

PECOS RIVER COMPACT

Report of the River Master

Water Year 1998

Accounting Year 1999

Final Report

June 17, 1999

**Neil S. Grigg
River Master of the Pecos River
749 S. Lemay, #A3-330
Fort Collins, Colorado 80524**

PECOS RIVER COMPACT

Report of the River Master

Water Year 1998

Accounting Year 1999

Final Report

June 17, 1999

**Neil S. Grigg
River Master of the Pecos River
749 S. Lemay, #A3-330
Fort Collins, Colorado 80524**

CONTENTS

Map of Pecos River Basin Showing Accounting Reaches

Purpose of the Report and Statement of Shortfall or Overage

Table of Annual and Accumulated Overage or Shortfall

Table 1. General Calculation of Annual Departures, T.A.F. (B.1.a.- d.)

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

Table 3. Flood Inflows, Artesia to Carlsbad (B.4)

Table 4. Flood Inflows, Carlsbad - State Line (B.5.c)

Table 5. Depletion Due to Irrigation above Alamogordo Dam (C.1.a)

Table 6. Depletion Due to Santa Rosa Reservoir Operations (C.1.b)

Table 7. Carlsbad Springs New Water (B.4.c)

Table 8. Carlsbad Main Canal Seepage Lagged (B.4.c.(1)(e))

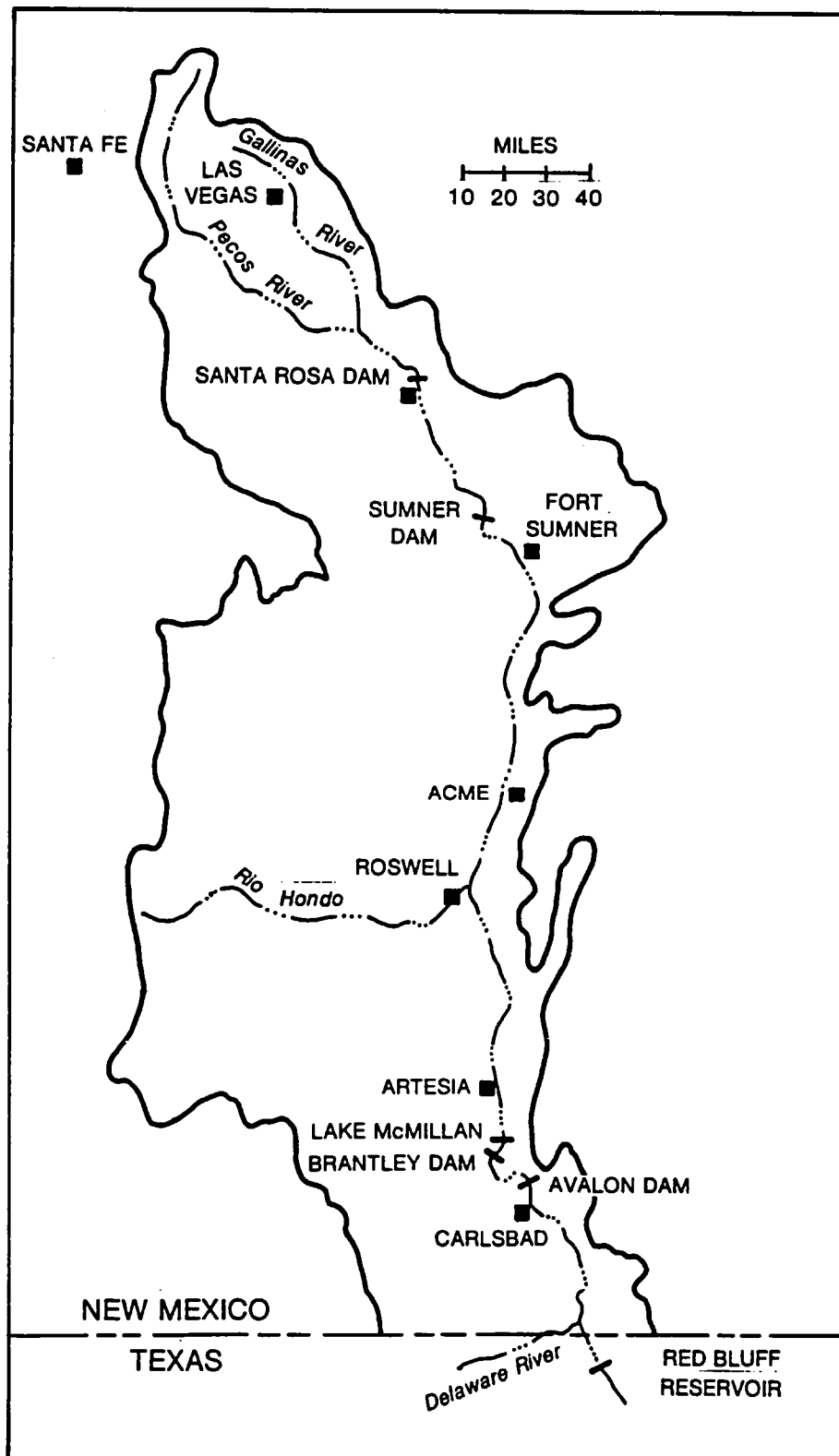
Table 9. Lake Avalon Leakage Lagged (B.4.c.(1)(g))

