

APPENDIX A
REFERENCES

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APPENDIX B
WATER RIGHTS

Appendix B

**Table B-1
Water Rights Downstream of Toledo Bend Reservoir**

Permit/ Cert. of Adjud.	Owner	Stream or Reservoir	County	Annual Permitted Use (AF/Y)	Type of Use	Reservoir Capacity (Ac-Ft)	Priority Date
4657	City of Center	Mill Creek	Shelby	1,460	Mun	446	8/04/22
5207	U S Department of Agriculture	Unnamed	Sabine	0	Recr	222	11/18/88
4658A	Sabine River Authority of TX	Toledo Bend Res.	Newton	**	Hydro	4,477,000	3/05/58
4658A	Sabine River Authority of TX	Toledo Bend Res.	Newton	50,000	Irr	4,477,000	3/05/58
4658A	Sabine River Authority of TX	Toledo Bend Res.	Newton	600,000	Ind	4,477,000	3/05/58
4658A	Sabine River Authority of TX	Toledo Bend Res.	Newton	100,000	Mun	4,477,000	3/05/58
4659	Weirgate Lumber Company	Little Cow Creek	Newton	235	Ind		11/17/69
4660	Temple-Inland Forest Prod Co.	Unnamed	Newton	50	Irr		12/2/74
4661	Louisiana-Pacific Corp	Harve Davis	Newton	0	Recr		11/6/69
4662	Sabine River Authority of TX	Sabine River	Newton	100,400	Mun/Ind		2/24/26
4662	Sabine River Authority of TX	Sabine River	Newton	46,700	Irr		11/13/78
4663	J.A. Heard et al	Orange Co DD	Orange	67	Irr		5/31/38
4664	E.I Dupont de Nemours & Co.	Adams Bayou	Orange	267,000 *	Ind	2,870	6/19/45
4575A	Robert Thomas Perry et al	Unnamed	Smith	0	Ind		
5491	Oxy USA Inc.	Unnamed	Gregg	0	Mining		6/1/94
				2 Municipal Right		101,460	
				1 Mun/Ind Right		100,400	
				4 Industrial Rights		867,235	
				4 Irrigation Rights		96,817	
				1 Mining		0	
				2 Recreational Rts		0	
				1 Hydroelectric Rts		0	
				15 Total Rights		1,165,912	

* Much of this water at the downstream end of Adams Bayou is brackish.

** The hydroelectric right is at a rate of 21,000 cubic feet per second, but is non-consumptive.

Appendix B

Table B-2

Water Rights Upstream of Toledo Bend Reservoir and Downstream of Lake Fork & Iron Bridge Dams

Permit/ Cert. Of Adjud.	Owner	Stream or Reservoir	County	Annual Permitted Use (AF/Y)	Type of Use	Reservoir Capacity (Ac-Ft)	Priority Date
4671	City of Wills Point	Magby Creek	Van Zandt	300	Mun	267	12/10/73
4672	Fin & Feather Hunt & Fish Club	Unnamed	Van Zandt	0	Recr		6/1/76
4673	Willow Lake Estates Assoc.	McBees Creek	Van Zandt	10	Ind		03/16/27
4673	Willow Lake Estates Assoc.	McBees Creek	Van Zandt	160	Mun	511	03/16/27
4674	Wirt Davis Trusts, TR#49220	Chinquapin	Van Zandt	0	Recr	282	12/6/76
4675	City of Canton	Mill Creek	Van Zandt	1,550	Mun	2,261	04/19/54
4676	City of Canton	Unnamed	Van Zandt	12	Mun	88	07/31/29
4677	William H McRae et al	Elliot	Van Zandt	0	Recr		3/4/74
4678	City of Edgewood	Unnamed	Van Zandt	317	Mun	416	12/31/51
4679	City of Grand Saline	Simmons	Van Zandt	399	Mun	399	02/05/26
4557	Clifford L Barlow	Unnamed	Van Zandt	0	Recr	360	4/16/85
4680	Sunset Advertising, Inc.	Unnamed	Wood	0	Recr	54	4/14/75
4681	Dorothy Jean Harvey et al.	Unnamed	Rains	33	Irr	30	06/30/66
4682	Edward C Jones	Unnamed	Van Zandt	27	Irr	400	12/31/64
4684	Jack C Kellam	Unnamed	Van Zandt	27	Irr		11/06/72
4685	Van Zandt Club 20 Inc.	Unnamed	Van Zandt	0	Recr		8/30/76
4686	Unocal Pipeline Company	Davis Creek	Van Zandt	0	Recr		2/19/74
4687	B R Darnell	Unnamed	Van Zandt	0	Recr		8/19/74
4688	Industrial Properties Corp.	Unnamed	Van Zandt	20	Irr		01/08/73
4689	Morton Salt Company Inc.	Unnamed	Van Zandt	251	Min		04/21/75
4683	Blount Realty Company	Small Creek	Wood	0	Recr	210	8/7/50
4690	Wood County	Lake Holbrook	Wood	0	Recr	7,990	12/19/60
4691	Mineola Club Lake	Smith Creek	Wood	0	Recr		3/13/72
4692	Lake Country Land Company	Smith Creek	Wood	0	Recr		3/29/76
4693	City of Van	Village Creek	Smith	400	Mun	1,175	02/01/49

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Table B-2 (continued)

Water Rights Upstream of Toledo Bend Reservoir and Downstream of Lake Fork & Iron Bridge Dams

Permit/ Cert. of Adjud.	Owner	Stream or Reservoir	County	Annual Permitted Use (AF/Y)	Type of Use	Reservoir Capacity (Ac-Ft)	Priority Date
4694	Sky Ranches Inc.	Unnamed	Smith	0	Recr	600	8/1/66
5229	Charles Breedlove	Unnamed	Smith	9	Irr		04/14/89
4695	David Brent Pogue, et al	Unnamed	Van Zandt	0	Recr	350	1/3/77
4696	Holiday Camplands of Texas	Unnamed	Smith	0	Recr	390	5/1/72
4697	Preston Southwest Investments	Rock Creek	Smith	0	Recr		8/24/73
4698	James C Miller & Wife	Old Sabine River	Smith	273	Irr		07/30/62
4707	Paul B. Horton	Turman Creek	Wood	0	Recr	600	1/13/75
4708	Wood County	Lake Quitman	Wood	0	Recr	7,440	12/19/60
4709	North American Coal Corp	Unnamed	Wood	0	Recr	440	2/23/76
4710	Walter L Lengel & Wife	Unnamed	Wood	17	Irr		06/30/48
4713	Wells Land & Cattle Company	Graveyard Creek	Wood	0	Recr		1/13/75
4711	Quitman Club Lake	Glade Creek	Wood	0	Recr	98	1/20/75
4712	Lake Lydia Inc.	Chinquapin	Wood	0	Recr	570	1/27/75
4513	William N Walker	Lake Fork Creek	Wood	750	Irr		11/01/84
4714	Tom E Glover et al.	Four Mile Creek	Wood	10	Ind		08/28/73
4715	Lake Brenda Owners Assoc.	Two Mile Creek	Wood	0	Recr	228	7/1/74
4716	Nations Bank of Texas, Trust	Unnamed	Wood	20	Ind	45	12/31/43
4769	Frank E Elro et al.	Unnamed	Wood	40	Irr	16	12/31/54
4717	Sundowner Property Owners	Unnamed	Wood	0	Recr	389	1/20/75
4718	H L Hobbs	Red Br & Tribs	Wood	30	Irr	49	06/30/62
4719	Salesmanship Club of Dallas	Unnamed	Wood	0	Recr		1/12/76
4720	Rock Falls Fishing Club	Rock Falls Creek	Wood	0	Recr`	237	6/10/74
4721	Jerry Paul Vaughan et al	Lacy Branch	Wood	0	Recr	275	6/30/75
4770	Woodvale Fishing Club	Black Creek	Wood	0	Recr	282	12/31/16
4722	Barney Holmes, Jr	Unnamed	Wood	38	Irr	50	12/31/50
4723	Youth with a Mission Inc.	Unnamed	Smith	0	Recr		6/1/76

Appendix B

Table B-2 (continued)

Water Rights Upstream of Toledo Bend Reservoir and Downstream of Lake Fork & Iron Bridge Dams

Permit/ Cert. of Adjud.	Owner	Stream or Reservoir	County	Annual Permitted Use (AF/Y)	Type of Use	Reservoir Capacity (Ac-Ft)	Priority Date
4724	Hide-A-Way Lake Club	Hubbard Creek	Smith	180	Irr	2,816	05/23/67
4725	Smith County Baptist Association	Unnamed	Smith	0	Recr	28	1/7/80
4726	Lindale Hunting & Fishing Club	Unnamed	Smith	0	Recr		11/15/71
4727	James C Miller & Wife	Mac's Creek	Smith	107	Irr	550	06/30/63
4727	James C Miller & Wife	Red Lake	Smith	218	Irr	80	06/30/63
4728	T L Arthur Jr & Wife	Mill Creek	Smith	23	Irr		12/31/1871
4729	Lake Lorraine Club	North Prairie Creek	Smith	0	Recr		2/7/72
4730	Marion B. Shelton Estate et al	Hitt's Creek	Smith	0	Recr	1,214	12/31/1883
4731	Texas Parks & Wildlife	Unnamed	Smith	0	Recr	1,090	12/16/63
4733	Weldon S. Wells et al	Red Branch	Wood	0	Recr	400	5/1/78
4734	West Lakes Club	Little Sandy Creek	Wood	0	Recr	990	1/13/75
4735	Community Centers International	Highland Pond	Wood	0	Recr	100	3/17/75
4736	Wood County	Lake Hawkins	Wood	0	Recr	11,890	12/19/60
4251	Dale A Hipke, et al	Unnamed	Smith	65	Recr	65	10/18/82
4771	Little Sandy Hunting & Fishing	Little Sandy	Wood	10	Ind	4,589	12/31/02
4737	Bo Holmes & Wife	Unnamed	Wood	8	Irr	5	07/31/61
4738	Barney Holmes Jr & Wife	Unnamed	Wood	44	Irr	5	12/31/60
4739	Wayne Moore, et al.	Unnamed	Smith	750	Irr	244	02/27/56
4740	William L Brady et al.	Spring Creek	Smith	8	Irr	15	12/31/56
4741	Pinedale Lake Company	Born Branch	Smith	0	Recr	248	4/22/75
5287	First City Texas-Tyler Trust	Born Branch	Smith	0	Recr	491	3/21/90
4742	Suzette D Shelmire et al.	Born Branch	Smith	25	Irr	207	10/09/52
4575	Charles D & Mary J Wood	Unnamed	Smith	117	Irr	7	06/04/85
4575	Robert Thomas Perry et al	Unnamed	Smith	0	Irr		
4744	Horseshoe Club Lake	Hankins Creek	Smith	0	Recr	291	1/15/73
4745	Edwin B Ashby & Wife	Harris Creek	Smith	15	Irr		07/31/45
4747	William L Brady et al.	Spring Creek	Smith	20	Irr	20	12/31/51

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Table B-2 (continued)

Water Rights Upstream of Toledo Bend Reservoir and Downstream of Lake Fork & Iron Bridge Dams

Permit/ Cert. of Adjud.	Owner	Stream or Reservoir	County	Annual Permitted Use (AF/Y)	Type of Use	Reservoir Capacity (Ac-Ft)	Priority Date
4746	William L Brady et al.	Spring Creek	Smith	20	Irr	9	12/31/51
4743	William L Brady & Wife	Glade Creek	Smith	5	Irr		12/31/51
4748	Pinehurst Partners, Ltd.	Harris Cr & Trib.	Smith	120	Irr	200	07/31/55
4749	Wood County	Lake Winnsboro	Wood	0	Recr	8,100	12/19/60
4750	Virgil Woodward & Wife	Turkey Creek	Wood	1	Irr	4	07/31/559
4751	Big Woods Springs Imp Assoc.	Turkey Creek	Wood	0	Recr	787	4/22/75
4752	Comy E Bradshaw & Wife	Buck Creek	Wood	30	Irr	4	07/31/56
4267	Louisiana-Pacific Corp.	Unnamed	Wood	200	Irr	8	11/22/82
4753	Gunstream Land Corp	Mill Creek	Wood	0	Recr	2,758	1/6/75
4754	Mill Creek Company	Mill Creek	Wood	500	Irr	698	02/04/80
5419	Silverleaf Resources, Ltd.	Holly Creek	Wood	432	Recr	432	6/1/92
4755	Real Estate Holdings Inc.	Greenbriar Cr	Wood	86	Irr	2,260	01/31/72
4756	A C Musgrave, Jr.	Boggy Creek	Wood	0	Recr	520	9/11/73
4757	Boggy Creek Ranchy	Boggy Creek	Wood	0	Recr		7/28/75
4307	Tyler Sand Company	Big Sandy Cr	Upshur	200	Min		01/24/83
4758	Ambassador College	Big Sandy & Trib.	Upshur	400	Mun		05/03/65
4758	Ambassador College	Big Sandy & Trib.	Upshur	350	Irr	914	05/03/65
4220	Ralph Trimble	Big Sandy Cr.	Upshur	80	Irr		06/07/82
4760	Gladewater Hunting & Fishing Club	Rocky Creek	Upshur	0	Recr		1/13/75
4761	Donald Therneau	Unnamed	Smith	7	Ind	4	07/02/73
4762	City of Gladewater	Lake Gladewater	Upshur	1,679	Mun	6,950	05/17/51
4763	Jack L Phillips & Wife	Glade Creek	Upshur	100	Irr	10	06/30/63
4622	Lake Devernia Hunting & Fishing	Campbells Creek	Gregg	0	Recr	690	11/4/71
4764	Howell Club Lake	Sandy Bottom Creek	Smith	0	Recr	608	7/8/74
4765	Hamrick Lake Association	Sandy Bottom Creek	Smith	0	Recr	306	12/9/74
4732	Edwin Baggett & Wife	Unnamed	Upshur	202	Irr	44	03/31/61
4623	G R Akin et al.	Unnamed	Gregg	5	Min		12/31/31

Appendix B

Table B-2 (continued)

Water Rights Upstream of Toledo Bend Reservoir and Downstream of Lake Fork & Iron Bridge Dams

Permit/ Cert. of Adjud.	Owner	Stream or Reservoir	County	Annual Permitted Use (AF/Y)	Type of Use	Reservoir Capacity (Ac-Ft)	Priority Date
5090	City of Longview	Sabine River	Gregg	13,860	Mun		08/26/86
4759	City of Longview	Big Sandy Creek	Upshur	100	Irr		07/13/45
4759	City of Longview	Big Sandy Creek	Upshur	100	Ind		07/13/45
4759	City of Longview	Big Sandy Creek	Upshur	5,400	Mun	183	04/24/35
4624	City of Longview	Sabine River	Gregg	1,087	Mun	180	07/07/15
4625	City of Overton	Unnamed	Smith	0	Mun	170	4/12/76
4626	M F Glover et al	Unnamed	Gregg	17	Irr	70	06/30/55
4627	Patricia Louise Phillips et al.	Unnamed	Rusk	80	Irr	334	04/12/76
4628	Gino Venitucci et al.	Unnamed	Gregg	37	Irr	100	12/31/63
4629	Carlos B. Griffin, Sr. & Wife	Unnamed	Gregg	28	Irr	240	08/31/53
4630	George D Grogan	Unnamed	Gregg	39	Irr	56	12/31/52
4632	Pinecrest Country Club	Unnamed	Harrison	0	Irr		12/31/36
4632	J L Finch Estate	Unnamed	Harrison	51	Irr	102	12/31/36
4631	Eastman Chemical Company	Sabine River	Harrison	22,500	Ind	8,135	09/19/49
4633	Clarence W Young & Wife	Unnamed	Harrison	3	Ind		12/31/55
4634	E C Johnston, Jr.	Unnamed	Harrison	69	Irr		03/31/63
4635	Gordon C Johnston et al.	Unnamed Trib Mason	Harrison	17	Irr	183	03/31/63
4636	Brown's Lake Fishing Club	Unnamed	Rusk	0	Mun	106	11/3/75
4637	Boral Bricks, Inc.	Unnamed	Rusk	15	Ind		08/18/75
4638	Alex Pope Jr et al.	Mill Creek	Rusk	37	Irr		07/31/63
5578	City of Henderson	Unnamed Trib Beaver Cr	Rusk	10	Mun		03/04/97
5519	Texas Util Mining Co/TU Svcs.	Unnamed	Rusk	245	Min	137	08/16/95
5441	Texas Utilities Mining Company	Boggy Branch	Rusk	1006	Ind		03/23/93
4639	Margene Tuthill et al.	Unnamed	Rusk	50	Irr		05/31/46
4640	C J Bennett & Wife	Unnamed	Rusk	16	Irr	24	12/31/22
4641	E E Brown & Wife	Unnamed	Rusk	0	Ind	21	12/31/44
4643	Long Glade Lake Inc.	Unnamed	Rusk	0	Recr	284	3/3/75

Appendix B

Table B-2 (continued)

Water Rights Upstream of Toledo Bend Reservoir and Downstream of Lake Fork & Iron Bridge Dams

Permit/ Cert. of Adjud.	Owner	Stream or Reservoir	County	Annual Permitted Use (AF/Y)	Type of Use	Reservoir Capacity (Ac-Ft)	Priority Date
4642	Cherokee Water Company	Lake Cherokee	Gregg	62,400*	Mun	62,400	10/05/46
4645	James E Utz	Unnamed	Harrison	118	Irr		03/31/60
4644	Highway Lake Company Inc.	Unnamed	Harrison	0	Recr	398	12/31/25
5439	Sabine Mining Company	Rodgers Creek	Harrison	100	Ind	93	12/03/92
5382	Sabine Mining Company	Clark Creek	Harrison	100	Ind	28	09/09/91
5246	Sabine Mining Company	Unnamed	Harrison	100	Ind	45	07/14/89
5177	Sabine Mining Company	Rodgers Creek	Harrison	100	Ind	187	04/28/88
4646	Carolyn Holloway Bicknell	Clark Creek	Harrison	9	Irr	60	12/31/37
5454	The Sabine Mining Company	Unnamed	Harrison	100	Ind	100	03/05/93
5082	The Sabine Mining Company	Unnamed	Harrison	5	Ind	59	08/07/86
5124	Sabine Mining Company	Unnamed	Harrison	15	Ind	50	03/23/87
4647	Southwestern Elec Power Co.	Brandy Branch	Harrison	11,000	Ind	29,513	08/21/78
5468	Norit Americas Inc.	Unnamed Trib	Harrison	7	Ind	7	08/18/93
5158	Norit Americas Inc.	Unnamed	Harrison	0	Other		9/28/87
4648	Philip H Megason & Wife	Unnamed Trib	Rusk	76	Ind	77	03/31/65
5492	Texas Utilities Mining Co/ TU Services	Weir Creek	Panola	164	Other	164	6/17/94
5526	Texas Utilities Mining Co/ TU Services	Unnamed	Panola	0	Mining	50	4/4/95
5504	Texas Utilities Mining Co/ TU Services	Caney Branch	Panola	0	Mining	180	9/14/94
4649	Texas Utilities Mining Co/ TU Services	Martin Lake	Rusk	25,000	Ind	56,500	07/19/71
5219	Texas Utilities Mining Co/ TU Services	Unnamed	Panola	129	Ind	100	03/20/89
4556	James A Burgess	Martin Creek	Panola	77	Irr		04/16/85
4650	3-H Lake Association, Inc.	Unnamed	Panola	0	Recr		11/10/75
4651	Dixie Lake Inc.	Little Six Mile Creek	Panola	0	Recr	740	5/7/73
4652	Hills Lake Fishing Club	Unnamed	Panola	286	Ind	220	01/10/72
5380	Charle R Johnson	Maxwell Branch	Rusk	20	Ind	9	08/23/91
4653	W C Smith Children Trust	Murvaul Bayou	Panola	50	Irr		04/16/64
4654	Panola Co FWSD 1	Murvaul Lake	Panola	1,120	Ind	44,650	07/19/56

Appendix B

Table B-2 (continued)

Water Rights Upstream of Toledo Bend Reservoir and Downstream of Lake Fork & Iron Bridge Dams

Permit/ Cert. of Adjud.	Owner	Stream or Reservoir	County	Annual Permitted Use (AF/Y)	Type of Use	Reservoir Capacity (Ac-Ft)	Priority Date
4654	Panola Co FWSD 1	Murvaul Lake	Panola	21,280	Mun	44,650	07/19/56
4655	Cities Service Oil & Gas Corp.	Unnamed	Panola	229	Ind	144	04/26/48
4531	Miriam H & Jeanette Bounds	Unnamed	Panola	70	Irr		01/03/85
4656	Arnold Hooper & Wife	Sabine River	Panola	118	Irr		06/20/55
			17	Municipal Rights	109,254		
			27	Industrial Rights	62,068		
			55	Irrigation Rights	5,456		
			56	Recreation	497		
			6	Mining Rights	701		
			2	Other	164		
			163	Total Rights	178,140		

* The firm yield of Lake Cherokee is less than the permitted water right.

Appendix B

Table B-3
Water Rights Upstream of Lake Fork Dam

Permit/ Cert. of Adjud.	Owner	Stream or Reservoir	County	Annual Permitted Use (AF/Y)	Type of Use	Reservoir Capacity (Ac-Ft)	Priority Date
5046	Robert Carrozza	Brickkiln Branch	Rains	0	Recr	278	2/27/86
4700	Nell Cobb Click	Unnamed	Rains	25	Irr	196	5/30/51
4699	Truman L. Renshaw	Unnamed	Hopkins	19	Irr		5/8/69
4702	Dewey Dickens & Wife	Unnamed	Hopkins	75	Irr		8/30/74
5217	Coy Johnson et at	Unnamed	Hopkins	0	Mun	318	2/10/89
4701	Donald L. Gale et al.	Elm Cr & Lake Fork	Rains	249	Irr		5/31/55
4703	Anita L. Tynes, et al.	Unnamed	Hopkins	1	Irr	1	6/27/77
4704	A.C. McAfee & Wife	Unnamed	Wood	137	Irr	75	4/30/58
4705	Elberta Lake Club Inc.	Running Creek	Hopkins	0	Recr		12/13/71
4669A	Sabine River Authority of TX	Lake Fork Reservoir	Wood	0	Mun	115	4/16/92
4669A	Sabine River Authority of TX	Lake Fork Reservoir	Wood	19,500	Ind		6/26/74
4669A	Sabine River Authority of TX	Lake Fork Reservoir	Wood	131,860	Mun		6/26/74
4669A	Sabine River Authority of TX	Lake Fork Reservoir	Wood	37,300	Mun	675,819	6/26/74
			1 Industrial Rts	19,500			
			4 Municipal Rts	169,160			
			6 Irrigation Rights	506			
			2 Recreation	0			
			13 Total Rights	189,166			

Appendix B

Table B-4
Water Rights Upstream of Iron Bridge Dam (Lake Tawakoni)

Permit/ Cert. of Adjud.	Owner	Stream or Reservoir	County	Annual Permitted Use (AF/Y)	Type of Use	Reservoir Capacity (Ac-Ft)	Priority Date
4665A	City of Greenville	Cowleech Fork	Hunt	4,159	Mun	6,864	6/30/25
4666	Mrs. Edgar Hutchins	Unnamed	Hunt	0	Recr		11/27/72
4667	E.H. Buehring, et al.	Cowleech Fork	Hunt	250	Irr		11/27/56
4668	Greenville Lake & Water Company	Cedar Creek	Hunt	0	Recr	2,170	9/29/75
4670	Sabine River Authority/City of Dallas	Lake Tawakoni	Hunt	238,100	Mun	927,440	9/12/55
				2Municipal Rights			242,259
				2Recreation			0
				1Irrigation Right			250
				5Total Rights			242,509

Appendix B

Table B-5

Historical Water Use Associated with Rights over 1,000 AF/Y in the Sabine Basin

Permit/ Cert. of Adjud.	Owner	Annual Right (AF/Y)	Historical Use								
			1988	1989	1990	1991	1992	1993	1994	1995	1996
Downstream of Toledo Bend Reservoir											
4657	City of Center	1,460	271	177	374	0	NR	NR	NR	10	1
4658A	SRA (Toledo Bend)- Irrigation	50,000	0	0	0	0	0	0	0	0	0
4658A	SRA (Toledo Bend)- Industrial	600,000	0	0	0	0	0	0	0	0	0
4658A	SRA (Toledo Bend)- Municipal	100,000	1,031	1,068	1,098	1,099	1,179	1,274	1,128	1,234	1,488
4658A	SRA (Toledo Bend)- Hydropower		3,046	4,637	5,190	5,115	5,580	5,333	3,382	5,721	443
4664	DuPont (Brackish)	267,000	123,886	126,905	125,707	121,449	154,690	149,113	97,385	0	0
4664	DuPont (Fresh)						636	709	517	0	0
4662	SRA-Municipal/Industrial	100,400	51,918	51,125	49,219	47,193	51,822	58,431	53,820	52,568	56,079
4662	SRA-Irrigation	46,700	4,596	5,391	3,340	3,550	3,308	3,270	3,619	2,117	2,563
Between Toledo Bend Reservoir & Lake Fork and Iron Bridge Dams											
4675	City of Canton	1,550	372	282	357	242	370	250	NR	647	627
4762	City of Gladewater	1,679	1,296	1,190	1,242	1,187	1,243	1,254	1,106	1,170	1,191
5090	City of Longview	13,860	0	80	0	826	898	819	1,011	658	197
4759	City of Longview- Municipal	5,400	4,011	4,144	3,594	3,642	4,051	4,027	4,150	3,628	2,527
4759	City of Longview- Irrigation	100	856	777	837	838	852	918	1,060		
4624	City of Longview	1,087	1,088	634	593	716	761	720	768	656	501
4631	Eastman Chemical	22,500	10,440	8,727	12,715	14,273	9,191	9,972	12,210	47,750	12,017
4642*	Cherokee Water Co- Municipal	62,400	14,900	15,164	14,538	17,370	17,100	12,899	13,743	14,208	17,400
4642	Cherokee Water Co- Industrial		8	3	9	8	10	19	24	10	1
4647	SWEPCO	11,000	513	524	490	1,428	1,701	1,558	1,576	NR	NR

Appendix B

Table B-5 (continued)

Historical Water Use Associated with Rights over 1,000 AF/Y in the Sabine Basin

Permit/ Cert of Adjud.	Owner	Annual Right (AF/Y)	Historical Uses									
			1988	1989	1990	1991	1992	1993	1994	1995	1996	
Between Toledo Bend Reservoir & Lake Fork and Iron Bridge Dams:												
4649	TU Electric	25,000	19,152	18,744	23,830	22,338	21,527	NR	19,721	19,966	NR	
4654	Panola Co. FWSD-Industrial	1,120										
4654	Panola Co. FWSD-Municipal	21,280	1,570	1,678	1,610	1,650	1,651	1,896	1,853	2,159	2,182	
Upstream of Lake Fork Dam:												
4669A	SRA (Lake Fork)-Industrial	19,500	0	0	3,491	0	0	0	0	0	0	
4669A	SRA (Lake Fork)-Municipal	169,160	10,889	12,187	3,321	4,782	4,588	5,210	5,394	9,739	12,653	
Upstream of Iron Bridge Dam:												
4665A	Greenville	4,159	5,443	5,016	5,302	3,436	4,625	5,382	4,803	4,070	1,240	
4670	SRA/City of Dallas (Tawakoni)	238,100	149,461	87,995	122,435	100,035	102,780	122,995	64,978	82,586	145,286	

NR- No Record

* The firm yield of Lake Cherokee is less than the permitted water right.

