 (PL 87-874) (HD 591/87/2)
  Authorized a reservoir system consisting of Lake Georgetown, Granger, and the South Fork Lakes.

- 1968 Construction of Lake Georgetown initiated.

- March 3, 1980 Deliberate impoundment of Lake Georgetown begins.

- 1982 Lake Georgetown completed.

Water Rights

- July 23, 1964 Commission Order
  Authorized the Brazos River Authority (BRA), for the purpose of system operation, to divert and use from the North Fork Reservoir 16,500 acre-feet per annum for municipal purposes, 16,500 acre-feet per annum for industrial uses, and 4,100 acre-feet per annum for irrigation purposes.

- July 16, 1968 Permit to Appropriate State Water no. 2367
  Granted the BRA the right to impound 37,100 acre-feet in the North Fork Reservoir System, and a priority right of 14,200 acre-feet of water per annum for beneficial use.

- July 17, 1968 Permit to Appropriate State Water no. 2367A- Amendment to Permit no. 2367
  Authorized the BRA to utilize the lake for recreational purposes.

- November 3, 1980 Permit to Appropriate State Water no. 2367B- Amendment to Permit no. 2367
  Authorized the BRA to convert 100 acre-feet out of the 16,500 acre-ft previously authorized for industrial uses, to mining uses.

- November 24, 1986 Certificate of Adjudication 12-5162
  Amended the priority right of the BRA to 13,610 acre-ft of water per annum from Lake Georgetown. However, for the purposes of system operation, the BRA is authorized to exceed this new priority right and charge the excess against the sum of

1

the amounts designated as priority rights in the other reservoirs included in the System Operation Order. The right to divert and use for municipal, irrigation, industrial, and mining uses remains the same as originally authorized and amended by Permit no. 2367B.   The complete certificate is on file in the Records Division of the Texas Commission on Environmental Quality (TCEQ).

Table 1. Pertinent Data for Lake Georgetown and the North San Gabriel Dam[1]

Owner of Lake Georgetown and Facilities
 United States of America
Operator of Lake Georgetown and Facilities
 U. S. Army Corps of Engineers (USACE), Fort Worth District
Engineer (Design)
 USACE, Fort Worth District
Location of Dam
 River Mile 4.3 on the North Fork of the San Gabriel River, Brazos River Basin, 3.5 miles west of Georgetown, TX in Williamson County. (Figure 1)
Drainage Area
 246 square miles
Dam

Type	Rock fill, impervious cover
Length (total)	6,700 ft (including spillway)
Maximum Height	164 ft
Top Width	30 ft

Spillway

Type	Broadcrested
Length	1000 ft
Crest elevation	834.0 ft msl
Control	None

Outlet Works

Type	1 gate controlled conduit
Dimension	11 ft diameter
Control	2- 5 ft x 11 ft hydraulic operated slide gates
Invert Elevation	720.0 ft msl

Reservoir Data (Based on TWDB 2005 volumetric survey)

Feature	Elevation (ft above msl)	Capacity (Acre-feet)	Area (Acres)
Top of Dam	861.0	N/A	N/A
Top of Flood Control Pool And Spillway Crest	834.0	N/A	N/A
Top of Conservation Pool	791.0	36,904	1,287

Figure 1

LAKE GEORGETOWN

Location Map

Williamson County

SH0138
FM2843
FM0481
FM1105
Bartlett
Florence
FM0487
US0183
FM0970
SH0096
FM0971
RM2338
SH0195
FM0035
FM0972
FM1105
Granger
FM3405
Serenada
Weir
FM0971
FM1331
Lake Georgetown
RM1869
Liberty Hill
SH0029
Georgetown
FM0619
FM1062
Thorndale
RM2243
FM1460
FM1660
FM0397
Thrall
Taylor
RM2243
FM0112
Leander
US0079
Hutto
FM3349
FM0973
RM1431
FM0734
Round Rock
FM0685
FM1660
FM1466
FM0619
Cedar Park
Brushy Creek
BR0035L
FM0486
Cedar P.
FM1325
Pflugerville
US0079
Anderson Mill
Austin
Austin

3

Miles
0   1.25 2.5   5   7.5   10

TEXAS WATER DEVELOPMENT BOARD

Volumetric Survey of Lake Georgetown

Introduction

In March of 2005, the Texas Water Development Board (TWDB) entered into agreement with the Brazos River Authority, for the purpose of performing a volumetric survey of Lake Georgetown. The survey was performed while the reservoir was near the top of the conservation pool elevation, and this information was converted into updated Elevation-Volume and Elevation-Area Tables. Secondarily, the data was compared to the 1995 TWDB survey of Lake Georgetown to monitor changes in volume and surface area. In addition, cross-sections of the 1995 data and 2005 data are compared to the pre-impoundment sediment range lines established in 1978 by the U.S. Army Corp of Engineers (USACE).

Hydrographic Survey

Records1 indicate the conservation pool elevation for Lake Georgetown is 791.0 ft above mean sea level (msl). The TWDB survey occurred on May 18th and 19th of 2005. During the TWDB 2005 survey, water levels varied between 791.33 ft and 791.34 ft msl.2 The survey team used two boats equipped with depth sounders, velocity profilers, and integrated Differential Global Positioning System (DGPS) equipment. The depth sounders were calibrated each day using the velocity profilers to measure the speed of sound in the water column and a weighted tape or stadia rod to verify the depth reading. The speed of sound varied between 4,892 and 4,899 feet per second during the TWDB 2005 Survey. Depth and positional data were collected along a set of pre-plotted navigation lines, originally designed for the TWDB 1995 Survey, which were spaced approximately 500 feet apart. Additional data were collected around the water supply intake and outlet works structures near the dam. The survey team navigated approximately 50 miles of range lines and collected over 34,000 data points.

Survey Results

The results of the TWDB 2005 Survey indicate Lake Georgetown has a capacity of 36,904 acre-feet of water and encompasses 1,287 acres at conservation pool elevation, 791.0 ft. Table 2 compares the TWDB 2005 Survey with previous surveys of Lake Georgetown completed by the TWDB and USACE.

| Table 2: Area and Volume Comparisons of Lake Georgetown			
Feature	USACE	TWDB	
	Original Design[1]	Volumetric Survey	
Year	N/A*	1995 (Revised 2005)	2005
Area (acres)	1,310	1,287	1,287
Volume (acre-feet)	37,100	36,123	36,904

* Deliberate impoundment began in 1980

The TWDB 1995 Survey was revised using the 2005 boundary for the purpose of directly comparing any changes in volume between 1995 and 2005. Originally, the 1995 boundary was digitized from 1:24,000 scale USGS Topographic Maps[3], whereas, the 2005 boundary was digitized from 1995-1996 1:12,000 scale aerial photographs.

The addition of a shallow water boat during the TWDB 2005 Survey allowed data to be collected in shallow areas near the shore and in the upper reaches, areas inaccessible by boat during the 1995 survey. A revised Triangular Irregular Network (TIN) Model using the 1995 data with the 2005 boundary was created and compared to the 2005 model. The additional data in 2005 resulted in a better interpolation of the TIN Model around the edges and may explain the 2.2% increase in volume in the 2005 survey results. The TWDB 2005 survey data is presented in Figure 2. Figure 3 compares the data collected in 2005 to the data the TWDB collected in 1995.

There is a 0.5% difference in volume and a 1.8% difference in surface area between the 2005 Survey and the original design, and a 2.6% difference in volume between the 1995 Revised Survey and the original design. Some differences between the original design and the TWDB surveys may be due to methodological differences used in computing the area and volume and direct comparisons are not recommended.[4]

Figure 2
Lake Georgetown
Data points collected during the TWDB 2005 Survey
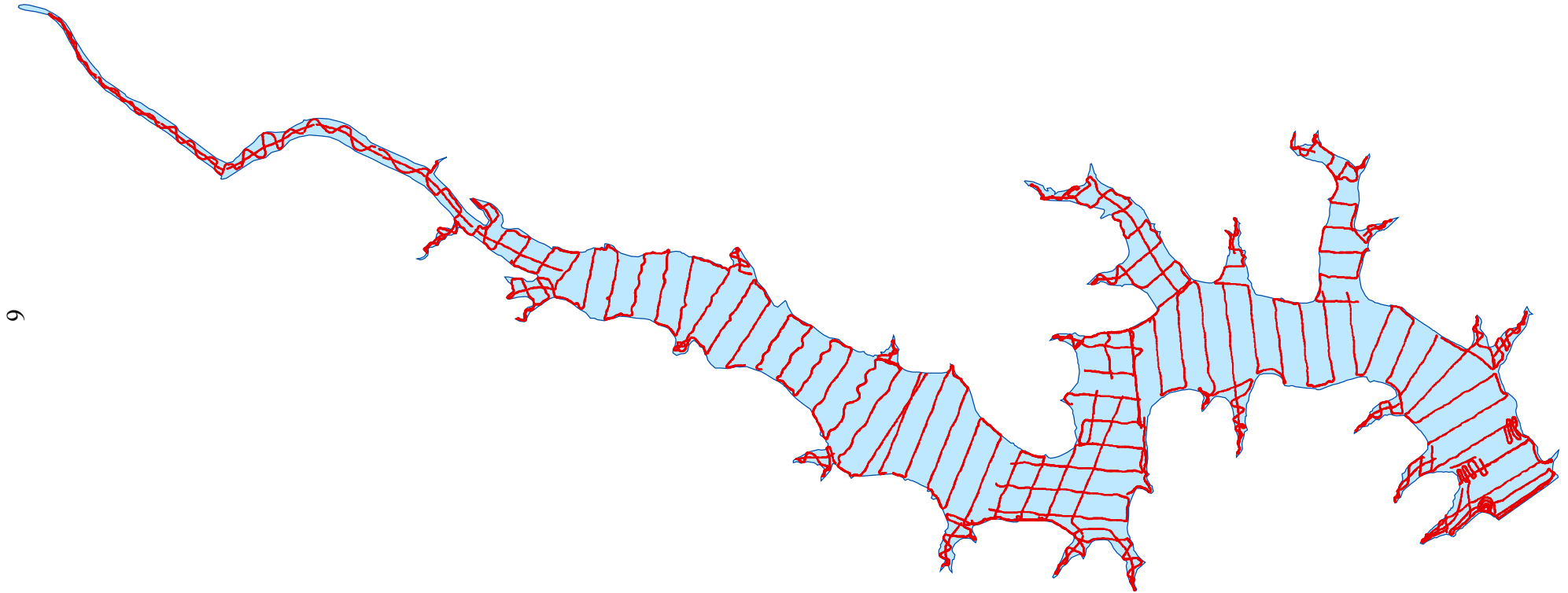
Legend

...... Data Points

Lake Boundary

Miles
0   0.25   0.5   1
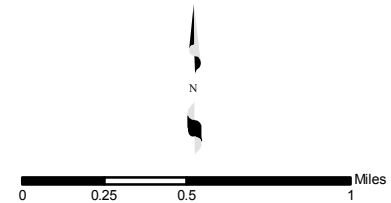
Figure 3
Lake Georgetown
Comparison of data collected in the TWDB 1995 Survey and data collected in the TWDB 2005 Survey

Legend

- - - - TWDB 1995 Survey Data

. . . . . TWDB 2005 Survey Data

——— Lake Boundary

Miles
0   0.25   0.5   1
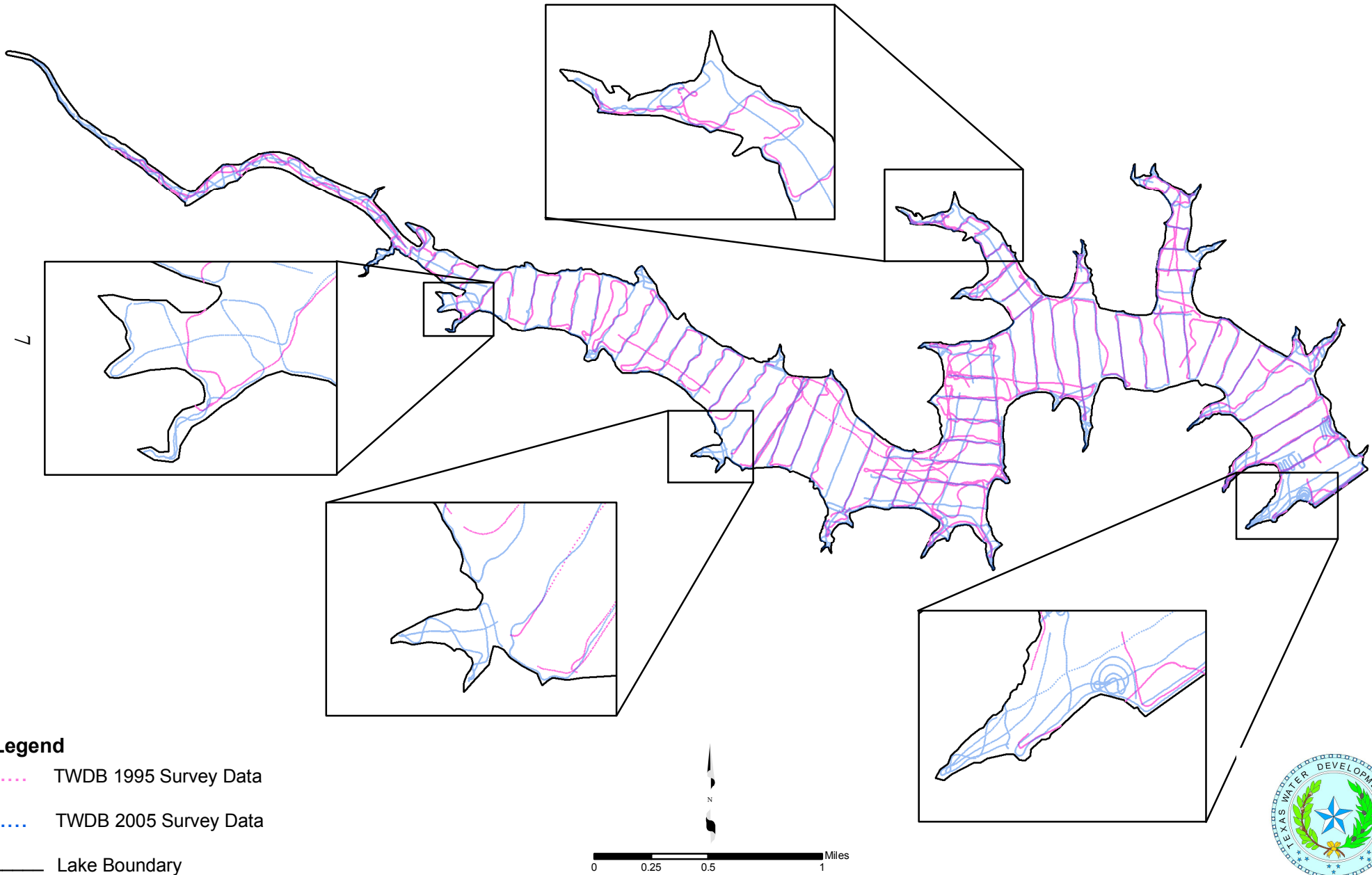
Data Processing

Datum

The vertical datum used during this survey is that used by the United States Geological Survey (USGS) for the reservoir elevation gauge USGS 08104650 Lake Georgetown near Georgetown.[2] The datum for this gauge is reported as mean sea level (msl), thus elevations reported here are in feet (ft) above msl. 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 Central Zone.