Table 10. Evaporation Loss at Lake Avalon (B.4.f)

Table 11. Change in Storage, Lake Avalon (B.4.g)

Table 12. Data Required for River Master Manual Calculations

Appendix: Response to States' Objections



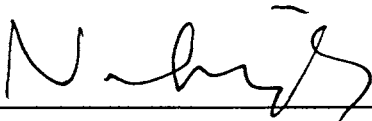
PECOS RIVER COMPACT
Supreme Court of the United States
No. 65, Original
Amended Decree

Final Report of the River Master
Water Year 1998 - Accounting Year 1999
June 17, 1999

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 1998 was an overage of 1,700 acre-feet. The accumulated overage since the beginning of Water Year 1987 is 21,500 acre-feet.



Neil S. Grigg
River Master of the Pecos River

Pecos River Compact		
Accumulated Shortfall or Overage		
	June 16, 1999	
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

Table 1. General Calculation of Annual Departures, TAF, WY 98			
	6/16/99		
	1996	1997	1998
B.1.a. Index Inflows			
(1) Annual flood inflow			
(a) Gaged flow Pecos R bel Alamogordo Dam	134.2	160.0	191.1
(b) Flood Inflow Alamogordo - Artesia (Table 2)	9.4	13.2	6.2
(c) Flood Inflow Artesia - Carlsbad (Table 3)	10.3	1.0	4.7
(d) Flood Inflow Carlsbad - State Line (Table 4)	10.5	6.6	1.4
Total (annual flood inflow)	164.4	180.8	203.4
(2) Index Inflow (3-year avg)			182.9
B.1.b. 1947 Condition Delivery Obligation			81.2
(Index Outflow)			
B.1.c. Average Historical (Gaged) Outflow			
Gaged Flow Pecos River at Red Bluff NM	72.8	98.1	66.7
Gaged Flow Delaware River nr Red Bluff NM	5.6	2.5	0.9
(1) Total Annual Historical Outflow	78.4	100.6	67.6
(2) Average Historical Outflow (3-yr average)			82.2
B.1.d. Annual Departure			1.0
C. Adjustments to Computed Departure			
1. Adjustments for Depletions above Alam Dam			
a. Depletions Due to Irrigation (Table 5)	-2.2	-3.6	0.7
b. Depl fr Operation of Santa Rosa Reservoir (Table 6)	3.5	0.6	3.9
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	135.5	157.0	195.7
(b) Flood Inflow Alamogordo - Artesia	9.4	13.2	6.2
(c) Flood Inflow Artesia - Carlsbad	10.3	1.0	4.7
(d) Flood Inflow Carlsbad - State Line	10.5	6.6	1.4
Total (annual flood inflow)	165.7	177.845	208.0
Recomputed Index Inflow (3-year avg)			183.8
Recomputed 1947 Condition Del Outflow			81.8
(Index Outflow)			
Recomputed Annual Departures			0.4
Credits to New Mexico			
C.2 Depletions Due to McMillan Dike			1.3
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			1.7