APPENDIX C

POPULATION AND WATER USE DATA

Appendix C

Table C-1
Sabine River Basin Population Projections¹
Most Likely Migration Rate Scenario
Upper Basin Cities

Year	1990	2000	2010	2020	2030	2040	2050
Big Sandy	1,185	1,334	1,455	1,566	1,657	1,722	1,776
Caddo Mills	1,068	1,305	1,540	1,742	1,859	1,912	1,967
Canton	2,949	3,406	3,685	3,861	3,813	3,666	3,508
Carthage	6,496	6,860	7,102	7,196	7,173	6,943	6,720
Edgewood	1,284	1,477	1,597	1,674	1,653	1,589	1,520
Emory	963	979	994	1,005	1,014	1,029	1,044
Gladewater	6,027	6,832	7,471	8,122	8,710	9,226	9,749
Grand Saline	2,630	2,907	3,145	3,296	3,254	3,129	2,994
Greenville	23,071	24,137	25,075	25,565	26,276	26,476	26,678
Hallsville	2,288	3,081	3,901	4,514	4,859	4,919	4,980
Hawkins	1,309	1,474	1,590	1,663	1,647	1,552	1,386
Henderson	1,115	1,202	1,217	1,188	1,160	1,157	1,154
Kilgore	11,066	12,767	13,705	14,644	15,435	16,270	17,151
Liberty City	1,607	2,177	2,565	2,863	3,073	3,200	3,332
Lindale	1,214	1,372	1,491	1,566	1,626	1,677	1,709
Longview	70,311	78,218	84,498	91,157	97,281	102,956	108,979
Marshall	18,621	20,094	21,612	22,959	23,211	22,143	21,124
Mineola	4,321	4,858	5,239	5,480	5,426	5,115	4,566
Overton¹	1,954	2,043	2,081	2,048	2,010	2,013	2,015
Quinlan	1,360	1,841	2,322	2,752	2,982	3,089	3,200
Quitman	1,684	1,897	2,046	2,140	2,119	1,998	1,783
Royse City	2,206	3,948	5,827	8,311	11,348	14,920	19,633
Tatum	1,289	1,392	1,443	1,445	1,433	1,427	1,421
Tyler¹	8	8	8	9	9	10	11
Van	91	105	113	119	117	113	108
White Oak	5,136	5,882	6,466	7,089	7,682	8,246	8,851
Wills Point	1,491	1,671	1,810	1,899	1,876	1,805	1,736
Winnsboro¹	2,202	2,453	2,652	2,786	2,776	2,634	2,377

1. City population includes only that portion of the population within the Sabine River Basin

Appendix C

Table C-2
Sabine River Basin Population Projections¹
Most Likely Migration Rate Scenario
Lower Basin Cities

Year	1990	2000	2010	2020	2030	2040	2050
Bessmay-Buna	2,127	2,528	2,629	2,695	2,738	2,828	2,921
Bridge City	4,820	5,578	6,163	6,755	7,354	7,637	7,931
Center	4,950	5,403	5,911	6,301	6,724	7,059	7,411
Hemphill	1,182	1,265	1,335	1,384	1,470	1,555	1,645
Kirbyville	1,871	2,162	2,248	2,306	2,341	2,419	2,419
Newton	1,885	2,267	2,594	2,908	3,185	3,294	3,407
Orange	19,381	20,317	22,300	24,444	26,612	27,632	28,691
Pinehurst	2,682	2,952	3,189	3,351	3,543	3,760	3,960
Tenaha	1,072	1,169	1,213	1,264	1,320	1,370	1,420
Timpson	1,029	1,142	1,178	1,222	1,269	1,313	1,359
Vidor	3,279	3,606	3,758	3,885	3,990	4,067	4,146
West Orange	4,187	4,785	5,289	5,647	6,073	6,558	7,082

1. Population is for that portion of the city within the Sabine River basin.

Appendix C

Table C-3
Sabine River Basin: Lower Basin Population Projections
Most Likely Migration Rate Scenario

COUNTY	1990	2000	2010	2020	2030	2040	2050
Jasper	11,337	12,267	12,941	13,589	14,329	14,964	15,556
Newton	13,556	14,271	14,900	15,172	15,231	14,967	14,567
Orange	54,313	59,943	65,092	68,949	73,382	77,802	81,949
Sabine	6,774	7,592	8,252	8,704	8,864	9,086	9,333
San Augustine	785	787	802	813	830	837	843
Shelby	20,095	21,073	21,914	22,852	23,878	24,796	25,710
Total	106,860	115,933	123,901	130,079	136,514	142,452	147,958

Table C-4
Sabine River Basin: Upper Basin Population Projections
Most Likely Migration Rate Scenario

COUNTY	1990	2000	2010	2020	2030	2040	2050
Collin	2,015	3,144	2,646	5,432	9,555	14,759	20,211
Franklin	81	94	109	125	142	151	161
Gregg	103,325	112,188	119,566	127,469	134,662	141,231	148,128
Harrison	37,123	40,283	43,388	45,336	45,169	43,586	42,065
Hopkins	6,257	6,446	6,659	6,804	6,828	6,768	6,669
Hunt	51,714	57,464	62,772	66,990	69,750	70,849	73,395
Kaufman	964	1,135	1,346	1,579	1,782	1,938	2,029
Panola	21,998	23,561	24,716	25,306	25,357	24,650	23,943
Rains	6,715	7,444	8,210	8,870	9,436	9,807	10,506
Rockwall	3,480	5,494	7,711	11,068	15,229	20,162	24,949
Rusk	20,646	22,314	23,783	26,172	28,596	30,131	31,104
Smith	21,554	25,421	27,887	29,018	28,995	28,431	26,973
Upshur	11,139	12,464	13,593	14,630	15,484	16,091	16,593
Van Zandt	20,784	23,291	25,196	26,404	26,072	25,066	23,985
Wood	27,703	31,002	33,434	34,972	34,628	32,641	29,138
Total	335,498	371,745	401,016	430,175	451,685	466,261	479,849

Projections are for the portion of each county that lies within the Sabine Basin.

Appendix C

Table C-5
Sabine River Basin "Most Likely" Municipal Use Scenario¹
(Acre-Feet/Year)

County	1990	2000	2010	2020	2030	2040	2050
Collin	320	485	377	716	1,231	1,994	2,600
Franklin	13	18	20	21	24	25	26
Gregg	17,469	21,438	21,761	22,248	23,048	23,769	24,849
Harrison	5,287	6,338	6,435	6,407	6,222	5,791	5,583
Hopkins	828	1,070	1,053	1,022	995	956	935
Hunt	9,337	9,762	9,879	9,829	9,933	9,826	10,011
Jasper	1,548	1,752	1,737	1,708	1,731	1,752	1,791
Kaufman	109	153	169	186	204	215	223
Newton	1,675	1,764	1,753	1,701	1,663	1,577	1,551
Orange	8,523	9,553	9,828	9,971	10,348	10,646	11,073
Panola	3,010	3,651	3,607	3,488	3,377	3,171	3,072
Rains	1,096	1,317	1,377	1,415	1,463	1,487	1,579
Rockwall	482	1,004	1,280	1,734	2,347	3,084	3,679
Rusk	2,743	3,250	3,252	3,307	3,431	3,490	3,589
Sabine	751	927	927	917	913	912	934
San Augustine	147	98	93	89	87	85	85
Shelby	2,794	3,104	3,052	3,004	3,053	3,071	3,158
Smith	3,348	3,920	4,042	3,976	3,846	3,680	3,469
Upshur	1,700	1,895	1,930	1,954	1,988	2,003	2,041
Van Zandt	3,017	3,368	3,421	3,385	3,234	2,995	2,869
Wood	4,032	4,864	4,934	4,870	4,702	4,264	3,843
TOTAL	68,229	79,731	80,927	81,948	83,840	84,793	86,960

1. "Most Likely" Scenario uses "most likely" population series and assumes below average rainfall and expected levels of conservation.

Projections are for the portion of each county that lies within the Sabine Basin.

Appendix C

Table C-6
Sabine River Basin 1.0 Migration Rate Municipal Use Scenario²
(Acre-Feet/Year)

County	1990	2000	2010	2020	2030	2040	2050
Collin	320	619	949	1,385	1,872	2,299	2,404
Franklin	13	13	11	9	7	6	5
Gregg	17,469	20,111	19,274	18,147	17,069	15,497	14,017
Harrison	5,287	6,314	6,393	6,358	6,169	5,757	5,535
Hopkins	828	1,098	1,070	1,047	1,008	921	866
Hunt	9,337	10,245	10,706	10,860	11,142	11,299	11,442
Jasper	1,548	1,604	1,477	1,353	1,245	1,061	869
Kaufman	109	170	202	240	283	326	344
Newton	1,675	1,815	1,808	1,714	1,555	1,411	1,274
Orange	8,523	8,751	7,985	7,109	6,167	5,407	4,627
Panola	3,010	3,764	3,701	3,518	3,411	2,968	2,617
Rains	1,096	1,443	1,615	1,758	1,879	1,983	2,040
Rockwall	482	1,003	1,278	1,732	2,344	3,079	3,672
Rusk	2,743	3,170	3,120	2,968	2,799	2,471	2,271
Sabine	751	882	834	773	705	658	625
San Augustine	147	92	80	67	56	46	38
Shelby	2,794	2,941	2,677	2,349	2,030	1,804	1,548
Smith	3,348	3,923	4,016	3,980	3,850	3,684	3,472
Upshur	1,700	1,822	1,766	1,667	1,544	1,484	1,423
Van Zandt	3,017	3,308	3,340	3,315	3,099	2,864	2,698
Wood	4,032	4,799	4,818	4,679	4,430	4,054	3,625
TOTAL	68,229	77,887	77,120	75,028	72,664	69,079	65,412

2. 1.0 Migration Rate Scenario assumes 1.0 migration rate population series with Below Average Rainfall and Expected Conservation.

Projections are for the portion of each county that lies within the Sabine Basin.

Appendix C

Table C-7
Sabine River Basin Advanced Conservation Municipal Use Scenario³
(Acre-Feet/Year)

County	1990	2000	2010	2020	2030	2040	2050
Collin	320	464	343	639	1,234	1,813	2,354
Franklin	13	17	18	20	22	23	25
Gregg	17,469	20,706	20,290	20,339	21,274	22,199	23,199
Harrison	5,287	6,109	5,968	5,831	5,730	5,433	5,192
Hopkins	828	1,034	986	938	926	903	882
Hunt	9,337	9,360	9,096	8,800	8,974	8,978	9,140
Jasper	1,548	1,681	1,602	1,558	1,600	1,645	1,672
Kaufman	109	147	157	168	188	200	209
Newton	1,675	1,695	1,610	1,531	1,526	1,484	1,446
Orange	8,523	9,234	9,230	9,198	9,680	10,104	10,438
Panola	3,010	3,531	3,344	3,156	3,101	2,958	2,846
Rains	1,096	1,284	1,293	1,314	1,376	1,418	1,504
Rockwall	482	962	1,195	1,581	2,158	2,833	3,400
Rusk	2,743	3,138	3,007	2,995	3,159	3,248	3,316
Sabine	751	889	864	837	849	859	879
San Augustine	147	94	87	81	82	81	80
Shelby	2,794	2,986	2,834	2,734	2,809	2,871	2,951
Smith	3,348	3,749	3,696	3,547	3,481	3,357	3,189
Upshur	1,700	1,829	1,799	1,785	1,845	1,887	1,909
Van Zandt	3,017	3,245	3,161	3,039	2,945	2,779	2,660
Wood	4,032	4,686	4,544	4,377	4,258	3,982	3,533
Total	68,229	76,840	75,124	74,468	77,217	79,055	80,824

3. Advanced Conservation Scenario assumes "most likely" population series with below average rainfall and advanced levels of conservation.

Projections are for the portion of each county that lies within the Sabine Basin.

Appendix C

Table C-8
Sabine River Basin Low Oil Price Manufacturing Use Scenario¹
(Acre-Feet/Year)

County	1990	2000	2010	2020	2030	2040	2050
Collin	0	0	0	0	0	0	0
Franklin	0	0	0	0	0	0	0
Gregg	14,634	16,431	18,276	20,363	22,576	24,931	27,351
Harrison	74,107	115,543	150,737	169,499	190,993	214,392	244,883
Hopkins	2	2	3	3	3	4	4
Hunt	409	434	461	485	509	533	559
Jasper	0	0	0	0	0	0	0
Kaufman	0	0	0	0	0	0	0
Newton	114	125	135	146	156	166	180
Orange	49,169	55,518	62,835	71,073	80,130	91,522	104,257
Panola	641	720	804	888	967	1,046	1,121
Rains	0	0	0	0	0	0	0
Rockwall	0	0	0	0	0	0	0
Rusk	48	54	60	66	72	77	84
Sabine	0	0	0	0	0	0	0
San Augustine	0	0	0	0	0	0	0
Shelby	1,204	1,505	1,856	2,242	2,656	3,099	3,560
Smith	229	280	340	402	465	526	587
Upshur	0	0	0	0	0	0	0
Van Zandt	223	296	385	471	570	648	729
Wood	41	48	55	64	73	82	93
TOTAL	140,821	190,956	235,947	265,702	299,170	337,026	383,408

1. Low Oil Price Scenario assumes lower priced oil with no conservation efforts.

Projections are for the portion of each county that lies within the Sabine Basin.

Appendix C

Table C-9
Sabine River Basin "Most Likely" Manufacturing Use Scenario²
(Acre-Feet/Year)

County	1990	2000	2010	2020	2030	2040	2050
Collin	0	0	0	0	0	0	0
Franklin	0	0	0	0	0	0	0
Gregg	14,634	16,538	18,576	20,934	23,507	26,515	29,716
Harrison	74,107	109,321	133,587	140,270	146,244	159,506	174,422
Hopkins	2	2	3	3	4	5	5
Hunt	409	426	443	456	466	488	508
Jasper	0	0	0	0	0	0	0
Kaufman	0	0	0	0	0	0	0
Newton	114	122	131	139	146	154	162
Orange	49,169	52,936	56,817	60,388	63,391	69,938	76,790
Panola	641	685	730	762	785	844	897
Rains	0	0	0	0	0	0	0
Rockwall	0	0	0	0	0	0	0
Rusk	48	54	59	65	71	76	83
Sabine	0	0	0	0	0	0	0
San Augustine	0	0	0	0	0	0	0
Shelby	1,204	1,436	1,694	1,944	2,189	2,550	2,928
Smith	229	262	298	325	346	377	403
Upshur	0	0	0	0	0	0	0
Van Zandt	223	280	344	396	451	508	566
Wood	41	48	57	67	77	92	107
TOTAL	140,821	182,110	212,739	225,749	237,677	261,053	286,587

2. "Most Likely" scenario assumes base oil price with expected conservation.

Projections are for the portion of each county that lies within the Sabine Basin.

Appendix C

Table C-10
Sabine River Basin Base with No Conservation Manufacturing Use Scenario³
(Acre-Feet/Year)

County	1990	2000	2010	2020	2030	2040	2050
Collin	0	0	0	0	0	0	0
Franklin	0	0	0	0	0	0	0
Gregg	14,634	16,637	18,801	21,330	24,108	27,177	30,440
Harrison	74,107	113,211	143,704	157,554	171,951	187,617	205,322
Hopkins	2	2	3	3	4	5	5
Hunt	409	434	458	482	504	530	554
Jasper	0	0	0	0	0	0	0
Kaufman	0	0	0	0	0	0	0
Newton	114	122	131	139	146	154	162
Orange	49,169	54,410	60,337	66,691	73,143	80,903	89,017
Panola	641	712	790	864	935	1,004	1,067
Rains	0	0	0	0	0	0	0
Rockwall	0	0	0	0	0	0	0
Rusk	48	54	59	65	71	76	83
Sabine	0	0	0	0	0	0	0
San Augustine	0	0	0	0	0	0	0
Shelby	1,204	1,492	1,833	2,207	2,613	3,045	3,498
Smith	229	273	324	371	416	455	486
Upshur	0	0	0	0	0	0	0
Van Zandt	223	291	374	453	544	612	682
Wood	41	49	58	69	81	95	111
TOTAL	140,821	187,687	226,872	250,228	274,516	301,673	331,427

3. No Conservation Scenario assumes base oil prices with no conservation efforts.

Projections are for the portion of each county that lies within the Sabine Basin.

Appendix C

Table C-11
Total Water Requirements - Year 2000
(Acre-Feet per Year)

County	Municipal ¹	Irrigation ¹	Livestock	Manufac. ²	Mining	Power ³	Total
Collin	485	0	38	0	0	0	523
Franklin	18	0	2	0	0	0	20
Gregg	21,438	0	230	16,431	96	2,500	40,695
Harrison	6,338	50	326	115,543	186	5,000	127,443
Hopkins	1,070	0	2,130	2	0	0	3,202
Hunt	9,762	271	896	434	70	800	12,233
Jasper	1,752	0	100	0	2	0	1,854
Kaufman	153	0	72	0	0	0	225
Newton	1,764	2,200	82	125	30	0	4,201
Orange	9,553	3,329	70	55,518	1	6,000	74,471
Panola	3,651	0	2,027	720	3,245	0	9,643
Rains	1,317	20	700	0	0	0	2,037
Rockwall	1,004	0	26	0	0	0	1,030
Rusk	3,250	75	549	54	563	30,000	34,491
Sabine	927	0	337	0	0	0	1,264
San Augustine	98	0	87	0	0	0	185
Shelby	3,104	27	1,635	1,505	0	0	6,271
Smith	3,920	63	453	280	425	0	5,141
Upshur	1,895	0	418	0	0	0	2,313
Van Zandt	3,368	0	1,100	296	1,233	0	5,997
Wood	4,864	235	2,360	48	2,102	0	9,609
TOTALS	79,731	6,270	13,638	190,956	7,953	44,300	342,848

¹. "Most Likely" Projection Series

². Low Oil Price without Conservation Series

³. "High" Projection Series

Projections are for the portion of the county that lies within the Sabine Basin.

Appendix C

Table C-12
Total Water Requirements - Year 2010
(Acre-Feet per Year)

County	Municipal ¹	Irrigation ¹	Livestock	Manufac. ²	Mining	Power ³	Total
Collin	377	0	38	0	0	0	415
Franklin	20	0	2	0	0	0	22
Gregg	21,761	0	230	18,276	67	3,000	43,334
Harrison	6,435	50	326	150,737	89	5,000	162,637
Hopkins	1,053	0	2,130	3	0	0	3,186
Hunt	9,879	271	896	461	71	0	11,578
Jasper	1,737	0	100	0	2	0	1,839
Kaufman	169	0	72	0	0	0	241
Newton	1,753	2,200	82	135	30	0	4,200
Orange	9,828	3,014	70	62,835	1	10,000	85,748
Panola	3,607	0	2,027	804	2,645	0	9,083
Rains	1,377	20	700	0	0	0	2,097
Rockwall	1,280	0	26	0	0	0	1,306
Rusk	3,252	75	549	60	314	35,000	39,250
Sabine	927	0	337	0	0	0	1,264
San Augustine	93	0	87	0	0	0	180
Shelby	3,052	27	1,635	1,856	0	0	6,570
Smith	4,042	63	453	340	178	0	5,076
Upshur	1,930	0	418	0	0	0	2,348
Van Zandt	3,421	0	1,100	385	1,073	0	5,979
Wood	4,934	235	2,360	55	17,584	7,500	32,668
TOTALS	80,927	5,955	13,638	235,947	22,054	60,500	419,021

¹. "Most Likely" Projection Series

². Low Oil Price without Conservation Series

³. "High" Projection Series

Projections are for the portion of the county that lies within the Sabine Basin.

Appendix C

**Table C-13
Total Water Requirements - Year 2020
(Acre-Feet per Year)**

County	Municipal ¹	Irrigation ¹	Livestock	Manufac. ²	Mining	Power ³	Total
Collin	716	0	38	0	0	0	754
Franklin	21	0	2	0	0	0	23
Gregg	22,248	0	230	20,363	46	3,000	45,887
Harrison	6,407	50	326	169,499	50	5,000	181,332
Hopkins	1,022	0	2,130	3	0	0	3,155
Hunt	9,829	271	896	485	73	0	11,554
Jasper	1,708	0	100	0	2	0	1,810
Kaufman	186	0	72	0	0	0	258
Newton	1,701	2,200	82	146	31	0	4,160
Orange	9,971	3,014	70	71,073	1	15,000	99,129
Panola	3,488	0	2,027	888	8,697	0	15,100
Rains	1,415	20	700	0	0	0	2,135
Rockwall	1,734	0	26	0	0	0	1,760
Rusk	3,307	75	549	66	104	40,000	44,101
Sabine	917	0	337	0	0	0	1,254
San Augustine	89	0	87	0	0	0	176
Shelby	3,004	27	1,635	2,242	0	0	6,908
Smith	3,976	63	453	402	91	0	4,985
Upshur	1,954	0	418	0	0	0	2,372
Van Zandt	3,385	0	1,100	471	1,026	0	5,982
Wood	4,870	235	2,360	64	17,344	7,500	32,373
TOTALS	81,948	5,955	13,638	265,702	27,465	70,500	465,208

¹. "Most Likely" Projection Series

². Low Oil Price without Conservation Series

³. "High" Projection Series

Projections are for the portion of the county that lies within the Sabine Basin.

Appendix C

**Table C-14
Total Water Requirements - Year 2030
(Acre-Feet per Year)**

County	Municipal ¹	Irrigation ¹	Livestock	Manufac. ²	Mining	Power ³	Total
Collin	1,231	0	38	0	0	0	1,269
Franklin	24	0	2	0	0	0	26
Gregg	23,048	0	230	22,576	37	3,000	48,891
Harrison	6,222	50	326	190,993	24	10,000	207,615
Hopkins	995	0	2,130	3	0	0	3,128
Hunt	9,933	271	896	509	75	0	11,684
Jasper	1,731	0	100	0	2	0	1,833
Kaufman	204	0	72	0	0	0	276
Newton	1,663	2,200	82	156	32	0	4,133
Orange	10,348	2,940	70	80,130	1	20,000	113,489
Panola	3,377	0	2,027	967	16,912	0	23,283
Rains	1,463	20	700	0	0	0	2,183
Rockwall	2,347	0	26	0	0	0	2,373
Rusk	3,431	75	549	72	89	45,000	49,216
Sabine	913	0	337	0	0	0	1,250
San Augustine	87	0	87	0	0	0	174
Shelby	3,053	27	1,635	2,656	0	0	7,371
Smith	3,846	63	453	465	32	0	4,859
Upshur	1,988	0	418	0	0	0	2,406
Van Zandt	3,234	0	1,100	570	1,014	0	5,918
Wood	4,702	235	2,360	73	17,107	7,500	31,977
TOTALS	83,840	5,881	13,638	299,170	35,325	85,500	523,354

¹. "Most Likely" Projection Series

². Low Oil Price without Conservation Series

³. "High" Projection Series

Projections are for the portion of the county that lies within the Sabine Basin.