Model boundary

The reservoir boundary was digitized from digital orthophoto quadrangle images (DOQs) using Environmental Systems Research Institute's (ESRI) ArcGIS 9.1 software. The DOQs used for Lake Georgetown were Georgetown and Leander NE, photographed between January and February of 1995. At the time of the photographs the water surface elevation varied between 784.78 and 786.81 ft, therefore staff used field observations, 1:24,000 scale hypsography (contours), and beaches and vegetation visible in the DOQs to interpret the boundary at elevation 791 ft.

VARGIS of Texas LLC produced the DOQs for the Texas Orthoimagery Program (TOP). The DOQs produced for the Department of Information Resources and the GIS Planning Council under the TOP reside in the public domain. More information can be obtained on the Internet at http://www.tnris.state.tx.us/DigitalData/doqs.htm.

Triangular Irregular Network (TIN) Model

Upon completion of data collection, the raw data files are edited in HYPACK MAX to remove any data anomalies. The water surface elevations for each respective day are applied and the depths are converted to corresponding elevations and exported as a MASS points file. The MASS points and boundary files are used to create a Triangulated Irregular Network (TIN) model, a function of the 3D Analyst Extension of ArcGIS. The model uses Delauney's criteria for triangulation to place a triangle between three non-uniformly spaced points, including the boundary.[5]

Using Arc/Info software, volumes and areas are calculated from the TIN Model for the entire lake at one-tenth of a foot intervals, from elevation 706.4 ft to elevation 791.0 ft. The Elevation-Volume and Elevation-Area Tables, updated for 2005, are presented in Appendices A and B, respectively. The 1995 Revised Survey Elevation-Volume and Elevation-Area Tables are presented in Appendices C and D, respectively. An Elevation-Volume graph comparing the TWDB 2005 Survey with the 1995 TWDB Revised Survey is presented in Appendix E. An Elevation-Area graph is presented in Appendix F. A raster image of the TIN Model was used to create Figure 4, an Elevation Relief Map representing the topography of the lake bottom, Figure 5, a map showing shaded depth ranges for Lake Georgetown, and Figure 6, a 5 ft contour map.

Sediment Range Lines

A cross-sectional comparison of eleven of the seventeen USACE 1978 sediment range lines with the TWDB 2005 Survey and the TWDB 1995 Revised Survey is presented in Appendix G. Also presented in Appendix G are a map, depicting the historical locations of the Sediment Range Lines and Table 3, a list of the endpoint coordinates for each line. Sediment Range Lines SR01 through SR03 compare the TWDB 2005 Survey data with the TWDB 1995 Revised Survey data only, as the 1978 data for these lines is unavailable. The results of the cross-sectional comparisons are variable and significant differences are most likely due to the interpolation routine of the TIN Model.

REFERENCES

1. United States Corps of Engineers, Fort Worth District, Reservoir Control Office. 1981. <http://www.swf-wc.usace.army.mil/> Reservoir Pertinent Data. 29 August 2005.

2. United States Geological Society. http://tx.usgs.gov/. 20 May 2005

3. Texas Water Development Board. 1995. "Volumetric Survey of Lake Georgetown."

4. Blanton III, James O. Bureau of Reclamation. 1982. "Procedures for Monitoring Reservoir Sedimentation."

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

Figure 4
Lake Georgetown
Elevation Relief
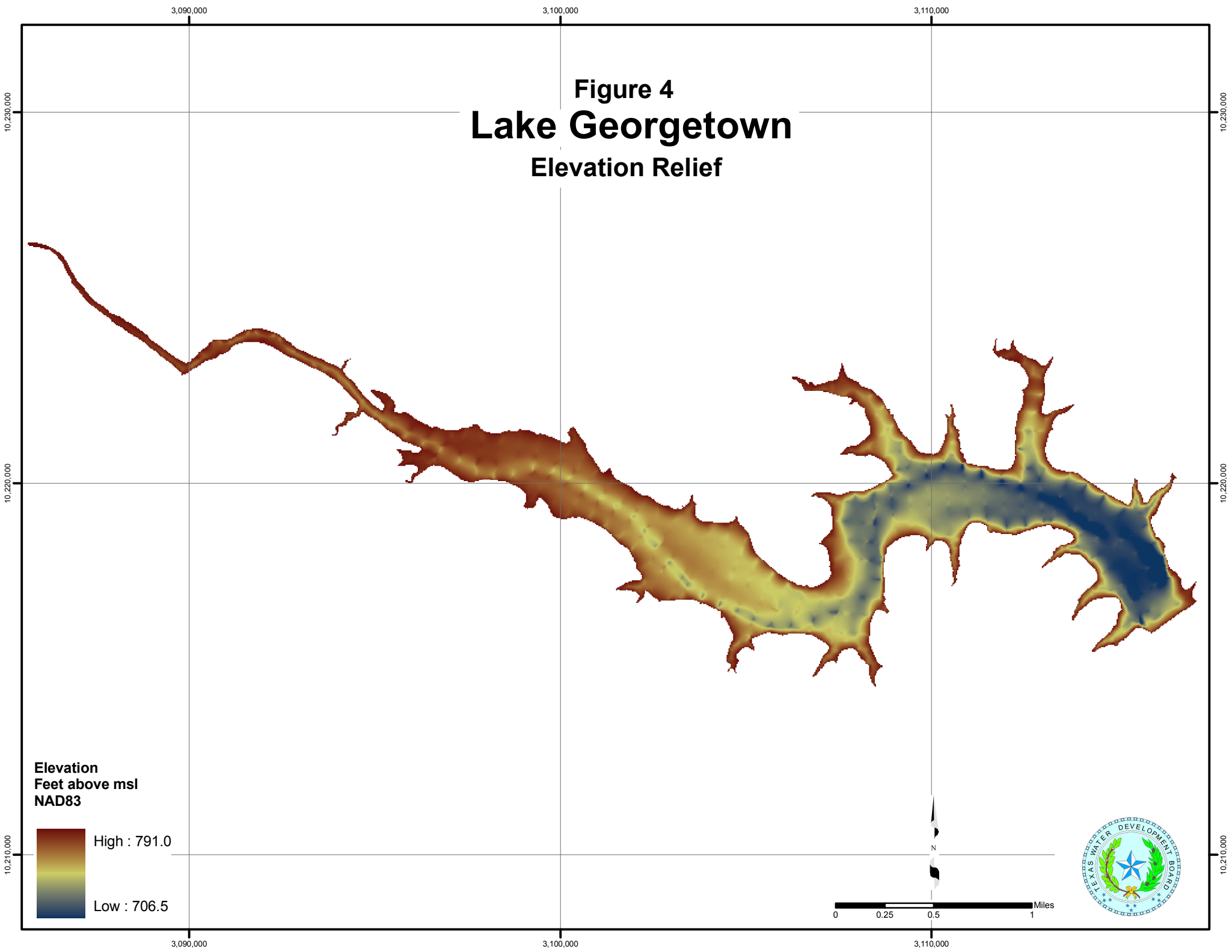
Elevation
Feet above msl
NAD83

High : 791.0

Low : 706.5

0   0.25   0.5   1   Miles
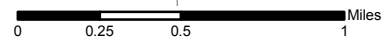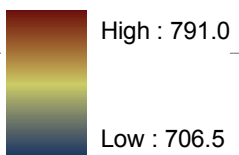
Figure 5
Lake Georgetown
Depth Ranges

Depth Ranges

	0 - 10'
	10 - 20'
	20 - 30'
	30 - 40'
	40 - 50'
	50 - 60'
	60 - 70'
	70 - 80'
	> 80'

Appendix A
Lake Georgetown
RESERVOIR VOLUME TABLE

TEXAS WATER DEVELOPMENT BOARD

MAY 2005 SURVEY

Conservation Pool Elevation 791.0'

VOLUME IN ACRE-FEET

ELEVATION INCREMENT IS ONE TENTH FOOT

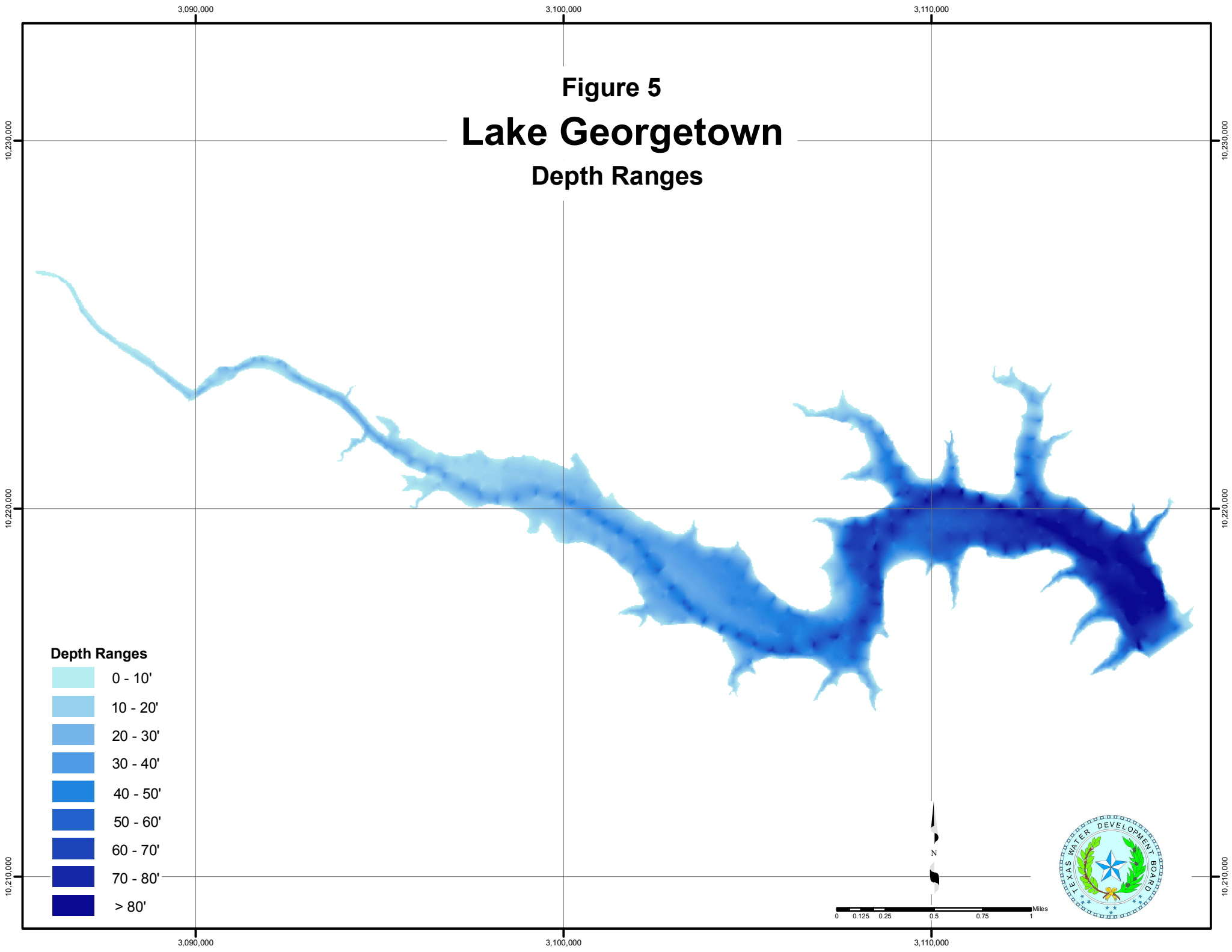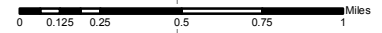| ELEVATION in Feet	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
706					0	0	0	0	0	0
707	0	0	0	0	0	0	0	0	0	0
708	0	0	0	0	1	1	1	1	1	1
709	1	1	2	2	2	2	2	2	3	3
710	3	3	3	4	4	4	4	5	5	5
711	5	6	6	6	7	7	7	8	8	8
712	8	9	9	9	10	10	11	11	11	12
713	12	13	13	14	14	15	15	16	16	17
714	17	18	19	19	20	20	21	22	22	23
715	24	24	25	26	27	27	28	29	30	31
716	31	32	33	34	35	36	37	38	39	40
717	41	42	43	44	45	46	48	49	50	51
718	52	54	55	56	58	59	60	62	63	64
719	66	67	69	70	72	73	75	76	78	80
720	81	83	84	86	88	90	91	93	95	97
721	98	100	102	104	106	108	110	112	114	116
722	118	120	122	125	127	129	131	134	136	138
723	141	143	146	148	151	153	156	158	161	164
724	166	169	172	175	178	181	183	187	190	193
725	197	200	204	208	212	216	220	225	229	234
726	239	244	249	254	259	264	269	275	280	286
727	291	297	303	309	315	321	327	334	340	346
728	353	360	367	374	381	388	396	403	411	419
729	427	435	444	452	461	469	478	488	497	506
730	516	525	535	545	555	565	575	585	596	606
731	617	627	638	649	660	671	682	694	705	716
732	728	740	752	764	776	788	800	812	825	837
733	850	862	875	888	901	914	928	941	954	968
734	982	995	1,009	1,023	1,037	1,051	1,065	1,080	1,094	1,109
735	1,123	1,138	1,153	1,168	1,183	1,199	1,214	1,229	1,245	1,261
736	1,277	1,292	1,309	1,325	1,341	1,357	1,374	1,390	1,407	1,424
737	1,441	1,458	1,475	1,493	1,510	1,528	1,546	1,564	1,582	1,600
738	1,619	1,637	1,656	1,675	1,694	1,713	1,732	1,752	1,772	1,791
739	1,811	1,832	1,852	1,872	1,893	1,914	1,935	1,956	1,977	1,998
740	2,020	2,041	2,063	2,085	2,107	2,129	2,152	2,174	2,197	2,220
741	2,243	2,266	2,289	2,312	2,336	2,359	2,383	2,407	2,431	2,455
742	2,479	2,504	2,528	2,553	2,578	2,603	2,628	2,653	2,679	2,704
743	2,730	2,756	2,782	2,808	2,834	2,860	2,887	2,914	2,940	2,967
744	2,994	3,022	3,049	3,076	3,104	3,132	3,160	3,188	3,216	3,245
745	3,273	3,302	3,331	3,360	3,389	3,419	3,448	3,478	3,508	3,538
746	3,569	3,599	3,630	3,661	3,692	3,723	3,754	3,785	3,817	3,848
747	3,880	3,912	3,944	3,976	4,009	4,041	4,074	4,107	4,140	4,173
748	4,206	4,240	4,273	4,307	4,341	4,375	4,409	4,444	4,478	4,513
749	4,547	4,582	4,618	4,653	4,688	4,724	4,759	4,795	4,831	4,867
750	4,904	4,940	4,977	5,014	5,051	5,088	5,125	5,163	5,200	5,238
751	5,276	5,314	5,352	5,391	5,429	5,468	5,507	5,546	5,585	5,624
752	5,663	5,703	5,743	5,782	5,822	5,862	5,903	5,943	5,983	6,024
753	6,064	6,105	6,146	6,187	6,228	6,270	6,311	6,353	6,394	6,436
754	6,478	6,520	6,562	6,604	6,647	6,690	6,732	6,775	6,818	6,861
755	6,905	6,948	6,992	7,035	7,079	7,124	7,168	7,212	7,257	7,302
756	7,346	7,391	7,437	7,482	7,528	7,573	7,619	7,666	7,712	7,758
757	7,805	7,852	7,899	7,946	7,994	8,041	8,089	8,137	8,185	8,234
758	8,282	8,331	8,380	8,429	8,479	8,528	8,578	8,628	8,678	8,728
759	8,779	8,829	8,880	8,931	8,982	9,034	9,085	9,137	9,189	9,241
760	9,293	9,346	9,399	9,452	9,505	9,558	9,612	9,666	9,719	9,774
761	9,828	9,883	9,937	9,992	10,047	10,103	10,158	10,214	10,270	10,326
762	10,382	10,439	10,496	10,553	10,610	10,667	10,725	10,783	10,841	10,899