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

Table 3. Determination of Flood Inflows, Artesia to Carsbad, WY 1998 (B.4)

Table 4. Summary Table for Computations, Carlsbad to State Line - WY 98

5/1/99							
	BCB - RB	CB - RB	Del R	DC			
	RM	USGS	USGS				
Jan	109	24	0	0			
Feb	0	0	0	0			
Mar	33	52	0	0			
Apr	0	4	0	0			
May	0	246	0	0			
Jun	0	44	0	0			
Jul	141	192	0	0			
Aug	120	202	315	0			
Sep	36	48	10	0			
Oct	376	276	73	0			
Nov	161	250	44	0			
Dec	0	32	0	0			
Total	976	1370	442	0			
Summary of flood inflows, Carlsbad to State Line, TAF							
Carlsbad - Red Bluff + Dark			1.0				
Delaware River (USGS Com			0.4				
Total Flood Inflow, Carlsba			1.4				

Table 5. Depletions Due to Irrigation Above Alamogordo Dam - WY 1998 (C.1.a)											
	5/1/99	APR	MAY	JUN	JUL	AUG	SEPT	OCT	TOTAL		
Precip Las Vegas FAA AP		1.16	0.00	0.02	5.05	2.99	0.52	4.47	14.21		
Eff prec Las Veg FAA AP		1.11	0.00	0.02	3.83	2.58	0.51	3.58	11.63		
Precip Pecos Natl Monument		0.19	0.00	0.20	5.48	4.64	0.52	5.16	16.19		
Eff Precip Pecos RS		0.19	0.00	0.20	3.96	3.66	0.51	3.87	12.39		
Precip Santa Rosa		1.36	0.00	0.02	3.12	4.10	0.73	3.45	12.78		
Eff Precip Santa Ro		1.28	0.00	0.02	2.67	3.37	0.71	2.91	10.96		
Average eff precip, ft		0.07	0.00	0.01	0.29	0.27	0.05	0.29	0.97		
Consumptive use, ft		0.19	0.36	0.36	0.30	0.27	0.18	0.11	1.77		
CU less eff precip, ft		0.12	0.36	0.35	0.01	0.00	0.13	0.00	0.98		
Acres (most recent inventory)		11761									
Streamflow depletion, AF		11480									
1947 depletion, AF		10804									
Difference, TAF		-0.7									
Adjustment to Gaged Flow - Pecos River below Alamogordo Dam =							0.7				

