PECOS RIVER COMPACT

Report of the River Master

Water Year 2007

Accounting Year 2008

Final Report

June 25, 2008

Neil S. Grigg
River Master of the Pecos River
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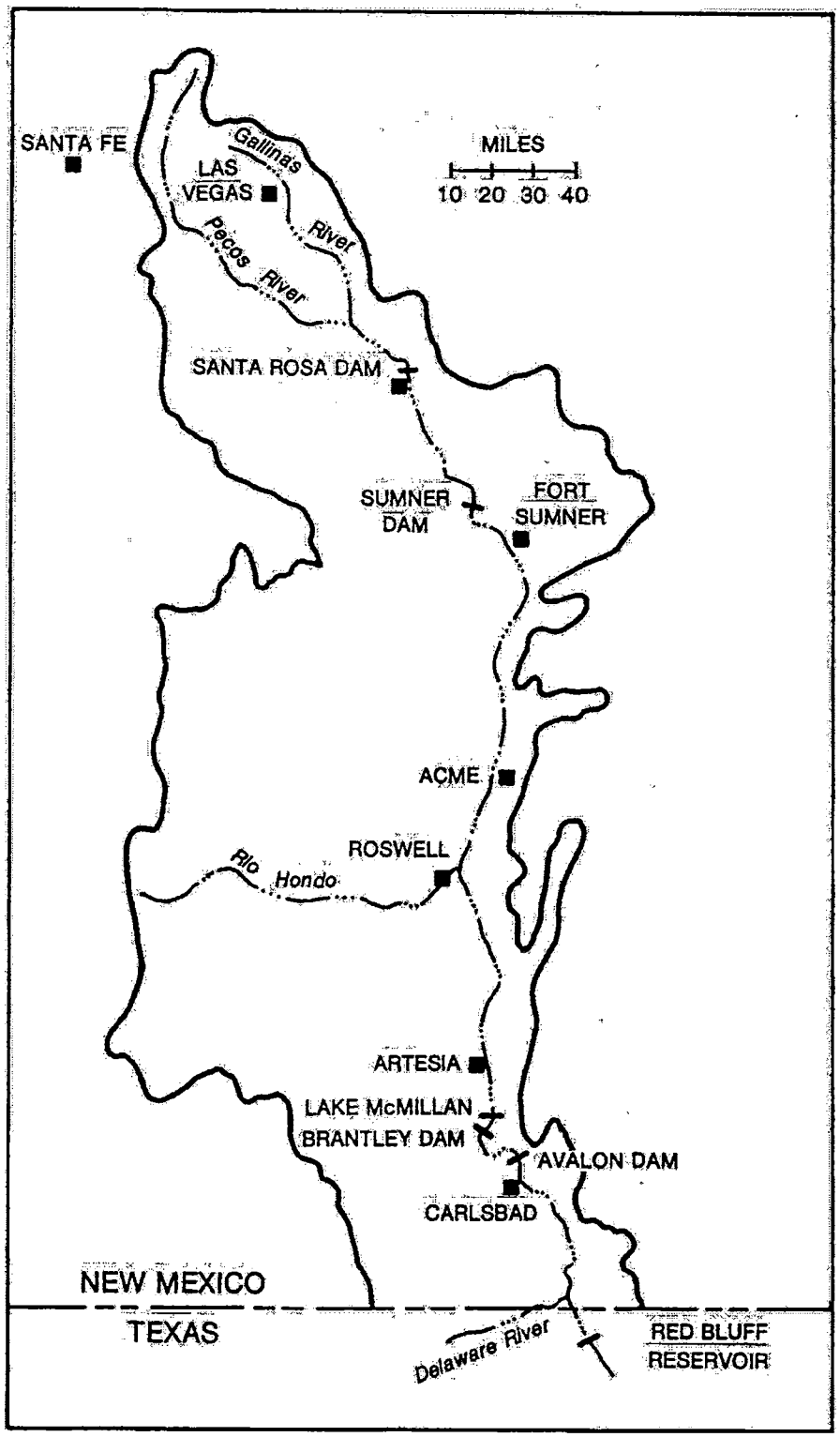


Map of Pecos River Basin Showing Accounting Reaches

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

Final Report of the River Master
Water Year 2007 - Accounting Year 2008
June 25, 2008

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 2007 was an overage of 25,200 acre-feet. The accumulated overage since the beginning of Water Year 1987 is 92,500 acre-feet.

