PECOS RIVER COMPACT

Report of the River Master

Water Year 1999

Accounting Year 2000

Final Report

June 26, 2000

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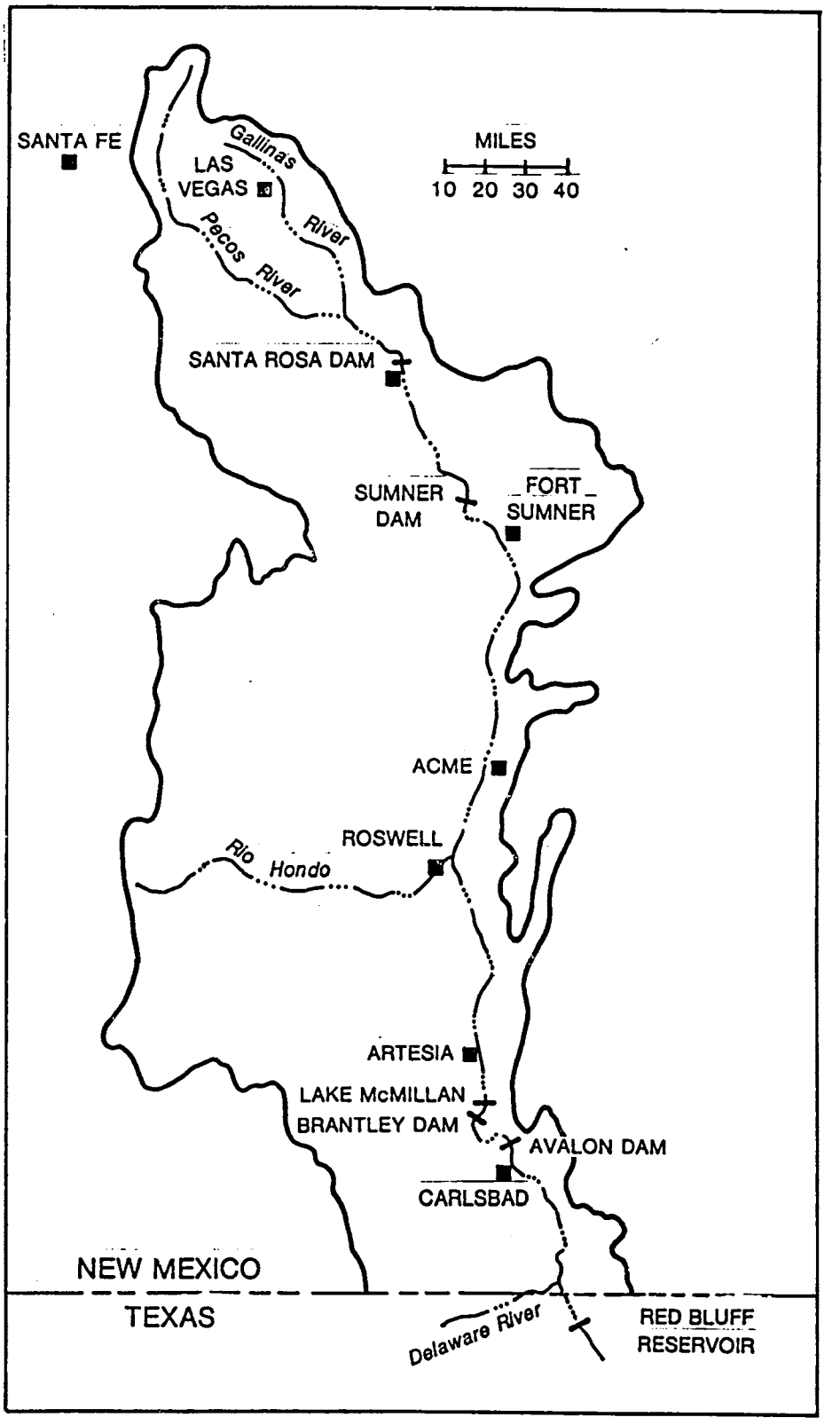


Map of Pecos River Basin Showing Accounting Reaches

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

Final Report of the River Master
Water Year 1999 - Accounting Year 2000
June 26, 2000

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 1999 was an overage of 1,400 acre-feet. The accumulated overage since the beginning of Water Year 1987 is 22,900 acre-feet.