Table 6. Depletions Due to Santa Rosa Reservoir Operations - WY 1998 - (C.1.b)													
6/16/99													
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	TOTAL
Lk Sumner ga ht, avg	54.04	59.48	58.40	55.78	57.45	54.66	48.13	50.88	50.06	42.56	45.62	48.79	52.15
LS content, AF, avg	26778	39613	36816	30538	34457	28074	16535	20917	19543	9726	13116	17526	
LS area, acres, avg	2049	2646	2533	2259	2434	2132	1473	1706	1644	961	1251	1532	1885
LS evap, inches	2.69	4.13	7.80	10.88	15.87	19.54	14.22	13.05	10.73	12.15	4.00	2.79	117.85
.77 LS Evap	2.07	3.18	6.01	8.38	12.22	15.05	10.95	10.05	8.26	9.36	3.08	2.15	90.74
LS Precip, inches	0.01	0.85	0.89	0.86	0.00	0.28	2.41	4.95	0.76	4.35	0.30	0.38	16.04
Net LS Evap, inches	2.06	2.33	5.12	7.52	12.22	14.77	8.54	5.10	7.50	5.01	2.78	1.77	74.70
LSum Evaploss, TAF	0.35	0.51	1.08	1.42	2.48	2.62	1.05	0.72	1.03	0.40	0.29	0.23	12.18
L S Rosa ga ht, avg	44.79	42.45	40.47	41.19	42.68	38.42	31.17	26.00	24.80	19.50	26.36	28.45	33.86
LSR content, AF, avg	96306	88047	81417	83792	88837	74867	54792	42972	40516	30793	43730	48305	
LSR area, acres, avg	3636	3427	3273	3325	3444	3113	2489	2092	2003	1663	2122	2258	
LSR evap, inches	3.72	4.98	8.56	7.58	12.58	15.65	11.52	9.87	9.3	5.63	3.33	3.54	96.26
.77 LSR Evap	2.86	3.83	6.59	5.84	9.69	12.05	8.87	7.60	7.16	4.34	2.56	2.73	74.12
LSR precip, inches	0.03	0.74	1.98	0.91	0.00	0.00	3.63	2.82	0.90	3.71	1.27	0.64	16.63
Net LSR Evap, inches	2.83	3.09	4.61	4.93	9.69	12.05	5.24	4.78	6.26	0.63	1.29	2.09	57.49
LSR Evaploss, TAF	0.86	0.88	1.26	1.37	2.78	3.13	1.09	0.83	1.05	0.09	0.23	0.39	13.94
Total evaploss, TAF	1.21	1.40	2.34	2.78	5.26	5.75	2.14	1.56	2.07	0.49	0.52	0.62	26.12
Sum contents, AF	123084	127660	118233	114330	123294	102941	71327	63889	60059	40519	56846	65831	
1947 area, acres	4380	4540	4260	4160	4390	3870	3040	2840	2750	1950	2620	2880	
1947 evaploss, TAF	0.75	0.88	1.82	2.61	4.47	4.76	2.16	1.21	1.72	0.81	0.61	0.42	22.22
current-1947evaploss	0.46	0.52	0.52	0.17	0.79	0.99	-0.03	0.35	0.35	-0.33	-0.09	0.19	3.90
	Annual adjustment for excess evaporation =												3.9
ADJUSTMENT FOR EXCESSIVE STORAGE IN SANTA ROSA RESERVOIR													
	1997		1997		1998		1998						
	Gage		Storage		Gage		Storage						
EndYear Sumner Sto			4252.54		23856		4250.01		19461				
EndYear S R Sto			4744.58		95544		4728.91		49355				
Sum			119400		68816								
Sto Adjustment, AF					0								
Adjustm Ex Evap, TAF					3.9								
Total Adjustment, TAF					3.9								

Table 7. Carlsbad Springs New Water WY 1998 - (B.4.c)					
5/1/99					
		TAF	cfs	Totals	
Pecos R bel DC, cfs	36.6		50.6	50.6	
Dark Canyon, cfs	0		0.0	0.0	
Pecos R bel Lake Av,	21.9		30.2	30.2	
Depletion, cfs				2.0	
CID lag seep, cfs (Table 8)				9.2	
Return flow, cfs				1.0	
Lake Av lagged seep, cfs (Table 9)				19.0	
PR seepage, cfs				3.0	
Carls new water, cfs				-9.9	
Carls new wat, TAF				-7.2	
Carls new wat monthly, TAF				-0.6	