Neil S. Grigg
River Master of the Pecos River

Pecos River Compact		
Accumulated Shortfall or Overage		
	June 25, 2008	
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
2003	2,000	8,900
2004	8,300	17,200
2005	24,000	41,200
2006	26,100	67,300
2007	25,200	92,500

Table 1. General Calculation of Annual Departures, TAF, WY 2007			
6/25/2008			
	WY 2005	WY 2006	WY 2007
B.1.a. Index Inflows			
(1) Annual flood inflow			
(a) Gaged flow Pecos R bel Alamogordo Dam	110.5	104.2	115.7
(b) Flood Inflow Alamogordo - Artesia (Table 2)	12.4	19.5	6.7
(c) Flood Inflow Artesia - Carlsbad (Table 3)	14.3	12.0	11.6
(d) Flood Inflow Carlsbad - State Line (Table 4)	5.6	6.0	9.5
Total (annual flood inflow)	142.8	141.7	143.5
(2) Index Inflow (3-year avg)			142.7
B.1.b. 1947 Condition Delivery Obligation			57.0
(Index Outflow)			
B.1.c. Average Historical (Gaged) Outflow			
(1) Annual historical outflow			
(a) Gaged Flow Pecos River at Red Bluff NM	106.5	66.9	67.5
(b) Gaged Flow Delaware River nr Red Bluff NM	2.8	2.1	4.0
(c) Metered diversions Permit 3254 into C-2713	0.2	0.0	0.0
Total Annual Historical Outflow	109.5	69.0	71.5
(2) Average Historical Outflow (3-yr average)			83.3
B.1.d. Annual Departure			26.3
C. Adjustments to Computed Departure			
1. Adjustments for Depletions above Alam Dam			
a. Depletions Due to Irrigation (Table 5)	-0.2	-0.4	-0.5
b. Depl fr Operation of Santa Rosa Reservoir (Table 6)	6.1	2.4	3.6
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	116.4	106.2	118.8
(b) Flood Inflow Alamogordo - Artesia	12.4	19.5	6.7
(c) Flood Inflow Artesia - Carlsbad	14.3	12.0	11.6
(d) Flood Inflow Carlsbad - State Line	5.6	6	9.5
Total (annual flood inflow)	148.7	143.7	146.6
Recomputed Index Inflow (3-year avg)			146.3
Recomputed 1947 Condition Del Outflow			59.1
(Index Outflow)			
Recomputed Annual Departures			24.2
Credits to New Mexico			
C.2 Depletions Due to McMillan Dike			1.0
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			25.2

Table 2. Determination of Flood Inflows, Alamogordo Dam to Artesia (B.3), WY 2007													
6/24/2008													
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	TOT
Flow bel Sumner Dam	1.6	9.4	18.4	6.2	5.6	6.3	26.1	11.4	22.8	5.8	0.9	1.2	115.7
FtSumner Irrig Div	0.0	0.0	3.7	4.5	4.9	5.0	5.2	5.3	5.4	5.2	0.1	0.0	39.3
Ft Sumner ID Return	0.8	0.6	1.5	1.7	2.5	2.5	2.5	2.5	2.3	2.1	1.0	0.8	20.8
Flow past FS IDist	2.5	10.0	16.2	3.4	3.2	3.8	23.4	8.6	19.7	2.6	1.8	2.1	97.2
Channel loss	0.2	0.7	3.1	1.5	1.5	1.4	3.8	2.1	3.0	0.8	0.7	0.2	19.0
Residual Flow	2.2	9.4	13.1	1.9	1.7	2.4	19.6	6.5	16.7	1.8	1.1	1.8	78.1
Base Inflow	3.8	3.3	3.3	3.1	2.8	1.7	1.6	1.5	1.5	1.6	2.0	3.7	30.0
River Pump Divers	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.5
Residual, Artesia	6.1	12.6	16.3	4.9	4.5	4.0	21.2	7.9	18.1	3.3	3.0	5.5	107.6
Pecos Flow Artesia	6.1	5.5	27.7	6.2	6.9	3.9	19.6	3.8	22.5	3.2	3.5	5.3	114.3
Flood Inflow, AD-Art	0.0	-7.2	11.4	1.3	2.4	-0.1	-1.5	-4.1	4.4	-0.1	0.5	-0.2	6.7

