PECOS RIVER COMPACT

Report of the River Master

Water Year 2002

Accounting Year 2003

Final Report

June 26, 2003

Neil S. Grigg
River Master of the Pecos River
749 S. Lemay, Ste. A3, PMB 330
Fort Collins, Colorado 80524

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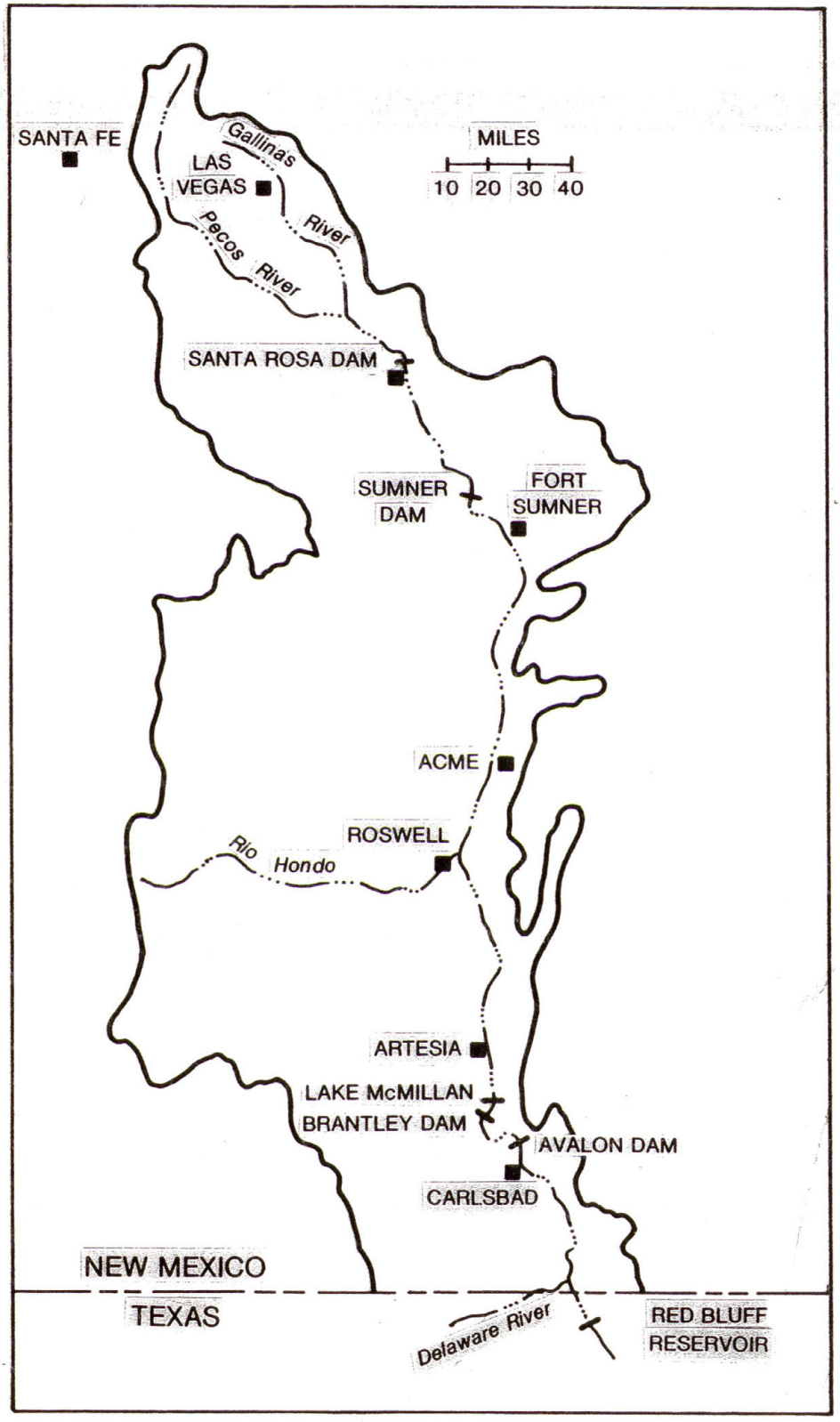
SANTA FE
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SANTA ROSA DAM
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ACME
ROSWELL
Rio Hondo
ARTESIA
LAKE McMILLAN
BRANTLEY DAM
AVALON DAM
CARLSBAD
NEW MEXICO
TEXAS
Delaware River
RED BLUFF RESERVOIR