Table 8. Carlsbad Main Canal Seepage Lagged - WY 1998 - [B.4.c.(1)(e)]												
5/1/99	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
TOTAL												
WY 1998												
CID, TAF	0.0	0.0	4.1	16.8	13.8	17.5	13.6	11.9	11.6	6.5	0.0	0.0
days/mo	31	28	31	30	31	30	31	31	30	31	30	31
cfs	0.0	0.0	67.2	282.5	224.4	294.3	221.8	193.4	195.1	105.9	0.0	0.0
cfs, qtr avg			23.1			266.6			203.5			35.7
1997		1Q	2Q	3Q	4Q							
FLAWS, cfs				198.4	30.1							
SEVEN %				13.9	2.1							
1998		1Q	2Q	3Q	4Q							
FLAWS, cfs		23.1	266.6	203.5	35.7							
SEVEN %		1.6	18.7	14.2	2.5							
LAG		3.8	10.2	13.6	9.1	Avg =	9.2	cfs				

Table 9. Lake Avalon Leakage Lagged - WY 1998 - B.4.c.(1)(g)												
5/1/99												
WY 1998	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
												TOT
ga ht, avg	18.22	18.83	18.72	16.42	16.32	15.85	16.12	16.62	16.60	16.55	16.46	17.49
cfs	25.1	28.0	27.5	16.5	16.0	13.8	15.1	17.4	17.3	17.1	16.7	21.6
days	31	28	31	30	31	30	31	31	30	31	30	31
cfs avg	26.8			15.4			16.6			18.5		19.3
1997		1Q	2Q	3Q	4Q							
cfs				14.7	16.3							
1998		1Q	2Q	3Q	4Q							
cfs		26.8	15.4	16.6	18.5							
lag cfs		21.3	19.4	17.9	17.3	Avg =	19.0 cfs					

Table 10. Evaporation Loss at Lake Avalon - WY 1998													
	5/1/99												
	6:38 JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOT
Avalon ga ht, avg, ft	18.22	18.83	18.72	16.42	16.32	15.85	16.12	16.62	16.60	16.55	16.46	17.49	
Avg area Avalon, ac.	752	795	787	637	631	604	619	649	648	645	640	704	
Panevap Brantley, in.	4.65	5.64	9.67	11.58	15.39	18.94	15.78	11.88	12.06	9.89	4.85	4.79	125.12
Lakeevap Brantley, in.	3.58	4.34	7.45	8.92	11.85	14.58	12.15	9.15	9.29	7.62	3.73	3.69	96.34
Precip Brantley, in.	0.00	0.04	0.36	0.08	0.00	0.36	0.63	0.99	0.31	1.58	0.05	0.45	4.85
Netevap, inches	3.58	4.30	7.09	8.84	11.85	14.22	11.52	8.16	8.98	6.04	3.68	3.24	91.49
Evaploss Av, TAF	0.2	0.3	0.5	0.5	0.6	0.7	0.6	0.4	0.5	0.3	0.2	0.2	5.0

Table 11. Change in Storage, Lake Avalon - 1998

(Gage heights are end of month)

5/1/99

	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	TOT
	1997													
Gage EOM, ft	17.8	18.6	19.0	16.1	16.9	16.2	15.4	15.6	17.0	17.0	17.0	17.0	17.8	
Storage, AF	2347	2948	3266	1209	1722	1271	790	907	1789	1789	1789	1789	2347	
Change sto, TAF		0.6	0.3	-2.1	0.5	-0.5	-0.5	0.1	0.9	0.0	0.0	0.0	0.6	0.0