Appendix C

Table C-15
Total Water Requirements - Year 2040
(Acre-Feet per Year)

County	Municipal ¹	Irrigation ¹	Livestock	Manufac. ²	Mining	Power ³	Total
Collin	1,994	0	38	0	0	0	2,032
Franklin	25	0	2	0	0	0	27
Gregg	23,769	0	230	24,931	29	3,000	51,959
Harrison	5,791	50	326	214,392	18	10,000	230,577
Hopkins	956	0	2,130	4	0	0	3,090
Hunt	9,826	271	896	533	77	0	11,603
Jasper	1,752	0	100	0	2	0	1,854
Kaufman	215	0	72	0	0	0	287
Newton	1,577	2,200	82	166	33	0	4,058
Orange	10,646	2,867	70	91,522	1	25,000	130,106
Panola	3,171	0	2,027	1,046	17,179	0	23,423
Rains	1,487	20	700	0	0	0	2,207
Rockwall	3,084	0	26	0	0	0	3,110
Rusk	3,490	75	549	77	60	45,000	49,251
Sabine	912	0	337	0	0	0	1,249
San Augustine	85	0	87	0	0	0	172
Shelby	3,071	27	1,635	3,099	0	0	7,832
Smith	3,680	63	453	526	18	0	4,740
Upshur	2,003	0	418	0	0	0	2,421
Van Zandt	2,995	0	1,100	648	1,025	0	5,768
Wood	4,264	235	2,360	82	16,107	7,500	30,548
TOTALS	84,793	5,808	13,638	337,026	34,549	90,500	566,314

¹. "Most Likely" Projection Series

². Low Oil Price without Conservation Series

³. "High" Projection Series

Projections are for the portion of the county that lies within the Sabine Basin.

Appendix C

**Table C-15
Total Water Requirements - Year 2050
(Acre-Feet per Year)**

County	Municipal ¹	Irrigation ¹	Livestock	Manufac. ²	Mining	Power ³	Total
Collin	2,600	0	38	0	0	0	2,638
Franklin	26	0	2	0	0	0	28
Gregg	24,849	0	230	27,351	27	4,000	56,457
Harrison	5,583	50	326	244,883	16	15,000	265,858
Hopkins	935	0	2,130	4	0	0	3,069
Hunt	10,011	271	896	559	79	0	11,816
Jasper	1,791	0	100	0	2	0	1,893
Kaufman	223	0	72	0	0	0	295
Newton	1,551	2,200	82	180	34	0	4,047
Orange	11,073	2,797	70	104,257	1	30,000	148,198
Panola	3,072	0	2,027	1,121	16,912	0	23,132
Rains	1,579	20	700	0	0	0	2,299
Rockwall	3,679	0	26	0	0	0	3,705
Rusk	3,589	75	549	84	7	45,000	49,304
Sabine	934	0	337	0	0	0	1,271
San Augustine	85	0	87	0	0	0	172
Shelby	3,158	27	1,635	3,560	0	0	8,380
Smith	3,469	63	453	587	6	0	4,578
Upshur	2,041	0	418	0	0	0	2,459
Van Zandt	2,869	0	1,100	729	1,055	0	5,753
Wood	3,843	235	2,360	93	4,641	15,000	26,172
TOTALS	86,960	5,738	13,638	383,408	22,780	109,000	621,524

¹. "Most Likely" Projection Series

². Low Oil Price without Conservation Series

³. "High" Projection Series

Projections are for the portion of the county that lies within the Sabine Basin.

Appendix C

Table C-16
Sabine River Basin Total Water Demand: Lower Basin
(Acre-Feet/Year)

1990

COUNTY	Municipal	Irrigation	Livestock	Manufact.	Mining	Power	Total
Jasper	1,548	0	128	0	0	0	1,676
Newton	1,675	2,200	97	114	27	0	4,113
Orange	8,523	3,340	50	49,169	1	5,574	66,657
Sabine	751	0	383	0	0	0	1,134
San Augustine	147	0	78	0	0	0	225
Shelby	2,794	28	1,650	1,204	0	0	5,676
Totals	15,438	5,568	2,386	50,487	28	5,574	79,481

2000

COUNTY	Municipal¹	Irrigation¹	Livestock	Manufact²	Mining	Power³	Total
Jasper	1,752	0	100	0	2	0	1,854
Newton	1,764	2,200	82	125	30	0	4,201
Orange	9,553	3,329	70	55,518	1	6,000	74,471
Sabine	927	0	337	0	0	0	1,264
San Augustine	98	0	87	0	0	0	185
Shelby	3,104	27	1,635	1,505	0	0	6,271
Totals	17,198	5,556	2,311	57,148	33	6,000	88,246

2010

COUNTY	Municipal¹	Irrigation¹	Livestock	Manufact²	Mining	Power³	Total
Jasper	1,737	0	100	0	2	0	1,839
Newton	1,753	2,200	82	135	30	0	4,200
Orange	9,828	3,014	70	62,835	1	10,000	85,748
Sabine	927	0	337	0	0	0	1,264
San Augustine	93	0	87	0	0	0	180
Shelby	3,052	27	1,635	1,856	0	0	6,570
Totals	17,390	5,241	2,311	64,826	33	10,000	99,801

2020

COUNTY	Municipal¹	Irrigation¹	Livestock	Manufact²	Mining	Power³	Total
Jasper	1,708	0	100	0	2	0	1,810
Newton	1,701	2,200	82	146	31	0	4,160
Orange	9,971	3,014	70	71,073	1	15,000	99,129
Sabine	917	0	337	0	0	0	1,254
San Augustine	89	0	87	0	0	0	176
Shelby	3,004	27	1,635	2,242	0	0	6,908
Totals	17,390	5,241	2,311	73,461	34	15,000	113,437

Projections are for the portion of the Sabine River basin.

Appendix C

Table C-16
Sabine River Basin Total Water Demand: Lower Basin
(Acre-Feet/Year)

2030

COUNTY	Municipal ¹	Irrigation ¹	Livestock	Manufact ²	Mining	Power ³	Total
Jasper	1,731	0	100	0	2	0	1,833
Newton	1,663	2,200	82	156	32	0	4,133
Orange	10,348	2,940	70	80,130	1	20,000	113,489
Sabine	913	0	337	0	0	0	1,250
San Augustine	87	0	87	0	0	0	174
Shelby	3,053	27	1,635	2,656	0	0	7,371
Totals	17,795	5,167	2,311	82,942	35	20,000	128,250

2040

COUNTY	Municipal ¹	Irrigation ¹	Livestock	Manufact ²	Mining	Power ³	Total
Jasper	1,752	0	100	0	2	0	1,854
Newton	1,577	2,200	82	166	33	0	4,058
Orange	10,646	2,867	70	91,522	1	25,000	130,106
Sabine	912	0	337	0	0	0	1,249
San Augustine	85	0	87	0	0	0	172
Shelby	3,071	27	1,635	3,099	0	0	7,832
Totals	18,043	5,094	2,311	94,787	36	25,000	145,271

2050

COUNTY	Municipal ¹	Irrigation ¹	Livestock	Manufact ²	Mining	Power ³	Total
Jasper	1,791	0	100	0	2	0	1,893
Newton	1,551	2,200	82	180	34	0	4,047
Orange	11,073	2,797	70	104,257	1	30,000	148,198
Sabine	934	0	337	0	0	0	1,271
San Augustine	85	0	87	0	0	0	172
Shelby	3,158	27	1,635	3,560	0	0	8,380
Totals	18,592	5,024	2,311	107,997	37	30,000	163,961

¹. "Most Likely" Projection Series

². "Low Oil Prices without Conservation" Series

³. "High" Projection Series

Projections are for the portion of the Sabine River basin.

Appendix C

Table C-17
Sabine River Basin Total Water Demand: Upper Basin
(Acre-Feet/Year)

1990

COUNTY	Municipal	Irrigation	Livestock	Manufact.	Mining	Power	Total
Collin	320	0	37	0	0	0	357
Franklin	13	0	0	0	0	0	13
Gregg	17,469	0	200	14,634	124	465	32,892
Harrison	5,287	50	420	74,107	170	4,869	84,903
Hopkins	828	0	1,797	2	0	0	2,627
Hunt	9,337	271	817	409	0	834	11,668
Kaufman	109	0	72	0	0	0	181
Panola	3,010	0	2,145	641	3,208	0	9,004
Rains	1,096	20	790	0	0	0	1,906
Rockwall	482	0	34	0	0	0	516
Rusk	2,743	75	563	48	732	28,320	32,481
Smith	3,348	63	495	229	555	0	4,690
Upshur	1,700	0	287	0	0	0	1,987
Van Zandt	3,017	0	1,023	223	785	0	5,048
Wood	4,032	236	1,673	41	3,162	0	9,144
Totals	52,791	715	10,353	90,334	8,736	34,488	197,417

2000

COUNTY	Municipal ¹	Irrigation ¹	Livestock	Manufact. ²	Mining	Power ³	Total
Collin	485	0	38	0	0	0	523
Franklin	18	0	2	0	0	0	20
Gregg	21,438	0	230	16,431	96	2,500	40,695
Harrison	6,338	50	326	115,543	186	5,000	127,443
Hopkins	1,070	0	2,130	2	0	0	3,202
Hunt	9,762	271	896	434	70	800	12,233
Kaufman	153	0	72	0	0	0	225
Panola	3,651	0	2,027	720	3,245	0	9,643
Rains	1,317	20	700	0	0	0	2,037
Rockwall	1,004	0	26	0	0	0	1,030
Rusk	3,250	75	549	54	563	30,000	34,491
Smith	3,920	63	453	280	425	0	5,141
Upshur	1,895	0	418	0	0	0	2,313
Van Zandt	3,368	0	1,100	296	1,233	0	5,997
Wood	4,864	235	2,360	48	2,102	0	9,609
Totals	62,533	714	11,327	133,808	7,920	38,300	254,602

Projections are for that portion of the county within the Sabine River basin.

Appendix C

Table C-17
Sabine River Basin Total Water Demand: Upper Basin
(Acre-Feet/Year)

2010

COUNTY	Municipal ¹	Irrigation ¹	Livestock	Manufact. ²	Mining	Power ³	Total
Collin	377	0	38	0	0	0	415
Franklin	20	0	2	0	0	0	22
Gregg	21,761	0	230	18,276	67	3,000	43,334
Harrison	6,435	50	326	150,737	89	5,000	162,637
Hopkins	1,053	0	2,130	3	0	0	3,186
Hunt	9,879	271	896	461	71	0	11,578
Kaufman	169	0	72	0	0	0	241
Panola	3,607	0	2,027	804	2,645	0	9,083
Rains	1,377	20	700	0	0	0	2,097
Rockwall	1,280	0	26	0	0	0	1,306
Rusk	3,252	75	549	60	314	35,000	39,250
Smith	4,042	63	453	340	178	0	5,076
Upshur	1,930	0	418	0	0	0	2,348
Van Zandt	3,421	0	1,100	385	1,073	0	5,979
Wood	4,934	235	2,360	55	17,584	7,500	32,668
Totals	63,537	714	11,327	171,121	22,021	50,500	319,220

2020

COUNTY	Municipal ¹	Irrigation ¹	Livestock	Manufact. ²	Mining	Power ³	Total
Collin	716	0	38	0	0	0	754
Franklin	21	0	2	0	0	0	23
Gregg	22,248	0	230	20,363	46	3,000	45,887
Harrison	6,407	50	326	169,499	50	5,000	181,332
Hopkins	1,022	0	2,130	3	0	0	3,155
Hunt	9,829	271	896	485	73	0	11,554
Kaufman	186	0	72	0	0	0	258
Panola	3,488	0	2,027	888	8,697	0	15,100
Rains	1,415	20	700	0	0	0	2,135
Rockwall	1,734	0	26	0	0	0	1,760
Rusk	3,307	75	549	66	104	40,000	44,101
Smith	3,976	63	453	402	91	0	4,985
Upshur	1,954	0	418	0	0	0	2,372
Van Zandt	3,385	0	1,100	471	1,026	0	5,982
Wood	4,870	235	2,360	64	17,344	7,500	32,373
Totals	64,558	714	11,327	192,241	27,431	55,500	351,771

Projections are for that portion of the county within the Sabine River basin.

Appendix C

Table C-17
Sabine River Basin Total Water Demand: Upper Basin
(Acre-Feet/Year)

2030

COUNTY	Municipal ¹	Irrigation ¹	Livestock	Manufact. ²	Mining	Power ³	Total
Collin	1,231	0	38	0	0	0	1,269
Franklin	24	0	2	0	0	0	26
Gregg	23,048	0	230	22,576	37	3,000	48,891
Harrison	6,222	50	326	190,993	24	10,000	207,615
Hopkins	995	0	2,130	3	0	0	3,128
Hunt	9,933	271	896	509	75	0	11,684
Kaufman	204	0	72	0	0	0	276
Panola	3,377	0	2,027	967	16,912	0	23,283
Rains	1,463	20	700	0	0	0	2,183
Rockwall	2,347	0	26	0	0	0	2,373
Rusk	3,431	75	549	72	89	45,000	49,216
Smith	3,846	63	453	465	32	0	4,859
Upshur	1,988	0	418	0	0	0	2,406
Van Zandt	3,234	0	1,100	570	1,014	0	5,918
Wood	4,702	235	2,360	73	17,107	7,500	31,977
Totals	66,045	714	11,327	216,228	35,290	65,500	395,104

2040

COUNTY	Municipal ¹	Irrigation ¹	Livestock	Manufact. ²	Mining	Power ³	Total
Collin	1,994	0	38	0	0	0	2,032
Franklin	25	0	2	0	0	0	27
Gregg	23,769	0	230	24,931	29	3,000	51,959
Harrison	5,791	50	326	214,392	18	10,000	230,577
Hopkins	956	0	2,130	4	0	0	3,090
Hunt	9,826	271	896	533	77	0	11,603
Kaufman	215	0	72	0	0	0	287
Panola	3,171	0	2,027	1,046	17,179	0	23,423
Rains	1,487	20	700	0	0	0	2,207
Rockwall	3,084	0	26	0	0	0	3,110
Rusk	3,490	75	549	77	60	45,000	49,251
Smith	3,680	63	453	526	18	0	4,740
Upshur	2,003	0	418	0	0	0	2,421
Van Zandt	2,995	0	1,100	648	1,025	0	5,768
Wood	4,264	235	2,360	82	16,107	7,500	30,548
Totals	66,750	714	11,327	242,239	34,513	65,500	421,043

Projections are for that portion of the county within the Sabine River basin.

Appendix C

Table C-17
Sabine River Basin Total Water Demand: Upper Basin
(Acre-Feet/Year)

2050

COUNTY	Municipal ¹	Irrigation ¹	Livestock	Manufact. ²	Mining	Power ³	Total
Collin	2,600	0	38	0	0	0	2,638
Franklin	26	0	2	0	0	0	28
Gregg	24,849	0	230	27,351	27	4,000	56,457
Harrison	5,583	50	326	244,883	16	15,000	265,858
Hopkins	935	0	2,130	4	0	0	3,069
Hunt	10,011	271	896	559	79	0	11,816
Kaufman	223	0	72	0	0	0	295
Panola	3,072	0	2,027	1,121	16,912	0	23,132
Rains	1,579	20	700	0	0	0	2,299
Rockwall	3,679	0	26	0	0	0	3,705
Rusk	3,589	75	549	84	7	45,000	49,304
Smith	3,469	63	453	587	6	0	4,578
Upshur	2,041	0	418	0	0	0	2,459
Van Zandt	2,869	0	1,100	729	1,055	0	5,753
Wood	3,843	235	2,360	93	4,641	15,000	26,172
Totals	68,368	714	11,327	275,411	22,743	79,000	457,563

¹. "Most Likely" Projection Series

². "Low Oil Prices without Conservation" Projection Series

³. "High" Projection Series

Projections are for that portion of the county within the Sabine River basin.

Appendix C

Table C-18
Sabine River Upper Basin: Municipal Water Demand for Cities
Upper Basin Cities "Most Likely" Migration Rate Scenario (Acre-Feet/Year)¹

City	1990	2000	2010	2020	2030	2040	2050
Big Sandy	180	220	225	230	236	239	245
Caddo Mills	85	165	181	193	200	201	205
Canton	605	664	681	679	658	612	585
Carthage	1,235	1,629	1,615	1,564	1,527	1,447	1,393
Edgewood	184	200	202	201	191	176	169
Emory	313	194	188	181	179	178	179
Gladewater	1,105	1,194	1,230	1,265	1,326	1,374	1,442
Grand Saline	465	563	578	576	558	522	500
Greenville	5,982	5,894	5,842	5,670	5,710	5,664	5,678
Hallsville	301	418	489	536	561	557	558
Hawkins	229	249	253	250	242	219	197
Henderson	227	246	239	224	212	206	206
Kilgore	2,211	2,731	2,794	2,854	2,940	3,043	3,189
Liberty City	198	410	454	481	506	520	537
Lindale	229	261	267	267	271	274	278
Longview	12,272	15,859	16,279	16,848	17,544	18,221	19,165
Marshall	3,112	3,894	3,970	4,012	3,952	3,671	3,502
Mineola	816	871	892	884	857	779	696
Overton	327	423	413	385	369	361	358
Quinlan	175	221	255	284	301	301	312
Quitman	367	395	408	408	394	363	324
Royse City	313	593	803	1,079	1,450	1,889	2,463
Tatum	160	184	180	169	162	155	152
Tyler	2	2	2	2	2	2	2
Van	22	24	24	25	24	22	21
White Oak	767	824	847	873	912	951	1,011
Wills Point	312	281	288	285	273	255	245
Winnsboro	358	462	476	477	464	431	386

Municipal water demands includes only that portion of the city that lies within the Sabine Basin.

Appendix C

Table C-19
Sabine River Upper Basin: Municipal Water Demand for Cities
Lower Basin Cities "Most Likely" Migration Rate Scenario (Acre-Feet/Year)¹

City	1990	2000	2010	2020	2030	2040	2050
Bessmay-Buna	321	374	368	356	353	355	360
Bridge City	617	812	849	885	939	950	977
Center	705	938	967	981	1,017	1,044	1,087
Hemphill	279	339	342	341	356	371	391
Kirbyville	342	470	466	457	456	461	458
Newton	356	467	506	541	578	590	607
Orange	4,000	4,438	4,621	4,846	5,157	5,262	5,431
Pinehurst	385	513	522	522	536	556	581
Tenaha	148	153	149	146	146	147	151
Timpson	189	299	297	294	301	306	315
Vidor	470	493	484	474	469	465	469
West Orange	509	649	675	683	707	742	793

Municipal water demands includes only that portion of the city that lies within the Sabine Basin.

APPENDIX D
HYDROLOGIC DATA

Lake Tawakoni

SUMMARY OF RUNOFF DATA
(VALUES IN ACRE-FEET)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1940	0.	4500.	5250.	47830.	21550.	58460.	28160.	1400.	12190.	820.	33350.	133840.	347350.
1941	29860.	31290.	60800.	26790.	107890.	148580.	16730.	10270.	3660.	4380.	10500.	29240.	479990.
1942	3720.	19070.	13690.	258910.	208870.	49970.	10.	5080.	6910.	4890.	10740.	18660.	600520.
1943	21070.	3240.	15600.	41060.	19590.	194300.	91530.	0.	0.	11620.	210.	5550.	403770.
1944	27360.	51670.	108630.	27830.	227790.	49990.	1870.	0.	1390.	380.	7650.	54050.	558610.
1945	72170.	36470.	180080.	430280.	9550.	65240.	208620.	2530.	510.	35050.	13300.	7320.	1061120.
1946	72220.	136390.	43460.	26050.	63340.	199260.	1880.	2120.	6360.	1760.	222610.	48720.	824170.
1947	38590.	4640.	20760.	56380.	18310.	11420.	6640.	560.	13720.	200.	17890.	77170.	266280.
1948	99570.	52300.	81340.	6190.	93760.	2320.	3090.	980.	0.	0.	750.	1390.	341690.
1949	13330.	73860.	96140.	17540.	30900.	19610.	10680.	5060.	850.	28340.	34390.	1830.	332530.
1950	68650.	224020.	20940.	24480.	127400.	30690.	4800.	27910.	15740.	270.	700.	360.	545960.
1951	4250.	26020.	21510.	1810.	15120.	55950.	19000.	0.	0.	100.	390.	760.	144910.
1952	1890.	3210.	9940.	55810.	112910.	30860.	100.	0.	0.	0.	590.	25520.	240830.
1953	38850.	2730.	21580.	19160.	259900.	0.	9690.	20.	1100.	0.	2820.	17650.	373500.
1954	48880.	12270.	1260.	14560.	22980.	4550.	0.	0.	0.	1470.	54140.	2310.	162420.
1955	3100.	23920.	27990.	31170.	2470.	830.	580.	1610.	1790.	0.	0.	140.	93600.
1956	580.	13620.	700.	290.	31350.	0.	0.	0.	0.	0.	3390.	670.	50600.
1957	1570.	17980.	16840.	169380.	440460.	89180.	520.	70.	70.	69020.	122910.	13310.	941310.
1958	49440.	4390.	47590.	40660.	334220.	11610.	21420.	0.	4900.	2590.	2660.	2070.	521550.
1959	1440.	37510.	17610.	45680.	35240.	3330.	7110.	13490.	220.	98000.	24890.	101660.	386180.
1960	67540.	39120.	9240.	22830.	18070.	5230.	24100.	4900.	4330.	19290.	920.	174900.	390470.
1961	62580.	36890.	84990.	3070.	5740.	20430.	1910.	1060.	5140.	1760.	27480.	50320.	301370.
1962	13240.	17720.	16770.	83270.	17220.	64750.	17560.	3580.	87380.	29260.	62660.	4240.	417650.
1963	7160.	1320.	5160.	70210.	63210.	1820.	27370.	1920.	1600.	1880.	1070.	1150.	183870.
1964	1290.	1340.	25270.	22810.	49830.	14230.	870.	2530.	56090.	1300.	51210.	2380.	229150.
1965	32690.	151730.	13750.	3190.	211890.	3570.	2450.	2150.	7190.	1440.	2720.	1590.	434360.
1966	2750.	36300.	7280.	316800.	60970.	3520.	3000.	5750.	6890.	11440.	1400.	1780.	457880.
1967	1510.	1210.	2750.	48330.	138990.	19570.	2670.	1950.	41170.	106190.	20560.	55560.	440460.
1968	69770.	24090.	152650.	49510.	192120.	39150.	35310.	3730.	9520.	4400.	13740.	24530.	618520.
1969	66300.	68110.	99010.	25360.	227660.	1930.	1910.	1900.	1390.	10170.	1480.	46910.	552130.
1970	6860.	132190.	128850.	80840.	22790.	12810.	1760.	4840.	46730.	75210.	1640.	1430.	515950.
1971	240.	7830.	2610.	0.	330.	0.	1490.	18320.	4480.	238560.	970.	306470.	581300.
1972	10110.	980.	590.	3570.	460.	460.	220.	290.	360.	4320.	17640.	8050.	47050.
1973	47070.	58020.	49590.	143760.	20140.	147470.	13450.	2120.	116930.	244210.	72150.	52390.	967300.
1974	124650.	5740.	18530.	113230.	24740.	107210.	2280.	32680.	176980.	59300.	126810.	41600.	833750.
1975	27920.	152290.	25090.	43780.	100530.	71030.	12540.	1860.	1890.	1930.	1650.	1690.	442200.
1976	1730.	1690.	15170.	117030.	73230.	9770.	41890.	2220.	2310.	19020.	2150.	54650.	340860.
1977	22160.	103940.	286780.	107750.	9750.	2970.	2030.	30650.	2530.	1430.	14590.	3960.	588540.
1978	10410.	70950.	29920.	3970.	9160.	30300.	3440.	2710.	2230.	1900.	3150.	15190.	183330.
1979	125330.	63450.	207470.	17730.	341020.	64230.	5810.	8780.	7660.	2170.	1820.	41010.	886480.
1980	109000.	41660.	1890.	11230.	44010.	2880.	2550.	2570.	13730.	3910.	1680.	33460.	268570.
AVG.	34313.	43797.	48660.	64150.	93060.	40231.	15538.	5064.	16242.	26780.	24180.	35743.	447758.