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 2007 (B.4)													
6/24/2008													
	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	0.0	0.0	0.2	0.0	0.0	0.0	0.2
Fourmile Draw nr Lakew	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1
South Seven Rivers	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Rocky Arroyo at Hwy Br	0.0	0.0	0.0	0.0	0.1	0.0	0.7	0.0	0.1	0.0	0.0	0.0	0.9
Flood Inflow, Art-DS3	0.0	0.0	0.0	0.0	0.1	0.0	0.7	0.0	0.4	0.0	0.0	0.0	1.2
Pecos R at Dam Site 3	1.2	1.1	2.9	11.1	7.1	15.8	10.7	11.5	8.2	13.1	18.0	1.2	101.8
CB Sprgs New Water (from Table 7)	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.8
Total Inflow, DS3 - CB	1.1	1.0	2.8	11.0	7.1	15.7	10.6	11.4	8.1	13.1	17.9	1.2	101.0
Evap Loss, Lake Avalon (from Table 10)	0.1	0.3	0.3	0.4	0.2	0.4	0.3	0.4	0.1	0.4	0.2	0.1	3.1
Storage Chg, Lake Avalon (from Table 11)	0.7	0.4	-0.7	-0.6	-0.2	0.4	0.1	-0.3	0.1	0.3	-0.4	0.8	0.5
Carls ID diversions	0.0	0.0	2.9	11.4	7.2	14.6	9.3	10.8	7.7	11.5	0.0	0.0	75.3
93% CID diver	0.0	0.0	2.7	10.6	6.7	13.6	8.7	10.1	7.2	10.7	0.0	0.0	70.0
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	0.5	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.8
Pecos b Dark Canyon	1.2	1.1	1.8	1.6	1.9	0.9	1.4	1.3	3.0	2.4	18.7	1.7	37.1
Pecos R at Carlsbad	1.2	1.1	1.8	1.6	1.5	0.9	1.4	1.3	2.7	2.4	18.7	1.7	36.2
Total Outflow	2.1	1.9	4.1	12.1	8.2	15.4	10.6	11.7	10.1	13.8	18.6	2.7	111.3
Flood Inflow, DS3-CB	1.0	0.9	1.3	1.0	1.1	-0.3	0.0	0.3	2.0	0.8	0.7	1.6	10.3
Flood Inflow, Art-CB	1.0	0.9	1.3	1.0	1.3	-0.3	0.7	0.3	2.3	0.8	0.7	1.6	11.6

Table 4. Summary Table for Computations, Carlsbad to State Line - WY 2007 (B.5)							
4/28/2008							
	BCB - RB	BCB - RB*	Del R	DC			
	RM	USGS	USGS				
Jan	0.2	0.2	0.0	0.0			
Feb	0.0	0.0	0.0	0.0			
Mar	1.0	1.0	0.3	0.0			
Apr	0.2	0.2	0.0	0.0			
May	1.0	0.6	0.0	0.5			
Jun	0.8	0.5	0.0	0.0			
Jul	1.5	1.2	0.9	0.0			
Aug	0.8	0.7	0.4	0.0			
Sep	1.1	1.3	0.4	0.4			
Oct	0.0	0.1	0.0	0.0			
Nov	0.0	0.0	0.0	0.0			
Dec	0.1	0.1	0.0	0.0			
Total	6.7	5.9	1.9	0.8			
* - Average of two USGS estimates is shown							
Summary of flood inflows, Carlsbad to State Line, TAF							
Red Bluff - Carlsbad + Dark C RM calcs)					7.5		
Delaware River (USGS Computation					1.9		
Total Flood Inflow, Carlsbad to State Line					9.5		

Table 5. Depletions Due to Irrigation Above Sumner Dam - WY 2007 (C.1.a)								
4/28/2008								
	APR	MAY	JUN	JUL	AUG	SEPT	OCT	TOTAL
Precip Las Vegas FAA AP	0.35	2.38	2.55	3.50	1.56	3.36	0.12	13.82
Eff prec Las Veg FAA AP	0.34	2.12	2.26	2.95	1.46	2.85	0.12	12.10
Precip Pecos Natl Monument	0.73	1.25	2.70	1.88	1.16	1.53	0.39	9.64
Eff Precip Pecos RS	0.71	1.19	2.37	1.73	1.11	1.43	0.38	8.92
Precip Santa Rosa	0.64	1.70	1.71	3.34	1.53	3.28	0.23	12.43
Eff Precip Santa Ro	0.63	1.58	1.59	2.84	1.43	2.79	0.23	11.09
Average eff precip, ft	0.05	0.14	0.17	0.21	0.11	0.20	0.02	0.89
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	0.14	0.22	0.19	0.09	0.16	0.00	0.09	0.89
Acres (most recent inventory)	11529							
Streamflow depletion (actual use), AF	10312							
1947 depletion, AF	10804							
Difference (actual use - 1947 depletion), TAF	-0.5							
Adjustment to Gaged Flow, Pecos River below Sumner Dam, TAF =						-0.5		