5/1/99														
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	TOTAL	
STREAMFLOW GAGING RECORDS, TAF														
Pecos R b Sumner Dam	0.2	1.1	31.7	5.0	6.0	51.6	41.1	6.2	41.1	5.6	0.7	0.9	191.1	
Fort Sumner Main C	0.0	0.0	4.4	4.7	5.8	5.9	5.9	5.5	5.6	4.7	0.0	0.0	42.4	
Pecos R nr Artesia	7.0	5.4	25.4	4.9	2.2	32.7	27.6	7.5	21.9	18.3	14.3	7.4	174.5	
Rio Penasco at Dayton	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Fourmile Draw nr Lakewood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
South Seven Rivers nr Lkwd*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Rocky Arroyo at Hwy Br nr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Pecos R at Dam Site 3	1.9	1.8	3.6	18.5	14.7	18.9	22.1	13.7	11.8	13.7	12.4	1.7	134.7	
Pecos bel Avalon Dam	0.0	0.0	0.0	0.0	0.0	0.0	5.1	0.0	0.0	6.4	10.4	0.0	21.9	
Carlsbad Main Canal	0.0	0.0	4.1	16.8	13.8	17.5	13.6	11.9	11.6	6.5	0.0	0.0	95.9	
Dark Canyon at Carlsbad	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Pecos below Dark Canyon	2.9	2.2	2.1	2.2	0.2	0.3	5.4	0.7	0.8	7.4	11.2	1.2	36.6	
Pecos R at Red Bluff	6.8	5.1	4.5	3.7	2.7	2.1	7.4	3.3	3.0	8.2	15.9	4.1	66.7	
Delaware R nr Red Bluff	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.3	0.0	0.1	0.1	0.1	0.9	
*out of service - assumed zero														
GAGE HEIGHTS														
Avalon gage ht, end mo	18.6	19.0	16.1	16.9	16.2	15.4	15.6	17.0	17.0	17.0	17.0	17.8		
Avalon gage ht, avg	18.22	18.83	18.72	16.42	16.32	15.85	16.12	16.62	16.60	16.55	16.46	17.49		
Alamogordo ga ht, end mo	55.20	60.38	56.40	56.07	59.63	58.21	49.14	51.77	41.65	42.90	46.95	50.01		
Alamogordo gage ht, avg	54.04	59.48	58.40	55.78	57.45	54.66	48.13	50.88	50.06	42.56	45.62	48.79		
Lake S Rosa ga ht, end mo	44.18	42.48	40.35	42.07	43.93	34.36	21.96	28.75	17.07	21.48	27.77	28.91		
Lake S Rosa ga ht, avg	44.79	42.45	40.47	41.19	42.68	38.42	31.17	26.00	24.80	19.50	26.36	28.45		
PRECIPITATION, INCHES														
Brantley Lake	0.00	0.04	0.36	0.08	0.00	0.36	0.63	0.99	0.31	1.58	0.05	0.45	4.85	
Las Vegas FAA AP				1.16	0.00	0.02	5.05	2.99	0.52	4.47			14.21	
Pecos National Monument				0.19	0.00	0.20	5.48	4.64	0.52	5.16			16.19	
Santa Rosa				1.36	0.00	0.02	3.12	4.10	0.73	3.45			12.78	
Lake Santa Rosa	0.03	0.74	1.98	0.91	0.00	0.00	3.63	2.82	0.90	3.71	1.27	0.64	16.63	
Sumner Lake	0.01	0.85	0.89	0.86	0.00	0.28	2.41	4.95	0.76	4.35	0.30	0.38	16.04	
PAN EVAPORATION, INCHES														
Lake Santa Rosa	3.72	4.98	8.56	7.58	12.58	15.65	11.52	9.87	9.3	5.63	3.33	3.54	96.26	
Lake Sumner	2.69	4.13	7.80	10.88	15.87	19.54	14.22	13.05	10.73	12.15				