SUMMARY OF NET EVAPORATION DATA
(VALUES IN FEET)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1940	.07	.00	.21	.01	.08	.13	.35	.49	.50	.29	-.27	-.09	1.77
1941	.08	-.05	.05	-.06	.17	-.12	.34	.40	.37	.04	.14	.01	1.37
1942	.10	.13	.18	-.39	.14	.16	.54	.34	.22	.17	.16	-.06	1.69
1943	.09	.22	.03	.24	-.04	.25	.57	.72	.31	.16	.23	-.05	2.73
1944	-.06	-.14	.03	.13	-.24	.44	.50	.45	.43	.35	-.06	-.15	1.68
1945	.03	-.18	-.46	.08	.27	.07	.14	.37	.37	.09	.19	.12	1.09
1946	-.14	-.02	.04	.08	-.22	.32	.56	.28	.30	.29	-.33	.04	1.20
1947	-.01	.15	.02	-.04	.16	.27	.64	.43	.40	.31	.06	-.14	2.25
1948	-.05	-.10	.05	.26	-.07	.44	.51	.66	.60	.32	.19	.08	2.89
1949	-.35	-.11	.03	-.02	.16	.28	.37	.42	.37	-.25	.29	-.01	1.18
1950	-.19	-.23	.22	-.03	-.12	.32	.10	.39	.07	.33	.31	.22	1.39
1951	.06	-.12	.21	.21	.21	.03	.50	.70	.07	.23	.16	.09	2.35
1952	.11	.04	.04	-.19	.05	.47	.50	.83	.67	.59	-.16	-.12	2.83
1953	.10	.06	-.03	-.10	.00	.60	.22	.41	.38	.25	.04	-.02	1.91
1954	-.08	.20	.24	.07	-.08	.47	.85	.89	.63	-.04	.15	.14	3.44
1955	.07	-.08	.06	.06	.12	.38	.47	.17	.19	.45	.37	.16	2.42
1956	.05	-.11	.29	.20	.21	.45	.86	.84	.71	.37	.14	.13	4.14
1957	.05	-.01	-.08	-.62	-.25	.17	.56	.34	.17	.03	-.19	.12	.29
1958	.00	.11	-.02	-.18	.09	.29	.40	.40	.00	.24	.15	.14	1.62
1959	.21	-.02	.18	.06	-.01	.01	.13	.40	.32	-.02	.27	-.12	1.41
1960	-.06	.02	.12	.23	.27	.19	.30	.30	.30	.11	.17	-.36	1.59
1961	-.08	-.03	-.05	.28	.19	-.01	.34	.50	.26	.30	-.05	.00	1.65
1962	.01	.03	.14	-.04	.34	-.05	.33	.54	-.02	.06	.02	.12	1.48
1963	.11	.15	.11	-.11	.11	.34	.43	.66	.45	.58	.26	.08	3.17
1964	.13	.05	-.02	.03	.07	.37	.74	.45	.03	.41	.02	.12	2.40
1965	.04	-.20	.06	.23	-.32	.25	.63	.55	.14	.29	.07	.04	1.78
1966	.00	-.04	.13	-.20	.09	.35	.41	.22	.03	.28	.24	.10	1.61
1967	.12	.08	.16	-.10	-.06	.39	.30	.43	.03	.13	.13	.03	1.64
1968	.01	.04	-.02	.00	-.02	.22	.30	.54	.19	.25	.14	.11	1.76
1969	.00	-.02	.02	-.02	-.22	.36	.66	.52	.28	.28	.19	.02	2.07
1970	.05	-.10	-.03	-.17	.05	.41	.60	.57	.15	.10	.23	.06	1.92
1971	.18	.05	.27	.25	.25	.56	.45	.26	.32	.07	.16	-.12	2.70
1972	.01	.18	.26	.21	.34	.36	.56	.53	.28	.16	.00	.03	2.92
1973	-.08	-.02	.05	-.03	.27	.17	.33	.59	.10	.08	.07	.12	1.65
1974	-.08	.15	.22	.22	.22	.31	.65	.27	.00	.12	.00	-.01	2.07
1975	.02	-.04	.03	.10	.09	.28	.43	.55	.44	.42	.21	.06	2.59
1976	.18	.21	.10	.06	.12	.28	.26	.55	.12	.09	.16	.04	2.17
1977	-.08	.04	.09	.12	.32	.43	.66	.43	.44	.39	.07	.20	3.11
1978	-.05	-.07	.12	.26	.19	.47	.77	.59	.37	.49	-.03	.05	3.16
1979	-.09	-.05	.06	.13	.14	.40	.39	.38	.33	.36	.21	.01	2.27
1980	-.04	.07	.18	.18	.19	.49	.83	.80	.43	.33	.16	.07	3.69
AVG.	.01	.01	.08	.03	.08	.29	.48	.49	.29	.23	.10	.03	2.12

THERE ARE 63 AREA/CAPACITY/ELEVATION POINTS.

AREA (ACRES)	CAPACITY (ACRE-FEET)	ELEVATION (FEET)
0.	0.	373.0
1.	1.	374.0
2.	2.	375.0
3.	5.	376.0
4.	9.	377.0
6.	14.	378.0
8.	21.	379.0
11.	31.	380.0
14.	43.	381.0
22.	61.	382.0
50.	94.	383.0
169.	197.	384.0
434.	476.	385.0
797.	1097.	386.0
1191.	2075.	387.0
1669.	3503.	388.0
2336.	5486.	389.0
2941.	8138.	390.0
3522.	11364.	391.0
4089.	15170.	392.0
4654.	19539.	393.0
5336.	24545.	394.0
5911.	30174.	395.0
6453.	36360.	396.0
6987.	43073.	397.0
7502.	50310.	398.0
8159.	58133.	399.0
8862.	66627.	400.0
9542.	75839.	401.0
11025.	96387.	403.0
11621.	107736.	404.0
12125.	119608.	405.0
12640.	131983.	406.0
13199.	144901.	407.0
13758.	158385.	408.0
14324.	172430.	409.0
14940.	187050.	410.0
15658.	202338.	411.0
16483.	218407.	412.0
17279.	235291.	413.0
18034.	252947.	414.0
18784.	271359.	415.0
19500.	290508.	416.0
20181.	310359.	417.0
20823.	330855.	418.0
21427.	350985.	419.0
22000.	373691.	420.0
22650.	396006.	421.0
24104.	442733.	423.0
24913.	467244.	424.0
25785.	492587.	425.0
26669.	518811.	426.0
27472.	545886.	427.0
28265.	573743.	428.0
29164.	602452.	429.0
30280.	632162.	430.0
32176.	694633.	432.0
33140.	727299.	433.0
34132.	760930.	434.0
35154.	795619.	435.0
36244.	831809.	436.0
37334.	869088.	437.0
37879.	888137.	437.5

Lake Fork Reservoir

LAKE FORK OPERATION w/ 2000 Area Capacity data sfk 10/29/98
 1985 UPDATE OF SRA MASTER PLAN - ESPEY, HUSTON, & ASSOC

SUMMARY OF RUNOFF DATA
 (VALUES IN ACRE-FEET)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1940	0.	379.	2717.	26615.	26207.	36170.	18083.	1676.	4383.	164.	16859.	76281.	209534.
1941	14026.	25453.	45808.	28802.	41090.	52712.	11903.	3773.	1005.	235.	3353.	8474.	236634.
1942	4230.	9200.	13070.	131400.	106820.	8800.	140.	1560.	1710.	600.	1800.	13950.	293280.
1943	10300.	3000.	6390.	14980.	18400.	111520.	52540.	0.	0.	2220.	0.	1890.	221240.
1944	11350.	29150.	44630.	23500.	134060.	23420.	1630.	170.	3170.	20.	5420.	28260.	304780.
1945	44610.	26110.	180550.	297930.	11140.	33000.	116230.	1530.	120.	43370.	11250.	6400.	772240.
1946	85750.	102030.	49490.	14590.	78420.	131390.	970.	1350.	1480.	570.	113220.	33540.	612800.
1947	33615.	5031.	19907.	50694.	23405.	4478.	2099.	476.	1409.	0.	8752.	51073.	200939.
1948	60837.	54009.	60485.	11583.	83454.	917.	3621.	132.	0.	0.	396.	698.	276132.
1949	16002.	48252.	59660.	32633.	18498.	3137.	4731.	229.	809.	41903.	41392.	6040.	273286.
1950	57480.	153230.	31450.	14490.	87770.	28200.	17850.	23100.	7180.	1000.	440.	690.	422880.
1951	5487.	31750.	26375.	2361.	6153.	9255.	1543.	0.	0.	0.	272.	1080.	84276.
1952	6090.	6158.	13905.	93359.	66253.	6044.	73.	0.	0.	0.	890.	18236.	211008.
1953	31580.	6790.	14960.	31870.	164740.	230.	7690.	760.	10040.	10.	850.	14790.	284310.
1954	42816.	20927.	2682.	8259.	14458.	1052.	0.	0.	0.	1194.	27738.	1674.	120800.
1955	4435.	10697.	18027.	24907.	1662.	515.	0.	1356.	2563.	136.	0.	0.	64298.
1956	256.	13065.	886.	777.	12045.	104.	0.	0.	0.	0.	1222.	166.	28521.
1957	1610.	10600.	10200.	104410.	261220.	61100.	90.	170.	3500.	34430.	88380.	16140.	591850.
1958	49000.	6030.	40500.	50340.	249740.	14580.	4430.	0.	7020.	1660.	5950.	4040.	433290.
1959	2030.	41893.	39766.	34516.	23619.	2009.	5599.	3863.	1909.	23625.	6530.	86545.	271904.
1960	89837.	32754.	24328.	2525.	4448.	6659.	4523.	159.	4133.	3275.	7299.	91177.	271117.
1961	48501.	45871.	50788.	22209.	3485.	26418.	5947.	508.	2039.	109.	9921.	28759.	244555.
1962	17521.	22613.	25009.	27622.	22995.	6586.	6209.	2231.	24045.	1908.	16524.	16683.	189946.
1963	13536.	1776.	5411.	15512.	31204.	6773.	358.	1.	142.	0.	0.	0.	74713.
1964	133.	1067.	3111.	14896.	954.	693.	0.	15.	105.	195.	477.	90.	21736.
1965	1280.	42372.	7260.	1548.	93856.	16973.	89.	0.	1045.	8.	165.	45.	164641.
1966	1750.	28490.	2370.	131140.	119740.	1230.	690.	2470.	12160.	4650.	330.	5190.	310210.
1967	3181.	3324.	3349.	24381.	45937.	23866.	1117.	0.	1213.	11105.	41828.	44684.	203985.
1968	49000.	29930.	71670.	37750.	140500.	24240.	3140.	240.	6980.	890.	9040.	33500.	406880.
1969	6880.	73500.	89080.	38170.	120230.	1380.	0.	0.	0.	120.	2110.	5770.	337240.
1970	15969.	30987.	91009.	38090.	8996.	17305.	759.	689.	4762.	19261.	3530.	1336.	232693.
1971	1630.	12010.	6570.	1210.	9240.	110.	2960.	2650.	1880.	29220.	3750.	174010.	245240.
1972	43995.	8388.	4410.	1453.	643.	10647.	167.	0.	0.	3547.	19403.	21095.	113748.
1973	29660.	35570.	96870.	120070.	9830.	50830.	1870.	50.	7600.	25970.	75560.	48790.	502670.
1974	83370.	11700.	13270.	56250.	10890.	40750.	210.	730.	37580.	6410.	160190.	66780.	488130.
1975	22120.	108850.	47580.	47280.	62050.	39840.	3640.	1360.	720.	600.	400.	770.	335210.
1976	457.	915.	7180.	75612.	76966.	4496.	18933.	212.	965.	1510.	1451.	10355.	199052.
1977	10627.	58220.	72551.	52030.	2478.	5696.	2621.	1280.	272.	0.	1665.	500.	207940.
1978	3281.	10920.	28417.	3364.	10857.	629.	0.	0.	0.	0.	1538.	311.	59317.
1979	18222.	20299.	35150.	52153.	92927.	8906.	1490.	27041.	2760.	2064.	4003.	56660.	321675.
1980	71759.	38599.	18467.	59621.	87143.	7633.	217.	0.	806.	1146.	821.	9022.	295234.
AVG.	24737.	29803.	33788.	44412.	58159.	20251.	7419.	1946.	3793.	6418.	16944.	24036.	271706.

LAKE FORK OPERATION w/ 2000 Area Capacity data sfk 10/29/98
 1985 UPDATE OF SRA MASTER PLAN - ESPEY, HUSTON, & ASSOC

SUMMARY OF NET EVAPORATION DATA
 (VALUES IN FEET)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1940	.06	-.02	.15	.03	.05	.10	.33	.36	.42	.23	-.33	-.13	1.25
1941	.04	-.05	.02	-.08	.17	-.14	.26	.37	.26	.01	.09	-.03	.92
1942	.09	.11	.13	-.35	.15	.12	.47	.26	.20	.21	.13	-.12	1.40
1943	.04	.21	.02	.19	-.08	.22	.47	.61	.26	.06	.17	-.07	2.10
1944	-.09	-.17	-.06	.06	-.34	.35	.46	.29	.36	.36	-.14	-.24	.84
1945	-.01	-.16	-.59	.07	.23	.02	.10	.32	.31	.02	.17	.09	.57
1946	-.23	-.05	-.03	.04	-.31	.25	.49	.15	.29	.24	-.36	.03	.51
1947	-.05	.12	-.06	-.10	.08	.26	.54	.38	.29	.29	.00	-.16	1.59
1948	-.10	-.12	.02	.15	-.10	.42	.53	.59	.56	.27	.10	.01	2.33
1949	-.43	-.13	.01	-.11	.19	.26	.24	.32	.32	-.37	.26	-.06	.50
1950	-.20	-.29	.16	-.08	-.20	.29	.13	.39	-.03	.27	.26	.20	.90
1951	.01	-.15	.15	.16	.21	.06	.38	.61	-.07	.19	.12	-.02	1.65
1952	.05	-.03	-.02	-.22	.02	.37	.40	.77	.65	.56	-.18	-.16	2.21
1953	.05	.03	-.09	-.14	-.10	.47	.08	.33	.31	.29	.03	-.10	1.16
1954	-.11	.15	.18	.03	-.16	.44	.77	.83	.61	-.14	.11	.08	2.79
1955	.02	-.11	-.03	-.01	.07	.36	.33	-.02	.12	.39	.33	.14	1.59
1956	.02	-.16	.23	.15	.13	.36	.75	.66	.62	.34	.13	.14	3.37
1957	.02	-.05	-.10	-.63	-.21	.05	.48	.34	.14	-.08	-.21	.10	-.15
1958	-.02	.08	.00	-.22	.06	.13	.27	.29	-.10	.19	.09	.15	.92
1959	.19	-.06	.10	-.02	-.15	-.03	.04	.29	.25	.07	.24	-.16	.76
1960	-.08	-.01	.08	.17	.24	.06	.24	.29	.21	.09	.13	-.38	1.04
1961	-.09	-.05	-.08	.23	.17	-.10	.23	.39	.21	.27	-.10	-.06	1.02
1962	-.07	-.04	.09	-.06	.27	-.10	.30	.46	.00	.00	.00	.10	.95
1963	.09	.13	.04	-.14	.09	.27	.31	.59	.39	.54	.22	.06	2.59
1964	.13	-.01	-.04	-.05	-.04	.29	.62	.37	.08	.38	.05	.08	1.86
1965	.01	-.25	.00	.18	-.41	.21	.52	.47	.08	.26	.09	.00	1.16
1966	-.03	-.05	.08	-.22	-.03	.23	.26	.19	.07	.23	.17	.10	1.00
1967	.09	.05	.07	-.22	-.18	.35	.19	.27	.06	.08	.15	.04	.95
1968	.08	.07	-.01	-.02	-.11	.19	.16	.49	.15	.25	.20	.10	1.55
1969	-.04	-.04	.01	-.16	-.33	.30	.52	.53	.28	.33	.17	.01	1.58
1970	.03	-.10	-.06	-.23	.01	.27	.53	.56	.24	.10	.14	-.05	1.44
1971	.18	.02	.17	.22	.22	.51	.38	.26	.30	.06	.10	-.14	2.28
1972	-.02	.17	.18	.19	.32	.27	.43	.47	.24	.14	-.01	.02	2.40
1973	-.08	-.02	.01	-.03	.22	.14	.32	.54	.08	.05	.02	.08	1.33
1974	-.12	.11	.17	.16	.18	.24	.56	.23	-.05	.12	-.02	-.03	1.55
1975	.01	-.05	.03	.08	.10	.22	.46	.53	.44	.35	.19	.05	2.41
1976	.12	.15	.05	.07	.11	.24	.23	.51	.12	.07	.14	.02	1.83
1977	-.08	.01	.08	.11	.31	.40	.59	.37	.37	.36	.03	.15	2.70
1978	-.08	-.07	.09	.24	.20	.42	.68	.58	.36	.44	-.04	.02	2.84
1979	-.11	-.04	.06	.13	.17	.37	.35	.40	.29	.34	.17	.01	2.14
1980	-.07	.06	.13	.14	.16	.38	.75	.70	.38	.26	.12	.09	3.10
AVG.	-.02	-.02	.03	-.01	.03	.23	.39	.42	.25	.20	.07	.00	1.57

LAKE FORK OPERATION w/ 2000 Area Capacity data sfk 10/29/98
1985 UPDATE OF SRA MASTER PLAN - ESPEY, HUSTON, & ASSOC

THERE ARE 15 AREA/CAPACITY/ELEVATION POINTS.

AREA (ACRES)	CAPACITY (ACRE-FEET)	ELEVATION (FEET)
0.	0.	335.0
16.	39.	340.0
656.	1717.	345.0
1706.	7621.	350.0
3176.	19824.	355.0
4776.	39702.	360.0
6456.	67780.	365.0
8316.	104709.	370.0
10906.	152762.	375.0
13886.	214740.	380.0
16056.	289593.	385.0
18416.	375772.	390.0
21706.	476075.	395.0
25306.	593603.	400.0
27626.	673000.	403.0

Wood County Lakes

Lake Winnsboro

Lake Hawkins

Lake Quitman

Lake Holbrook

LAKE WINNSBORO Firm yield calculations
 SRA96425 ADK 9/22/98 1997 A/C Data

SUMMARY OF RUNOFF DATA
 (VALUES IN ACRE-FEET)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1940	259.	523.	511.	892.	688.	1637.	772.	127.	497.	126.	1111.	3174.	10317.
1941	1441.	1330.	2736.	1490.	1014.	2873.	873.	237.	224.	354.	588.	1498.	14658.
1942	1075.	1079.	1238.	3538.	4926.	852.	253.	719.	387.	320.	408.	1607.	16402.
1943	2101.	804.	429.	1522.	571.	2636.	1483.	119.	145.	1090.	243.	891.	12034.
1944	2238.	3432.	3259.	2401.	6136.	1043.	181.	188.	245.	154.	387.	2094.	21758.
1945	2898.	1027.	9052.	18963.	1520.	2007.	5492.	345.	228.	2055.	993.	1576.	46156.
1946	5303.	3639.	3390.	1963.	4070.	8885.	545.	284.	618.	414.	4720.	2369.	36200.
1947	2591.	1359.	2210.	2762.	1704.	448.	415.	87.	341.	234.	402.	2614.	15167.
1948	4202.	2815.	3732.	1383.	3446.	505.	263.	157.	132.	174.	290.	392.	17491.
1949	568.	2049.	3311.	1826.	2179.	530.	1670.	348.	399.	1663.	2446.	937.	17926.
1950	4325.	5910.	1520.	1608.	6252.	1379.	637.	1620.	717.	396.	493.	522.	25379.
1951	1234.	1955.	2465.	844.	1118.	570.	230.	126.	184.	204.	354.	388.	9672.
1952	579.	928.	1277.	2044.	3976.	1073.	186.	113.	94.	114.	101.	994.	11479.
1953	2003.	892.	1587.	1478.	7034.	263.	824.	311.	481.	198.	421.	1322.	16814.
1954	1692.	1057.	641.	585.	1215.	552.	133.	78.	66.	11.	551.	510.	7091.
1955	577.	941.	1983.	1444.	446.	192.	177.	249.	224.	140.	138.	244.	6755.
1956	359.	1144.	503.	318.	583.	98.	60.	54.	64.	65.	138.	199.	3585.
1957	113.	1055.	384.	3773.	8134.	2983.	274.	309.	320.	1805.	3685.	1499.	24334.
1958	2731.	1152.	2153.	2107.	10323.	1706.	1002.	257.	795.	469.	1071.	874.	24640.
1959	613.	2069.	2205.	2379.	2546.	574.	349.	642.	433.	358.	446.	2665.	15279.
1960	5002.	1855.	2100.	718.	656.	419.	434.	271.	364.	352.	562.	4453.	17186.
1961	2809.	2727.	3204.	2039.	631.	1226.	936.	302.	466.	277.	1009.	2950.	18576.
1962	1727.	2081.	2379.	1668.	1493.	477.	520.	217.	363.	415.	589.	807.	12736.
1963	810.	581.	939.	1449.	1481.	237.	188.	130.	169.	141.	255.	345.	6725.
1964	362.	558.	858.	736.	445.	180.	88.	110.	151.	176.	267.	259.	4190.
1965	486.	1586.	884.	503.	1968.	855.	117.	81.	105.	119.	159.	223.	7086.
1966	314.	555.	389.	5674.	4651.	313.	127.	197.	444.	260.	326.	434.	13684.
1967	609.	442.	424.	1037.	1019.	1687.	157.	96.	151.	173.	419.	843.	7057.
1968	1963.	1321.	2434.	2085.	5743.	1472.	598.	220.	500.	388.	694.	1627.	19045.
1969	806.	3261.	5006.	2961.	3117.	476.	158.	133.	133.	186.	766.	1033.	18036.
1970	1199.	1269.	2954.	1673.	860.	827.	198.	140.	208.	581.	553.	475.	10937.
1971	512.	662.	606.	425.	380.	133.	484.	309.	129.	209.	514.	2493.	6856.
1972	2686.	1022.	883.	433.	436.	420.	217.	126.	156.	294.	986.	949.	8608.
1973	1268.	1669.	4733.	7452.	1384.	3574.	488.	266.	807.	1221.	3277.	2868.	29007.
1974	3113.	1586.	1236.	2866.	1293.	2833.	328.	404.	3080.	865.	6171.	3785.	27560.
1975	2295.	4313.	3506.	2573.	4262.	1644.	636.	316.	229.	256.	389.	660.	21079.
1976	829.	816.	1934.	1797.	2391.	700.	2292.	194.	615.	567.	509.	1548.	14192.
1977	980.	3364.	3384.	4023.	650.	412.	223.	445.	290.	202.	448.	683.	15104.
1978	1035.	1045.	1835.	629.	1018.	202.	178.	208.	208.	111.	213.	227.	6909.
1979	1633.	1122.	2116.	3084.	4307.	2171.	1652.	1235.	2574.	684.	1150.	1844.	23572.
1980	3732.	2853.	1933.	3130.	3877.	497.	104.	102.	158.	237.	338.	481.	17442.
AVG.	1733.	1704.	2154.	2446.	2682.	1258.	633.	290.	436.	440.	941.	1350.	16067.

LAKE WINNSBORO Firm yield calculations
 SRA96425 ADK 9/22/98 1997 A/C Data

SUMMARY OF NET EVAPORATION DATA
 (VALUES IN FEET)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1940	.06	-.02	.13	-.01	.02	.10	.28	.36	.42	.23	-.31	-.13	1.13
1941	.04	-.04	.01	-.10	.14	-.12	.24	.36	.27	.01	.08	-.03	.86
1942	.10	.11	.11	-.33	.13	.12	.47	.22	.21	.20	.14	-.12	1.36
1943	.02	.20	.02	.19	-.03	.24	.47	.61	.28	.10	.17	-.07	2.20
1944	-.10	-.20	-.07	.04	-.34	.34	.46	.26	.36	.35	-.15	-.26	.69
1945	-.01	-.18	-.58	.06	.21	.00	.12	.32	.31	.03	.16	.09	.53
1946	-.24	-.05	-.02	.02	-.31	.24	.47	.20	.29	.24	-.36	.03	.51
1947	-.05	.12	-.07	-.10	.06	.27	.53	.38	.28	.28	-.02	-.17	1.51
1948	-.11	-.13	.00	.16	-.14	.40	.49	.58	.54	.25	.07	.02	2.13
1949	-.43	-.12	.00	-.10	.20	.23	.20	.31	.32	-.35	.25	-.05	.46
1950	-.23	-.29	.14	-.07	-.24	.28	.10	.35	-.10	.25	.25	.19	.63
1951	-.01	-.16	.14	.15	.21	.04	.37	.58	-.09	.19	.11	.01	1.54
1952	.02	-.02	-.04	-.23	.01	.36	.37	.74	.64	.55	-.19	-.14	2.07
1953	.02	.03	-.08	-.16	-.11	.48	.05	.33	.31	.30	.03	-.10	1.10
1954	-.13	.14	.18	.03	-.20	.43	.74	.81	.61	-.11	.12	.07	2.69
1955	.02	-.11	-.03	-.02	.08	.38	.32	-.02	.13	.35	.32	.14	1.56
1956	.03	-.20	.22	.15	.14	.34	.72	.66	.61	.33	.14	.14	3.28
1957	.01	-.06	-.11	-.59	-.21	.03	.45	.35	.13	-.06	-.23	.09	-.20
1958	-.03	.08	-.01	-.25	.05	.12	.26	.27	-.06	.20	.08	.15	.86
1959	.19	-.07	.09	-.01	-.11	-.02	.02	.29	.24	.07	.24	-.17	.76
1960	-.08	-.01	.08	.19	.24	.10	.26	.29	.18	.11	.15	-.36	1.15
1961	-.05	-.04	-.09	.22	.17	-.09	.20	.40	.22	.27	-.10	-.06	1.05
1962	-.08	-.03	.09	-.06	.29	-.10	.36	.48	.04	.01	.01	.12	1.13
1963	.08	.13	.02	-.14	.11	.25	.27	.58	.40	.53	.22	.05	2.50
1964	.15	.00	-.05	-.09	.00	.30	.63	.33	.08	.39	.05	.07	1.86
1965	.00	-.26	.00	.19	-.34	.20	.54	.47	.10	.28	.10	.02	1.30
1966	-.03	-.03	.12	-.16	.00	.29	.29	.23	.08	.24	.16	.07	1.26
1967	.07	.05	.10	-.16	-.13	.35	.20	.32	.07	.10	.13	.03	1.13
1968	.06	.06	-.02	.00	-.09	.19	.22	.45	.13	.21	.16	.10	1.47
1969	-.03	-.05	.00	-.13	-.24	.31	.52	.52	.24	.29	.16	.01	1.60
1970	.01	-.11	-.03	-.27	.04	.33	.53	.54	.23	.09	.14	-.05	1.45
1971	.15	.01	.19	.22	.22	.50	.36	.26	.29	.06	.10	-.15	2.21
1972	-.02	.16	.18	.19	.31	.27	.43	.47	.23	.12	-.03	.01	2.32
1973	-.08	-.02	.00	-.04	.23	.13	.30	.53	.07	.04	.01	.05	1.22
1974	-.13	.10	.17	.15	.18	.22	.53	.23	-.06	.11	-.03	-.04	1.43
1975	.01	-.06	.02	.08	.09	.21	.46	.51	.42	.36	.17	.04	2.31
1976	.12	-.14	.04	.07	.10	.23	.23	.52	.13	.07	.13	.02	1.80
1977	-.08	.01	.08	.11	.31	.40	.56	.35	.36	.36	.03	.14	2.63
1978	-.08	-.06	.09	.23	.20	.42	.67	.59	.36	.44	-.05	.01	2.82
1979	-.11	-.04	.05	.11	.15	.35	.33	.37	.28	.31	.15	.01	1.96
1980	-.07	.06	.12	.14	.15	.36	.74	.70	.38	.25	.11	.09	3.03
AVG.	-.02	-.02	.03	-.01	.04	.23	.38	.42	.24	.20	.07	.00	1.56

LAKE WINNSBORO Firm yield calculations
SRA96425 ADK 9/22/98 1997 A/C Data

THERE ARE 5 AREA/CAPACITY/ELEVATION POINTS.