Table 6. Depletions Due to Santa Rosa Reservoir Operations - WY 2007 - (C.1.b)													
6/24/2008													
	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	57.81	62.89	57.06	56.19	55.46	54.21	55.78	54.57	53.31	51.65	51.97	54.02	
LS content, AF, avg	30335	42954	28718	26915	25463	23101	26093	23765	21497	18751	19259	22755	
LS area, acres, avg	2195	2811	2117	2027	1953	1827	1985	1863	1737	1576	1603	1808	
LS evap, inches	1.80	4.27	6.91	9.73	10.18	13.21	12.70	13.94	9.95	9.58	5.77	3.79	101.83
.77 LS Evap	1.39	3.29	5.32	7.49	7.84	10.17	9.78	10.73	7.66	7.38	4.44	2.92	78.41
LS Precip, inches	0.67	0.28	1.32	0.61	2.28	1.53	1.25	1.31	1.61	0.29	0.10	0.45	11.70
Net LS Evap, inches	0.72	3.01	4.00	6.88	5.56	8.64	8.53	9.42	6.05	7.09	4.34	2.47	66.71
LSum Evaploss, TAF	0.13	0.70	0.71	1.16	0.90	1.32	1.41	1.46	0.88	0.93	0.58	0.37	10.56
L S Rosa ga ht, avg	39.84	39.45	35.42	37.62	40.80	43.96	37.36	36.95	29.69	29.27	29.12	29.30	
LSR content, AF, avg	79368	78117	65962	72409	82499	93319	71622	70395	51181	50190	49840	50260	
LSR area, acres, avg	3228	3197	2807	3036	3295	3561	3009	2971	2382	2340	2324	2343	
LSR evap, inches	3.72	4.98	7.76	7.14	8.7	11.16	11.22	11.05	8.14	8.21	5	3.76	90.84
.77 LSR Evap	2.86	3.83	5.98	5.50	6.70	8.59	8.64	8.51	6.27	6.32	3.85	2.90	69.95
LSR precip, inches	0.75	0.30	0.61	0.48	2.73	2.45	1.89	2.64	1.63	0.34	0.35	1.14	15.31
Net LSR Evap, inches	2.11	3.53	5.37	5.02	3.97	6.14	6.75	5.87	4.64	5.98	3.50	1.76	54.64
LSR Evaploss, TAF	0.57	0.94	1.26	1.27	1.09	1.82	1.69	1.45	0.92	1.17	0.68	0.34	13.20
Total evaploss, TAF	0.70	1.65	1.96	2.43	1.99	3.14	3.10	2.92	1.80	2.10	1.26	0.71	23.76
Sum contents, AF	109703	121071	94680	99324	107962	116420	97715	94160	72678	68941	69099	73015	
1947 area, acres	4046	4332	3655	3779	4004	4211	3736	3642	3096	2996	2971	3101	
1947 evaploss, TAF	0.24	1.09	1.22	2.17	1.85	3.03	2.66	2.86	1.56	1.77	1.08	0.64	20.16
current-1947evaploss	0.46	0.56	0.74	0.26	0.14	0.11	0.45	0.06	0.24	0.33	0.18	0.08	3.60
						Annual adjustment for excess evaporation =							3.6
ADJUSTMENT FOR EXCESSIVE STORAGE IN SANTA ROSA RESERVOIR													
			2006	2006	2007	2007							
			Gage	Storage	Gage	Storage							
EndYear Sumner Sto			4257.08	28760	4254.90	24385							
EndYear S R Sto			4739.81	79272	4729.40	50495							
Sum				108032		74880							
Sto Adjustment, AF						0							
Adjustm Ex Evap, TAF						3.6							
Total Adjustment,TAF						3.6							

Table 7. Carlsbad Springs New Water WY 2007 - (B.4.c)					
6/24/2008					
		TAF	AF/day	cfs	Totals
Pecos R bel DC		37.1	101.6	51.2	51.2
Dark Canyon		0.8	2.2	1.1	1.1
Pecos R bel Lake Av, cfs		18.0	49.3	24.9	24.9
Depletion, cfs					2.0
CID lag seep, cfs (from Table 8)					7.1
Return flow, cfs					1.0
Lake Av lagged seep, cfs (from Table 9)					17.3
PR seepage, cfs					3.0
Carls new water, cfs					-1.1
Carls new wat, TAF					-0.8
Carls new wat monthly, TAF					-0.1