5/1/99													
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	TOTAL
STREAMFLOW GAGING RECORDS, TAF													
Pecos R b Sumner Dam	0.2	1.1	31.7	5.0	6.0	51.6	41.1	6.2	41.1	5.6	0.7	0.9	191.1
Fort Sumner Main C	0.0	0.0	4.4	4.7	5.8	5.9	5.9	5.5	5.6	4.7	0.0	0.0	42.4
Pecos R nr Artesia	7.0	5.4	25.4	4.9	2.2	32.7	27.6	7.5	21.9	18.3	14.3	7.4	174.5
Rio Penasco at Dayton	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fourmile Draw nr Lakewood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
South Seven Rivers nr Lkwd*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rocky Arroyo at Hwy Br nr	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pecos R at Dam Site 3	1.9	1.8	3.6	18.5	14.7	18.9	22.1	13.7	11.8	13.7	12.4	1.7	134.7
Pecos bel Avalon Dam	0.0	0.0	0.0	0.0	0.0	0.0	5.1	0.0	0.0	6.4	10.4	0.0	21.9
Carlsbad Main Canal	0.0	0.0	4.1	16.8	13.8	17.5	13.6	11.9	11.6	6.5	0.0	0.0	95.9
Dark Canyon at Carlsbad	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pecos below Dark Canyon	2.9	2.2	2.1	2.2	0.2	0.3	5.4	0.7	0.8	7.4	11.2	1.2	36.6
Pecos R at Red Bluff	6.8	5.1	4.5	3.7	2.7	2.1	7.4	3.3	3.0	8.2	15.9	4.1	66.7
Delaware R nr Red Bluff	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.3	0.0	0.1	0.1	0.1	0.9
*out of service - assumed zero													
GAGE HEIGHTS													
Avalon gage ht, end mo	18.6	19.0	16.1	16.9	16.2	15.4	15.6	17.0	17.0	17.0	17.0	17.8	
Avalon gage ht, avg	18.22	18.83	18.72	16.42	16.32	15.85	16.12	16.62	16.60	16.55	16.46	17.49	
Alamogordo ga ht, end mo	55.20	60.38	56.40	56.07	59.63	58.21	49.14	51.77	41.65	42.90	46.95	50.01	
Alamogordo gage ht, avg	54.04	59.48	58.40	55.78	57.45	54.66	48.13	50.88	50.06	42.56	45.62	48.79	
Lake S Rosa ga ht, end mo	44.18	42.48	40.35	42.07	43.93	34.36	21.96	28.75	17.07	21.48	27.77	28.91	
Lake S Rosa ga ht, avg	44.79	42.45	40.47	41.19	42.68	38.42	31.17	26.00	24.80	19.50	26.36	28.45	
PRECIPITATION, INCHES													
Brantley Lake	0.00	0.04	0.36	0.08	0.00	0.36	0.63	0.99	0.31	1.58	0.05	0.45	4.85
Las Vegas FAA AP				1.16	0.00	0.02	5.05	2.99	0.52	4.47			14.21
Pecos National Monument				0.19	0.00	0.20	5.48	4.64	0.52	5.16			16.19
Santa Rosa				1.36	0.00	0.02	3.12	4.10	0.73	3.45			12.78
Lake Santa Rosa	0.03	0.74	1.98	0.91	0.00	0.00	3.63	2.82	0.90	3.71	1.27	0.64	16.63
Sumner Lake	0.01	0.85	0.89	0.86	0.00	0.28	2.41	4.95	0.76	4.35	0.30	0.38	16.04
PAN EVAPORATION, INCHES													
Lake Santa Rosa	3.72	4.98	8.56	7.58	12.58	15.65	11.52	9.87	9.3	5.63	3.33	3.54	96.26
Lake Sumner	2.69	4.13	7.80	10.88	15.87	19.54	14.22	13.05	10.73	12.15	4.00	2.79	117.85
Brantley Lake	4.65	5.64	9.67	11.58	15.39	18.94	15.78	11.88	12.06	9.89	4.85	4.79	125.12
OTHER REPORTS													
Base Acme-Art, TAF (USGS)	4.5	3.8	2.6	2.1	1.4	1.1	1.5	1.8	1.4	1.7	3.7	4.1	29.7
Pump depl Ac-Artesia, TAF	0.0	0.0	0.2	0.6	0.6	0.8	0.6	0.6	0.7	0.1	0.0	0.0	4.3
NM irrigation inv, acres													11761
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 1999

NEW MEXICO'S OBJECTIONS

1. Base Inflow, Acme to Artesia

New Mexico objected again this year to some of the USGS results from hydrograph scalping, primarily where the base flow lines should be drawn. This basic issue was discussed in the last two Final Reports and involves judgment about the separation of base flow from flood flow.