PECOS RIVER COMPACT
Supreme Court of the United States
No. 65, Original
Amended Decree

Final Report of the River Master
Water Year 2002 - Accounting Year 2003
June 26, 2003

Purpose of the Report. In its Amended Decree issued March 28, 1988 the Supreme Court of the United States appointed a River Master of the Pecos River and directed him to "... Deliver to the parties a Preliminary Report setting forth the tentative results of the calculations required by Section III.B.1 of this Decree by May 15 of the accounting year..." and to consider "... any written objections to the Preliminary Report submitted by the parties prior to June 15 of the accounting year..." and to deliver "... to the parties a Final Report setting forth the final results of the calculations required by Section III.B.1 of this Decree by July 1 of the accounting year." This is the required Final Report with the determination of:

a. The Article III(a) obligation;

b. Any shortfall or overage, which calculation shall disregard deliveries of water pursuant to an Approved Plan;

c. The net shortfall, if any, after subtracting any overages accumulated in previous years, beginning with water year 1987.

Result of Calculations and Statement of Shortfall or Overage. The results of the calculations in this Final Report show that New Mexico's delivery in Water Year 2002 was a shortfall of 3,000 acre-feet. The accumulated overage since the beginning of Water Year 1987 is 6,900 acre-feet.

Neil S. Grigg
River Master of the Pecos River

Pecos River Compact		
Accumulated Shortfall or Overage		
	June 26, 2003	
Water Year	Annual Overage or Shortfall, AF	Accumulated Overage or Shortfall, AF
1987	15,400	15,400
1988	23,600	39,000
1989	2,700	41,700
1990	-14,100	27,600
1991	-16,500	11,100
1992	10,900	22,000
1993	6,600	28,600
1994	5,900	34,500
1995	-14,100	20,400
1996	-6,700	13,700
1997	6,100	19,800
1998	1,700	21,500
1999	1,400	22,900
2000	-12,300	10,600
2001	-700	9,900
2002	-3,000	6,900

Table 1. General Calculation of Annual Departures, TAF, WY 2002			
6/26/03			
	2000	2001	2002
B.1.a. Index Inflows			
(1) Annual flood inflow			
(a) Gaged flow Pecos R bel Alamogordo Dam	166.1	114.9	69.6
(b) Flood Inflow Alamogordo - Artesia (Table 2)	-4.9	-13.5	15.8
(c) Flood Inflow Artesia - Carlsbad (Table 3)	8.3	4.1	20.0
(d) Flood Inflow Carlsbad - State Line (Table 4)	4.4	1.2	6.9
Total (annual flood inflow)	173.9	106.7	112.3
(2) Index Inflow (3-year avg)			131.0
B.1.b. 1947 Condition Delivery Obligation			50.5
(Index Outflow)			
B.1.c. Average Historical (Gaged) Outflow			
Gaged Flow Pecos River at Red Bluff NM	58.2	43.7	39.7
Gaged Flow Delaware River nr Red Bluff NM	1.0	0.3	2.5
(1) Total Annual Historical Outflow	59.2	44.0	42.2
(2) Average Historical Outflow (3-yr average)			48.5
(3) Metered diversions Permit 3254 into C-2713 (awaiting report)			
B.1.d. Annual Departure			-2.0
C. Adjustments to Computed Departure			
1. Adjustments for Depletions above Alam Dam			
a. Depletions Due to Irrigation (Table 5)	0.9	2.3	1.5
b. Depl fr Operation of Santa Rosa Reservoir (Table 6)	2.4	2.8	0.4
c. Transfer of Water Use to Upstream of AD	0	0	0
Recomputed Index Inflows			
(1) Annual flood inflow			
(a) Gaged flow Pecos R bel Alamogordo Dam	169.4	120.0	71.5
(b) Flood Inflow Alamogordo - Artesia	-4.9	-13.5	15.8
(c) Flood Inflow Artesia - Carlsbad	8.3	4.1	20.0
(d) Flood Inflow Carlsbad - State Line	4.4	1.2	6.9
Total (annual flood inflow)	177.2	111.8	114.2
Recomputed Index Inflow (3-year avg)			134.4
Recomputed 1947 Condition Del Outflow			52.4
(Index Outflow)			
Recomputed Annual Departures			-3.9
Credits to New Mexico			
C.2 Depletions Due to McMillan Dike			0.9
C.3 Salvage Water Analysis			0
C.4 Unappropriated Flood Waters			0
C.5 Texas Water Stored in NM Reservoirs			0
C.6 Beneficial C.U. Delaware River Water			0
Final Calculated Departure, TAF			-3.0