RESERVOIR VOLUME TABLE (Continued)

| | | | TEXAS WATER DEVELOPMENT BOARD | | | MAY 2005 SURVEY | | | | |

Conservation Pool Elevation 791.0'

| | | 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
763	10,957	11,016	11,075	11,134	11,193	11,252	11,312	11,372	11,432	11,492
764	11,552	11,613	11,674	11,735	11,796	11,858	11,920	11,982	12,044	12,106
765	12,169	12,232	12,295	12,358	12,422	12,486	12,550	12,614	12,679	12,744
766	12,809	12,874	12,939	13,005	13,071	13,137	13,203	13,270	13,337	13,404
767	13,471	13,539	13,607	13,675	13,743	13,812	13,881	13,950	14,019	14,089
768	14,159	14,229	14,299	14,370	14,441	14,512	14,583	14,655	14,727	14,799
769	14,871	14,944	15,017	15,090	15,163	15,237	15,311	15,385	15,460	15,534
770	15,609	15,684	15,760	15,836	15,912	15,988	16,064	16,141	16,218	16,295
771	16,373	16,450	16,528	16,606	16,685	16,764	16,842	16,922	17,001	17,081
772	17,161	17,241	17,321	17,402	17,483	17,564	17,645	17,726	17,808	17,890
773	17,972	18,054	18,137	18,220	18,303	18,386	18,470	18,553	18,638	18,722
774	18,806	18,891	18,976	19,061	19,147	19,233	19,319	19,405	19,491	19,578
775	19,665	19,752	19,839	19,927	20,015	20,102	20,191	20,279	20,368	20,457
776	20,546	20,635	20,725	20,815	20,905	20,995	21,086	21,177	21,268	21,359
777	21,450	21,542	21,634	21,727	21,819	21,912	22,005	22,098	22,192	22,286
778	22,380	22,474	22,569	22,663	22,758	22,854	22,949	23,045	23,141	23,238
779	23,334	23,431	23,528	23,626	23,723	23,821	23,919	24,018	24,116	24,215
780	24,314	24,414	24,514	24,614	24,714	24,814	24,915	25,016	25,118	25,220
781	25,322	25,424	25,526	25,629	25,732	25,835	25,939	26,043	26,147	26,251
782	26,356	26,460	26,566	26,671	26,776	26,882	26,988	27,095	27,202	27,309
783	27,416	27,524	27,632	27,740	27,848	27,957	28,066	28,176	28,286	28,396
784	28,506	28,616	28,727	28,839	28,950	29,062	29,174	29,286	29,399	29,512
785	29,625	29,739	29,853	29,967	30,082	30,197	30,312	30,427	30,543	30,659
786	30,775	30,891	31,008	31,125	31,242	31,360	31,477	31,595	31,714	31,832
787	31,951	32,070	32,189	32,309	32,429	32,549	32,670	32,790	32,911	33,032
788	33,154	33,275	33,397	33,520	33,642	33,765	33,888	34,011	34,134	34,258
789	34,382	34,506	34,630	34,755	34,879	35,004	35,129	35,255	35,380	35,506
790	35,632	35,758	35,885	36,011	36,138	36,265	36,393	36,520	36,648	36,776
791	36,904									

Appendix B
Lake Georgetown
RESERVOIR AREA TABLE

TEXAS WATER DEVELOPMENT BOARD

MAY 2005 SURVEY
Conservation Pool Elevation 791.0'

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
706					0	0	0	0	0	0
707	0	0	0	0	0	0	0	0	0	0
708	0	1	1	1	1	1	1	1	1	1
709	1	2	2	2	2	2	2	2	2	2
710	2	2	2	2	2	2	2	3	3	3
711	3	3	3	3	3	3	3	3	3	3
712	3	3	3	4	4	4	4	4	4	4
713	5	5	5	5	5	5	5	5	6	6
714	6	6	6	6	6	6	6	7	7	7
715	7	7	7	7	7	8	8	8	8	8
716	9	9	9	9	9	9	10	10	10	10
717	10	11	11	11	11	12	12	12	12	12
718	13	13	13	13	13	13	14	14	14	14
719	14	15	15	15	15	15	15	16	16	16
720	16	16	17	17	17	17	18	18	18	18
721	18	19	19	19	19	20	20	20	21	21
722	21	21	22	22	22	22	23	23	23	24
723	24	24	25	25	25	26	26	26	27	27
724	27	28	28	28	29	29	30	31	33	34
725	35	37	38	40	41	43	44	45	46	47
726	48	49	50	51	52	52	53	54	55	56
727	57	58	59	60	61	62	63	64	65	66
728	67	68	69	71	72	74	75	77	79	80
729	82	83	84	86	87	89	90	92	93	94
730	96	97	98	99	100	101	102	103	104	105
731	106	107	108	109	110	111	112	113	115	116
732	117	118	119	120	121	122	123	124	125	126
733	127	128	129	130	131	132	133	134	135	136
734	137	138	139	140	141	142	143	144	145	146
735	147	149	150	151	152	153	154	155	157	158
736	159	160	161	162	163	164	166	167	168	169
737	171	172	173	175	176	177	179	180	182	183
738	185	186	188	190	191	193	195	196	198	199
739	201	203	204	205	207	208	210	211	213	214
740	215	217	218	220	221	223	224	226	227	229
741	230	231	233	234	235	237	238	239	241	242
742	244	245	247	248	249	251	252	253	255	256
743	258	259	260	262	263	264	266	267	268	270
744	271	273	274	276	277	279	280	282	283	285
745	287	288	290	292	294	296	297	299	301	302
746	304	306	307	309	310	312	313	315	316	317
747	319	320	321	323	324	326	327	329	331	332
748	334	335	337	338	340	341	343	344	346	347
749	349	350	352	353	355	356	358	359	361	363
750	364	366	367	369	371	372	374	375	377	379
751	380	382	383	385	386	388	389	390	392	393
752	395	396	397	398	400	401	402	404	405	406
753	407	409	410	411	412	414	415	416	417	418
754	420	421	422	424	425	426	428	429	431	432
755	434	436	437	439	440	442	443	445	447	448
756	450	452	453	455	457	458	460	462	464	466
757	468	470	471	473	475	478	480	482	484	486
758	487	489	491	493	495	496	498	500	502	503
759	505	507	509	511	512	514	516	519	521	523
760	525	527	529	531	533	535	537	539	541	543
761	545	547	548	550	552	554	556	558	560	562

RESERVOIR AREA TABLE (Continued)

TEXAS WATER DEVELOPMENT BOARD

MAY 2005 SURVEY

Conservation Pool Elevation 791.0'

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
762	564	566	569	571	573	575	577	579	581	583
763	585	587	589	591	593	595	597	599	601	603
764	605	608	610	612	614	617	619	621	623	625
765	628	631	633	635	638	640	642	644	646	649
766	651	653	655	658	660	662	665	667	670	672
767	675	677	680	683	685	688	690	692	695	698
768	700	703	705	708	710	713	715	718	720	723
769	725	727	730	733	735	738	740	743	746	748
770	751	754	756	759	761	763	766	768	771	773
771	776	778	781	783	786	788	791	793	796	798
772	801	803	805	807	809	811	813	816	818	820
773	822	824	827	829	832	834	837	839	842	844
774	847	849	851	854	856	858	861	863	865	868
775	870	872	874	877	879	881	883	886	888	890
776	893	895	897	900	902	905	907	909	912	914
777	917	919	922	924	927	929	932	934	937	939
778	942	945	947	950	952	955	957	960	962	965
779	967	970	972	975	977	980	982	985	988	990
780	993	996	999	1,002	1,004	1,007	1,010	1,013	1,015	1,018
781	1,021	1,024	1,026	1,029	1,032	1,034	1,037	1,039	1,042	1,044
782	1,047	1,049	1,052	1,055	1,057	1,060	1,063	1,066	1,069	1,072
783	1,075	1,078	1,081	1,084	1,087	1,090	1,093	1,096	1,099	1,102
784	1,105	1,108	1,111	1,114	1,117	1,120	1,123	1,126	1,129	1,132
785	1,135	1,138	1,141	1,144	1,147	1,149	1,152	1,155	1,158	1,160
786	1,163	1,166	1,168	1,171	1,174	1,176	1,179	1,182	1,184	1,187
787	1,190	1,192	1,195	1,198	1,200	1,203	1,205	1,208	1,211	1,213
788	1,216	1,218	1,221	1,223	1,225	1,228	1,230	1,233	1,235	1,237
789	1,240	1,242	1,244	1,246	1,248	1,250	1,253	1,255	1,257	1,259
790	1,261	1,263	1,265	1,267	1,270	1,272	1,274	1,276	1,278	1,280
791	1,287									

Appendix C
Lake Georgetown
RESERVOIR VOLUME TABLE

TEXAS WATER DEVELOPMENT BOARD

April-May 1995 SURVEY (Revised 2005)

Conservation Pool Elevation 791.0'