Table 8. Carlsbad Main Canal Seepage Lagged - WY 2007 - [B.4.c.(1)(e)]													
4/27/2008													
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	TOTAL
WY 2007													
CID, TAF	0.0	0.0	2.9	11.4	7.2	14.6	9.3	10.8	7.7	11.5	0.0	0.0	75.3
days/mo	31	28	31	30	31	30	31	31	30	31	30	31	365
cfs	0.0	0.0	46.4	190.9	116.4	245.5	151.4	176.0	129.9	186.7	0.0	0.0	103.6
cfs, qtr avg			16.0			183.5			152.7			62.9	
WY 2006		1Q	2Q	3Q	4Q								
FLOWS, cfs				127.1	49.2								
SEVEN %				8.9	3.4								
WY 2007 lagged		1Q	2Q	3Q	4Q								
FLOWS, cfs		16.0	183.5	152.7	62.9								
SEVEN %		1.1	12.8	10.7	4.4								
LAG		3.2	7.4	9.8	7.9	Avg =	7.1	cfs					

Table 9. Lake Avalon Leakage Lagged - WY 2007 - B.4.c.(1)(g)													
6/24/2008													
WY 2007	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	TOT
WS NM rept	74.03	74.93	74.79	73.30	73.35	73.12	73.27	73.41	73.15	73.08	73.19	73.68	
ga ht, avg*	17.03	17.93	17.79	16.30	16.35	16.12	16.27	16.41	16.15	16.08	16.19	16.68	
cfs	19.4	23.7	23.0	15.9	16.2	15.1	15.8	16.4	15.2	14.9	15.4	17.7	
days	31	28	31	30	31	30	31	31	30	31	30	31	365
cfs avg	22.0			15.7			15.8			16.0			17.4
2006		1Q	2Q	3Q	4Q								
cfs				16.5	15.5								
2006 lagged		1Q	2Q	3Q	4Q								
cfs		22.0	15.7	15.8	16.0								
lag cfs		18.9	17.8	16.8	15.9	Avg =	17.3	cfs					
* Computed as WS elev by NM Report minus Gage datum at 3157.0 (USBR datum)													

Table 10. Evaporation Loss at Lake Avalon - WY 2007 - (B.4.f)													
6/25/2008													
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOT
Av WS NM Rept	74.03	74.93	74.79	73.30	73.35	73.12	73.27	73.41	73.15	73.08	73.19	73.68	
Avalon ga ht, avg, ft*	17.03	17.93	17.79	16.30	16.35	16.12	16.27	16.41	16.15	16.08	16.19	16.68	
Avg area Avalon, ac**	674	732	723	630	633	619	628	637	621	648	612	685	
Panevap Brantley, in.	4.65	5.60	7.74	10.39	10.48	12.55	11.21	11.21	9.11	8.85	4.80	4.34	100.93
Lakeevap Brantley, in.	3.58	4.31	5.96	8.00	8.07	9.66	8.63	8.63	7.01	6.81	3.70	3.34	77.72
Precip Brantley, in.	1.28	0.21	0.62	0.48	4.28	1.63	3.42	1.32	5.44	0.02	0.38	0.84	19.92
Netevap, inches	2.30	4.10	5.34	7.52	3.79	8.03	5.21	7.31	1.57	6.79	3.32	2.50	57.80
Evaploss Av, TAF	0.1	0.3	0.3	0.4	0.2	0.4	0.3	0.4	0.1	0.4	0.2	0.1	3.1
* Computed as WS elev by NM Report minus Gage datum at 3157.0 (USBR datum)													
** Based on USBR Area and Capacity Table in effect January 1, 1997													

Table 11. Change in Storage, Lake Avalon - WY 2007 - (B.4.g)

(Gage heights are end of month)

4/27/2008

	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	TOT
	2006	2007												
WS NM Rept	73.50	74.50	75.10	74.10	73.10	72.70	73.40	73.50	73.10	73.20	73.60	73.00	74.20	
Gage EOM, ft*	16.50	17.50	18.10	17.10	16.10	15.70	16.40	16.50	16.10	16.20	16.60	16.00	17.20	
Storage, AF**	1461	2133	2568	1857	1209	966	1397	1461	1209	1271	1525	1147	1925	
Change sto, TAF		0.7	0.4	-0.7	-0.6	-0.2	0.4	0.1	-0.3	0.1	0.3	-0.4	0.8	0.5