Table 2. Determination of Flood Inflows, Alamogordo Dam to Artesia (B.3)

Water Year 2002

6/26/03

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	TOT
Flow bel Alamog Dam	2.0	4.0	30.0	5.3	4.6	3.5	4.7	5.0	2.9	4.6	1.6	1.6	69.6
FtSumner Irrig Div	0.0	2.6	5.1	5.2	4.8	3.0	4.3	4.8	2.7	4.3	0.0	0.0	36.7
Ft Sumner ID Return	0.8	0.6	1.4	1.6	2.3	2.3	2.3	2.3	2.1	1.9	1.0	0.8	19.4
Flow past FS IDist	2.7	2.0	26.2	1.6	2.3	2.8	2.7	2.5	2.4	2.3	2.5	2.3	52.5
Channel loss	0.3	0.2	4.9	1.3	1.4	1.2	1.0	1.6	0.8	0.8	0.8	0.2	14.4
Residual Flow	2.5	1.8	21.3	0.3	1.0	1.6	1.7	0.9	1.6	1.5	1.7	2.1	38.1
Base Inflow	3.1	2.9	2.8	2.3	1.3	0.4	0.9	0.7	0.5	1.5	2.2	2.9	21.5
River Pump Divers	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.3
Residual, Artesia	5.6	4.7	24.1	2.6	2.2	1.9	2.6	1.6	2.0	3.0	3.9	5.0	59.3
Pecos Flow Artesia	5.1	4.9	22.6	5.1	1.6	6.1	3.7	2.3	10.4	4.0	4.2	5.2	75.1
Flood Inflow, AD-Art	-0.4	0.1	-1.5	2.5	-0.6	4.2	1.2	0.7	8.3	0.9	0.2	0.2	15.8

Note: Whenever the computed flow past the District is less than the return flow, set the flow past the District equal to the return flow (Manual, B.3.d).

Table 3. Determination of Flood Inflows, Artesia to Carsbad, WY 2002 (B.4)

4/26/03

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	TOT
Rio Penasco at Dayton	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.3	0.0	0.0	0.0	0.6
Fourmile Draw nr Lakew	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.9	0.0	0.0	0.0	1.2
South Seven Rivers	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.3	0.0	0.0	0.0	0.5
Rocky Arroyo at Hwy Br	0.0	0.0	0.0	0.0	0.0	0.0	4.5	0.1	4.2	0.3	0.0	0.0	9.1
Flood Inflow, Art-DS3	0.0	0.0	0.0	0.0	0.0	0.3	5.0	0.1	5.6	0.3	0.0	0.0	11.3
Pecos R at Dam Site 3	1.7	1.4	2.0	7.6	8.0	10.6	7.1	4.4	7.7	3.5	1.4	10.4	65.4
CB Sprgs New Water, T7	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-12.0
Total Inflow, DS3 - CB	0.6	0.4	0.9	6.6	7.0	9.6	6.1	3.4	6.6	2.5	0.4	9.4	53.4
Evap Loss, Lake Avalon, T10	0.2	0.2	0.4	0.5	0.6	0.6	0.5	0.6	0.4	0.1	0.2	0.1	4.3
Storage Chg, Lake Aval, T11	0.8	0.4	0.4	-1.9	0.1	-0.1	-0.4	0.6	-0.2	0.9	0.4	-2.5	-1.5
Carls ID diversions	0.0	0.0	0.0	8.3	7.2	7.8	6.2	3.0	6.6	2.5	0.0	0.0	41.6
93% CID diver	0.0	0.0	0.0	7.8	6.6	7.3	5.8	2.8	6.1	2.3	0.0	0.0	38.7
Other depletions	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	1.4
Dark Canyon at Csbad	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0
Pecos b Dark Canyon	0.8	0.7	0.8	0.6	0.5	1.8	3.1	0.3	0.2	0.6	0.8	11.0	21.2
Pecos R at Carlsbad	0.8	0.7	0.8	0.6	0.5	1.8	1.2	0.3	0.2	0.6	0.8	11.0	19.2
Total Outflow	1.9	1.4	1.6	7.1	7.9	9.6	7.3	4.5	6.6	4.0	1.5	8.7	62.0
Flood Inflow, DS3-CB	1.2	1.0	0.7	0.5	0.9	0.1	1.2	1.1	-0.1	1.5	1.2	-0.7	8.6
Flood Inflow, Art-CB	1.2	1.0	0.7	0.5	0.9	0.4	6.2	1.2	5.6	1.8	1.2	-0.7	20.0