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
706					0	0	0	0	0	0
707	0	0	0	0	0	0	0	0	0	0
708	0	0	0	0	0	0	0	0	0	0
709	0	0	0	0	0	0	0	0	0	0
710	0	0	0	0	0	0	0	0	0	0
711	0	0	0	0	0	0	0	0	0	0
712	0	0	0	0	0	0	0	0	0	0
713	0	0	0	0	0	0	0	0	0	0
714	0	0	0	0	1	1	1	1	1	1
715	1	1	1	1	1	2	2	2	2	2
716	2	2	3	3	3	3	3	3	4	4
717	4	4	5	5	5	5	6	6	6	7
718	7	7	8	8	8	9	9	10	10	11
719	11	12	12	13	13	14	15	15	16	17
720	17	18	19	20	21	22	22	23	24	25
721	26	27	29	30	31	32	33	34	36	37
722	38	40	41	43	44	46	47	49	50	52
723	53	55	57	59	60	62	64	66	68	70
724	72	74	76	78	80	82	85	87	89	91
725	94	96	99	101	104	106	109	112	114	117
726	121	124	127	131	135	138	142	146	150	154
727	159	163	168	173	177	182	187	192	197	203
728	208	213	219	225	230	236	242	248	254	261
729	267	274	281	287	295	302	309	316	324	332
730	340	348	356	365	374	382	391	400	410	419
731	429	439	449	459	469	480	490	501	512	523
732	534	545	557	568	580	591	603	615	627	640
733	652	664	677	690	702	715	728	741	755	768
734	781	795	808	822	836	850	864	878	892	907
735	921	936	951	965	980	996	1,011	1,026	1,042	1,057
736	1,073	1,089	1,105	1,121	1,137	1,154	1,170	1,187	1,204	1,221
737	1,238	1,255	1,273	1,290	1,308	1,326	1,344	1,362	1,381	1,399
738	1,418	1,437	1,456	1,475	1,494	1,514	1,533	1,553	1,573	1,593
739	1,613	1,634	1,654	1,675	1,696	1,717	1,738	1,759	1,780	1,802
740	1,823	1,845	1,867	1,889	1,911	1,933	1,955	1,978	2,000	2,023
741	2,045	2,068	2,091	2,114	2,138	2,161	2,184	2,208	2,232	2,256
742	2,279	2,304	2,328	2,352	2,377	2,401	2,426	2,451	2,476	2,501
743	2,526	2,551	2,576	2,602	2,628	2,653	2,679	2,706	2,732	2,758
744	2,784	2,811	2,838	2,865	2,892	2,919	2,946	2,974	3,001	3,029
745	3,057	3,085	3,113	3,142	3,170	3,199	3,228	3,257	3,286	3,315
746	3,345	3,375	3,405	3,435	3,465	3,495	3,526	3,557	3,588	3,619
747	3,650	3,681	3,713	3,744	3,776	3,808	3,840	3,872	3,905	3,937
748	3,970	4,003	4,035	4,068	4,102	4,135	4,168	4,202	4,236	4,270
749	4,304	4,338	4,372	4,407	4,442	4,476	4,511	4,546	4,582	4,617
750	4,652	4,688	4,724	4,760	4,796	4,832	4,868	4,905	4,942	4,979
751	5,016	5,053	5,090	5,128	5,165	5,203	5,241	5,279	5,317	5,356
752	5,394	5,433	5,472	5,511	5,550	5,589	5,629	5,669	5,708	5,748
753	5,788	5,828	5,869	5,909	5,950	5,991	6,031	6,072	6,114	6,155
754	6,196	6,238	6,280	6,322	6,364	6,406	6,449	6,491	6,534	6,577
755	6,620	6,663	6,706	6,750	6,794	6,837	6,881	6,925	6,970	7,014
756	7,059	7,103	7,148	7,193	7,238	7,284	7,329	7,375	7,421	7,467
757	7,513	7,560	7,607	7,653	7,701	7,748	7,796	7,844	7,892	7,940
758	7,989	8,038	8,087	8,136	8,186	8,235	8,285	8,335	8,385	8,436
759	8,486	8,537	8,588	8,640	8,691	8,743	8,794	8,846	8,898	8,951
760	9,003	9,056	9,109	9,162	9,215	9,269	9,322	9,376	9,430	9,484
761	9,539	9,593	9,648	9,703	9,759	9,814	9,870	9,925	9,981	10,038
762	10,094	10,150	10,207	10,264	10,321	10,378	10,436	10,493	10,551	10,609

RESERVOIR VOLUME TABLE (Continued)

TEXAS WATER DEVELOPMENT BOARD

April-May 1995 SURVEY (Revised 2005)

Conservation Pool Elevation 791.0'

VOLUME IN ACRE-FEET

ELEVATION INCREMENT IS ONE TENTH FOOT

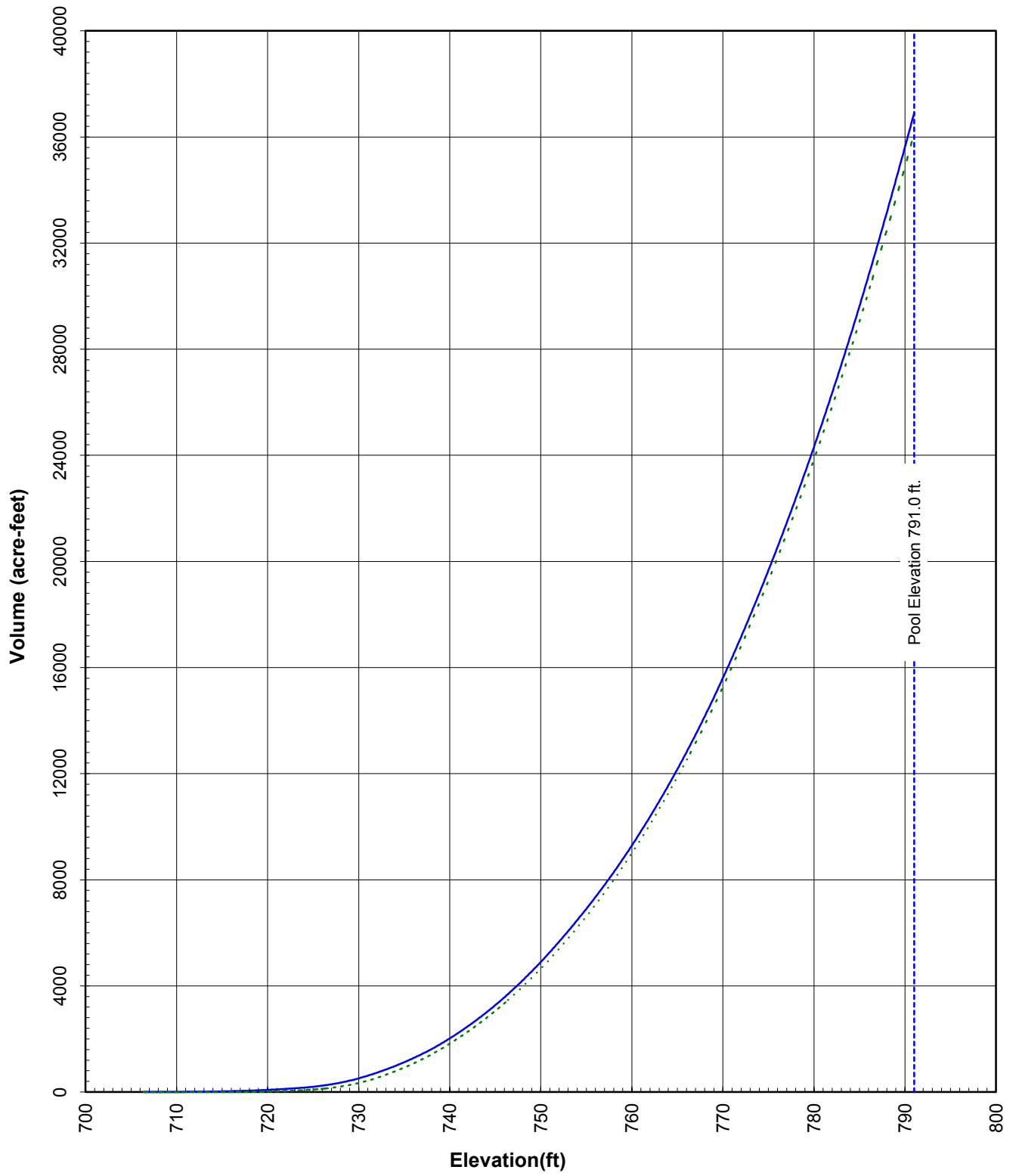| ELEVATION IN FEET	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
763	10,667	10,725	10,784	10,842	10,901	10,960	11,019	11,078	11,138	11,198
764	11,258	11,318	11,378	11,439	11,500	11,561	11,622	11,684	11,745	11,807
765	11,869	11,932	11,994	12,057	12,120	12,183	12,247	12,310	12,374	12,438
766	12,502	12,567	12,632	12,696	12,762	12,827	12,892	12,958	13,024	13,091
767	13,157	13,224	13,291	13,359	13,427	13,495	13,563	13,631	13,700	13,769
768	13,838	13,908	13,977	14,047	14,117	14,188	14,258	14,329	14,400	14,472
769	14,543	14,615	14,687	14,760	14,833	14,906	14,979	15,052	15,126	15,200
770	15,275	15,349	15,424	15,499	15,575	15,650	15,726	15,802	15,879	15,955
771	16,032	16,110	16,187	16,265	16,343	16,421	16,500	16,578	16,657	16,736
772	16,815	16,894	16,974	17,054	17,134	17,214	17,294	17,375	17,455	17,536
773	17,617	17,699	17,780	17,862	17,944	18,026	18,108	18,191	18,273	18,356
774	18,439	18,523	18,606	18,690	18,774	18,858	18,942	19,027	19,112	19,196
775	19,282	19,367	19,453	19,538	19,624	19,711	19,797	19,884	19,971	20,058
776	20,145	20,233	20,320	20,408	20,497	20,585	20,674	20,763	20,853	20,942
777	21,032	21,122	21,212	21,303	21,394	21,485	21,576	21,668	21,759	21,851
778	21,944	22,036	22,129	22,222	22,316	22,409	22,503	22,597	22,691	22,786
779	22,881	22,976	23,071	23,167	23,263	23,359	23,455	23,552	23,649	23,746
780	23,843	23,941	24,039	24,137	24,235	24,334	24,433	24,532	24,632	24,732
781	24,832	24,932	25,033	25,134	25,235	25,336	25,438	25,540	25,642	25,744
782	25,847	25,950	26,054	26,157	26,261	26,365	26,469	26,574	26,679	26,784
783	26,890	26,996	27,102	27,208	27,315	27,422	27,529	27,637	27,744	27,852
784	27,960	28,069	28,177	28,286	28,396	28,505	28,615	28,725	28,835	28,945
785	29,056	29,167	29,278	29,389	29,501	29,613	29,725	29,838	29,951	30,064
786	30,177	30,290	30,404	30,518	30,632	30,746	30,860	30,975	31,090	31,205
787	31,321	31,436	31,552	31,668	31,785	31,901	32,018	32,135	32,252	32,370
788	32,488	32,606	32,724	32,842	32,961	33,080	33,199	33,318	33,438	33,557
789	33,677	33,797	33,918	34,039	34,159	34,280	34,402	34,523	34,645	34,767
790	34,889	35,012	35,134	35,257	35,380	35,503	35,627	35,751	35,875	35,999
791	36,123									

Appendix D
Lake Georgetown
RESERVOIR AREA TABLE

TEXAS WATER DEVELOPMENT BOARD

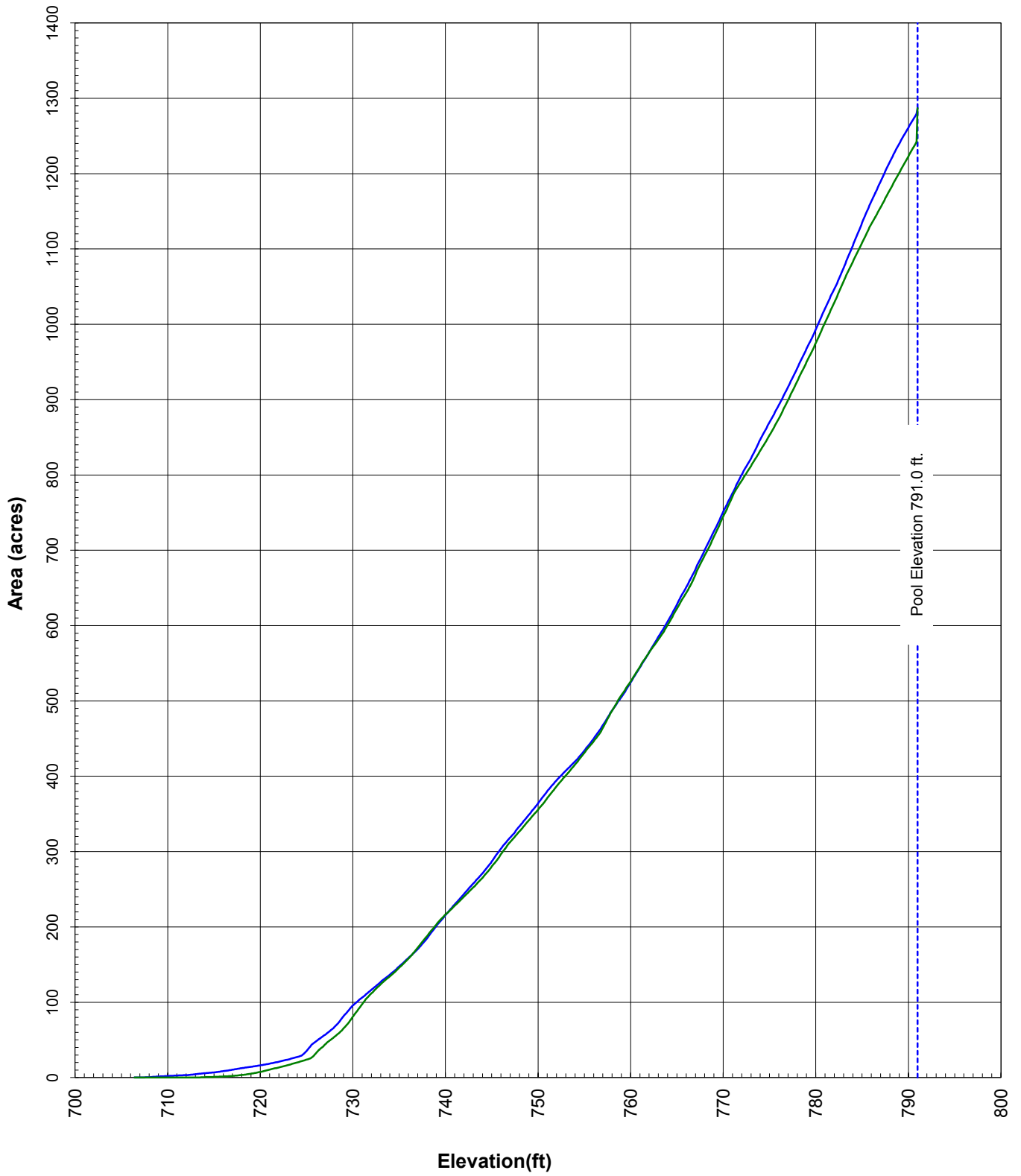April-May 1995 SURVEY (Revised 2005)