AREA (ACRES)	CAPACITY (ACRE-FEET)	ELEVATION (FEET)
0.	0.	400.0
163.	163.	405.0
358.	2247.	410.0
558.	4537.	415.0
734.	7121.	419.0

LAKE HAWKINS Firm yield calculations
 SRA96425 JSA 4/30/97

SUMMARY OF RUNOFF DATA
 (VALUES IN ACRE-FEET)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1940	286.	578.	566.	988.	761.	1813.	854.	141.	550.	139.	1229.	3513.	11418.
1941	1595.	1472.	3028.	1649.	1123.	3180.	967.	263.	248.	392.	651.	1658.	16226.
1942	1189.	1195.	1371.	3917.	5453.	943.	280.	796.	428.	353.	452.	1779.	18156.
1943	2326.	889.	475.	1685.	633.	2918.	1641.	132.	160.	1206.	269.	987.	13321.
1944	2478.	3799.	3608.	2658.	6793.	1154.	200.	208.	271.	171.	428.	2318.	24086.
1945	3208.	1137.	10021.	20992.	1682.	2222.	6079.	382.	253.	2275.	1099.	1745.	51095.
1946	5871.	4028.	3753.	2173.	4506.	9836.	603.	314.	683.	458.	5225.	2623.	40073.
1947	2869.	1505.	2446.	3058.	1886.	496.	459.	97.	378.	258.	445.	2893.	16790.
1948	4652.	3117.	4132.	1530.	3814.	559.	292.	173.	147.	193.	321.	434.	19364.
1949	628.	2268.	3666.	2022.	2412.	586.	1849.	385.	442.	1842.	2708.	1038.	19846.
1950	4788.	6543.	1682.	1780.	6922.	1527.	705.	1793.	794.	439.	546.	578.	28097.
1951	1366.	2165.	2728.	934.	1238.	631.	255.	139.	203.	226.	392.	429.	10706.
1952	641.	1028.	1413.	2263.	4402.	1188.	206.	124.	103.	127.	112.	1100.	12707.
1953	2218.	988.	1757.	1637.	7788.	292.	913.	345.	533.	219.	467.	1463.	18620.
1954	1873.	1171.	709.	648.	1345.	611.	147.	87.	73.	13.	609.	565.	7851.
1955	638.	1042.	2195.	1598.	494.	213.	196.	276.	248.	155.	153.	270.	7478.
1956	397.	1267.	557.	353.	645.	108.	66.	60.	71.	73.	153.	220.	3970.
1957	125.	1168.	425.	4177.	9005.	3302.	303.	342.	354.	1998.	4079.	1659.	26937.
1958	3023.	1275.	2383.	2333.	11428.	1888.	1108.	285.	880.	519.	1186.	968.	27276.
1959	678.	2291.	2441.	2633.	2819.	635.	387.	711.	478.	396.	494.	2951.	16914.
1960	5539.	2054.	2325.	795.	726.	464.	481.	300.	403.	390.	622.	4931.	19030.
1961	3111.	3020.	3548.	2258.	699.	1358.	1037.	334.	516.	307.	1117.	3267.	20572.
1962	1912.	2304.	2634.	1847.	1654.	529.	575.	240.	402.	459.	652.	893.	14101.
1963	896.	643.	1039.	1604.	1639.	262.	208.	143.	187.	156.	283.	381.	7441.
1964	401.	617.	950.	814.	492.	200.	98.	121.	167.	195.	295.	286.	4636.
1965	538.	1756.	979.	557.	2178.	947.	130.	90.	116.	132.	176.	246.	7845.
1966	348.	614.	430.	6280.	5151.	346.	141.	218.	492.	288.	361.	480.	15149.
1967	674.	489.	470.	1149.	1128.	1867.	174.	106.	167.	192.	464.	933.	7813.
1968	2174.	1463.	2696.	2309.	6360.	1631.	662.	243.	554.	430.	768.	1802.	21092.
1969	893.	3611.	5544.	3279.	3452.	527.	175.	147.	148.	206.	847.	1143.	19972.
1970	1327.	1405.	3271.	1853.	952.	915.	219.	155.	230.	643.	612.	525.	12107.
1971	566.	733.	671.	471.	421.	147.	536.	341.	143.	231.	569.	2760.	7589.
1972	2975.	1131.	978.	480.	483.	465.	241.	139.	173.	325.	1092.	1051.	9533.
1973	1404.	1849.	5242.	8253.	1533.	3958.	540.	294.	893.	1352.	3629.	3176.	32123.
1974	3448.	1756.	1369.	3174.	1432.	3138.	363.	447.	3411.	958.	6834.	4192.	30522.
1975	2542.	4776.	3883.	2850.	4720.	1820.	704.	349.	254.	283.	431.	731.	23343.
1976	918.	903.	2142.	1990.	2648.	775.	2538.	214.	680.	627.	564.	1714.	15713.
1977	1084.	3726.	3748.	4456.	720.	456.	247.	493.	321.	224.	496.	756.	16727.
1978	1146.	1156.	2032.	696.	1126.	223.	197.	231.	231.	123.	235.	252.	7648.
1979	1808.	1242.	2343.	3415.	4770.	2404.	1829.	1367.	2849.	758.	1273.	2042.	26100.
1980	4133.	3159.	2141.	3467.	4293.	550.	115.	113.	175.	262.	374.	533.	19315.
AVG.	1919.	1886.	2385.	2708.	2969.	1392.	700.	320.	483.	488.	1042.	1495.	17787.

LAKE HAWKINS Firm yield calculations
 SRA96425 JSA 4/30/97

SUMMARY OF NET EVAPORATION DATA
 (VALUES IN FEET)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1940	.05	-.03	.12	.02	.07	.07	.31	.30	.40	.22	-.38	-.17	.98
1941	.01	-.06	-.01	-.07	.13	-.13	.26	.35	.22	.00	.06	-.05	.71
1942	.08	.10	.11	-.31	.13	.09	.43	.17	.19	.18	.13	-.12	1.18
1943	.05	.21	.02	.19	-.09	.23	.44	.59	.24	.05	.17	-.09	2.01
1944	-.14	-.22	-.10	.00	-.40	.32	.46	.26	.34	.35	-.16	-.31	.40
1945	-.04	-.14	-.59	.04	.22	.02	.08	.32	.34	-.02	.15	.05	.43
1946	-.28	-.06	-.04	.03	-.33	.21	.48	.14	.29	.22	-.38	.04	.32
1947	-.08	.09	-.10	-.08	.04	.26	.52	.38	.28	.28	-.02	-.17	1.40
1948	-.14	-.14	.00	.13	-.09	.40	.51	.58	.54	.27	.03	.00	2.09
1949	-.41	-.12	-.01	-.13	.17	.26	.15	.29	.29	-.39	.25	-.07	.28
1950	-.22	-.28	.13	-.10	-.20	.26	.15	.35	-.07	.24	.22	.19	.67
1951	-.03	-.14	.10	.16	.21	.10	.37	.64	-.11	.22	.09	-.05	1.56
1952	.01	-.07	-.03	-.19	.00	.35	.37	.73	.63	.53	-.18	-.17	1.98
1953	.03	.01	-.11	-.13	-.17	.44	.05	.32	.30	.29	.02	-.14	.91
1954	-.13	.13	.16	.03	-.20	.44	.73	.79	.62	-.13	.07	.06	2.57
1955	-.01	-.16	-.04	-.02	.02	.34	.31	-.04	.11	.39	.31	.12	1.33
1956	.01	-.18	.20	.13	.07	.33	.68	.59	.57	.31	.12	.12	2.95
1957	.01	-.08	-.11	-.67	-.14	.01	.44	.32	.15	-.18	-.23	.09	-.39
1958	-.04	.05	.01	-.26	.05	.10	.28	.27	-.14	.17	.09	.15	.73
1959	.17	-.09	.09	-.06	-.21	-.02	.04	.29	.22	.09	.21	-.18	.55
1960	-.10	-.03	.06	.16	.25	.06	.26	.29	.18	.10	.10	-.41	.92
1961	-.11	-.07	-.09	.22	.18	-.17	.19	.38	.18	.24	-.10	-.08	.77
1962	-.11	-.05	.08	-.09	.23	-.07	.30	.47	.02	.02	-.02	.08	.86
1963	.07	.11	.04	-.16	.10	.25	.33	.55	.35	.53	.19	.02	2.38
1964	.12	-.02	-.05	-.06	-.03	.30	.58	.34	.10	.36	.05	.04	1.73
1965	-.03	-.25	-.03	.18	-.42	.19	.51	.45	.09	.28	.11	-.03	1.05
1966	-.06	-.03	.08	-.13	-.05	.29	.30	.22	.08	.20	.13	.07	1.10
1967	.05	.05	.09	-.18	-.14	.34	.26	.31	.07	.10	.11	.05	1.11
1968	.08	.06	-.01	-.02	-.03	.25	.23	.47	.18	.20	.20	.10	1.71
1969	-.04	-.06	.01	-.20	-.29	.35	.53	.51	.26	.31	.14	.01	1.53
1970	.01	-.08	-.03	-.25	.03	.28	.52	.53	.30	.13	.13	-.09	1.48
1971	.17	.01	.18	.22	.22	.49	.37	.27	.29	.10	.09	-.10	2.31
1972	-.04	.16	.15	.17	.30	.25	.39	.46	.24	.14	-.03	.01	2.20
1973	-.08	-.01	.02	-.04	.22	.13	.29	.53	.10	.05	.03	.06	1.30
1974	-.14	.09	.15	.15	.18	.23	.54	.23	-.02	.13	-.02	-.03	1.49
1975	.01	-.06	.02	.06	.10	.22	.46	.49	.43	.31	.17	.05	2.26
1976	.10	.13	.04	.08	.10	.22	.21	.48	.12	.07	.13	.00	1.68
1977	-.08	.01	.07	.10	.32	.38	.57	.35	.33	.36	.03	.12	2.56
1978	-.08	-.05	.11	.23	.21	.43	.64	.56	.32	.41	-.05	.01	2.74
1979	-.12	-.02	.06	.13	.18	.37	.36	.41	.29	.36	.14	.00	2.16
1980	-.09	.05	.10	.12	.15	.39	.74	.68	.38	.26	.10	.10	2.98
AVG.	-.04	-.03	.02	-.01	.03	.23	.38	.41	.24	.19	.05	-.02	1.45

LAKE HAWKINS Firm yield calculations
SRA96425 JSA 4/30/97

THERE ARE 8 AREA/CAPACITY/ELEVATION POINTS.

AREA (ACRES)	CAPACITY (ACRE-FEET)	ELEVATION (FEET)
0.	0.	312.0
72.	117.	315.0
161.	823.	320.0
266.	2005.	325.0
390.	3646.	330.0
518.	4926.	335.0
656.	8830.	340.0
776.	11794.	343.8

LAKE QUITMAN Firm yield calculations
 SRA96425 ADK 9/22/98

SUMMARY OF RUNOFF DATA
 (VALUES IN ACRE-FEET)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1940	1.	27.	176.	1705.	1680.	2317.	1160.	110.	283.	13.	1081.	4882.	13435.
1941	899.	1629.	2931.	1844.	2630.	3373.	764.	245.	67.	18.	217.	544.	15161.
1942	273.	591.	837.	8400.	6829.	566.	12.	103.	111.	41.	118.	894.	18775.
1943	666.	196.	413.	966.	1187.	7176.	3383.	0.	2.	146.	2.	124.	14261.
1944	728.	1865.	2854.	1504.	8569.	1499.	107.	14.	205.	4.	349.	1808.	19506.
1945	2836.	1661.	11471.	18926.	711.	2099.	7386.	100.	10.	2757.	717.	409.	49083.
1946	5456.	6491.	3150.	930.	4991.	8359.	65.	89.	97.	39.	7203.	2136.	39006.
1947	2178.	328.	1291.	3283.	1518.	293.	139.	34.	94.	2.	569.	3308.	13037.
1948	3932.	3491.	3909.	751.	5393.	62.	237.	12.	0.	0.	28.	48.	17863.
1949	1030.	3100.	3832.	2097.	1191.	204.	307.	18.	55.	2692.	2659.	390.	17575.
1950	3680.	9806.	2014.	930.	5619.	1807.	1145.	1481.	462.	67.	30.	46.	27087.
1951	374.	2150.	1786.	162.	420.	629.	108.	0.	0.	0.	21.	76.	5726.
1952	400.	405.	911.	6101.	4331.	398.	8.	0.	0.	0.	60.	1194.	13808.
1953	2040.	441.	968.	2059.	10634.	18.	500.	53.	650.	4.	57.	957.	18381.
1954	2897.	1417.	184.	561.	981.	75.	0.	0.	0.	83.	1878.	116.	8192.
1955	309.	742.	1248.	1724.	118.	39.	1.	97.	180.	12.	0.	3.	4473.
1956	22.	964.	68.	60.	890.	11.	0.	0.	0.	0.	93.	15.	2123.
1957	105.	678.	653.	6655.	16648.	3896.	9.	14.	226.	2196.	5634.	1031.	37745.
1958	3142.	389.	2597.	3228.	16003.	938.	287.	2.	452.	109.	384.	261.	27792.
1959	134.	2710.	2572.	2233.	1530.	133.	365.	253.	126.	409.	510.	3049.	14024.
1960	5722.	2122.	2402.	821.	750.	479.	497.	310.	416.	403.	643.	5094.	19659.
1961	3214.	3120.	3665.	2332.	722.	1402.	1071.	345.	533.	317.	1154.	3375.	21250.
1962	1975.	2381.	2722.	1908.	1708.	546.	594.	248.	415.	474.	673.	923.	14567.
1963	926.	665.	1073.	1657.	1694.	271.	215.	148.	193.	161.	292.	394.	7689.
1964	414.	638.	981.	842.	509.	206.	101.	125.	173.	202.	305.	296.	4792.
1965	555.	1814.	1011.	575.	2250.	978.	134.	93.	120.	136.	182.	255.	8103.
1966	359.	635.	445.	6490.	5322.	358.	146.	226.	508.	297.	373.	496.	15655.
1967	697.	505.	485.	1187.	1165.	1930.	180.	110.	172.	198.	479.	964.	8072.
1968	2246.	1511.	2785.	2385.	6571.	1685.	684.	251.	572.	444.	794.	1862.	21790.
1969	922.	3731.	5728.	3387.	3566.	544.	181.	152.	152.	213.	876.	1181.	20633.
1970	1371.	1452.	3379.	1914.	984.	946.	227.	161.	238.	664.	632.	543.	12511.
1971	585.	757.	693.	486.	435.	152.	553.	353.	147.	239.	588.	2852.	7840.
1972	3073.	1169.	1011.	496.	499.	480.	249.	144.	179.	336.	1128.	1086.	9850.
1973	1451.	1910.	5415.	8526.	1584.	4089.	558.	304.	923.	1397.	3750.	3281.	33188.
1974	3562.	1815.	1415.	3279.	1480.	3242.	375.	462.	3524.	990.	7060.	4331.	31535.
1975	2626.	4934.	4011.	2944.	4876.	1880.	727.	361.	262.	293.	445.	755.	24114.
1976	949.	933.	2213.	2056.	2736.	800.	2622.	221.	703.	648.	582.	1771.	16234.
1977	1120.	3849.	3872.	4603.	744.	471.	256.	509.	331.	231.	512.	781.	17279.
1978	1184.	1195.	2099.	719.	1164.	230.	204.	238.	238.	127.	243.	260.	7901.
1979	1868.	1283.	2421.	3528.	4928.	2484.	1890.	1412.	2944.	783.	1315.	2110.	26966.
1980	4269.	3264.	2212.	3581.	4435.	568.	119.	117.	181.	271.	386.	551.	19954.
AVG.	1712.	1921.	2290.	2874.	3415.	1406.	672.	217.	389.	425.	1074.	1328.	17723.

LAKE QUITMAN Firm yield calculations
 SRA96425 ADK 9/22/98

SUMMARY OF NET EVAPORATION DATA
 (VALUES IN FEET)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1940	.06	-.01	.15	.01	.03	.11	.32	.38	.42	.24	-.31	-.12	1.28
1941	.05	-.04	.03	-.09	.17	-.13	.25	.37	.28	.01	.10	-.02	.98
1942	.10	.11	.13	-.35	.15	.13	.48	.27	.21	.21	.13	-.12	1.45
1943	.02	.21	.02	.19	-.05	.22	.48	.62	.28	.08	.17	-.06	2.18
1944	-.08	-.17	-.06	.07	-.32	.36	.46	.29	.37	.36	-.14	-.23	.91
1945	.00	-.17	-.58	.08	.23	.02	.11	.32	.30	.03	.18	.10	.62
1946	-.22	-.05	-.02	.04	-.30	.26	.49	.18	.29	.25	-.36	.03	.59
1947	-.04	.13	-.06	-.10	.09	.27	.54	.38	.29	.29	.00	-.16	1.63
1948	-.10	-.12	.02	.16	-.12	.42	.52	.59	.56	.27	.11	.02	2.33
1949	-.43	-.13	.01	-.10	.20	.25	.25	.33	.32	-.35	.26	-.05	.56
1950	-.21	-.29	.16	-.07	-.21	.30	.11	.38	-.05	.27	.26	.20	.85
1951	.01	-.15	.16	.16	.21	.04	.38	.58	-.07	.18	.12	.00	1.62
1952	.05	-.02	-.03	-.23	.02	.37	.40	.77	.65	.56	-.18	-.15	2.21
1953	.05	.04	-.08	-.15	-.08	.49	.08	.34	.32	.29	.04	-.09	1.25
1954	-.11	.15	.19	.03	-.17	.44	.77	.83	.61	-.13	.13	.09	2.83
1955	.03	-.09	-.03	-.01	.09	.38	.34	-.01	.13	.38	.33	.14	1.68
1956	.03	-.17	.24	.16	.15	.36	.76	.68	.63	.34	.14	.15	3.47
1957	.02	-.04	-.10	-.60	-.23	.06	.48	.35	.13	-.04	-.21	.10	-.08
1958	-.02	.09	-.01	-.21	.06	.14	.27	.29	-.07	.20	.09	.15	.98
1959	.20	-.05	.10	.00	-.12	-.03	.03	.29	.25	.06	.25	-.16	.82
1960	-.07	.00	.09	.18	.24	.08	.24	.29	.20	.10	.15	-.37	1.13
1961	-.06	-.04	-.08	.23	.17	-.08	.23	.40	.23	.28	-.10	-.05	1.13
1962	-.06	-.03	.09	-.05	.28	-.11	.33	.47	.01	.00	.01	.11	1.05
1963	.09	.14	.03	-.14	.10	.27	.29	.59	.41	.54	.23	.07	2.62
1964	.14	.00	-.04	-.07	-.02	.29	.64	.36	.08	.39	.05	.09	1.91
1965	.02	-.25	.01	.19	-.38	.21	.54	.48	.09	.27	.09	.02	1.29
1966	-.02	-.04	.10	-.21	-.02	.24	.26	.20	.06	.24	.17	.10	1.08
1967	.10	.05	.08	-.20	-.17	.35	.17	.28	.06	.08	.15	.04	.99
1968	.08	.07	-.01	-.01	-.12	.18	.17	.47	.13	.25	.19	.11	1.51
1969	-.03	-.04	.01	-.14	-.31	.29	.52	.53	.26	.32	.18	.01	1.60
1970	.03	-.11	-.06	-.24	.01	.30	.53	.56	.21	.08	.14	-.04	1.41
1971	.17	.02	.19	.22	.21	.52	.38	.25	.30	.05	.11	-.15	2.27
1972	-.01	.17	.19	.20	.32	.28	.44	.47	.24	.13	-.01	.02	2.44
1973	-.08	-.02	.01	-.03	.22	.14	.32	.54	.07	.05	.02	.07	1.31
1974	-.12	.11	.18	.16	.18	.24	.55	.23	-.06	.11	-.02	-.03	1.53
1975	.01	-.05	.03	.08	.10	.22	.46	.54	.44	.37	.19	.04	2.43
1976	.13	.15	.05	.07	.11	.24	.23	.53	.13	.07	.14	.02	1.87
1977	-.08	.01	.08	.11	.31	.41	.59	.37	.38	.36	.03	.16	2.73
1978	-.08	-.07	.09	.24	.20	.42	.68	.59	.37	.45	-.04	.02	2.87
1979	-.11	-.04	.06	.13	.16	.36	.34	.38	.29	.33	.17	.01	2.08
1980	-.06	.06	.13	.15	.16	.37	.75	.71	.39	.26	.12	.08	3.12
AVG.	-.01	-.02	.04	.00	.04	.24	.39	.43	.25	.20	.08	.00	1.64

LAKE QUITMAN Firm yield calculations
SRA96425 ADK 9/22/98

THERE ARE 5 AREA/CAPACITY/ELEVATION POINTS.