Table 4. Summary Table for Computations, Carlsbad to State Line - WY 2002

6/26/03

	BCB - RB		Del R	DC*
	RM		USGS	
Jan	0		0	0
Feb	45		0	0
Mar	53		2.7	0
Apr	120		0	0
May	13		0	0
Jun	0		284	0
Jul	349		311	1655
Aug	1241		69.6	0
Sep	798		1016	0
Oct	262		494	0
Nov	29		14.5	0
Dec	121		0	0
Total	3031		2191.8	1655

Summary of flood inflows, Carlsbad to State Line, TAF

Red Bluff - Carlsbad + Dark C RM calcs)	4.7
Delaware River (USGS Computation	2.2
Total Flood Inflow, Carlsbad to State Line	6.9

* - Dark Canyon flow was actually 1990 acre–feet, see Appendix 1 (of Prel Rpt) for explanation

Table 5. Depletions Due to Irrigation Above Alamogordo Dam - WY 2002 (C.1.a)								
4/26/03								
	APR	MAY	JUN	JUL	AUG	SEPT	OCT	TOTAL
Precip Las Vegas FAA AP	0.20	0.25	0.68	3.31	0.40	3.05	1.36	9.25
Eff prec Las Veg FAA AP	0.20	0.25	0.60	2.82	0.39	2.62	1.28	8.16
Precip Pecos Natl Monument	0.36	0.21	1.27	4.48	1.40	2.50	0.50	10.72
Eff Precip Pecos RS	0.35	0.21	1.21	3.59	1.32	2.22	0.49	9.39
Precip Santa Rosa	0.30	0.31	0.96	1.88	0.63	4.37	2.36	10.81
Eff Precip Santa Ro	0.29	0.30	0.93	1.73	0.62	3.53	2.11	9.51
Average eff precip, ft	0.02	0.02	0.08	0.23	0.06	0.23	0.11	0.75
Consumptive use, ft	0.19	0.36	0.36	0.30	0.27	0.18	0.11	1.77
Unit depletion rate (CU less eff precip), ft	0.17	0.34	0.28	0.07	0.21	0.00	0.00	1.07
Acres (most recent inventory)	11529							
Streamflow depletion (actual use), AF	12346							
1947 depletion, AF	10804							
Difference (actual use - 1947 depletion), TAF	1.5							
Adjustment to Gaged Flow, Pecos River below Alamogordo Dam, TAF =						1.5		