* Computed as WS elev by NM Report minus Gage datum at 3157.0 (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 2007													
6/24/2008													
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	TOTAL
.													
STREAMFLOW GAGING RECORDS, TAF													
Pecos R b Sumner Dam	1.6	9.4	18.4	6.2	5.6	6.3	26.1	11.4	22.8	5.8	0.9	1.2	115.7
Fort Sumner Main C	0.0	0.0	3.7	4.5	4.9	5.0	5.2	5.3	5.4	5.2	0.1	0.0	39.3
Pecos R nr Artesia	6.1	5.5	27.7	6.2	6.9	3.9	19.6	3.8	22.5	3.2	3.5	5.3	114.3
Rio Penasco at Dayton	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.2
Fourmile Draw nr Lakewood	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1
South Seven Rivers nr Lkwd	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Rocky Arroyo at Hwy Br nr	0.0	0.0	0.0	0.0	0.1	0.0	0.7	0.0	0.1	0.0	0.0	0.0	0.9
Pecos R at Dam Site 3	1.2	1.1	2.9	11.1	7.1	15.8	10.7	11.5	8.2	13.1	18.0	1.2	101.8
Pecos bel Avalon Dam	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.0	0.0	18.0
Carlsbad Main Canal	0.0	0.0	2.9	11.4	7.2	14.6	9.3	10.8	7.7	11.5	0.0	0.0	75.3
Dark Canyon at Carlsbad	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.8
Pecos below Dark Canyon	1.2	1.1	1.8	1.6	1.9	0.9	1.4	1.3	3.0	2.4	18.7	1.7	37.1
Pecos R at Red Bluff	4.0	3.5	4.4	3.3	4.9	3.7	4.9	4.0	5.4	4.5	20.2	4.7	67.5
Delaware R nr Red Bluff	0.1	0.1	0.4	0.1	0.1	0.2	1.2	0.1	1.2	0.2	0.1	0.2	4.0
GAGE HEIGHTS													
Avalon gage ht, end mo	74.50	75.10	74.10	73.10	72.70	73.40	73.50	73.10	73.20	73.60	73.00	74.20	
Avalon gage ht, avg*	74.03	74.93	74.79	73.30	73.35	73.12	73.27	73.41	73.15	73.08	73.19	73.68	
Sumner Lake ga ht, end mo	58.47	61.28	56.63	55.80	54.97	53.97	55.37	54.64	52.52	50.92	52.93	54.90	
Sumner Lake gage ht, avg**	57.81	62.89	57.06	56.19	55.46	54.21	55.78	54.57	53.31	51.65	51.97	54.02	
Lake S Rosa ga ht, end mo	39.90	35.64	36.65	38.27	43.11	43.46	36.44	34.25	29.42	29.15	29.11	29.40	
Lake S Rosa ga ht, avg	39.84	39.45	35.42	37.62	40.80	43.96	37.36	36.95	29.69	29.27	19.12	29.30	
PRECIPITATION, INCHES													
Brantley Lake	1.28	0.21	0.62	0.48	4.28	1.63	3.42	1.32	5.44	0.02	0.38	0.84	19.92
Las Vegas FAA AP	0.48	0.05	0.49	0.35	2.38	2.55	3.50	1.56	3.36	0.12	0.51	0.75	16.10
Pecos National Monument	0.88	1.05	0.65	0.73	1.25	2.7	1.88	1.16	1.53	0.39	0.38	2.39	14.99
Santa Rosa*	0.75	0.52	0.36	0.64	1.70	1.71	3.34	1.53	3.28	0.23	0.49	1.23	15.78
Lake Santa Rosa	0.75	0.30	0.61	0.48	2.73	2.45	1.89	2.64	1.63	0.34	0.35	1.14	15.31
Sumner Lake	0.67	0.28	1.32	0.61	2.28	1.53	1.25	1.31	1.61	0.29	0.10	0.45	11.70
PAN EVAPORATION, INCHES													
Lake Santa Rosa	3.72	4.98	7.76	7.14	8.7	11.16	11.22	11.05	8.14	8.21	5	3.76	90.84
Lake Sumner	1.80	4.27	6.91	9.73	10.18	13.21	12.70	13.94	9.95	9.58	5.77	3.79	101.83
Brantley Lake	4.65	5.60	7.74	10.39	10.48	12.55	11.21	11.21	9.11	8.85	4.80	4.34	100.93
OTHER REPORTS													
Base Acme-Art, TAF (USGS)	3.8	3.3	3.3	3.1	2.8	1.7	1.6	1.5	1.5	1.6	2.0	3.7	30.0
Pump depl Ac-Artesia, TAF	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.5
Pumping, C-2713, Brine Part.	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
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 2008