AREA (ACRES)	CAPACITY (ACRE-FEET)	ELEVATION (FEET)
0.	0.	375.0
94.	235.	380.0
288.	1190.	385.0
510.	3185.	390.0
756.	6350.	395.0

LAKE HOLBROOK Firm yield calculations
 SRA96425 ADK 9/22/98 1997 A/C Data

SUMMARY OF RUNOFF DATA
 (VALUES IN ACRE-FEET)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1940	0.	13.	85.	825.	813.	1121.	561.	53.	137.	6.	523.	2362.	6499.
1941	435.	788.	1418.	892.	1273.	1632.	370.	118.	32.	9.	105.	263.	7335.
1942	132.	286.	405.	4064.	3304.	274.	6.	50.	54.	20.	57.	432.	9084.
1943	322.	95.	200.	468.	574.	3472.	1637.	0.	1.	70.	1.	60.	6900.
1944	352.	903.	1381.	728.	4146.	726.	52.	7.	99.	2.	169.	875.	9440.
1945	1372.	804.	5550.	9158.	344.	1016.	3574.	48.	5.	1334.	347.	198.	23750.
1946	2640.	3141.	1524.	450.	2415.	4044.	31.	43.	47.	19.	3485.	1033.	18872.
1947	1054.	159.	625.	1589.	734.	142.	67.	17.	45.	1.	275.	1600.	6308.
1948	7902.	1689.	1891.	363.	2609.	30.	115.	6.	0.	0.	14.	23.	14642.
1949	498.	1500.	1854.	1015.	576.	99.	149.	9.	26.	1303.	1287.	189.	8505.
1950	1781.	4745.	975.	450.	2719.	874.	554.	717.	224.	32.	15.	22.	13108.
1951	181.	1040.	864.	78.	203.	304.	52.	0.	0.	0.	10.	37.	2769.
1952	194.	196.	441.	2952.	2096.	193.	4.	0.	0.	0.	29.	578.	6683.
1953	987.	213.	468.	996.	5145.	9.	242.	25.	315.	2.	28.	463.	8893.
1954	1402.	686.	89.	271.	475.	36.	0.	0.	0.	40.	909.	56.	3964.
1955	150.	359.	604.	834.	57.	19.	0.	47.	87.	6.	0.	1.	2164.
1956	10.	467.	33.	29.	431.	6.	0.	0.	0.	0.	45.	7.	1028.
1957	51.	328.	316.	3220.	8055.	1885.	4.	7.	109.	1063.	2726.	499.	18263.
1958	1520.	188.	1257.	1562.	7743.	454.	139.	1.	219.	53.	186.	127.	13449.
1959	65.	1311.	1245.	1081.	740.	64.	177.	122.	61.	198.	247.	1475.	6786.
1960	2767.	1026.	1162.	397.	363.	232.	240.	150.	201.	195.	311.	2464.	9508.
1961	1554.	1509.	1772.	1128.	349.	678.	518.	167.	258.	153.	558.	1632.	10276.
1962	955.	1151.	1316.	923.	826.	264.	288.	120.	201.	230.	326.	447.	7047.
1963	448.	322.	520.	802.	820.	131.	104.	72.	94.	78.	142.	191.	3724.
1964	201.	309.	475.	408.	246.	100.	49.	61.	84.	98.	148.	143.	2322.
1965	269.	878.	490.	279.	1090.	474.	65.	45.	58.	66.	88.	123.	3925.
1966	174.	307.	215.	3142.	2574.	173.	71.	109.	246.	144.	181.	240.	7576.
1967	337.	245.	235.	574.	564.	934.	87.	53.	84.	96.	232.	466.	3907.
1968	1086.	732.	1347.	1154.	3178.	815.	331.	122.	277.	215.	384.	900.	10541.
1969	446.	1804.	2770.	1638.	1724.	264.	88.	73.	74.	103.	424.	572.	9980.
1970	664.	703.	1634.	926.	476.	458.	110.	78.	115.	322.	306.	263.	6055.
1971	283.	367.	336.	236.	211.	74.	268.	171.	71.	116.	285.	1379.	3797.
1972	1486.	565.	489.	240.	241.	233.	120.	70.	87.	163.	546.	525.	4765.
1973	702.	924.	2619.	4123.	766.	1978.	270.	147.	447.	676.	1813.	1587.	16052.
1974	1723.	878.	684.	1586.	716.	1568.	182.	224.	1704.	479.	3414.	2094.	15252.
1975	1270.	2386.	1940.	1424.	2358.	909.	352.	175.	127.	142.	216.	366.	11665.
1976	459.	452.	1070.	994.	1323.	388.	1268.	107.	340.	314.	282.	858.	7855.
1977	542.	1861.	1872.	2226.	360.	228.	124.	247.	160.	112.	248.	378.	8358.
1978	573.	579.	1016.	348.	564.	112.	99.	115.	115.	61.	118.	126.	3826.
1979	905.	621.	1171.	1706.	2383.	1201.	914.	684.	1426.	379.	636.	1020.	13046.
1980	2065.	1579.	1070.	1732.	2145.	275.	58.	56.	87.	131.	187.	267.	9652.
AVG.	975.	929.	1108.	1391.	1652.	680.	325.	105.	188.	206.	520.	642.	8721.

LAKE HOLBROOK Firm yield calculations
 SRA96425 ADK 9/22/98 1997 A/C Data

SUMMARY OF NET EVAPORATION DATA
 (VALUES IN FEET)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1940	.06	-.02	.14	.04	.06	.09	.34	.34	.42	.23	-.35	-.14	1.21
1941	.04	-.05	.02	-.07	.17	-.14	.27	.37	.25	.01	.09	-.03	.93
1942	.09	.11	.13	-.34	.15	.11	.47	.25	.20	.20	.13	-.12	1.38
1943	.05	.21	.02	.19	-.11	.21	.47	.61	.25	.04	.17	-.07	2.04
1944	-.10	-.18	-.07	.06	-.35	.35	.47	.29	.36	.36	-.15	-.25	.79
1945	-.01	-.14	-.60	.06	.23	.03	.08	.31	.32	.00	.17	.08	.53
1946	-.24	-.05	-.04	.04	-.32	.25	.50	.13	.29	.24	-.37	.04	.47
1947	-.06	.11	-.07	-.09	.08	.25	.54	.38	.29	.29	-.01	-.16	1.55
1948	-.11	-.11	.02	.14	-.08	.42	.54	.60	.56	.28	.09	.00	2.35
1949	-.42	-.13	.00	-.12	.18	.28	.24	.32	.31	-.39	.26	-.07	.46
1950	-.19	-.29	.15	-.10	-.19	.29	.15	.40	-.02	.26	.25	.20	.91
1951	.01	-.14	.13	.17	.22	.09	.38	.64	-.08	.20	.11	-.04	1.69
1952	.05	-.05	-.02	-.20	.02	.37	.40	.77	.65	.56	-.18	-.17	2.20
1953	.06	.03	-.09	-.12	-.12	.46	.08	.32	.31	.28	.03	-.12	1.12
1954	-.11	.14	.17	.03	-.15	.45	.76	.82	.62	-.15	.10	.08	2.76
1955	.01	-.12	-.04	.00	.05	.35	.33	-.03	.12	.40	.33	.13	1.53
1956	.02	-.15	.23	.15	.11	.36	.73	.64	.61	.33	.12	.14	3.29
1957	.02	-.06	-.10	-.65	-.19	.05	.47	.33	.14	-.11	-.21	.10	-.21
1958	-.02	.07	.01	-.23	.07	.13	.28	.29	-.12	.18	.10	.15	.91
1959	.19	-.07	.10	-.04	-.18	-.04	.06	.30	.24	.07	.24	-.17	.70
1960	-.09	-.01	.07	.16	.25	.04	.24	.29	.21	.09	.12	-.40	.97
1961	-.11	-.06	-.08	.23	.17	-.13	.23	.38	.20	.27	-.10	-.06	.94
1962	-.07	-.05	.09	-.08	.25	-.09	.28	.46	-.01	.00	-.02	.09	.85
1963	.08	.12	.05	-.14	.09	.27	.34	.58	.38	.54	.21	.06	2.58
1964	.12	-.01	-.04	-.04	-.05	.29	.60	.38	.08	.37	.04	.08	1.82
1965	.00	-.24	-.01	.18	-.44	.21	.51	.46	.07	.26	.09	-.01	1.08
1966	-.04	-.05	.07	-.22	-.04	.23	.26	.19	.07	.21	.16	.10	.94
1967	.09	.04	.07	-.24	-.19	.34	.20	.26	.05	.08	.15	.05	.90
1968	.08	.08	-.01	-.03	-.09	.21	.15	.51	.17	.26	.22	.10	1.65
1969	-.05	-.04	.01	-.17	-.36	.30	.53	.53	.29	.34	.15	.01	1.54
1970	.03	-.10	-.07	-.21	.01	.25	.53	.56	.27	.11	.13	-.07	1.44
1971	.18	.02	.19	.22	.22	.51	.39	.26	.31	.08	.10	-.12	2.36
1972	-.02	.17	.17	.18	.32	.27	.42	.47	.24	.15	-.01	.02	2.38
1973	-.07	-.01	.02	-.04	.21	.14	.31	.54	.09	.06	.03	.08	1.36
1974	-.12	.11	.17	.16	.17	.25	.56	.24	-.04	.12	-.02	-.03	1.57
1975	.02	-.05	.03	.07	.10	.22	.46	.53	.45	.33	.20	.05	2.41
1976	.11	.15	.05	.07	.10	.23	.22	.50	.12	.08	.15	.01	1.79
1977	-.08	.01	.08	.10	.31	.39	.60	.37	.36	.36	.03	.14	2.67
1978	-.08	-.06	.10	.24	.20	.42	.67	.57	.34	.43	-.04	.02	2.81
1979	-.11	-.03	.06	.14	.18	.37	.36	.41	.30	.36	.17	.00	2.21
1980	-.08	.06	.12	.13	.16	.39	.75	.69	.38	.26	.11	.09	3.06
AVG.	-.02	-.02	.03	-.01	.03	.23	.39	.42	.25	.20	.07	-.01	1.56

LAKE HOLBROOK Firm yield calculations
SRA96425 ADK 9/22/98 1997 A/C Data

THERE ARE 9 AREA/CAPACITY/ELEVATION POINTS.

AREA (ACRES)	CAPACITY (ACRE-FEET)	ELEVATION (FEET)
0.	0.	338.0
4.	4.	340.0
44.	124.	345.0
100.	484.	350.0
173.	1167.	355.0
273.	2282.	360.0
397.	3957.	365.0
554.	6334.	370.0
631.	7519.	372.0

Lake Murvaul

LAKE MURVAUL OPERATION w/ 2000 Area Capacity data adk 9/85/98
 Inflow from 1985 UPDATE OF SRA MASTER PLAN - ESPEY, HUSTON, & ASSOC

SUMMARY OF RUNOFF DATA
 (VALUES IN ACRE-FEET)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1940	3200.	19400.	1800.	5800.	6100.	7900.	2600.	200.	2500.	600.	19800.	45800.	115700.
1941	36500.	12600.	21000.	8800.	17400.	12200.	18100.	100.	1800.	5100.	19600.	10100.	163300.
1942	8400.	4900.	15700.	5300.	33100.	14200.	2700.	0.	5400.	400.	600.	500.	91200.
1943	6900.	2600.	1900.	2600.	100.	0.	900.	300.	100.	300.	600.	2300.	18600.
1944	20400.	11400.	20800.	25500.	51800.	13400.	600.	200.	400.	100.	0.	1300.	145900.
1945	42700.	13200.	31300.	34400.	3900.	0.	1500.	2600.	600.	8300.	2100.	9200.	149800.
1946	30100.	33900.	37500.	10300.	15400.	25300.	2300.	0.	1600.	700.	0.	10600.	167700.
1947	22100.	13400.	19600.	16800.	11100.	2200.	1000.	100.	0.	0.	200.	0.	86500.
1948	10800.	22500.	20500.	7600.	1200.	11200.	300.	0.	100.	100.	400.	1200.	75900.
1949	9700.	9100.	10300.	8800.	3800.	2400.	1500.	2700.	700.	12000.	2400.	5000.	68400.
1950	24000.	18000.	23300.	1700.	13800.	20600.	5000.	200.	600.	1300.	800.	700.	110000.
1951	3200.	8200.	6400.	4900.	100.	0.	400.	100.	300.	0.	0.	2300.	25900.
1952	3300.	22900.	14200.	14600.	6400.	3300.	400.	300.	100.	0.	0.	160.	65660.
1953	2866.	20472.	24584.	4208.	48668.	22632.	536.	644.	106.	0.	0.	1928.	126644.
1954	1672.	2499.	2846.	1482.	12009.	2607.	203.	0.	28.	1262.	0.	2056.	26664.
1955	4514.	12500.	10527.	19711.	9718.	2771.	715.	2389.	338.	0.	0.	228.	63411.
1956	3719.	5081.	8040.	17475.	2051.	0.	95.	0.	236.	0.	0.	0.	36697.
1957	437.	3869.	4873.	4616.	29062.	7850.	2592.	196.	584.	5851.	7209.	11626.	78765.
1958	8177.	9760.	7165.	15374.	10293.	13508.	625.	1028.	11986.	4133.	38.	1016.	83103.
1959	1834.	10093.	1356.	9208.	3856.	5383.	803.	184.	95.	1427.	650.	7991.	42880.
1960	11886.	15378.	15237.	4588.	1611.	337.	382.	26.	3233.	3418.	5438.	20606.	82140.
1961	31670.	12442.	20668.	2261.	1222.	4720.	1541.	323.	377.	0.	1357.	19007.	95588.
1962	24981.	5075.	7587.	7862.	13288.	2235.	352.	0.	161.	4080.	770.	2818.	69209.
1963	2700.	2638.	408.	1291.	0.	377.	532.	0.	271.	0.	1718.	1143.	11078.
1964	2089.	2001.	5437.	3734.	1528.	895.	162.	174.	321.	274.	491.	866.	17972.
1965	1259.	4978.	13654.	5822.	7169.	1754.	354.	311.	793.	394.	634.	2948.	40070.
1966	2780.	4665.	2249.	18442.	15888.	1470.	662.	1601.	822.	624.	675.	1310.	51188.
1967	1310.	1237.	1470.	2052.	1208.	1667.	560.	135.	162.	154.	356.	961.	11272.
1968	8581.	2365.	3661.	18195.	14614.	3006.	10604.	1332.	3836.	2438.	4010.	14687.	87329.
1969	4891.	11114.	25298.	19221.	14076.	1710.	616.	317.	533.	638.	1907.	2780.	83101.
1970	4119.	4760.	7111.	3937.	1339.	655.	406.	356.	462.	1135.	1470.	1172.	26922.
1971	1303.	1987.	2009.	2322.	8945.	640.	371.	464.	417.	440.	689.	3173.	22760.
1972	6579.	3093.	2263.	1419.	721.	573.	566.	310.	360.	1608.	4374.	7045.	28911.
1973	13770.	6514.	10757.	16194.	4214.	8093.	6718.	2336.	9774.	9964.	6572.	15866.	110772.
1974	27511.	8311.	5822.	3282.	3013.	1426.	830.	576.	4367.	3923.	10466.	7831.	77358.
1975	9971.	17467.	6630.	6310.	13392.	8566.	2911.	1674.	961.	1361.	2795.	2991.	75029.
1976	3552.	4476.	9265.	4891.	6849.	9010.	6980.	1143.	902.	1041.	1550.	6201.	55860.
1977	5080.	7977.	6921.	3035.	2358.	1652.	381.	697.	477.	384.	771.	1128.	30861.
1978	3806.	4498.	2889.	2627.	2227.	658.	294.	191.	4425.	678.	6405.	5582.	34280.
1979	21441.	14949.	13559.	11201.	18413.	18049.	4680.	3064.	4505.	1929.	8151.	8188.	128129.
1980	13166.	11405.	5757.	29461.	17089.	2438.	910.	580.	644.	808.	1419.	1608.	85285.
AVG.	10902.	9846.	11033.	9447.	10464.	5790.	2041.	655.	1595.	1875.	2839.	5900.	72387.

LAKE MURVAUL OPERATION w/ 2000 Area Capacity data adk 9/85/98
 Inflow from 1985 UPDATE OF SRA MASTER PLAN - ESPEY, HUSTON, & ASSOC

SUMMARY OF NET EVAPORATION DATA
 (VALUES IN FEET)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
1940	.01	-.17	.09	-.08	.07	.00	.25	.11	.34	.22	-.63	-.34	-.13
1941	-.04	-.11	-.05	-.05	-.09	-.10	.09	.32	.04	-.22	-.02	-.06	-.29
1942	.06	.06	.03	-.18	.02	.01	.31	.01	.22	.18	.13	-.09	.76
1943	-.04	.19	.04	.19	.07	.27	.31	.50	.23	.17	.10	-.12	1.91
1944	-.31	-.25	-.14	-.12	-.64	.23	.44	.21	.28	.33	-.22	-.46	-.65
1945	-.15	-.15	-.31	-.07	.10	.05	.08	.27	.29	-.13	.10	-.05	.03
1946	-.40	-.17	-.08	.02	-.29	.04	.33	.18	.23	.15	-.39	-.02	-.40
1947	-.23	.03	-.18	-.01	-.15	.24	.40	.41	.35	.27	-.08	-.18	.87
1948	-.19	-.22	-.01	.06	-.08	.33	.35	.48	.37	.24	-.22	-.03	1.08
1949	-.37	-.11	-.08	-.15	.12	.11	-.02	.22	.23	-.41	.22	-.17	-.41
1950	-.35	-.28	.07	-.09	-.25	.01	.13	.25	-.18	.19	.10	.06	-.34
1951	-.11	-.15	-.05	.16	.17	.14	.30	.58	-.14	.29	.05	-.10	1.14
1952	-.08	-.16	-.07	-.20	-.09	.30	.16	.55	.52	.48	-.15	-.09	1.17
1953	-.04	-.12	-.20	-.28	-.42	.28	-.03	.29	.29	.29	.04	-.15	-.05
1954	-.14	.16	.14	.01	-.25	.40	.55	.64	.56	.00	.01	.06	2.14
1955	-.07	-.24	.04	-.09	-.01	.32	.25	.04	.15	.36	.24	.07	1.06
1956	-.05	-.26	.08	.04	.01	.21	.50	.45	.45	.24	.12	.06	1.85
1957	-.05	-.13	-.16	-.60	.00	-.12	.29	.31	.09	-.25	-.35	.03	-.94
1958	-.16	-.01	.02	-.18	.02	.05	.33	.17	-.32	.18	.05	.12	.27
1959	.12	-.14	.09	-.13	-.09	.05	-.08	.23	.19	.08	.10	-.22	.20
1960	-.10	-.11	.06	.13	.28	.06	.29	.14	.14	.07	-.04	-.38	.54
1961	-.18	-.08	-.14	.19	.21	-.16	.03	.36	.05	.21	-.06	-.17	.26
1962	-.18	.02	.09	-.15	.18	.02	.40	.47	.11	.15	-.06	-.04	1.01
1963	.02	-.01	.09	-.12	.17	.09	.22	.45	.20	.43	.04	-.08	1.50
1964	.04	-.01	-.08	-.20	.08	.33	.53	.27	.19	.34	.08	-.10	1.47
1965	-.08	-.24	-.11	.18	-.31	.13	.47	.39	.12	.31	.10	-.19	.77
1966	-.06	.04	.13	.06	-.05	.32	.31	.24	.14	.16	.09	.05	1.43
1967	-.03	.02	.08	.02	-.08	.27	.31	.39	.23	.26	.06	.07	1.60
1968	.05	.02	-.01	-.03	.06	.21	.36	.31	.09	.01	.15	.09	1.31
1969	.05	-.07	.00	-.17	-.10	.41	.52	.43	.23	.25	.18	.04	1.77
1970	-.09	-.07	.08	-.26	.04	.34	.41	.35	.31	.13	.15	-.06	1.33
1971	.14	.02	.16	.23	.16	.33	.34	.30	.20	.14	.08	-.06	2.04
1972	-.06	.12	.09	.11	.20	.19	.23	.34	.19	.11	-.04	-.05	1.43
1973	-.09	.01	.02	-.03	.22	.11	.23	.38	.09	.04	.04	-.01	1.01
1974	-.21	.06	.09	.14	.15	.24	.44	.22	.02	.14	.00	-.03	1.26
1975	-.01	-.07	.01	.04	.08	.19	.41	.38	.35	.20	.07	.04	1.69
1976	.07	.06	.01	.13	.09	.22	.17	.43	.15	.10	.07	-.04	1.46
1977	-.08	.02	.05	.12	.30	.31	.48	.23	.25	.36	.05	.06	2.15
1978	-.10	-.01	.15	.22	.24	.40	.50	.49	.15	.36	-.03	-.03	2.34
1979	-.15	-.05	.05	.07	.16	.31	.28	.38	.23	.28	.06	-.01	1.61
1980	-.10	.03	.02	.07	.09	.42	.65	.62	.38	.26	.04	.12	2.60
AVG.	-.09	-.06	.00	-.02	.01	.18	.31	.34	.20	.17	.01	-.06	.99

LAKE MURVAUL OPERATION w/ 2000 Area Capacity data adk 9/85/98
Inflow from 1985 UPDATE OF SRA MASTER PLAN - ESPEY, HUSTON, & ASSOC

THERE ARE 8 AREA/CAPACITY/ELEVATION POINTS.

AREA (ACRES)	CAPACITY (ACRE-FEET)	ELEVATION (FEET)
0.	0.	237.0
1.	2.	240.0
401.	1007.	245.0
1171.	4938.	250.0
2031.	12943.	255.0
3111.	25799.	260.0
3721.	42879.	265.0
3751.	44000.	265.3

APPENDIX E
EXISTING WATER SUPPLY

Appendix E: Water Supply Distribution by County

County	Basin		Entity	Surface Supply (AF/Y)	Groundwater Supply (AF/Y)	Source of Surface Supply	Comment
Collin	Upper	1		2,638	11	NTMWD	Assume NTMWD will provide all of future need for Sabine portion of Collin County
Rockwall	Upper	2		3,705	50	NTMWD	Assume NTMWD will provide all of future need for Sabine portion of Rockwall County
Hunt	Upper	3	Greenville	21,283		Lake Tawakoni	
Hunt	Upper	3	Greenville	4,159		Cowleech Fork	
Hunt	Upper	3	West Tawakoni	1,120		Lake Tawakoni	
Hunt	Upper	3	Cash WSC	1,323		NTMWD	Import
Hunt	Upper	3	Cash WSC	3,004		Lake Tawakoni & Lk Fork	1680 AF/Y from Tawakoni & 1324 AF/Y Option from Lake Fork
Hunt	Upper	3	Community WC	92		Lake Tawakoni	
Hunt	Upper	3	Unassigned	11,860		Lake Tawakoni	Dallas' portion that is not available for interbasin transfer; currently not contracted to any entity
Hunt	Upper	3	Various	250		Misc Run-of-River Rts	
Hunt	Upper	3	Wills Point	2,240		Lake Tawakoni	Export
Hunt	Upper	3	Dallas	190,480		Lake Tawakoni	City of Dallas right in Tawakoni
Hunt	Upper	3	Terrell	10,081		Lake Tawakoni	Export
Hunt	Upper	3	Commerce	8,401		Lake Tawakoni	Export
Hunt	Upper	3	Total County	254,293	352		TWDB projected year 2000 Groundwater Use
Kaufman	Upper	4	Able Springs WSC	1,120	5	Lake Fork	280 AF/Y Contract w/ 840 AF/Y Option
Van Zandt	Upper	5	Wills Point	2,240		Lake Tawakoni	
Van Zandt	Upper	5	Quitman	1,120		Lake Fork	
Van Zandt	Upper	5	Edgewood	840		Lake Fork	
Van Zandt	Upper	5	MacBee WSC	2,240		Lake Fork	
Van Zandt	Upper	5	South Tawakoni WSC	560		Lake Fork	
Van Zandt	Upper	5	Canton	1,562		Mill Creek & unnamed trib	
Van Zandt	Upper	5	Wills Point	300		Magby Creek	

Appendix E: Water Supply Distribution by County

County	Basin		Entity	Surface Supply (AF/Y)	Groundwater Supply (AF/Y)	Source of Surface Supply	Comment
Van Zandt	Upper	5	Edgewood	317		Unnamed trib, Giladon	
Van Zandt	Upper	5	Grand Saline	399		Simmons	
Van Zandt	Upper	5	Tawakoni Plant	184		Lake Tawakoni	
Van Zandt	Upper	5	Various	494		Misc Run-of-River Rts	
Van Zandt	Upper	5	Total County	10,256	3,714		TWDB projected year 2000 Groundwater Use
Rains	Upper	6	Emory	1,120		Lake Tawakoni	
Rains	Upper	6	Emory	896		Lake Fork	
Rains	Upper	6	Combined Consumers WSC	1,500		Lake Fork & Tawakoni	Assumed 2/3 of service area, 1680 AF/Y Tawakoni & 560 AF/Y Lake Fork
Rains	Upper	6	Point	448		Lake Fork & Tawakoni	224 AF/Y from Tawakoni, 224 AF/Y Option from Lake Fork
Rains	Upper	6	Various	307		Misc Run-of-River Rts	
Rains	Upper	6	Total County	4,271	114		TWDB projected year 2000 Groundwater Use
Hopkins	Upper	7	Various	95		Misc Run-of-River Rts	
Hopkins	Upper	7	Total County	95	876		
Wood	Upper	8	Unassigned	169		Lake Fork	Unpermitted additional yield
Wood	Upper	8	Combined Consumers WSC	740		Lake Fork & Tawakoni	Assumed 1/3 of service area, 1680 AF/Y Tawakoni & 560 AF/Y Lake Fork
Wood	Upper	8	TU	7,000		Lake Fork	TU portion of its contract in Lake Fork assigned for power in Wood Co.
Wood	Upper	8	Dallas	120,000		Lake Fork	Dallas' water right in Lake Fork
Wood	Upper	8	Able Springs WSC	280		Lake Fork	Used in Trinity Basin
Wood	Upper	8	Various	2,353		Misc Run-of-River Rts	
Wood	Upper	8	Total County	130,542	6,551		Sabine portion of Wood Co (85%) estimated 1995 pumpage (TWDB East TX model)