Conservation Pool Elevation 791.0'

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
706					0	0	0	0	0	0
707	0	0	0	0	0	0	0	0	0	0
708	0	0	0	0	0	0	0	0	0	0
709	0	0	0	0	0	0	0	0	0	0
710	0	0	0	0	0	0	0	0	0	0
711	0	0	0	0	0	0	0	0	0	0
712	0	0	0	0	0	0	0	0	0	0
713	0	0	0	0	0	0	0	0	0	1
714	1	1	1	1	1	1	1	1	1	1
715	1	1	1	1	1	1	1	1	1	1
716	1	2	2	2	2	2	2	2	2	2
717	2	2	2	3	3	3	3	3	3	3
718	3	4	4	4	4	4	4	5	5	5
719	5	5	6	6	6	6	6	7	7	7
720	8	8	8	8	9	9	9	10	10	10
721	10	11	11	11	12	12	12	13	13	13
722	14	14	14	14	15	15	15	16	16	16
723	17	17	17	18	18	18	19	19	19	20
724	20	20	21	21	22	22	22	23	23	23
725	24	24	25	25	25	26	27	28	29	31
726	32	34	35	36	37	38	39	40	41	43
727	44	45	46	47	48	49	50	51	52	53
728	54	55	56	57	58	59	60	61	63	64
729	65	67	68	69	71	72	74	75	77	79
730	81	83	84	86	88	89	91	92	94	96
731	97	99	101	102	104	105	107	108	109	111
732	112	113	114	115	117	118	119	120	122	123
733	124	125	126	127	128	129	130	131	132	133
734	134	136	137	138	139	140	141	142	143	144
735	146	147	148	149	151	152	153	154	155	157
736	158	159	161	162	163	165	166	168	169	171
737	172	174	176	177	179	180	182	183	185	186
738	188	189	191	192	194	195	197	198	200	201
739	203	204	206	207	209	210	211	213	214	215
740	216	217	219	220	221	222	223	224	226	227
741	228	229	230	232	233	234	235	236	238	239
742	240	241	243	244	245	246	247	249	250	251
743	252	254	255	256	257	259	260	261	263	264
744	265	267	268	270	271	272	274	275	277	278
745	280	282	283	285	286	288	289	291	293	295
746	297	298	300	302	303	305	307	308	310	311
747	313	314	316	317	319	320	321	323	324	326
748	327	328	330	331	333	334	336	337	339	340
749	341	343	344	346	347	349	350	351	353	354
750	356	357	359	360	361	363	364	366	368	369
751	371	372	374	376	377	379	380	382	383	385
752	387	388	390	391	393	394	396	397	398	400
753	401	402	404	405	407	408	410	411	413	414
754	416	417	419	420	422	423	425	427	428	430
755	431	433	434	436	437	439	440	442	443	445
756	446	448	449	451	453	454	456	458	460	462
757	464	466	469	471	474	476	478	481	483	485
758	487	489	491	493	495	498	500	502	504	506
759	507	509	511	513	515	517	519	520	522	524
760	526	528	530	532	534	536	538	539	541	543
761	545	547	549	551	553	555	557	559	561	563
762	564	566	568	570	571	573	575	576	578	580

RESERVOIR AREA TABLE (Continued)

TEXAS WATER DEVELOPMENT BOARD | April-May 1995 SURVEY (Revised 2005)

Conservation Pool Elevation 791.0'

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
763	582	583	585	587	589	591	593	595	597	599
764	601	603	605	607	609	612	614	616	618	620
765	623	625	627	629	631	633	635	637	639	641
766	644	646	648	650	652	654	657	659	662	665
767	668	671	673	676	679	681	684	686	688	691
768	693	695	698	700	702	705	708	710	713	715
769	718	721	723	726	729	731	734	737	739	742
770	745	747	750	752	755	758	760	763	766	768
771	771	775	777	779	781	783	785	787	789	791
772	792	794	796	798	800	802	804	806	808	810
773	812	814	816	818	820	822	824	826	828	830
774	832	834	836	838	840	842	844	846	848	851
775	853	855	857	859	861	863	866	868	870	872
776	875	877	879	882	885	887	889	892	894	897
777	899	902	904	907	909	912	914	917	919	922
778	925	927	930	932	935	937	940	942	945	947
779	950	952	955	957	960	962	965	967	970	972
780	975	978	980	983	986	989	991	994	997	999
781	1,002	1,005	1,008	1,010	1,013	1,016	1,018	1,021	1,024	1,026
782	1,029	1,032	1,034	1,037	1,040	1,043	1,045	1,048	1,051	1,054
783	1,057	1,060	1,063	1,065	1,068	1,070	1,073	1,075	1,078	1,080
784	1,083	1,085	1,088	1,090	1,093	1,096	1,098	1,101	1,103	1,106
785	1,108	1,111	1,113	1,116	1,118	1,121	1,123	1,126	1,128	1,131
786	1,133	1,135	1,138	1,140	1,142	1,144	1,146	1,148	1,151	1,153
787	1,155	1,158	1,160	1,162	1,164	1,167	1,169	1,171	1,174	1,176
788	1,178	1,181	1,183	1,185	1,188	1,190	1,192	1,194	1,196	1,199
789	1,201	1,203	1,205	1,208	1,210	1,212	1,214	1,216	1,219	1,221
790	1,223	1,225	1,227	1,230	1,232	1,234	1,236	1,238	1,240	1,243
791	1287									

Volume (acre-feet)

Elevation(ft)

- – – – Pool Elevation 791.0'
- —— Volume 2005
- – – – Volume 1995 (Revised 2005)

Pool Elevation 791.0 ft.

Lake Georgetown
May 2005
Prepared by: TWDB

Appendix E Elevation vs. Volume

Area (acres) (y-axis)
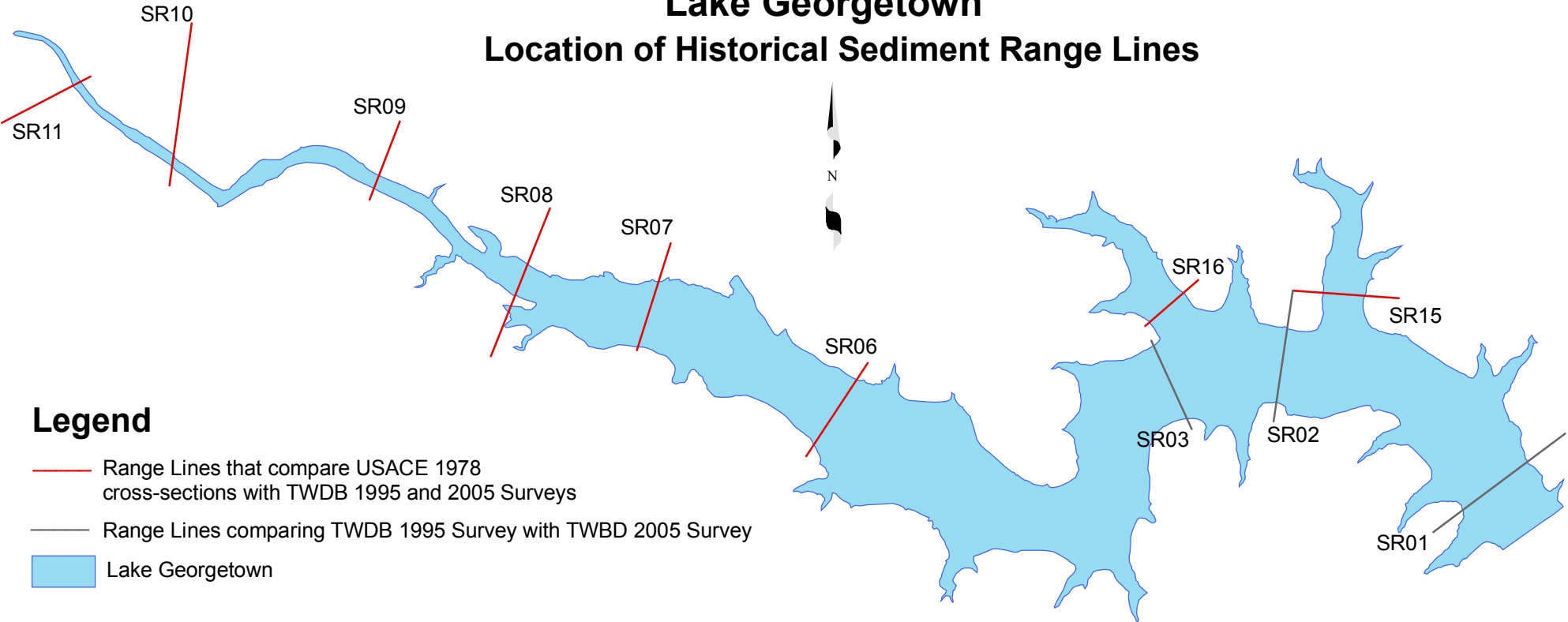
Elevation(ft) (x-axis)

Pool Elevation 791.0 ft.

Legend:
- - - - - Pool Elevation 791.0'
——— Area 2005
——— Area 1995 (Revised 2005)

Lake Georgetown
May 2005
Prepared by: TWDB

Appendix F Elevation vs. Area

Appendix G
Lake Georgetown
Location of Historical Sediment Range Lines

N

SR10

SR11

SR09

SR08

SR07

SR06

SR16

SR15

SR03

SR02

SR01

Legend

— Range Lines that compare USACE 1978 cross-sections with TWDB 1995 and 2005 Surveys

— Range Lines comparing TWDB 1995 Survey with TWBD 2005 Survey

☐ Lake Georgetown

Table 3: Lake Georgetown Sediment Range Lines Endpoints Est. 1978 USACE				
Sediment Range Line	X_L	Y_L	X_R	Y_R
SR01	2,820,695.56	375,734.64	2,818,009.32	373,728.01
SR02	2,815,159.06	378,640.20	2,814,763.21	375,972.37
SR03	2,812,284.95	377,623.70	2,813,104.96	375,818.84
SR06	2,806,525.87	377,172.58	2,805,271.62	375,271.97
SR07	2,802,524.41	379,602.24	2,801,834.00	377,422.96
SR08	2,800,070.01	380,304.86	2,798,862.10	377,297.99
SR09	2,797,015.27	382,073.51	2,796,402.25	380,480.53
SR10	2,792,793.12	384,063.081	2,792,334.69	380,773.05
SR11	2,790,740.85	382,988.09	2,788,934.00	382,041.33
SR15	2,817,312.71	378,482.72	2,815,159.06	378,640.29
SR16	2,813,234.28	378,853.61	2,812,163.85	377,917.39
XY: Lambert Grid Coordinates North American Datum 1927 L= Left End Pt R= Right End Pt				

Miles

0   0.25   0.5   1   1.5   2

Lake Georgetown

Range Line SR01

Appendix G
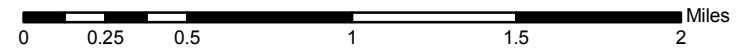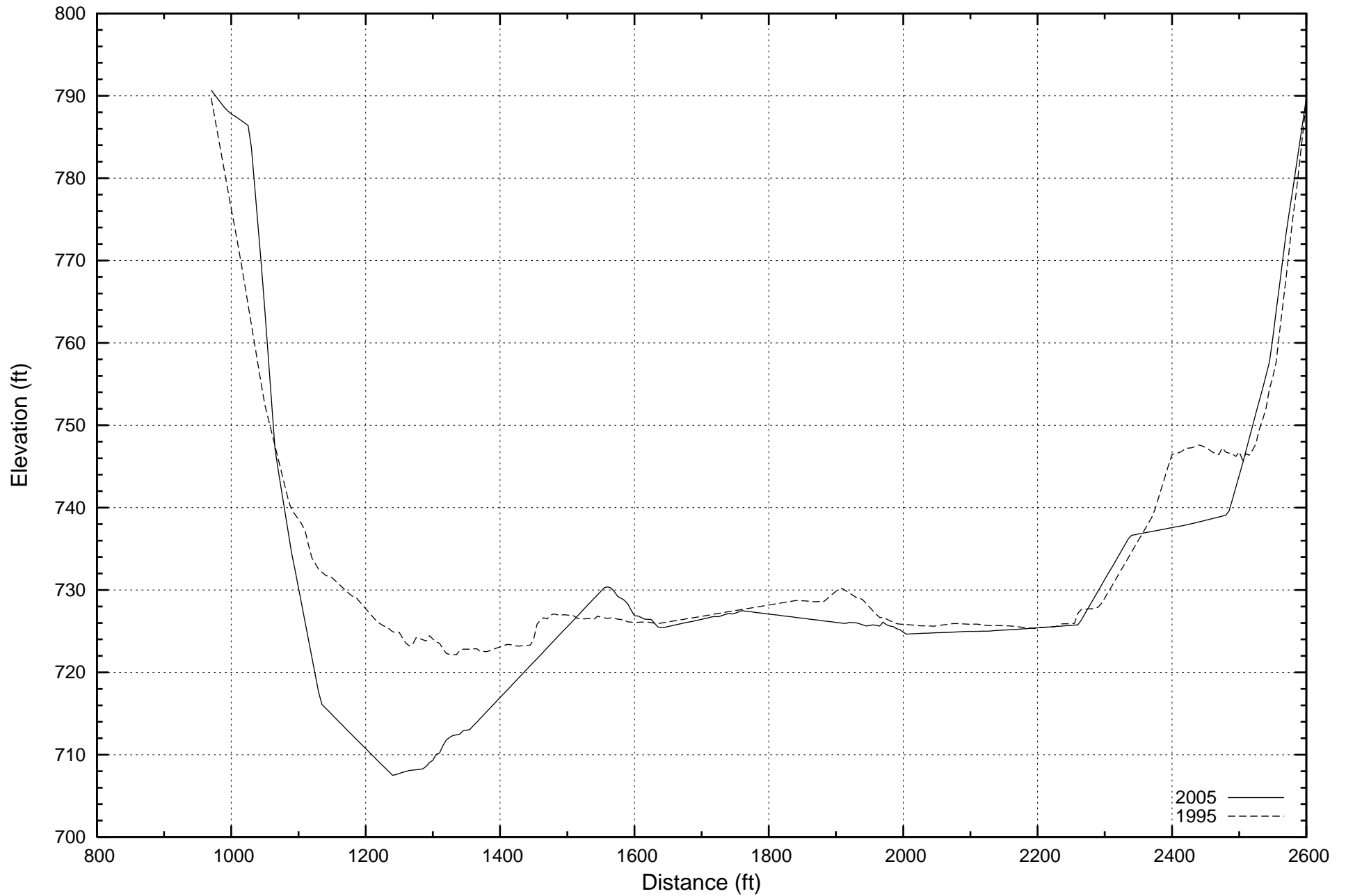
Lake Georgetown