NEW MEXICO'S OBJECTIONS

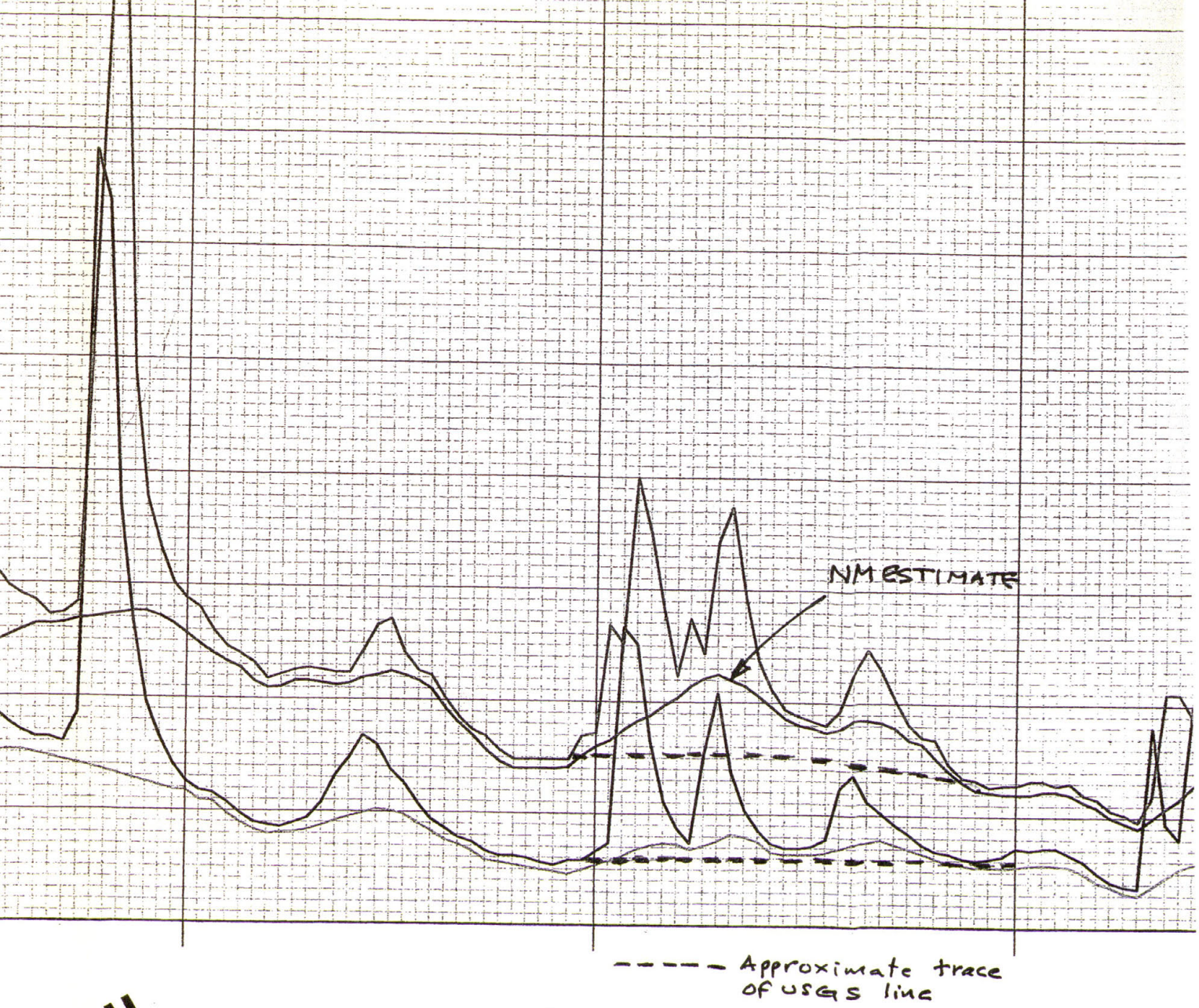
1. Table 2. Determination of Flood Inflows, Alamogordo Dam to Artesia – WY 2007 – [B.3]:

New Mexico (NM) objected to the USGS base inflow calculation and presented proposed base inflow calculations. New Mexico's reasons are explained as to be based on consistency in scalping the hydrographs. Comparing NM and USGS calculations by month shows that most differences are in the April-September time interval (see table below that compares NM and USGS estimates of base inflow in TAF).