My review of New Mexico's objections resulted in the following conclusions:

January. I accept New Mexico's basic objection for January, USGS's Acme line seems too high for the latter part of December, thus giving an unrealistically low estimate of base inflow for the month. New Mexico apparently used an approximate method to recalculate the base inflow values, but the method is not explained. As shown on the graph supplied by New Mexico, the method apparently taking a mid-point value as the average and multiplying it by the number of days in the month. I could not check New Mexico's proposed revised value of 5,104 acre-feet for January and my calculation of the January value, which I have adopted for the Final Report, is 4,950 acre-feet.

February through July; September. There were no objections to USGS estimates for these periods.

August. I accept New Mexico's basic objection and suggestion about the that the wet month would have resulted in more base inflow; however, New Mexico's increase in base flow for Artesia plus pumping seems too sharp, and I accept half the proposed increase, making a value for August of 2,457 acre-feet.

October through December. I agree generally with New Mexico's assessment of the base inflow in this period. In periods of high flow such as this, it is difficult to determine exactly what is base flow and what is flood flow, but New Mexico's decisions about hydrograph scalping in this period seem reasonable. Again, I could not check New Mexico's calculations based on a very approximate method. Since USGS' original computations were also quite approximate and based on a graphical method, it does not seem appropriate to shift to a numerical calculation for part of the year, so I used a graphical method to compute the October-December period. Values adopted for the year are shown on this table:

	USGS	NM	RM
Jan	4,490	5,104	4,950
Feb	3,780	3,780	3,780
Mar	2,580	2,580	2,580
Apr	2,080	2,080	2,080

May	1,350	1,350	1,350
Jun	1,130	1,130	1,130
Jul	1,480	1,480	1,480
Aug	1,840	3,074	2,457
Sep	1,430	1,430	1,430
Oct	1,720	3,566	3,336
Nov	3,690	4,344	4,068
Dec	4,120	4,919	4,596
Total	29,690	34,837	33,237

Thus, the adopted value for base inflow is 33.2 TAF. Note: New Mexico's table on page 2 of the objections reads "Total for 1997," but it should read "Total for 1998."

2. Flood Inflow, Carlsbad to Stateline.

New Mexico's objection here only amounts to 109 acre-feet. I reject the objection for the following reason. There is a peak at Pecos River Below Dark Canyon that precedes the peak at Red Bluff that occurred beginning January 3. However, the rise at BDC began on January 1, and it is my judgement that the sharp rise at Red Bluff beginning on January 3 is the result of the rainfall, not the BDC peak passing through. Several elements of evidence point to that, including the fact that the peak at Red Bluff is about twice the size of the one at BDC.

On New Mexico's second point, the base flows shown in the Preliminary Report for Below Dark Canyon in January should be removed. It was my judgment that the flow there was not due to flooding. This will not change the value of 109 acre-feet for January.

3. Table 6. Depletion due to Santa Rose Reservoir Operations.

The River Master accepts New Mexico's objections about the two numerical values for contents of Lake Sumner. These had insignificant impacts on the computations. However, the other objection, that erroneous values for 1947 Lake Sumner areas were used, had a significant effect. I checked New Mexico's values and agree with them. The results are included in the revised Table 6.

4. Final Calculated Departure.

New Mexico arrived at +2.1 TAF and the Final Determination is +1.7 TAF after the River Master's determinations.

TEXAS' OBJECTIONS

Texas did not have any objections to the Preliminary Report.

6635 2416 12
09•09•99 MAB INFORMATION
CONFIDENTIAL