Range Line SR02

Appendix G
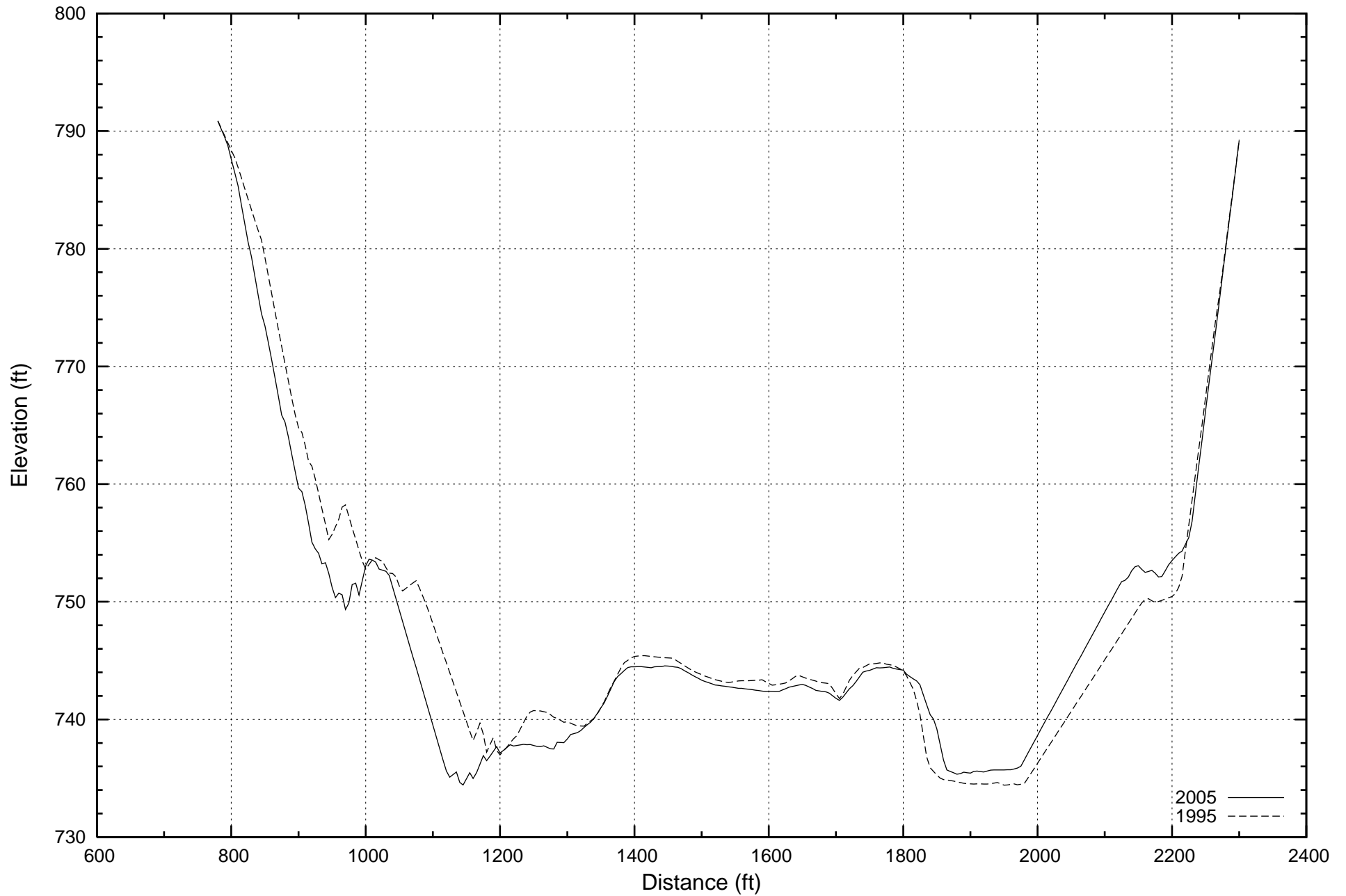
Lake Georgetown
Range Line SR03

Appendix G
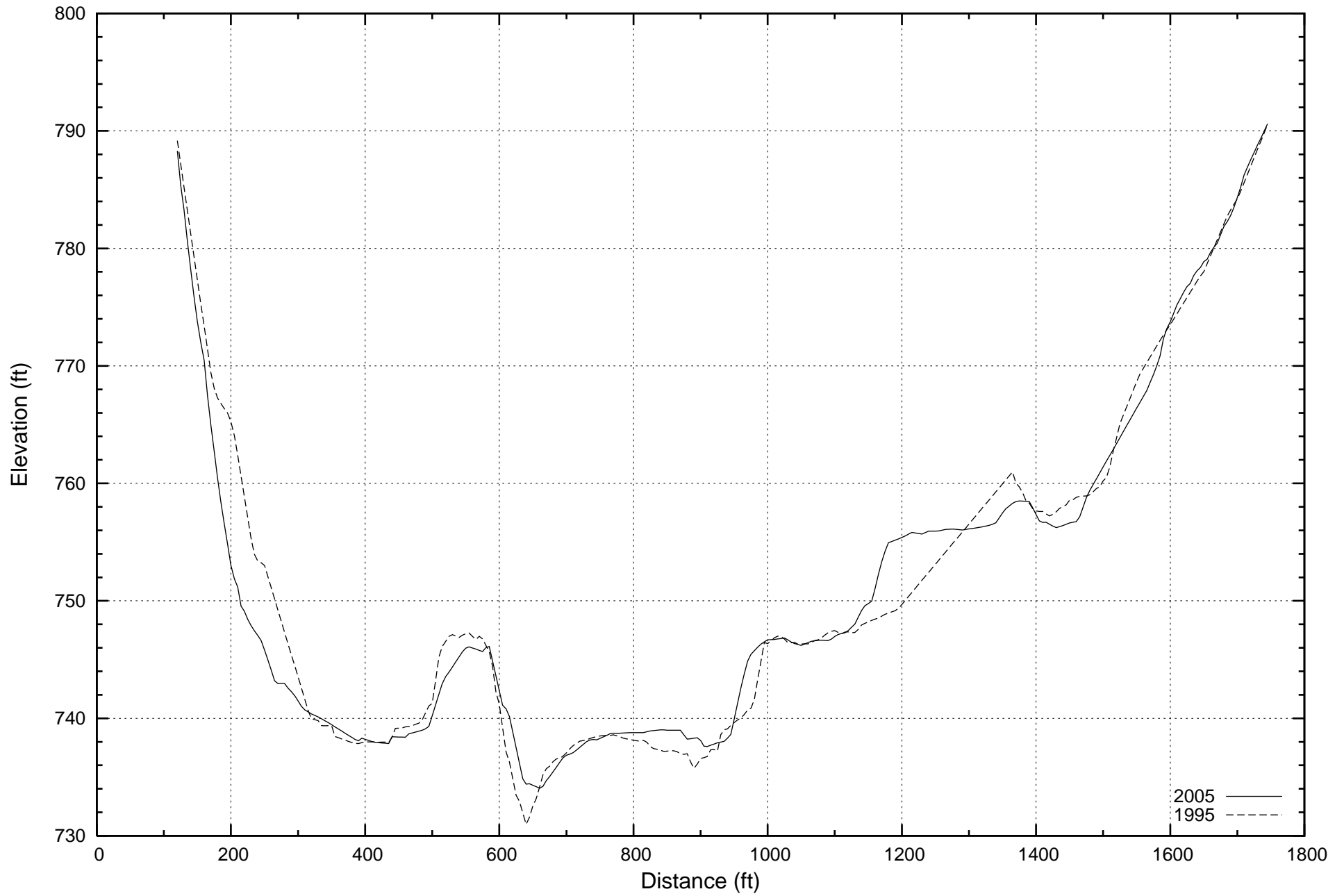
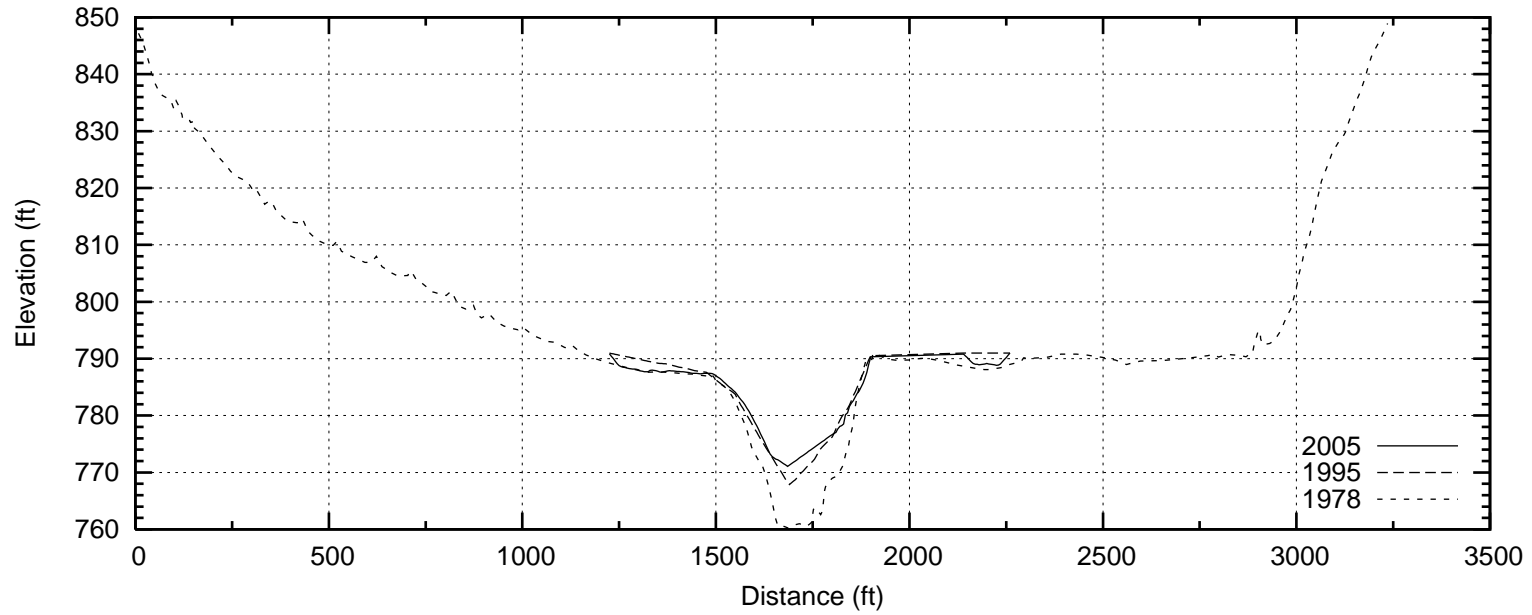# Lake Georgetown