Appendix E: Water Supply Distribution by County

County	Basin		Entity	Surface Supply (AF/Y)	Groundwater Supply (AF/Y)	Source of Surface Supply	Comment
Smith	Upper	9	Various	2,362		Misc Run-of-River Rts	
Smith	Upper	9	Total County	2,362	5,058		TWDB projected year 2000 Groundwater Use
Franklin	Upper	10		28		FCFWD1	Assume to be met by Franklin Co. Freshwater Supply Dist #1 in Cypress Basin
Upshur	Upper	11	Gladewater	3,358		Lake Gladewater	Current right is 1679 AF/Y; applying to increase use to 3358 AF (twice current right)
Upshur	Upper	11	Gladewater	1,081		Lake Gladewater	Additional yield; assume only 67% of total yield is available for future water supply.
Upshur	Upper	11	Various	1,130		Misc Run-of-River Rts	
Upshur	Upper	11	Total County	5,569	1,250		Sabine portion of Upshur Co (33%) estimated 1995 pumpage (TWDB East TX model)
Gregg	Upper	12	Longview	20,547		Sabine & Big Sandy	
Gregg	Upper	12	Longview	19,000		Lake Fork	
Gregg	Upper	12	Longview	10,500		Lake Cherokee	
Gregg	Upper	12	Longview	20,000		Lake O' the Pines	System to be on in 2002; would like to get more from LOP if available.
Gregg	Upper	12	Kilgore	6,721		Lake Fork	
Gregg	Upper	12	SWEPCO	2,000		Lake Cherokee	Knox Power Plant
Gregg	Upper	12	Various	334		Misc Run-of-River Rts	
Gregg	Upper	12	Total County	79,102	1,936		TWDB projected year 2000 Groundwater Use
Rusk	Upper	13	Henderson	4,033		Lake Fork	Assume 80% remains in Sabine Basin
Rusk	Upper	13	Henderson	1,008		Lake Fork	Assume 20% is used in Neches Basin
Rusk	Upper	13	TU	25,000		Lake Martin	
Rusk	Upper	13	TU	5,000		Lake Fork	TU reserves its portion of its contract in Lake Fork for future use at Lake Martin

Appendix E: Water Supply Distribution by County

County	Basin		Entity	Surface Supply (AF/Y)	Groundwater Supply (AF/Y)	Source of Surface Supply	Comment
Rusk	Upper	13	Various	1,555		Misc Run-of-River Rts	
Rusk	Upper	13	Total County	36,596	3,393		TWDB projected year 2000 Groundwater Use
Harrison	Upper	14	Longview	1,000		Lake Fork	
Harrison	Upper	14	Longview	5,500		Lake Cherokee	
Harrison	Upper	14	Marshall	16,000		Cypress Bayou	Interbasin Transfer from Cypress Basin
Harrison	Upper	14	SWEPCO	18,000		Brandy Branch	Interbasin transfer from Lake O' the Pines (Cypress Basin)
Harrison	Upper	14	Eastman Chem	3,500		Lake Fork	
Harrison	Upper	14	Eastman Chem	134,500		Run-of-River Rt	Diversion amount is 134,500 AF/Y, but consumption amount is 22,500 AF/Y
Harrison	Upper	14	Various	793		Misc Run-of-River Rts	
Harrison	Upper	14	Total County	179,293	2,606		TWDB projected year 2000 Groundwater Use
Panola	Upper	15	PCFWD1	22,400		Lake Murvaul	
Panola	Upper	15	PCFWD1	4,650		Lake Murvaul	Unpermitted additional yield
Panola	Upper	15	Various	1,123		Misc Run-of-River Rts	
Panola	Upper	15	Total County	28,173	3,661		TWDB projected year 2000 Groundwater Use
Shelby	Lower	16	City of Center	1,460		Lake Center on Mill Creek	
Shelby	Lower	16	City of Center	3,800		Pinkston Reservoir	Import from Neches. Portion is sold to Sandhills.
Shelby	Lower	16	Total - Portion of County	5,260	2,793		Sabine portion of Shelby Co (80%) estimated 1995 pumpage (TWDB East TX model)
San Augustine	Lower	17	Portion of County		103		TWDB projected year 2000 Groundwater Use

Appendix E: Water Supply Distribution by County

County	Basin		Entity	Surface Supply (AF/Y)	Groundwater Supply (AF/Y)	Source of Surface Supply	Comment
Sabine	Lower	18	Portion of County		368		TWDB projected year 2000 Groundwater Use
Jasper	Lower	19	Portion of Co.		1,838		TWDB projected year 2000 Groundwater Use
Newton	Lower	20	SRA	750,000		Toledo Bend Reservoir	
Newton	Lower	20	Various	285		Misc Run-of-River Rts	
Newton	Lower	20	Total County	750,285	4,144		TWDB projected year 2000 Groundwater Use
Orange	Lower	21	SRA	147,100		SRA Canal	
Orange	Lower	21	Various	67		Misc Run-of-River Rts	
Orange	Lower	21	Portion of County		9,243		TWDB projected year 2000 Groundwater Use
Orange	Lower	21	Rose City	478		Sabine Canal System	Exported to Neches Basin.
Orange	Lower	21	North Star Steel	4,480		Sabine Canal System	Exported to Neches Basin.
Orange	Lower	21	Entergy Power Plant	4,480		Sabine Canal System	Exported to Neches Basin.
Orange	Lower	21	Total County	156,605	9,243		

APPENDIX F
COST ESTIMATES



OPINION OF PROBABLE CONSTRUCTION COST

CARL L. ESTES RESERVOIR
SABINE RIVER AUTHORITY

ACCOUNT NO.	ESTIMATOR	CHECKED BY	DATE
SRA96425	JSV/JMC	JMN	December 14, 1998

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
COST SUMMARY					
1	CONSTRUCTION COST	1	LS	\$109,844,700.00	\$109,844,700.00
2	LAND ACQUISITION COST	1	LS	\$71,587,500.00	\$71,587,500.00
3	CONFLICT RESOLUTION COST	1	LS	\$36,681,620.00	\$36,681,620.00
4	ENVIRONMENTAL MITIGATION COST	1	LS	\$71,587,500.00	\$71,587,500.00
5	PERMIT AND STUDIES	1	LS	\$13,086,829.20	\$13,086,829.20
6	ENGINEERING FEES (4% OF ITEMS 1, 2, &3)	1	LS	\$8,724,552.80	\$8,724,552.80
				SUBTOTAL:	\$311,512,702.00
				CONTINGENCY:	20% \$62,302,500.00
PROJECT TOTAL					\$373,815,202.00



CONSTRUCTION COST DETAILS

CARL L. ESTES RESERVOIR
SABINE RIVER AUTHORITY

ACCOUNT NO.	ESTIMATOR	CHECKED BY	DATE
SRA96425	JSV/JMC	JMN	December 14, 1998

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
DAM EMBANKMENT					
					\$56,845,274.72
1	DIVERSION AND CARE OF WATER	1	LS	\$720,000.00	\$720,000.00
2	CLEARING AND GRUBBING	600	AC	\$864.00	\$518,400.00
3	EXCAVATION	3,303,333	CY	\$2.88	\$9,513,599.04
4	COMPACTED FILL	7,448,999	CY	\$2.88	\$21,453,117.12
5	IMPERVIOUS FILL (CORE)	2,194,332	CY	\$2.88	\$6,319,676.16
6	RIPRAP BEDDING	68,206	CY	\$21.60	\$1,473,249.60
7	RIPRAP	227,354	TON	\$43.20	\$9,821,692.80
8	SLURRY TRENCH	130,500	SF	\$5.76	\$751,680.00
9	EMBANKMENT DRAINAGE AND INSTRUMENTATION	1	LS	\$950,000.00	\$950,000.00
10	TOPSOIL	110,700	CY	\$14.40	\$1,594,080.00
11	HYDROMULCH	5,977,800	SF	\$0.10	\$597,780.00
12	ROADWAY	783,000	SF	\$4.00	\$3,132,000.00
SPILLWAY					
					\$34,123,380.00
1	CLEARING AND GRUBBING	5	AC	\$864.00	\$4,320.00
2	EXCAVATION	205,000	CY	\$2.88	\$590,400.00
3	PILES	260	EA	\$864.00	\$224,640.00
4	CONCRETE WEIR	30,000	CY	\$300.00	\$9,000,000.00
5	CONCRETE SLAB	900	CY	\$250.00	\$225,000.00
6	CONCRETE WALLS	2,300	CY	\$325.00	\$747,500.00
7	CONCRETE STILLING BASIN	2,500	CY	\$250.00	\$625,000.00
8	TAINTER GATES (40' x 35')	5	EA	\$924,000.00	\$4,620,000.00
9	SUPERSTRUCTURE AND HOISTS	1	LS	\$500,000.00	\$500,000.00
10	NON-OVERFLOW SECTION	52,600	CY	\$325.00	\$17,095,000.00
11	DRAINAGE SYSTEM	1	LS	\$70,000.00	\$70,000.00
12	RIPRAP BEDDING	1,200	CY	\$21.60	\$25,920.00
13	RIPRAP	8,200	TON	\$43.20	\$354,240.00
14	HYDROMULCH	44,000	SF	\$0.10	\$4,400.00
15	FENCING	600	LF	\$21.60	\$12,960.00
16	4'-0" x 8'-0" SLUICE GATES	2	EA	\$12,000.00	\$24,000.00

SUBTOTAL:	\$90,968,654.72
MOBILIZATION:	5% \$4,548,400.00
SUBTOTAL:	\$95,517,100.00
OH & P:	15% \$14,327,600.00

CONSTRUCTION COST TOTAL	\$109,844,700.00
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LAND ACQUISITION COST DETAILS

CARL L. ESTES RESERVOIR
SABINE RIVER AUTHORITY

ACCOUNT NO.	ESTIMATOR	CHECKED BY	DATE
SRA96425	JSV/JMC	JMN	December 14, 1998

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
LAND ACQUISITION COST					\$71,587,500.00
1	LAND ACQUISITION COST- 31125 AC	31,125	AC	\$2,300.00	\$71,587,500.00



CONFLICT RESOLUTION COST DETAILS

CARL L. ESTES RESERVOIR
SABINE RIVER AUTHORITY

ACCOUNT NO.	ESTIMATOR	CHECKED BY	DATE
SRA96425	JSV/JMC	JMN	December 14, 1998

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
CONFLICT RESOLUTION COST					\$36,681,620.00
1	MAIN HIGHWAYS	1	LS	\$21,848,000.00	\$21,848,000.00
2	LIGHT-DUTY ROADS (ASSUME 75% ABANDONED)	1	LS	\$5,322,500.00	\$5,322,500.00
3	UNIMPROVED ROADS (ASSUME ALL ABANDONED)	1	LS	\$0.00	\$0.00
4	PIPELINES	1	LS	\$5,275,000.00	\$5,275,000.00
5	POWER LINES	1	LS	\$3,498,600.00	\$3,498,600.00
6	OIL WELLS	1	LS	\$168,760.00	\$168,760.00
7	GAS WELLS	1	LS	\$168,760.00	\$168,760.00
8	DWELLINGS	1	LS	\$400,000.00	\$400,000.00



ENVIRONMENTAL MITIGATION COST DETAILS

CARL L. ESTES RESERVOIR
SABINE RIVER AUTHORITY

ACCOUNT NO.	ESTIMATOR	CHECKED BY	DATE
SRA96425	JSV/JMC	JMN	December 14, 1998

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
ENVIRONMENTAL MITIGATION COST					\$71,587,500.00
1	ENVIRONMENTAL MITIGATION COST (ASSUME EQUAL TO LAND ACQUISITION COST 1:1 RATIO)	1	LS	\$71,587,500.00	\$71,587,500.00



PERMIT AND STUDIES COST DETAILS

CARL L. ESTES RESERVOIR
SABINE RIVER AUTHORITY

ACCOUNT NO.	ESTIMATOR	CHECKED BY	DATE
SRA96425	JSV/JMC	JMN	December 14, 1998

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
PERMIT AND STUDIES					\$13,086,829.20
1	PERMIT AND STUDIES MEDIUM CLASSIFICATION (6% OF ITEMS 1, 2, & 3 ON SUMMARY SHEET)	1	LS	\$13,086,829.20	\$13,086,829.20



OPINION OF PROBABLE CONSTRUCTION COST

**BIG SANDY RESERVOIR
SABINE RIVER AUTHORITY**

ACCOUNT NO.	ESTIMATOR	CHECKED BY	DATE
SRA96425	JSV/JMC	JMN	December 14, 1998

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
COST SUMMARY					
1	CONSTRUCTION COST	1	LS	\$14,145,800.00	\$14,145,800.00
2	LAND ACQUISITION COST	1	LS	\$12,663,800.00	\$12,663,800.00
3	CONFLICT RESOLUTION COST	1	LS	\$21,768,800.00	\$21,768,800.00
4	ENVIRONMENTAL MITIGATION COST	1	LS	\$12,663,800.00	\$12,663,800.00
5	PERMIT AND STUDIES	1	LS	\$2,914,704.00	\$2,914,704.00
6	ENGINEERING FEES (10% OF ITEMS 1, 2, &3)	1	LS	\$4,857,840.00	\$4,857,840.00
				SUBTOTAL:	\$69,014,744.00
				CONTINGENCY:	20% \$13,802,900.00
PROJECT TOTAL					\$82,817,644.00



CONSTRUCTION COST DETAILS

BIG SANDY RESERVOIR
SABINE RIVER AUTHORITY

ACCOUNT NO.	ESTIMATOR	CHECKED BY	DATE
SRA96425	JSV/JMC	JMN	December 14, 1998

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
DAM EMBANKMENT					\$5,600,918.64
1	DIVERSION AND CARE OF WATER	1	LS	\$720,000.00	\$720,000.00
2	CLEARING AND GRUBBING	50	AC	\$864.00	\$43,200.00
3	EXCAVATION	273,944	CY	\$2.88	\$788,958.72
4	COMPACTED FILL	669,844	CY	\$2.88	\$1,929,150.72
5	RIPRAP BEDDING	5,647	CY	\$21.60	\$121,975.20
6	RIPRAP	18,824	TON	\$43.20	\$813,196.80
7	SLURRY TRENCH	10,900	SF	\$5.76	\$62,784.00
8	SOIL CEMENT	11,000	CY	\$28.80	\$316,800.00
9	EMBANKMENT DRAINAGE AND INSTRUMENTATION	1	LS	\$330,000.00	\$330,000.00
10	TOPSOIL	9,153	CY	\$14.40	\$131,803.20
11	HYDROMULCH	494,250	SF	\$0.10	\$49,425.00
12	ROADWAY	65,250	SF	\$4.50	\$293,625.00
SPILLWAY					\$5,183,952.00
1	CLEARING AND GRUBBING	5	AC	\$864.00	\$4,320.00
2	EXCAVATION	38,000	CY	\$2.88	\$109,440.00
3	PILES	308	EA	\$864.00	\$266,112.00
4	CONCRETE WEIR	950	CY	\$300.00	\$285,000.00
5	CONCRETE SLAB	460	CY	\$250.00	\$115,000.00
6	CONCRETE WALLS	2,280	CY	\$325.00	\$741,000.00
7	TAINTER GATES (45'x 23.6')	4	EA	\$715,000.00	\$2,860,000.00
8	SUPERSTRUCTURE AND HOISTS	1	LS	\$288,000.00	\$288,000.00
9	DRAINAGE SYSTEM	1	LS	\$73,000.00	\$73,000.00
10	RIPRAP BEDDING	1,700	CY	\$21.60	\$36,720.00
11	RIPRAP	9,000	TON	\$43.20	\$388,800.00
12	HYDROMULCH	36,000	SF	\$0.10	\$3,600.00
13	FENCING	600	LF	\$21.60	\$12,960.00
OUTLET WORKS					\$930,088.00
1	CONCRETE INTAKE STRUCTURE	130	CY	\$504.00	\$65,520.00
2	66" CONDUIT	500	LF	\$324.00	\$162,000.00
3	CONCRETE STILLING BASIN	2,300	CY	\$250.00	\$575,000.00
4	RIPRAP	120	TON	\$43.20	\$5,184.00
5	EXCAVATION	4,300	CY	\$2.88	\$12,384.00
6	GATES AND ACCESS BRIDGE	1	LS	\$110,000.00	\$110,000.00
SUBTOTAL:					\$11,714,958.64
MOBILIZATION: 5%					\$585,700.00
SUBTOTAL:					\$12,300,700.00
OH & P: 15%					\$1,845,100.00
CONSTRUCTION COST TOTAL					\$14,145,800.00



LAND ACQUISITION COST DETAILS

BIG SANDY RESERVOIR
SABINE RIVER AUTHORITY

ACCOUNT NO.	ESTIMATOR	CHECKED BY	DATE
SRA96425	JSV/JMC	JMN	December 14, 1998

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
LAND ACQUISITION COST					\$12,663,800.00
1	LAND ACQUISITION COST- 5506 AC	5,506	LS	\$2,300.00	\$12,663,800.00



CONFLICT RESOLUTION COST DETAILS

BIG SANDY RESERVOIR
SABINE RIVER AUTHORITY

ACCOUNT NO.	ESTIMATOR	CHECKED BY	DATE
SRA96425	JSV/JMC	JMN	December 14, 1998

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
CONFLICT RESOLUTION COST					\$21,768,800.00
1	MAIN HIGHWAYS	1	LS	\$15,048,000.00	\$15,048,000.00
2	LIGHT-DUTY ROADS (ASSUME 75% ABANDONED)	1	LS	\$3,352,000.00	\$3,352,000.00
3	UNIMPROVED ROADS (ASSUME ALL ABANDONED)	1	LS	\$0.00	\$0.00
4	PIPELINES	1	LS	\$2,125,000.00	\$2,125,000.00
5	OIL WELLS	1	LS	\$843,800.00	\$843,800.00
6	DWELLINGS	1	LS	\$400,000.00	\$400,000.00



ENVIRONMENTAL MITIGATION COST DETAILS

**BIG SANDY RESERVOIR
SABINE RIVER AUTHORITY**

ACCOUNT NO.	ESTIMATOR	CHECKED BY	DATE
SRA96425	JSV/JMC	JMN	December 14, 1998

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
ENVIRONMENTAL MITIGATION COST					\$12,663,800.00
1	ENVIRONMENTAL MITIGATION COST (ASSUME EQUAL TO LAND ACQUISITION COST 1:1 RATIO)	1	LS	\$12,663,800.00	\$12,663,800.00



PERMIT AND STUDIES COST DETAILS

**BIG SANDY RESERVOIR
SABINE RIVER AUTHORITY**

ACCOUNT NO.	ESTIMATOR	CHECKED BY	DATE
SRA96425	JSV/JMC	JMN	December 14, 1998

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
PERMIT AND STUDIES					\$2,914,704.00
1	PERMIT AND STUDIES MEDIUM CLASSIFICATION (6% OF ITEMS 1, 2, & 3 ON SUMMARY SHEET)	1	LS	\$2,914,704.00	\$2,914,704.00



OPINION OF PROBABLE CONSTRUCTION COST

**WATERS BLUFF RESERVOIR
SABINE RIVER AUTHORITY**

ACCOUNT NO.	ESTIMATOR	CHECKED BY	DATE
SRA96425	JSV/JMC	JMN	December 14, 1998

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
COST SUMMARY					
1	CONSTRUCTION COST	1	LS	\$71,974,600.00	\$71,974,600.00
2	LAND ACQUISITION COST	1	LS	\$104,638,500.00	\$104,638,500.00
3	CONFLICT RESOLUTION COST	1	LS	\$89,443,640.00	\$89,443,640.00
4	ENVIRONMENTAL MITIGATION COST	1	LS	\$104,638,500.00	\$104,638,500.00
5	PERMIT AND STUDIES	1	LS	\$26,605,674.00	\$26,605,674.00
6	ENGINEERING FEES (4% OF ITEMS 1, 2, & 3)	1	LS	\$10,642,269.60	\$10,642,269.60
				SUBTOTAL:	\$407,943,183.60
				CONTINGENCY:	20% \$81,588,600.00
PROJECT TOTAL					\$489,531,783.60



CONSTRUCTION COST DETAILS

WATERS BLUFF RESERVOIR
SABINE RIVER AUTHORITY

ACCOUNT NO.	ESTIMATOR	CHECKED BY	DATE
SRA96425	JSV/JMC	JMN	December 14, 1998

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
DAM EMBANKMENT					\$7,790,404.00
1	DIVERSION AND CARE OF WATER	1	LS	\$1,278,000.00	\$1,278,000.00
2	CLEARING AND GRUBBING	90	AC	\$532.50	\$47,925.00
3	EXCAVATION	860,200	CY	\$2.84	\$2,442,968.00
4	RANDOM FILL	716,400	CY	\$0.85	\$610,372.80
5	IMPERVIOUS EMBANKMENT CORE	329,100	CY	\$0.85	\$280,393.20
6	SOIL CEMENT	55,450	CY	\$24.14	\$1,338,563.00
7	FILTER MATERIAL	78,500	CY	\$17.04	\$1,337,640.00
8	ACCESS ROAD AND ROAD ON DAM	32,200	SY	\$6.39	\$205,758.00
9	STRIPPING AND INSPECTION TRENCH	116,800	CY	\$2.13	\$248,784.00
SPILLWAY					\$51,815,921.80
1	SILL CONCRETE	24,850	CY	\$200.00	\$4,970,000.00
2	PIER CONCRETE	19,300	CY	\$250.00	\$4,825,000.00
3	BASIN CONCRETE	22,340	CY	\$250.00	\$5,585,000.00
4	TRAINING WALL CONCRETE	18,800	CY	\$325.00	\$6,110,000.00
5	CEMENT	24,740	TON	\$106.50	\$2,634,810.00
6	REINFORCING STEEL	5,700	TON	\$1,136.00	\$6,475,200.00
7	TANTER GATES (40' x 28') **	11	EA	\$742,500.00	\$8,167,500.00
8	GATE ANCHORAGE	1	LS	\$976,960.00	\$976,960.00
9	GATE MACHINERY	1	LS	\$2,577,300.00	\$2,577,300.00
9	MAINTENANCE BULKHEADS	110,000	LB	\$4.26	\$468,600.00
10	MISC. METALS AND EMBEDS	233,450	LB	\$5.68	\$1,325,996.00
11	SPILLWAY BRIDGE	1	LS	\$535,340.00	\$535,340.00
12	FOUNDATION DRAINAGE	1	LS	\$1,299,300.00	\$1,299,300.00
13	APPROACH SLAB	9,450	CY	\$250.00	\$2,362,500.00
14	STONE PROTECTION	31,850	TON	\$65.32	\$2,080,442.00
15	GRADED FILTER RIPRAP	4,950	CY	\$17.04	\$84,348.00
16	UPSTREAM IMPERVIOUS BLANKET	11,650	CY	\$0.85	\$9,925.80
17	NON-OVERFLOW SECTION	1	LS	\$1,327,700.00	\$1,327,700.00
SUBTOTAL:					\$59,606,325.80
MOBILIZATION: 5%					\$2,980,300.00
SUBTOTAL:					\$62,586,600.00
OH & P: 15%					\$9,388,000.00

CONSTRUCTION COST TOTAL **\$71,974,600.00**

NOTE: COST ADJUSTED FROM OCTOBER 1985 TO DECEMBER 1998

** PRICE QUOTE FROM SUPPLIER



LAND ACQUISITION COST DETAILS

**WATERS BLUFF RESERVOIR
SABINE RIVER AUTHORITY**

ACCOUNT NO.	ESTIMATOR	CHECKED BY	DATE
SRA96425	JSV/JMC	JMN	December 14, 1998

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
LAND ACQUISITION COST					\$104,638,500.00
1	LAND ACQUISITION COST- 45,495 AC	45,495	AC	\$2,300.00	\$104,638,500.00



CONFLICT RESOLUTION COST DETAILS

WATERS BLUFF RESERVOIR
SABINE RIVER AUTHORITY

ACCOUNT NO.	ESTIMATOR	CHECKED BY	DATE
SRA96425	JSV/JMC	JMN	December 14, 1998

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
CONFLICT RESOLUTION COST					\$89,443,640.00
1	MAIN HIGHWAYS	1	LS	\$38,008,000.00	\$38,008,000.00
2	LIGHT-DUTY ROADS (ASSUME 75% ABANDONED)	1	LS	\$9,582,500.00	\$9,582,500.00
3	UNIMPROVED ROADS (ASSUME ALL ABANDONED)	1	LS	\$0.00	\$0.00
4	PIPELINES	1	LS	\$17,175,000.00	\$17,175,000.00
5	POWER LINES	1	LS	\$1,500,000.00	\$1,500,000.00
6	RAILROADS	1	LS	\$9,250,000.00	\$9,250,000.00
7	OIL WELLS	1	LS	\$253,140.00	\$253,140.00
8	DWELLINGS	1	LS	\$1,000,000.00	\$1,000,000.00
9	FISH HATCHERY	1	LS	\$750,000.00	\$750,000.00
10	PUMP STATION	1	LS	\$1,250,000.00	\$1,250,000.00
11	AQUADUCT	1	LS	\$1,850,000.00	\$1,850,000.00
12	WATER / WASTEWATER PLANT	1	LS	\$8,750,000.00	\$8,750,000.00
13	GAGING STATION	1	LS	\$75,000.00	\$75,000.00



ENVIRONMENTAL MITIGATION COST DETAILS

WATERS BLUFF RESERVOIR
SABINE RIVER AUTHORITY

ACCOUNT NO.	ESTIMATOR	CHECKED BY	DATE
SRA96425	JSV/JMC	JMN	December 14, 1998

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
ENVIRONMENTAL MITIGATION COST					\$104,638,500.00
1	ENVIRONMENTAL MITIGATION COST (ASSUME EQUAL TO LAND ACQUISITION COST 1:1 RATIO)	1	LS	\$104,638,500.00	\$104,638,500.00



PERMIT AND STUDIES COST DETAILS

**WATERS BLUFF RESERVOIR
SABINE RIVER AUTHORITY**

ACCOUNT NO.	ESTIMATOR	CHECKED BY	DATE
SRA96425	JSV/JMC	JMN	December 14, 1998

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
PERMIT AND STUDIES					\$26,605,674.00
1	PERMIT AND STUDIES HIGH CLASSIFICATION (10% OF ITEMS 1, 2, & 3 ON SUMMARY SHEET)	1	LS	\$26,605,674.00	\$26,605,674.00