	NM	USGS	Diff	Adjusted values See below
Jan	3.60	3.94	-0.34	3.83
Feb	3.17	3.34	-0.17	3.28
Mar	3.26	3.32	-0.06	3.30
Apr	3.49	2.92	0.57	3.11
May	3.40	2.52	0.88	2.81
Jun	1.90	1.61	0.29	1.71
Jul	1.91	1.48	0.43	1.62
Aug	1.88	1.35	0.53	1.53
Sep	1.89	1.31	0.58	1.50
Oct	1.69	1.54	0.15	1.59
Nov	2.02	1.96	0.06	1.98
Dec	3.84	3.63	0.21	3.70
	32.05	28.92	3.13	29.96

Similar to last year, most of the difference apparently results from the different results that result from the flat lines of USGS compared to NM's upward-curving base flow lines. To discuss the merits of the two approaches, the estimates for May 2007 will be compared. As the following graph marked "Comparison of base flow estimates" shows, NM estimates much more fluctuation in base flow than USGS does. USGS estimates are based on an apparent assumption that base flow levels change very slowly, whereas NM estimates have base flow changing quickly, in a matter of a few days. Evaluating the estimates requires a definition of base flow, for which there is no universal standard. However, base flow is generally considered groundwater flow, with an allowance for delayed return of infiltrated or stored surface water flow. Thus, whether you consider base flow as slowly-changing or rapidly-changing depends on the hydrologic characteristics of the basin in question.

NM's upward bulge for the scalped Artesia flow in May seems too high, almost reaching 50% of the full flood hydrograph. Where to draw the line involves subjective judgment.



Comparison of base flow estimates

Mo

On the other hand, the USGS lines for the July-September period seem too rigid in not recognizing much change at all in base flow from the delayed runoff of that period.

While the River Master believes USGS' approach to be mostly valid, he thinks NM's attempts to recognize fluctuations in base flow have some validity. While the River Master could have prepared a new estimate, the decision is to choose values between the NM and USGS approach using the following method: for each month, compute the difference between NM and USGS estimates; add 1/3 of this difference to the USGS value. This results in the adjusted values shown in the table above. Where the difference is negative, it is added in the same way. Table 2 has been revised with the adjusted values.

2. Table 4. Summary Table for Computations, Flood Inflows, Carlsbad - State Line (B.5.c)

NM objected to including three hydrograph rises as flood events. The events were:

April 1-5	NM states it is not preceded by precipitation. It is the River Master's judgment that the hydrograph recession is part of the event beginning around March 22, which clearly involves rainfall.
May 22-25	NM views this as increased base flow resulting from rain. It is the River Master's judgment that this is part of the recession hydrograph from the storm beginning about mid-May.
July 17-21	NM views this as increased base flow resulting from rain. It is the River Master's judgment that this runoff is part of the continuing flooding that occurred from frequent rain in the reach.

Based on the reasoning above, New Mexico's objection on Table 4 is rejected.

3. Table 6. Depletions Due to Santa Rosa Reservoir Operations.

New Mexico found a typographical error in the Lake Santa Rosa gage height for November. This resulted originally from an error in NM's submittal, which showed an average November gage height of 4619.12, which is clearly in error but not detected by the River Master. Therefore the River Master accepts NM's revised value of 4729.12.

NM found that the end year Sumner storage shown was for December 30, and requires a slight adjustment. This was accepted.

NM did not explain the error they found where the River Master had failed to update the "1947 area" row. However, NM had highlighted the correct values in blue on their spreadsheet, so these values were accepted and Table 6 has been revised.

4. Table 9. Lake Avalon Leakage Lagged—WY 2007.

NM reported an averaging error which has been corrected for the non-leap year. Also, NM pointed out three gage heights that were erroneously taken from end-of-month values. Two corrections are necessary here. First, NM's revised Table 9 incorrectly lists

"End of Month Elev" and this is apparently just an oversight and should read "Average elev." The second error was in NM's original submittal of these gage heights, which listed end-of-month and average elevations as the same for October, November, and December. Given that NM caught these errors and used revised average gage heights for October, November, and December, the River Master accepts NM's revised Table 9 and has corrected Table 12 also for the incorrect gage heights.

Revision of Table 9 requires revision of Tables 7 and 3 as well. These were revised.

5. Table 12. Data required for River Master Manual Calculations, WY 2007.

New Mexico reported a typographical error on Table 12 for the October value of the Fort Sumner Main Canal. The River Master checked the original USGS report and affirmed the value in the Preliminary Report. NM may have mistaken the September value, which is about the same. This objection is rejected.

TEXAS'S OBJECTIONS

Texas reported an error in Table 2, where the October value for Fort Sumner Irrigation Diversions was given as 5.2 TAF instead of 5.4 TAF, which Texas reported as the USGS value. However, on checking the USGS reported data, the River Master found the values to be the same as those in the Preliminary Report. In any case, Texas did not compute that any changes in the flood inflow for Table 2 were indicated so there is no need to investigate this report any further.

FINAL CALCULATED DEPARTURE

The Preliminary Report's Final Calculated Departure was an overage of 24.5 TAF. After considering the states' objections, the Final Determination is an overage of 25.2 TAF.