Range Line SR06
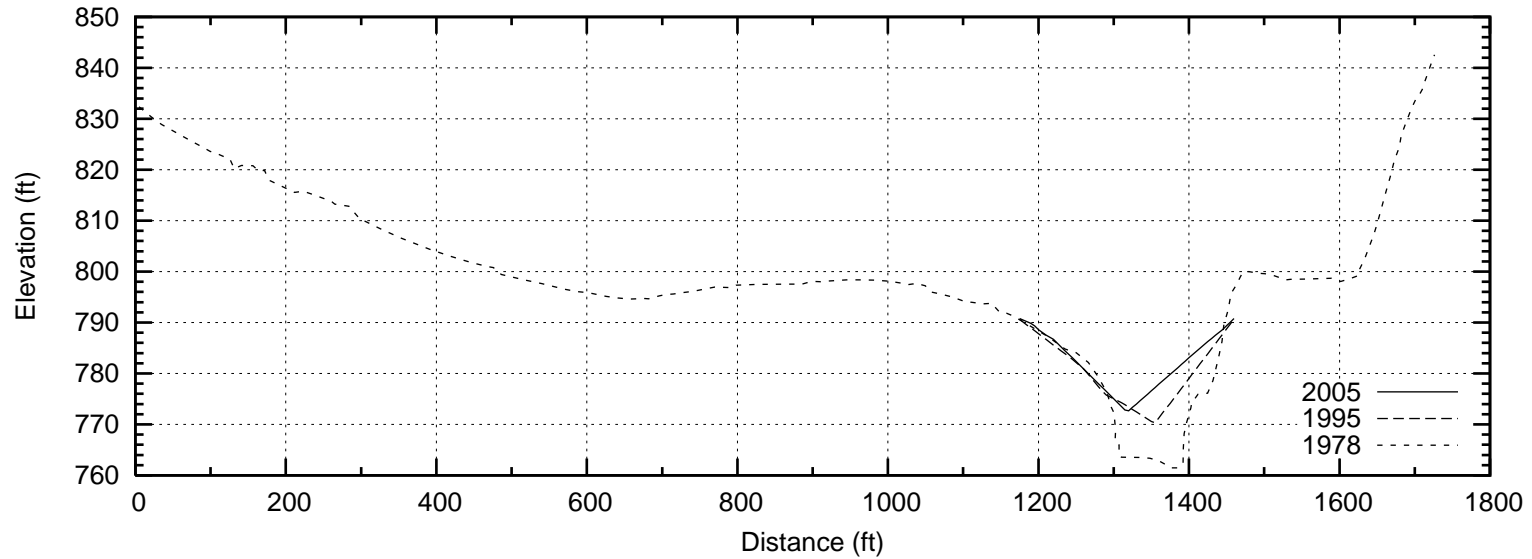

Range Line SR07

Appendix G
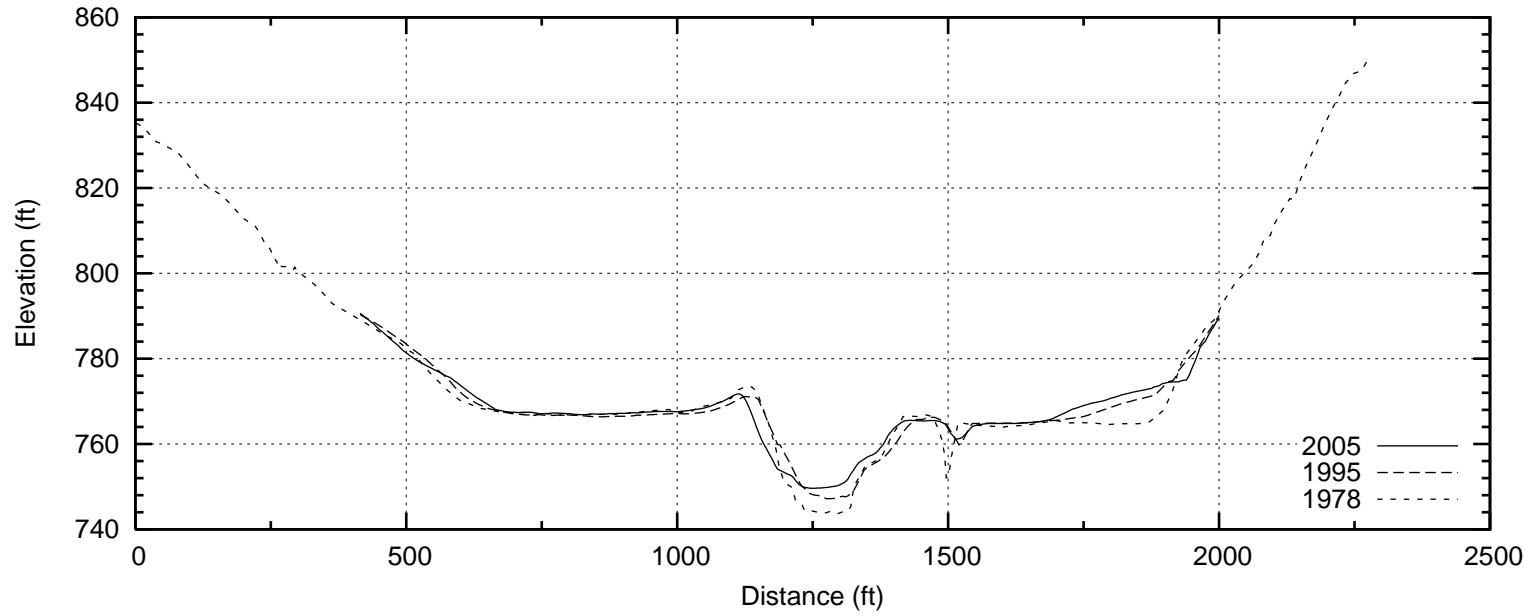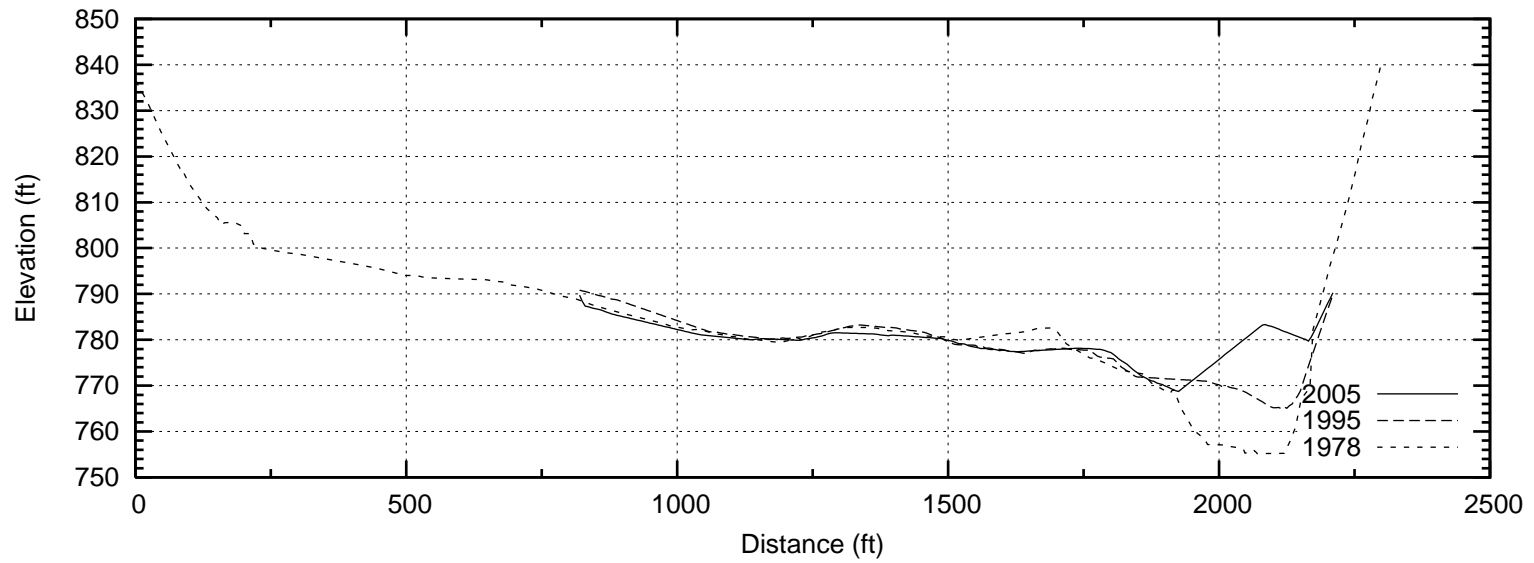
Lake Georgetown