Table 6. Depletions Due to Santa Rosa Reservoir Operations - WY 2002 - (C.1.b)													
6/26/03	Computed using linear interpolation												
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	TOTAL
LS 2001 table (USBR); SRL 1997 tables used (COE)													
Lk Sumner ga ht, avg	46.36	49.97	37.28	27.93	22.28	25.76	27.64	24.87	30.02	34.09	38.52	43.26	34.00
LS content, AF, avg	11625	16222	4944	1469	413	995	1401	824	2026	3473	5601	8726	
LS area, acres, avg	1095	1434	510	237	129	200	232	185	297	414	550	800	
LS evap, inches	4.31	5.79	7.47	12.77	16.20	15.67	10.06	13.35	7.75	3.72	4.54	2.72	104.35
.77 LS Evap	3.32	4.46	5.75	9.83	12.47	12.07	7.75	10.28	5.97	2.86	3.50	2.09	80.35
LS Precip, inches	0.62	0.00	0.64	0.22	0.05	0.64	3.47	0.34	3.74	1.54	0.08	1.18	12.52
Net LS Evap, inches	2.70	4.46	5.11	9.61	12.42	11.43	4.28	9.94	2.23	1.32	3.42	0.91	67.83
LSum Evaploss, TAF	0.25	0.53	0.22	0.19	0.13	0.19	0.08	0.15	0.06	0.05	0.16	0.06	2.06
L S Rosa ga ht, avg	8.36	8.95	92.19	88.92	89.78	86.28	88.03	93.92	0.74	3.50	3.76	4.08	47.38
LSR content, AF, avg	16350	16941	5415	4279	4551	3529	4014	6119	10038	12092	12299	12557	
LSR area, acres, avg	987	1014	388	301	329	264	295	427	698	794	803	812	
LSR evap, inches	3.72	4.98	8.45	9.84	12.75	14.11	11.33	12.44	7.76	4.86	4.11	3.76	98.11
.77 LSR Evap	2.86	3.83	6.51	7.58	9.82	10.86	8.72	9.58	5.98	3.74	3.16	2.90	75.54
LSR precip, inches	0.73	0.10	0.08	0.05	0.36	1.20	3.25	0.26	4.88	2.19	0.23	1.08	14.41
Net LSR Evap, inches	2.13	3.73	6.43	7.53	9.46	9.66	5.47	9.32	1.10	1.55	2.93	1.82	61.13
LSR Evaploss, TAF	0.18	0.32	0.21	0.19	0.26	0.21	0.13	0.33	0.06	0.10	0.20	0.12	2.31
Total evaploss, TAF	0.42	0.85	0.43	0.38	0.39	0.40	0.22	0.48	0.12	0.15	0.35	0.18	4.38
Sum contents, AF	27975	33163	10359	5748	4964	4524	5415	6943	12064	15565	17900	21283	
1947 area, acres	1478	1644	760	585	506	469	552	600	800	953	1000	1124	
1947 evaploss, TAF	0.33	0.61	0.32	0.47	0.52	0.45	0.20	0.50	0.15	0.11	0.28	0.09	4.02
current-1947evaploss	0.09	0.24	0.10	-0.09	-0.13	-0.04	0.02	-0.01	-0.03	0.04	0.07	0.10	0.35
						Annual adjustment for excess evaporation =							0.4
ADJUSTMENT FOR EXCESSIVE STORAGE IN SANTA ROSA RESERVOIR													
			2001	2001	2002	2002							
			Gage	Storage	Gage	Storage							
EndYear Sumner Sto			4244.92	10158	4235.43	4054							
EndYear S R Sto			4707.98	15977	4704.23	12678							
Sum				26135		16732							
Sto Adjustment, AF						0							
Adjustm Ex Evap, TAF						0.4							
Total Adjustment,TAF						0.4							

Table 7. Carlsbad Springs New Water WY 2001 - (B.4.c)					
4/26/03					
		TAF	cfs	Totals	
Pecos R bel DC, cfs		21.2	29.3	29.3	
Dark Canyon, cfs		2.0	2.8	2.8	
Pecos R bel Lake Av,		13.2	18.2	18.2	
Depletion, cfs				2.0	
CID lag seep, cfs (Table 8)				4.3	
Return flow, cfs				1.0	
Lake Av lagged seep, cfs (Table 9)				18.6	
PR seepage, cfs				3.0	
Carls new water, cfs				-16.6	
Carls new wat, TAF				-12.0	
Carls new wat monthly, TAF				-1.0	
				-1.002	

Table 8. Carlsbad Main Canal Seepage Lagged - WY 2002 - [B.4.c.(1)(e)]													
4/26/03													
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	TOTAL
WY 2002													
CID, TAF	0.0	0.0	0.0	8.3	7.2	7.8	6.2	3.0	6.6	2.5	0.0	0.0	41.6
days/mo	31	28	31	30	31	30	31	31	30	31	30	31	365
cfs	0.0	0.0	0.0	140.2	116.3	131.4	101.2	48.5	110.1	41.0	0.0	0.0	57.4
cfs, qtr avg			0.0			129.1			86.3			13.8	
WY 2001		1Q	2Q	3Q	4Q								
FLOWS, cfs				133.3	28.8								
SEVEN %				9.3	2.0								
2002		1Q	2Q	3Q	4Q								
FLOWS, cfs		0.0	129.1	86.3	13.8								
SEVEN %		0.0	9.0	6.0	1.0								
LAG		2.2	4.9	6.0	4.0	Avg =	4.3	cfs					