OPINION OF PROBABLE CONSTRUCTION COST

PRAIRIE CREEK RESERVOIR
SABINE RIVER AUTHORITY

ACCOUNT NO.	ESTIMATOR	CHECKED BY	DATE
SRA96425	JSV/JMC	JMN	December 14, 1998

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
COST SUMMARY					
1	CONSTRUCTION COST	1	LS	\$18,184,400.00	\$18,184,400.00
2	LAND ACQUISITION COST	1	LS	\$6,555,000.00	\$6,555,000.00
3	CONFLICT RESOLUTION COST	1	LS	\$10,848,540.00	\$10,848,540.00
4	ENVIRONMENTAL MITIGATION COST	1	LS	\$6,555,000.00	\$6,555,000.00
5	PERMIT AND STUDIES	1	LS	\$711,758.80	\$711,758.80
6	ENGINEERING FEES (10% OF ITEMS 1, 2, & 3)	1	LS	\$3,558,794.00	\$3,558,794.00
				SUBTOTAL:	\$46,413,492.80
				CONTINGENCY:	20% \$9,282,700.00
PROJECT TOTAL					\$55,696,192.80



CONSTRUCTION COST DETAILS

PRAIRIE CREEK RESERVOIR
SABINE RIVER AUTHORITY

ACCOUNT NO.	ESTIMATOR	CHECKED BY	DATE
SRA96425	JSV/JMC	JMN	December 14, 1998

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
DAM EMBANKMENT					\$8,462,016.00
1	DIVERSION AND CARE OF WATER	1	LS	\$720,000.00	\$720,000.00
2	CLEARING AND GRUBBING	33	AC	\$864.00	\$28,512.00
3	EXCAVATION	53,200	CY	\$2.88	\$153,216.00
4	COMPACTED FILL	1,362,000	CY	\$2.88	\$3,922,560.00
5	SLURRY TRENCH	173,000	SF	\$5.76	\$996,480.00
6	SOIL CEMENT	65,800	CY	\$28.80	\$1,895,040.00
7	EMBANKMENT DRAINAGE AND INSTRUMENTATION	1	LS	\$423,360.00	\$423,360.00
8	TOPSOIL	10,100	CY	\$14.40	\$145,440.00
9	HYDROMULCH	660,000	SF	\$0.10	\$66,528.00
10	ROADWAY	1	LS	\$110,880.00	\$110,880.00
SPILLWAY					\$6,144,590.00
1	CLEARING AND GRUBBING	10	AC	\$864.00	\$8,640.00
2	EXCAVATION	356,000	CY	\$2.88	\$1,025,280.00
3	PILES	590	EA	\$864.00	\$509,760.00
4	CONCRETE WEIR	1,330	CY	\$300.00	\$399,000.00
5	CONCRETE SLAB	2,200	CY	\$250.00	\$550,000.00
6	CONCRETE WALLS	7,190	CY	\$325.00	\$2,336,750.00
7	TAINTER GATES (24' x 20') **	2	EA	\$319,000.00	\$638,000.00
8	SUPERSTRUCTURE AND HOISTS	1	LS	\$144,000.00	\$144,000.00
9	DRAINAGE SYSTEM	1	LS	\$72,000.00	\$72,000.00
10	RIPRAP BEDDING	960	CY	\$21.60	\$20,736.00
11	RIPRAP	9,620	TON	\$43.20	\$415,584.00
12	HYDROMULCH	75,000	SF	\$0.10	\$7,560.00
13	FENCING	800	LF	\$21.60	\$17,280.00
OUTLET WORKS					\$452,848.00
1	CONCRETE INTAKE STRUCTURE	250	CY	\$504.00	\$126,000.00
2	66" CONDUIT	500	LF	\$324.00	\$162,000.00
3	CONCRETE STILLING BASIN	160	CY	\$250.00	\$40,000.00
4	RIPRAP	110	TON	\$43.20	\$4,752.00
5	EXCAVATION	4,200	CY	\$2.88	\$12,096.00
6	GATES AND ACCESS BRIDGE	1	LS	\$108,000.00	\$108,000.00
SUBTOTAL:					\$15,059,454.00
MOBILIZATION: 5%					\$753,000.00
SUBTOTAL:					\$15,812,500.00
OH & P: 15%					\$2,371,900.00
CONSTRUCTION COST TOTAL					\$18,184,400.00

NOTE: COST ADJUSTED FROM JUNE 1984 TO DECEMBER 1998.
** PRICE QUOTE FROM SUPPLIER



LAND ACQUISITION COST DETAILS

**PRAIRIE CREEK RESERVOIR
SABINE RIVER AUTHORITY**

ACCOUNT NO.	ESTIMATOR	CHECKED BY	DATE
SRA96425	JSV/JMC	JMN	December 14, 1998

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
LAND ACQUISITION COST					\$6,555,000.00
1	LAND ACQUISITION COST- 2850 AC	2,850	AC	\$2,300.00	\$6,555,000.00



CONFLICT RESOLUTION COST DETAILS

PRAIRIE CREEK RESERVOIR
SABINE RIVER AUTHORITY

ACCOUNT NO.	ESTIMATOR	CHECKED BY	DATE
SRA96425	JSV/JMC	JMN	December 14, 1998

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
CONFLICT RESOLUTION COST					\$10,848,540.00
1	MAIN HIGHWAYS	1	LS	\$8,452,500.00	\$8,452,500.00
2	LIGHT-DUTY ROADS (ASSUME 75% ABANDONED)	1	LS	\$1,546,000.00	\$1,546,000.00
3	UNIMPROVED ROADS (ASSUME ALL ABANDONED)	1	LS	\$0.00	\$0.00
4	OIL WELLS	1	LS	\$675,040.00	\$675,040.00
5	DWELLINGS	1	LS	\$175,000.00	\$175,000.00



ENVIRONMENTAL MITIGATION COST DETAILS

PRAIRIE CREEK RESERVOIR
SABINE RIVER AUTHORITY

ACCOUNT NO.	ESTIMATOR	CHECKED BY	DATE
SRA96425	JSV/JMC	JMN	December 14, 1998

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
ENVIRONMENTAL MITIGATION COST					\$6,555,000.00
1	ENVIRONMENTAL MITIGATION COST (ASSUME EQUAL TO LAND ACQUISITION COST 1:1 RATIO)	1	LS	\$6,555,000.00	\$6,555,000.00



PERMIT AND STUDIES COST DETAILS

**PRAIRIE CREEK RESERVOIR
SABINE RIVER AUTHORITY**

ACCOUNT NO.	ESTIMATOR	CHECKED BY	DATE
SRA96425	JSV/JMC	JMN	December 14, 1998

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
PERMIT AND STUDIES					\$711,758.80
1	PERMIT AND STUDIES LOW CLASSIFICATION (2% OF ITEMS 1, 2, & 3 ON SUMMARY SHEET)	1	LS	\$711,758.80	\$711,758.80



OPINION OF PROBABLE CONSTRUCTION COST

STATE HWY 322 (STAGE I & II)
SABINE RIVER AUTHORITY

ACCOUNT NO.	ESTIMATOR	CHECKED BY	DATE
SRA96425	JSV/JMC	JMN	December 14, 1998

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
COST SUMMARY					
1	CONSTRUCTION COST	1	LS	\$43,844,200.00	\$43,844,200.00
2	LAND ACQUISITION COST	1	LS	\$18,715,100.00	\$18,715,100.00
3	CONFLICT RESOLUTION COST	1	LS	\$15,574,380.00	\$15,574,380.00
4	ENVIRONMENTAL MITIGATION COST	1	LS	\$18,715,100.00	\$18,715,100.00
5	PERMIT AND STUDIES	1	LS	\$1,562,673.60	\$1,562,673.60
6	ENGINEERING FEES (10% OF ITEMS 1, 2, &3)	1	LS	\$7,813,368.00	\$7,813,368.00
				SUBTOTAL:	\$106,224,821.60
				CONTINGENCY:	20% \$21,245,000.00
PROJECT TOTAL					\$127,469,821.60



CONSTRUCTION COST DETAILS

STATE HWY 322 (STAGE I & II)
SABINE RIVER AUTHORITY

ACCOUNT NO.	ESTIMATOR	CHECKED BY	DATE
SRA96425	JSV/JMC	JMN	December 14, 1998

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
DAM EMBANKMENT					\$16,517,859.44
1	DIVERSION AND CARE OF WATER	1	LS	\$720,000.00	\$720,000.00
2	CLEARING AND GRUBBING	214	AC	\$864.00	\$184,896.00
3	EXCAVATION	863,516	CY	\$2.88	\$2,486,926.08
4	COMPACTED FILL	1,781,657	CY	\$2.88	\$5,131,172.16
5	RIPRAP BEDDING	12,300	CY	\$21.60	\$265,680.00
6	RIPRAP	41,000	TON	\$43.20	\$1,771,200.00
7	SLURRY TRENCH	550,000	SF	\$5.76	\$3,168,000.00
8	SOIL CEMENT	54,600	CY	\$28.80	\$1,572,480.00
9	EMBANKMENT DRAINAGE AND INSTRUMENTATION	1	LS	\$423,360.00	\$423,360.00
10	TOPSOIL	27,708	CY	\$14.40	\$398,995.20
11	HYDROMULCH	1,496,300	SF	\$0.10	\$149,630.00
12	ROADWAY	186,000	SF	\$1.32	\$245,520.00
SPILLWAY					\$12,375,480.00
1	CLEARING AND GRUBBING	10	AC	\$864.00	\$8,640.00
2	EXCAVATION	50,000	CY	\$2.88	\$144,000.00
3	CONCRETE WEIR	1,950	CY	\$300.00	\$585,000.00
4	CONCRETE SLAB	22,400	CY	\$250.00	\$5,600,000.00
5	CONCRETE WALLS	13,400	CY	\$325.00	\$4,355,000.00
6	RIPRAP BEDDING	5,400	CY	\$21.60	\$116,640.00
7	RIPRAP	36,000	TON	\$43.20	\$1,555,200.00
8	HYDROMULCH	110,000	SF	\$0.10	\$11,000.00
OUTLET WORKS					\$7,416,560.00
1	CONCRETE INTAKE STRUCTURE (42" CONDUIT)	130	CY	\$504.00	\$65,520.00
2	42" CONDUIT	420	LF	\$324.00	\$136,080.00
3	CONCRETE INTAKE STRUCTURE (36" CONDUIT)	115	CY	\$504.00	\$57,960.00
4	36" CONDUIT	350	LF	\$324.00	\$113,400.00
5	CONCRETE STILLING BASIN	26,800	CY	\$250.00	\$6,700,000.00
6	RIPRAP	1,500	TON	\$43.20	\$64,800.00
7	EXCAVATION	10,000	CY	\$2.88	\$28,800.00
8	GATES AND ACCESS BRIDGE	1	LS	\$250,000.00	\$250,000.00
SUBTOTAL:					\$36,309,899.44
MOBILIZATION: 5%					\$1,815,500.00
SUBTOTAL:					\$38,125,400.00
OH & P: 15%					\$5,718,800.00
CONSTRUCTION COST TOTAL					\$43,844,200.00



LAND ACQUISITION COST DETAILS

STATE HWY 322 (STAGE I & II)
SABINE RIVER AUTHORITY

ACCOUNT NO.	ESTIMATOR	CHECKED BY	DATE
SRA96425	JSV/JMC	JMN	December 14, 1998

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
LAND ACQUISITION COST					\$18,715,100.00
1	LAND ACQUISITION COST- 8137 AC (STAGE I AND STAGE II)	8,137	AC	\$2,300.00	\$18,715,100.00



CONFLICT RESOLUTION COST DETAILS

STATE HWY 322 (STAGE I & II)
SABINE RIVER AUTHORITY

ACCOUNT NO.	ESTIMATOR	CHECKED BY	DATE
SRA96425	JSV/JMC	JMN	December 14, 1998

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
CONFLICT RESOLUTION COST					\$15,574,380.00
1	MAIN HIGHWAYS	1	LS	\$11,902,500.00	\$11,902,500.00
2	LIGHT-DUTY ROADS (ASSUME 75% ABANDONED)	1	LS	\$3,187,500.00	\$3,187,500.00
3	UNIMPROVED ROADS (ASSUME ALL ABANDONED)	1	LS	\$0.00	\$0.00
4	PIPELINES	1	LS	\$275,000.00	\$275,000.00
5	GAS WELLS	1	LS	\$84,380.00	\$84,380.00
6	DWELLINGS	1	LS	\$125,000.00	\$125,000.00



ENVIRONMENTAL MITIGATION COST DETAILS

STATE HWY 322 (STAGE I & II)
SABINE RIVER AUTHORITY

ACCOUNT NO.	ESTIMATOR	CHECKED BY	DATE
SRA96425	JSV/JMC	JMN	December 14, 1998

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
ENVIRONMENTAL MITIGATION COST					\$18,715,100.00
1	ENVIRONMENTAL MITIGATION COST (ASSUME EQUAL TO LAND ACQUISITION COST 1:1 RATIO)	1	LS	\$18,715,100.00	\$18,715,100.00



PERMIT AND STUDIES COST DETAILS

STATE HWY 322 (STAGE I & II)
SABINE RIVER AUTHORITY

ACCOUNT NO.	ESTIMATOR	CHECKED BY	DATE
SRA96425	JSV/JMC	JMN	December 14, 1998

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
PERMIT AND STUDIES					\$1,562,673.60
1	PERMIT AND STUDIES LOW CLASSIFICATION (2% OF ITEMS 1, 2, & 3 ON SUMMARY SHEET)	1	LS	\$1,562,673.60	\$1,562,673.60



OPINION OF PROBABLE CONSTRUCTION COST

**CARTHAGE RESERVOIR
SABINE RIVER AUTHORITY**

ACCOUNT NO.	ESTIMATOR	CHECKED BY	DATE
SRA96425	JSV/JMC	JMN	December 14, 1998

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
COST SUMMARY					
1	CONSTRUCTION COST	1	LS	\$42,309,200.00	\$42,309,200.00
2	LAND ACQUISITION COST	1	LS	\$118,450,000.00	\$118,450,000.00
3	CONFLICT RESOLUTION COST	1	LS	\$97,791,620.00	\$97,791,620.00
4	ENVIRONMENTAL MITIGATION COST	1	LS	\$118,450,000.00	\$118,450,000.00
5	PERMIT AND STUDIES	1	LS	\$25,855,082.00	\$25,855,082.00
6	ENGINEERING FEES (4% OF ITEMS 1, 2, &3)	1	LS	\$10,342,032.80	\$10,342,032.80
SUBTOTAL:					\$413,197,934.80
CONTINGENCY:					20% \$82,639,600.00
PROJECT TOTAL					\$495,837,534.80



CONSTRUCTION COST DETAILS

CARTHAGE RESERVOIR
SABINE RIVER AUTHORITY

ACCOUNT NO.	ESTIMATOR	CHECKED BY	DATE
SRA96425	JSV/JMC	JMN	December 14, 1998

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
DAM EMBANKMENT					\$24,967,341.92
1	DIVERSION AND CARE OF WATER	1	LS	\$720,000.00	\$720,000.00
2	CLEARING AND GRUBBING	420	AC	\$864.00	\$362,880.00
3	EXCAVATION	1,483,258	CY	\$2.88	\$4,271,783.04
4	COMPACTED FILL	2,863,406	CY	\$2.88	\$8,246,609.28
5	RIPRAP BEDDING	30,951	CY	\$21.60	\$668,541.60
6	RIPRAP	103,172	TON	\$43.20	\$4,457,030.40
7	SLURRY TRENCH	91,600	SF	\$5.76	\$527,616.00
8	SOIL CEMENT	82,300	CY	\$28.80	\$2,370,240.00
9	EMBANKMENT DRAINAGE AND INSTRUMENTATION	1	LS	\$700,000.00	\$700,000.00
10	TOPSOIL	50,194	CY	\$14.40	\$722,793.60
11	HYDROMULCH	2,710,480	SF	\$0.10	\$271,048.00
12	ROADWAY	366,400	SF	\$4.50	\$1,648,800.00
SPILLWAY					\$10,071,352.00
1	CLEARING AND GRUBBING	11	AC	\$864.00	\$9,504.00
2	EXCAVATION	53,600	CY	\$2.88	\$154,368.00
3	PILES	650	EA	\$864.00	\$561,600.00
4	CONCRETE WEIR	1,680	CY	\$300.00	\$504,000.00
5	CONCRETE SLAB	1,230	CY	\$250.00	\$307,500.00
6	CONCRETE WALLS	2,040	CY	\$325.00	\$663,000.00
6	CONCRETE STILLING BASIN	5,500	CY	\$250.00	\$1,375,000.00
7	TAINTER GATES (40' x 20')	10	EA	\$528,000.00	\$5,280,000.00
8	SUPERSTRUCTURE AND HOISTS	1	LS	\$800,000.00	\$800,000.00
9	DRAINAGE SYSTEM	1	LS	\$130,000.00	\$130,000.00
10	RIPRAP BEDDING	1,250	CY	\$21.60	\$27,000.00
11	RIPRAP	5,400	TON	\$43.20	\$233,280.00
12	HYDROMULCH	1,800	SF	\$0.10	\$180.00
13	FENCING	1,200	LF	\$21.60	\$25,920.00
SUBTOTAL:					\$35,038,693.92
MOBILIZATION: 5%					\$1,751,900.00
SUBTOTAL:					\$36,790,600.00
OH & P: 15%					\$5,518,600.00

CONSTRUCTION COST TOTAL	\$42,309,200.00
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LAND ACQUISITION COST DETAILS

**CARTHAGE RESERVOIR
SABINE RIVER AUTHORITY**

ACCOUNT NO.	ESTIMATOR	CHECKED BY	DATE
SRA96425	JSV/JMC	JMN	December 14, 1998

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
LAND ACQUISITION COST					\$118,450,000.00
1	LAND ACQUISITION COST- 51,500 AC	51,500	AC	\$2,300.00	\$118,450,000.00



CONFLICT RESOLUTION COST DETAILS

CARTHAGE RESERVOIR
SABINE RIVER AUTHORITY

ACCOUNT NO.	ESTIMATOR	CHECKED BY	DATE
SRA96425	JSV/JMC	JMN	December 14, 1998

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
CONFLICT RESOLUTION COST					\$97,791,620.00
1	MAIN HIGHWAYS	1	LS	\$49,208,000.00	\$49,208,000.00
2	LIGHT-DUTY ROADS (ASSUME 75% ABANDONED)	1	LS	\$16,370,000.00	\$16,370,000.00
3	UNIMPROVED ROADS (ASSUME ALL ABANDONED)	1	LS	\$0.00	\$0.00
4	PIPELINES	1	LS	\$9,637,500.00	\$9,637,500.00
5	POWER LINES	1	LS	\$15,351,000.00	\$15,351,000.00
6	RAILROADS	1	LS	\$1,700,000.00	\$1,700,000.00
7	OIL WELLS	1	LS	\$1,181,320.00	\$1,181,320.00
8	GAS WELLS	1	LS	\$843,800.00	\$843,800.00
9	DWELLINGS	1	LS	\$450,000.00	\$450,000.00
10	CEMETERIES	1	LS	\$750,000.00	\$750,000.00
11	FISH FARM	1	LS	\$300,000.00	\$300,000.00
12	POWER PLANT	1	LS	\$2,000,000.00	\$2,000,000.00



ENVIRONMENTAL MITIGATION COST DETAILS

**CARTHAGE RESERVOIR
SABINE RIVER AUTHORITY**

ACCOUNT NO.	ESTIMATOR	CHECKED BY	DATE
SRA96425	JSV/JMC	JMN	December 14, 1998

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
ENVIRONMENTAL MITIGATION COST					\$118,450,000.00
1	ENVIRONMENTAL MITIGATION COST (ASSUME EQUAL TO LAND ACQUISITION COST 1:1 RATIO)	1	LS	\$118,450,000.00	\$118,450,000.00



PERMIT AND STUDIES COST DETAILS

**CARTHAGE RESERVOIR
SABINE RIVER AUTHORITY**

ACCOUNT NO.	ESTIMATOR	CHECKED BY	DATE
SRA96425	JSV/JMC	JMN	December 14, 1998

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
PERMIT AND STUDIES					\$25,855,082.00
1	PERMIT AND STUDIES HIGH CLASSIFICATION (10% OF ITEMS 1, 2, & 3 ON SUMMARY SHEET)	1	LS	\$25,855,082.00	\$25,855,082.00



OPINION OF PROBABLE CONSTRUCTION COST

TOLEDO BEND PIPELINE
 SABINE RIVER AUTHORITY
 PRAIRIE CREEK - 87 mile pipeline

ACCOUNT NO.	ESTIMATOR	CHECKED BY	DATE
SRA96425			February 22, 1999

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
OPTION 1 - 60" PIPELINE - 50,000 ACRE-FEET PER YEAR					
	PIPELINE	459,360	LF	\$127	\$58,338,720
	PUMP STATIONS	1	LS	\$6,100,000	\$6,100,000
	RIGHT-OF-WAY	1	LS	\$1,687,273	\$1,687,273
	CONFLICTS	1	LS	\$1,427,440	\$1,427,440
SUBTOTAL:					\$67,553,433
ENGINEERING: 7%					\$4,728,740
SUBTOTAL:					\$72,282,173
CONTINGENCY: 20%					\$14,456,435

PROJECT TOTAL (OPTION 1) \$86,738,608

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
OPTION 2 - 66" PIPELINE - 75,000 ACRE-FEET PER YEAR					
	PIPELINE	459,360	LF	\$158	\$72,578,880
	PUMP STATIONS	1	LS	\$8,200,000	\$8,200,000
	RIGHT-OF-WAY	1	LS	\$1,687,273	\$1,687,273
	CONFLICTS	1	LS	\$1,427,440	\$1,427,440
SUBTOTAL:					\$83,893,593
ENGINEERING: 7%					\$5,872,552
SUBTOTAL:					\$89,766,145
CONTINGENCY: 20%					\$17,953,229

PROJECT TOTAL (OPTION 2) \$107,719,374

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
OPTION 3 - 90" PIPELINE - 100,000 ACRE-FEET PER YEAR					
	PIPELINE	459,360	LF	\$234	\$107,490,240
	PUMP STATIONS	1	LS	\$7,800,000	\$7,800,000
	RIGHT-OF-WAY	1	LS	\$1,687,273	\$1,687,273
	CONFLICTS	1	LS	\$1,879,040	\$1,879,040
SUBTOTAL:					\$118,856,553
ENGINEERING: 7%					\$8,319,959
SUBTOTAL:					\$127,176,512
CONTINGENCY: 20%					\$25,435,302

PROJECT TOTAL (OPTION 3) \$152,611,814



OPINION OF PROBABLE CONSTRUCTION COST

TOLEDO BEND PIPELINE
 SABINE RIVER AUTHORITY
 HIGHWAY 322 - 65 mile pipeline

ACCOUNT NO.	ESTIMATOR	CHECKED BY	DATE
SRA96425			February 22, 1999

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
OPTION 1 - 60" PIPELINE - 50,000 ACRE-FEET PER YEAR					
	PIPELINE	343,200	LF	\$127	\$43,586,400
	PUMP STATIONS	1	LS	\$5,800,000	\$5,800,000
	RIGHT-OF-WAY	1	LS	\$1,260,606	\$1,260,606
	CONFLICTS	1	LS	\$895,360	\$895,360
SUBTOTAL:					\$51,542,366
ENGINEERING: 7%					\$3,607,966
SUBTOTAL:					\$55,150,332
CONTINGENCY: 20%					\$11,030,066

PROJECT TOTAL (OPTION 1) \$66,180,398

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
OPTION 2 - 78" PIPELINE - 75,000 ACRE-FEET PER YEAR					
	PIPELINE	343,200	LF	\$205	\$70,356,000
	PUMP STATIONS	1	LS	\$6,600,000	\$6,600,000
	RIGHT-OF-WAY	1	LS	\$1,260,606	\$1,260,606
	CONFLICTS	1	LS	\$895,360	\$895,360
SUBTOTAL:					\$79,111,966
ENGINEERING: 7%					\$5,537,838
SUBTOTAL:					\$84,649,804
CONTINGENCY: 20%					\$16,929,961

PROJECT TOTAL (OPTION 2) \$101,579,765

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
OPTION 3 - 90" PIPELINE - 100,000 ACRE-FEET PER YEAR					
	PIPELINE	343,200	LF	\$234	\$80,308,800
	PUMP STATIONS	1	LS	\$7,800,000	\$7,600,000
	RIGHT-OF-WAY	1	LS	\$1,687,273	\$1,260,606
	CONFLICTS	1	LS	\$1,879,040	\$1,179,360
SUBTOTAL:					\$90,348,766
ENGINEERING: 7%					\$6,324,414
SUBTOTAL:					\$96,673,180
CONTINGENCY: 20%					\$19,334,636

PROJECT TOTAL (OPTION 3) \$116,007,816

APPENDIX G

TWDB COMMENTS ON DRAFT REPORT AND RESPONSES