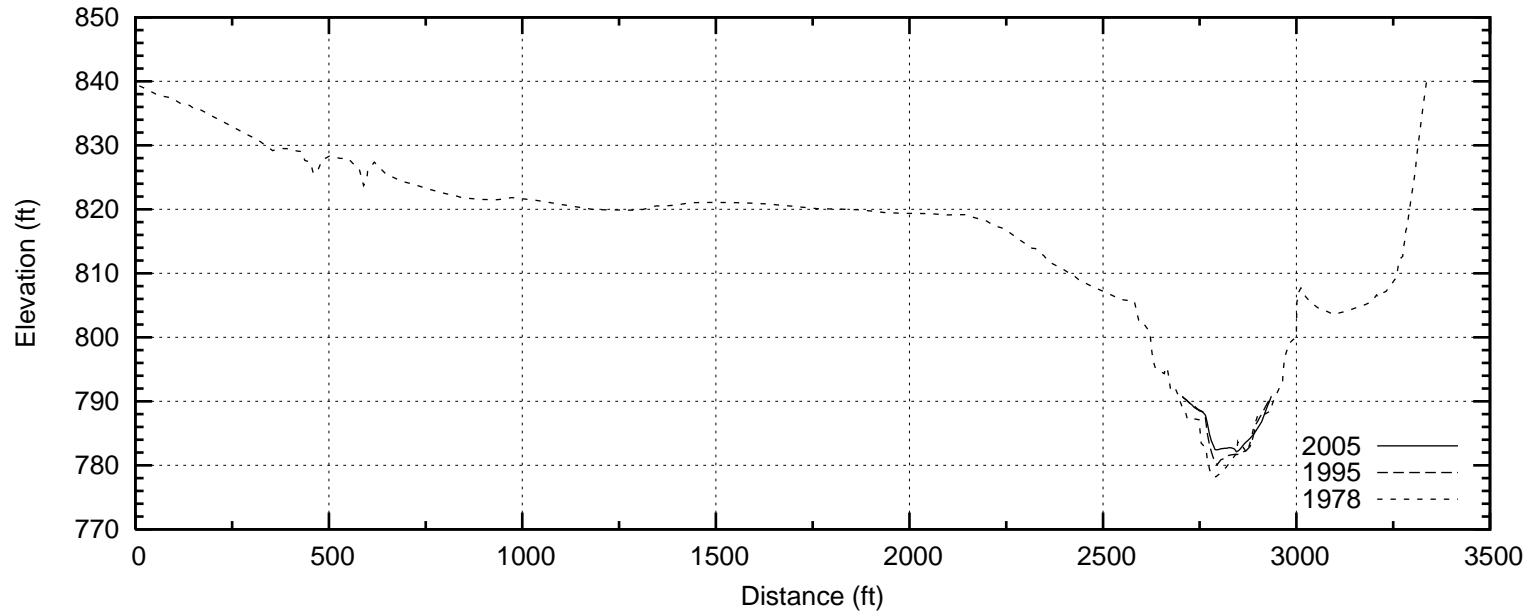## Range Line SR08

Range Line SR09

Appendix G
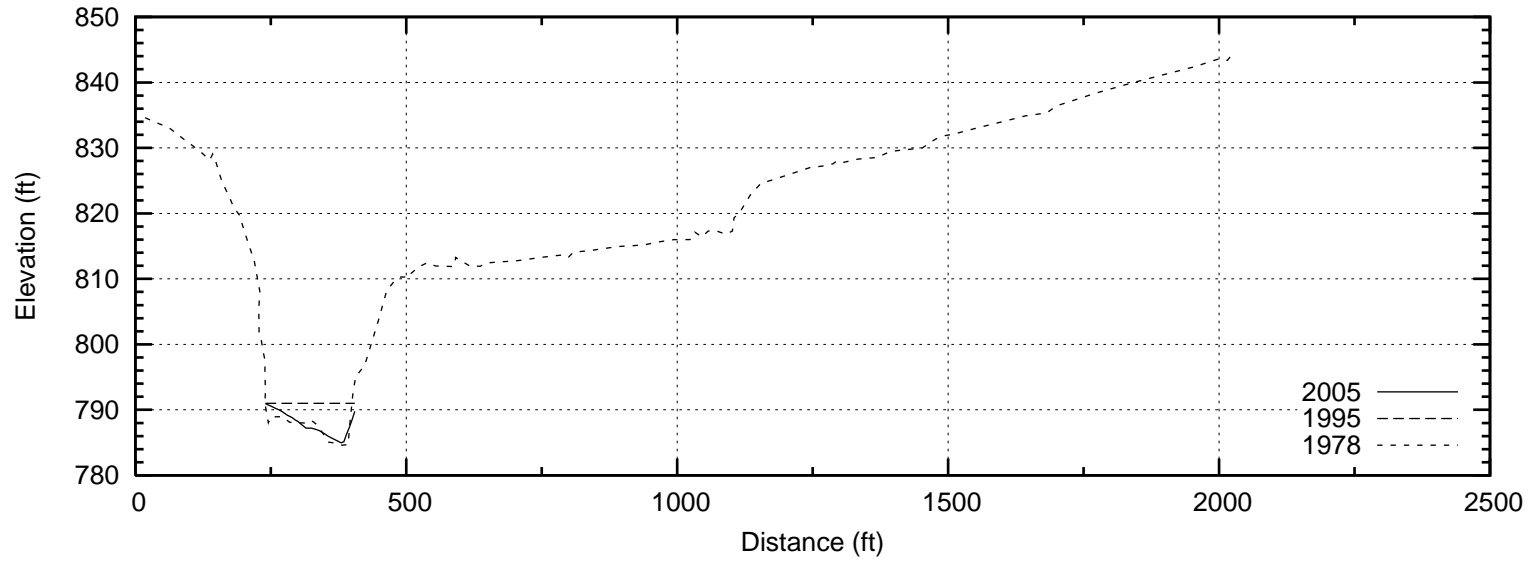
Lake Georgetown

Range Line SR10

Range Line SR11

Appendix G

Lake Georgetown
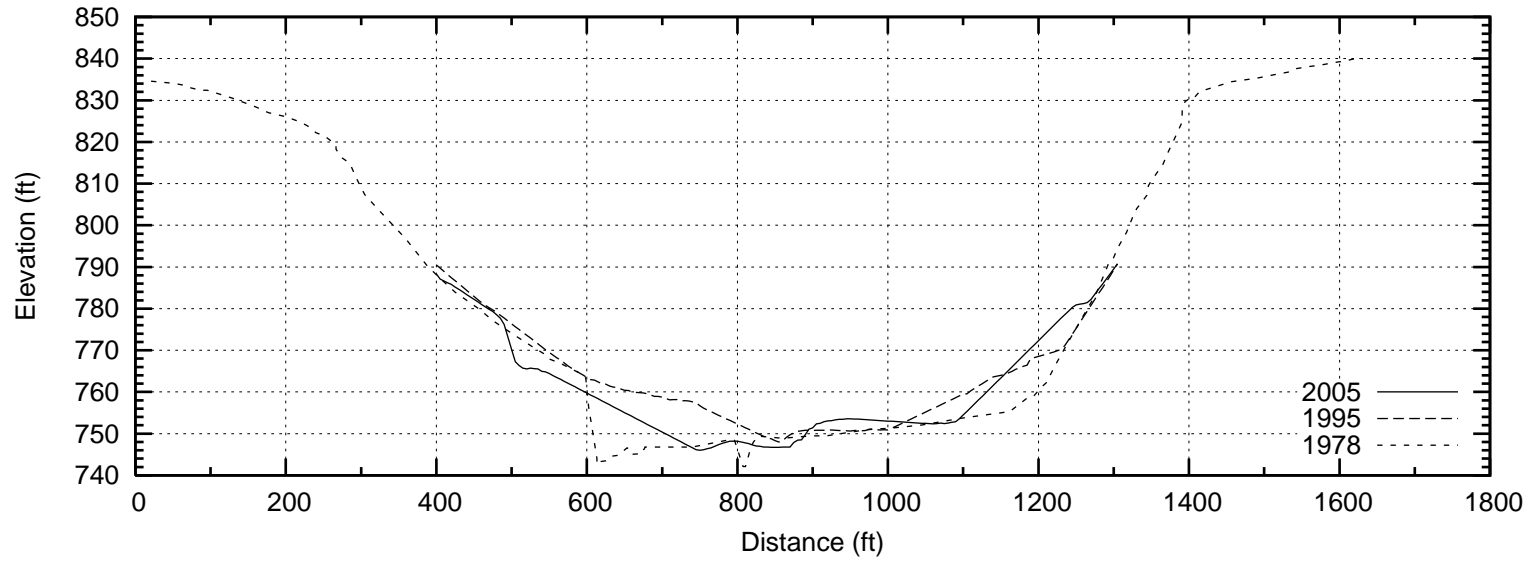
Range Line SR15

Range Line SR16

Appendix G
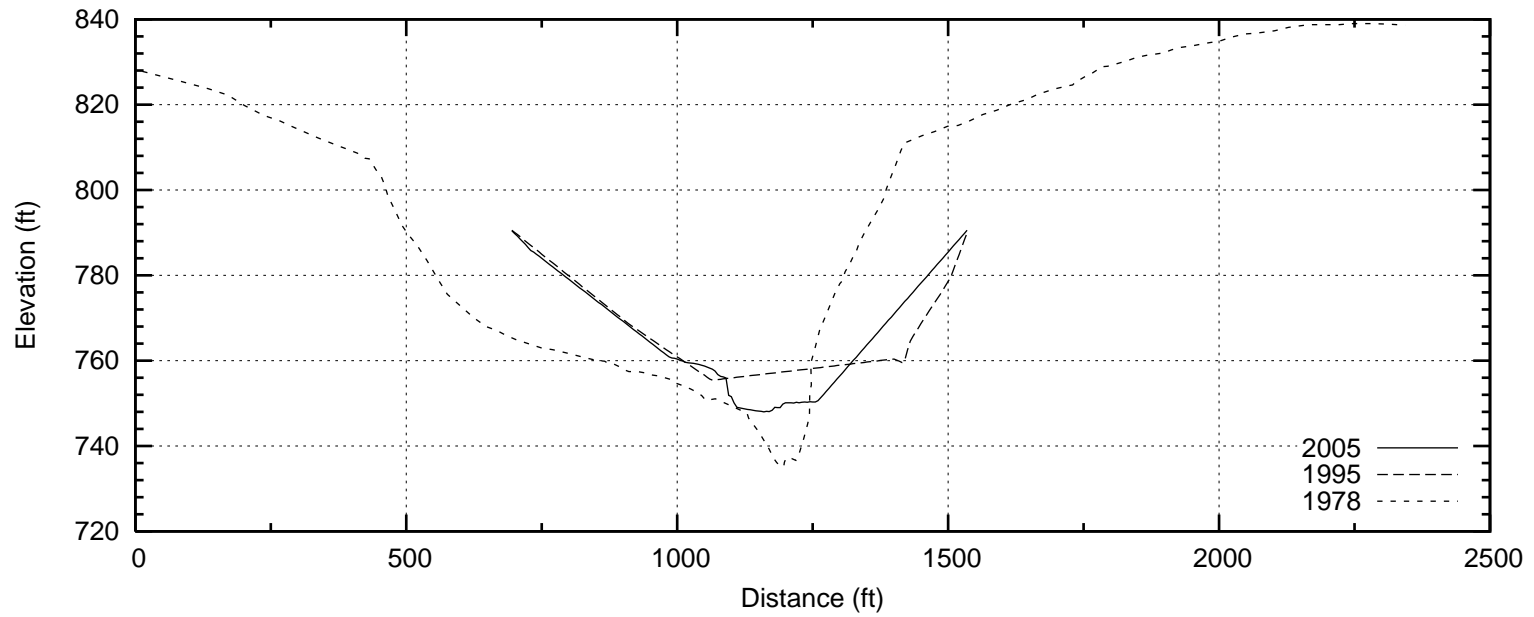
Figure 6

CONTOURS

〜 710
〜 715
〜 720

〜 725
〜 730
〜 735
〜 740
〜 745
〜 750
〜 755
〜 760
〜 765
〜 770
〜 775
〜 780
〜 785
〜 790
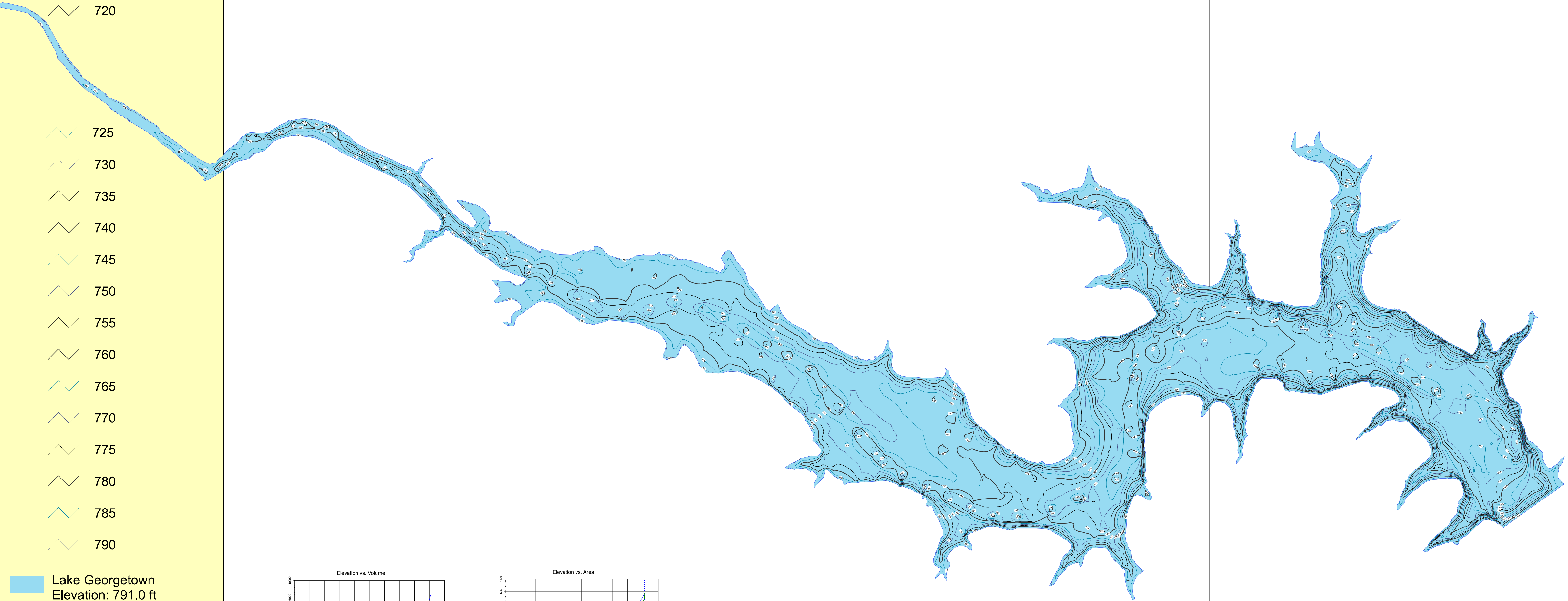
Lake Georgetown
Elevation: 791.0 ft

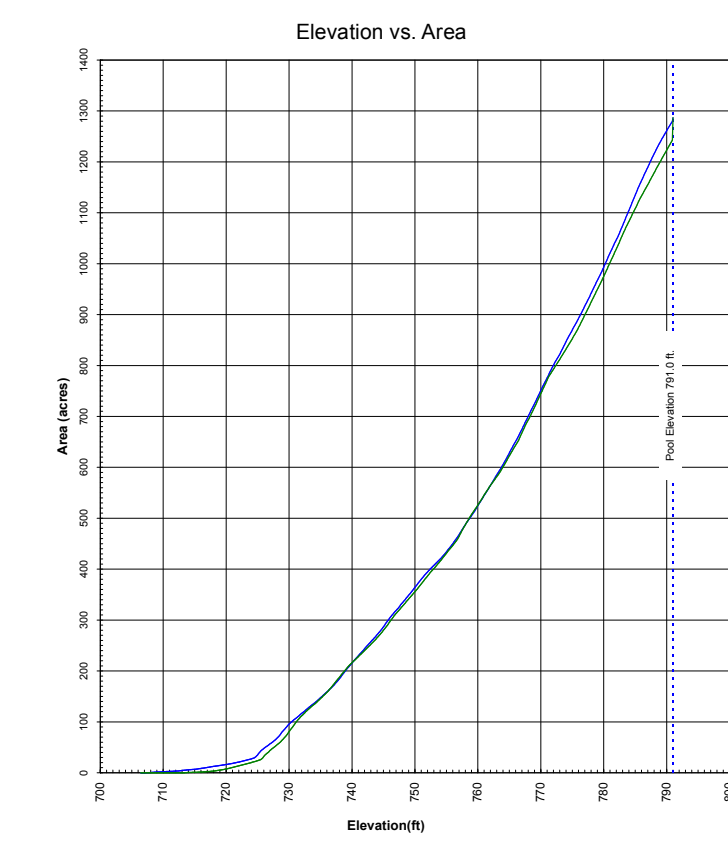Williamson County

NAD83
State Plane
Texas Central Zone

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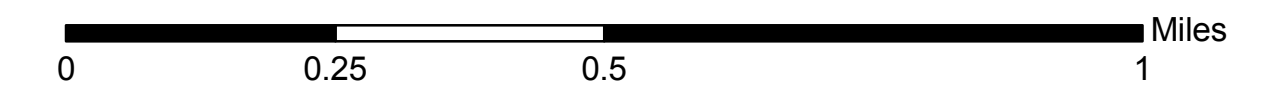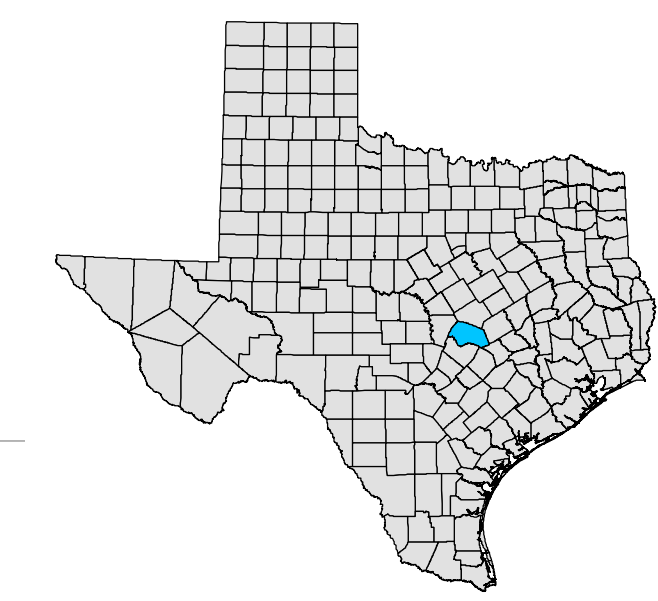assumes any liability.

LAKE GEORGETOWN
5' - Contour Map
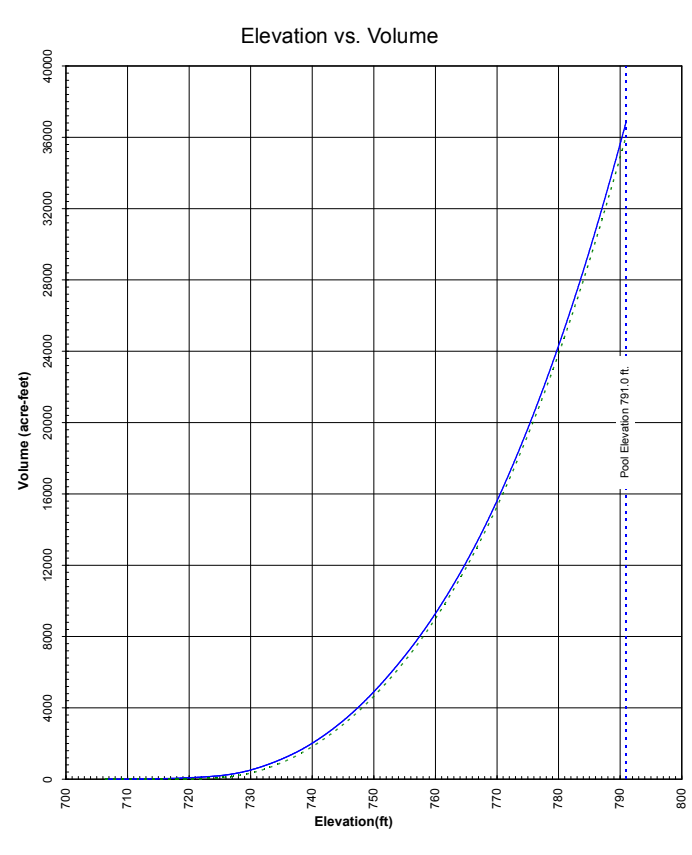
Elevation vs. Volume

Lake Georgetown
May 2005
Prepared by: TWDB

Elevation vs. Area

Lake Georgetown
May 2005
Prepared by: TWDB

N

0   0.25   0.5   1
Miles

Prepared by : TEXAS WATER DEVELOPMENT BOARD MAY 2005 SURVEY