Table 9. Lake Avalon Leakage Lagged - WY 2002 - B.4.c.(1)(g)													
4/26/03													
WY 2002	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	TOT
WS NM rept	74.28	75.13	75.60	73.92	72.88	73.20	74.69	73.11	73.99	73.51	74.86	72.43	
ga ht, avg*	17.28	18.13	18.60	16.92	15.88	16.20	17.69	16.11	16.99	16.51	17.86	15.43	
cfs	20.6	24.7	26.9	18.9	13.9	15.4	22.6	15.0	19.2	16.9	23.4	11.8	
days	31	28	31	30	31	30	31	31	30	31	30	31	365
cfs avg	24.0			16.0			18.9			17.3			19.1
2001		1Q	2Q	3Q	4Q								
cfs				15.4	14.5								
2002		1Q	2Q	3Q	4Q								
cfs		24.0	16.0	18.9	17.3								
lag cfs		19.4	18.5	18.8	17.6	Avg =	18.6	cfs					
* Computed as WS elev by NM Report minus Gage datum at 3257.0 (USBR datum)													

Table 10. Evaporation Loss at Lake Avalon - WY 2002 - (B.4.f)													
4/26/03													
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOT
Av WS NM Rept	74.28	75.13	75.60	73.92	72.88	73.20	74.69	73.11	73.99	73.51	74.86	72.43	
Avalon ga ht, avg, ft*	17.28	18.13	18.60	16.92	15.88	16.20	17.69	16.11	16.99	16.51	17.86	15.43	
Avg area Avalon, ac**	690	746	779	667	605	624	717	619	671	643	728	580	
Panevap Brantley, in.	4.65	5.60	9.89	11.38	15.34	16.83	13.73	14.57	11.03	6.20	4.80	4.34	118.36
Lakeevap Brantley, in.	3.58	4.31	7.62	8.76	11.81	12.96	10.57	11.22	8.49	4.77	3.70	3.34	91.14
Precip Brantley, in.	0.44	0.62	1.79	0.14	0.00	1.08	2.36	0.32	1.93	3.56	0.21	0.75	13.20
Netevap, inches	3.14	3.69	5.83	8.62	11.81	11.88	8.21	10.90	6.56	1.21	3.49	2.59	77.94
Evaploss Av, TAF	0.2	0.2	0.4	0.5	0.6	0.6	0.5	0.6	0.4	0.1	0.2	0.1	4.3
* Computed as WS elev by NM Report minus Gage datum at 3257.0 (USBR datum)													
** Based on USBR Area and Capacity Table in effect January 1, 1997													

Table 11. Change in Storage, Lake Avalon - 2002 - (B.4.g)														
(Gage heights are end of month)														
4/26/03														
	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	TOT
	2001	2002												
WS NM Rept	73.60	74.80	75.40	75.90	73.20	73.30	73.10	72.50	73.50	73.20	74.50	75.10	69.90	
Gage EOM, ft*	16.60	17.80	18.40	18.90	16.20	16.30	16.10	15.50	16.50	16.20	17.50	18.10	12.90	
Storage, ACRE-	1525	2347	2794	3185	1271	1333	1209	848	1461	1271	2133	2568	21	
Change sto, TAF		0.8	0.4	0.4	-1.9	0.1	-0.1	-0.4	0.6	-0.2	0.9	0.4	-2.5	-1.5
* Computed as WS elev by NM Report minus Gage datum at 3257.0 (USBR datum)														
** Based on USBR Area and Capacity Table in effect January 1, 1997														

Table 12. Data Required for River Master Manual Calculations, Water Year 2002													
6/26/03													
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	TOTAL
STREAMFLOW GAGING RECORDS, TAF													
Pecos R b Sumner Dam	2.0	4.0	30.0	5.3	4.6	3.5	4.7	5.0	2.9	4.6	1.6	1.6	69.6
Fort Sumner Main C	0.0	2.6	5.1	5.2	4.8	3.0	4.3	4.8	2.7	4.3	0.0	0.0	36.7
Pecos R nr Artesia	5.1	4.9	22.6	5.1	1.6	6.1	3.7	2.3	10.4	4.0	4.2	5.2	75.1
Rio Penasco at Dayton	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.3	0.0	0.0	0.0	0.6
Fourmile Draw nr Lakewood	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.9	0.0	0.0	0.0	1.2
South Seven Rivers nr Lkwd	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.3	0.0	0.0	0.0	0.5
Rocky Arroyo at Hwy Br nr	0.0	0.0	0.0	0.0	0.0	0.0	4.5	0.1	4.2	0.3	0.0	0.0	9.1
Pecos R at Dam Site 3	1.7	1.4	2.0	7.6	8.0	10.6	7.1	4.4	7.7	3.5	1.4	10.4	65.4
Pecos bel Avalon Dam	0.0	0.2	0.2	0.0	0.0	1.8	0.0	0.0	0.0	0.0	0.2	10.7	13.2
Carlsbad Main Canal	0.0	0.0	0.0	8.3	7.2	7.8	6.2	3.0	6.6	2.5	0.0	0.0	41.6
Dark Canyon at Carlsbad	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	2.0
Pecos below Dark Canyon	0.8	0.7	0.8	0.6	0.5	1.8	3.1	0.3	0.2	0.6	0.8	11.0	21.2
Pecos R at Red Bluff	2.9	2.4	2.4	2.3	1.2	2.2	4.0	2.2	1.7	2.1	2.2	13.9	39.7
Delaware R nr Red Bluff	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.1	1.0	0.5	0.1	0.1	2.5
GAGE HEIGHTS													
Avalon gage ht, end mo	74.80	75.40	75.90	73.20	73.30	73.10	72.50	73.50	73.20	74.50	75.10	69.90	
Avalon gage ht, avg	74.28	75.13	75.60	73.92	72.88	73.20	74.69	73.11	73.99	73.51	74.86	72.43	
Alamogordo ga ht, end mo	47.60	47.83	27.84	25.16	18.75	26.55	27.29	21.69	35.17	35.43	40.75	35.43	
Alamogordo gage ht, avg	46.36	49.97	37.28	27.93	22.28	25.76	27.64	24.87	30.02	34.09	38.52	43.26	
Lake S Rosa ga ht, end mo	8.70	9.13	88.12	89.92	86.71	85.26	94.98	95.17	3.28	3.65	3.84	4.23	
Lake S Rosa ga ht, avg	8.36	8.95	92.19	88.92	89.78	86.28	88.03	93.92	0.74	3.50	3.76	4.08	
PRECIPITATION, INCHES													
Brantley Lake	0.44	0.62	1.79	0.14	0.00	1.08	2.36	0.32	1.93	3.56	0.21	0.75	13.20
Las Vegas FAA AP	0.35	0.01	0.00	0.20	0.25	0.68	3.31	0.40	3.05	1.36	0.09	0.44	10.14
Pecos National Monument	1.42	0.15	0.20	0.36	0.21	1.27	4.48	1.40	2.50	0.50	0.55	1.65	14.69
Santa Rosa	0.85	0.00	0.10	0.30	0.31	0.96	1.88	0.63	4.37	2.36	0.24	1.06	13.06
Lake Santa Rosa	0.73	0.10	0.08	0.05	0.36	1.20	3.25	0.26	4.88	2.19	0.23	1.08	14.41
Sumner Lake	0.62	0.00	0.64	0.22	0.05	0.64	3.47	0.34	3.74	1.54	0.08	1.18	12.52
PAN EVAPORATION, INCHES													
Lake Santa Rosa	3.72	4.98	8.45	9.84	12.75	14.11	11.33	12.44	7.76	4.86	4.11	3.76	98.11
Lake Sumner	4.31	5.79	7.47	12.77	16.20	15.67	10.06	13.35	7.75	3.72	4.54	2.72	104.35
Brantley Lake	4.65	5.60	9.89	11.38	15.34	16.83	13.73	14.57	11.03	6.20	4.80	4.34	118.36
OTHER REPORTS													
Base Acme-Art, TAF (USGS)	3.1	2.9	2.8	2.3	1.3	0.4	0.9	0.7	0.5	1.5	2.2	2.9	21.4
Pump depl Ac-Artesia, TAF	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.3
NM irrig inv, acres (3/9/2000)													11529
NM Transfer water use, TAF													0
NM salvaged water, TAF													0
Texas, water stored NM, TAF	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Texas, use Del water, TAF													

APPENDIX

RIVER MASTER'S RESPONSE TO STATES' OBJECTIONS

RESPONSE TO STATES' OBJECTIONS
Final Report, Accounting Year 2003

NEW MEXICO'S OBJECTIONS

1. Base Inflow, Acme to Artesia
New Mexico made independent estimates of base inflows that had been estimated by USGS. The River Master's response is given below for each period where New Mexico differed from the USGS estimate. The procedure to estimate base inflows has been discussed in the process of New Mexico's Amended First Motion. Complex hydrologic factors contribute to the base inflow determination, and no agreement was reached among the states about the procedure. USGS continues to make the base inflow estimate using the information it has and its judgment on base inflow.

June and July. New Mexico re-drew the base separation lines from about mid-June to mid-July. New Mexico's reasoning hinged on consistency in the distance between hydrograph low points for Acme and Artesia. This objection is rejected. The scalping procedure involves much more than fitting curves to the low points of hydrographs, which is the main apparent justification for New Mexico's objection.

August and September. For this period, New Mexico presents data on rainfall and its expected effect on river pumping and groundwater levels. As a result of these factors, the River Master agrees that USGS's baseflow separation curve for Artesia plus pumping should be drawn about 5 cfs higher for the period August 10 to about September 10. However, New Mexico's curves drawn for the period September 10 to about September 25 are unsubstantiated. Based on an Artesia plus pumping curve that is 5 cfs higher for about 31 days, the River Master accepts an increase of base inflow of 300 AF, apportioned as 200 AF in August and 100 AF in September. The revised base inflow amounts are given in this table.

Month	USGS Base Inflow Estimate acre–feet	Revised Base Inflow Estimate acre–feet
Jan	3070	3070
Feb	2940	2940
Mar	2830	2830
Apr	2260	2260
May	1290	1290
Jun	417	417
Jul	861	861
Aug	492	692
Sep	357	457
Oct	1540	1540
Nov	2200	2200
Dec	2890	2890
Total	21147	21447

2. Flood Inflow, Carlsbad to Stateline.
New Mexico objected to the flood inflow estimates for the Carlsbad to Stateline reach. New Mexico's estimate is 3,031 acre–feet, a decrease of 127 acre–feet from the Preliminary Report.

For the June event, the rainfall did not produce any apparent flood inflow at the Red Bluff gage, so no mention was made of it. The River Master did not understand New Mexico's objection that "New Mexico requests that the prescribed ... method be used for consistency." In any event, no flood inflow or change in the computation is involved.

For July–November, New Mexico estimated the duration of some flood events as shorter than the River Master did, and New Mexico scalped a few small flow increases that were not included in the Preliminary Report. While the total effect of these changes is small, it is important to review all instances of flood inflow. In the case of the flood duration noted by New Mexico for July and September, the change from flood inflow to base flow is a matter of judgment. New Mexico's reasoning seems sound, so the objections are accepted. New Mexico's other computations also seem reasonable and add precision to the computation, so these are also accepted. New Mexico's figures for flood inflow are accepted for this reach. The revised table is given here:

Month	River Master's Estimate acre–feet	Revised Estimate Acre–feet
Jan	0	0
Feb	45	45
Mar	53	53
Apr	120	120
May	13	13
Jun	0	0
Jul	366	349
Aug	1267	1241
Sep	850	798
Oct	298	262
Nov	25	29
Dec	121	121
Total	3158	3031

3. Table 6. Depletions to Santa Rosa Reservoir Operations – 2002 – (C.1.b):
New Mexico objected to the use of the polynomial for calculating the 1947 area of Lake Sumner. As explained in Appendix 2 of the Preliminary Report, this was meant to be a time–saving measure, and that "if either state objects to the use of the polynomial to compute area, the River Master will revert to the interpolation method." Thus, this objection is accepted. Accordingly, Table 6 has been revised.

TEXAS'S OBJECTIONS

Texas did not have any objections to the Preliminary Report for Accounting Year 2003.

FINAL CALCULATED DEPARTURE.

The Preliminary Report's Final Calculated Departure was –3.1 TAF. After considering the states' objections, the Final Determination is –3.0 TAF.