Neil S. Grigg
River Master of the Pecos River

Pecos River Compact		
Accumulated Shortfall or Overage		
	June 24, 2000	
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

Table 1. General Calculation of Annual Departures, TAF, WY 99			
6/24/00			
	1997	1998	1999
B.1.a. Index Inflows			
(1) Annual flood inflow			
(a) Gaged flow Pecos R bel Alamogordo Dam	160.0	191.1	96.8
(b) Flood Inflow Alamogordo - Artesia (Table 2)	13.2	6.2	37.4
(c) Flood Inflow Artesia - Carlsbad (Table 3)	1.0	4.7	16.1
(d) Flood Inflow Carlsbad - State Line (Table 4)	6.6	1.4	21.9
Total (annual flood inflow)	180.8	203.4	172.2
(2) Index Inflow (3-year avg)			185.5
B.1.b. 1947 Condition Delivery Obligation			82.8
(Index Outflow)			
B.1.c. Average Historical (Gaged) Outflow			
Gaged Flow Pecos River at Red Bluff NM	98.1	66.7	75.2
Gaged Flow Delaware River nr Red Bluff NM	2.5	0.9	6.6
(1) Total Annual Historical Outflow	100.6	67.6	81.8
(2) Average Historical Outflow (3-yr average)			83.3
B.1.d. Annual Departure			0.5
C. Adjustments to Computed Departure			
1. Adjustments for Depletions above Alam Dam			
a. Depletions Due to Irrigation (Table 5)	-3.6	0.7	-3.4
b. Depl fr Operation of Santa Rosa Reservoir (Table 6)	0.6	3.9	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	157.0	195.7	97.0
(b) Flood Inflow Alamogordo - Artesia	13.2	6.2	37.4
(c) Flood Inflow Artesia - Carlsbad	1.0	4.7	16.1
(d) Flood Inflow Carlsbad - State Line	6.6	1.4	21.9
Total (annual flood inflow)	177.8	208.0	172.4
Recomputed Index Inflow (3-year avg)			186.1
Recomputed 1947 Condition Del Outflow			83.2
(Index Outflow)			
Recomputed Annual Departures			0.1
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			1.4

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

Water Year 1999

6/24/00

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	TOT
Flow bel Alamog Dam	1.3	1.2	5.2	5.6	5.6	6.6	10.7	29.4	6.2	23.0	0.7	1.3	96.8
FtSumner Irrig Div	0.0	0.0	4.3	5.1	3.6	5.5	5.7	4.9	5.4	5.3	0.0	0.0	39.7
Ft Sumner ID Return	0.8	0.6	1.5	1.7	2.5	2.5	2.5	2.5	2.3	2.1	1.1	0.8	21.0
Flow past FS IDist	2.2	1.8	2.4	2.2	4.5	3.7	7.6	27.1	3.1	19.8	1.7	2.2	78.1
Channel loss	0.2	0.2	0.7	1.4	1.6	1.4	1.7	3.7	0.9	3.0	0.7	0.2	15.6
Residual Flow	1.9	1.6	1.7	0.8	2.9	2.3	5.9	23.3	2.2	16.8	1.1	1.9	62.5
Base Inflow	3.4	3.5	2.9	2.4	4.0	2.9	3.5	3.4	2.2	1.9	2.9	2.9	36.0
River Pump Divers	0.0	0.0	0.3	0.7	0.3	0.3	0.5	0.6	0.5	0.1	0.0	0.0	3.4
Residual, Artesia	5.4	5.1	4.3	2.6	6.6	4.9	8.9	26.2	3.9	18.6	3.9	4.8	95.1
Pecos Flow Artesia	5.8	5.9	5.8	4.4	26.5	14.6	10.3	25.4	4.5	18.9	5.5	5.0	132.5
Flood Inflow, AD-Art	0.4	0.8	1.4	1.8	19.8	9.7	1.5	-0.8	0.6	0.3	1.6	0.1	37.4

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 1999 (B.4)

4/29/00

	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	0.1	0.0	0.0	0.0	0.0				0.2
Fourmile Draw nr Lakew	0.0	0.0	0.0	0.0	0.7	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.9
South Seven Rivers*						0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rocky Arroyo at Hwy Br	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
Flood Inflow, Art-DS3	0.0	0.0	0.0	0.1	0.8	0.1	0.1	0.0	0.0	0.0	0.0	0.0	1.1
Pecos R at Dam Site 3	1.8	1.8	2.8	15.2	12.1	10.4	24.1	15.9	13.8	18.0	0.7	0.3	116.6
CB Sprgs New Water, T7	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7	-8.4
Total Inflow, DS3 - CB	1.1	1.1	2.1	14.5	11.4	9.7	23.4	15.2	13.1	17.3	0.0	-0.4	108.2
Evap Loss, Lake Avalon, T10	0.2	0.3	0.4	0.5	0.5	0.5	0.5	0.5	0.3	0.3	0.0	0.0	4.2
Storage Chg, Lake Aval, T11	0.8	0.9	-3.3	0.3	0.4	-0.5	0.0	0.1	0.1	-0.4	-0.7	0.0	-2.3
Carls ID diversions	0.0	0.0	3.7	15.0	12.2	10.4	14.0	16.7	12.4	13.4	0.0	0.0	97.8
93% CID diver	0.0	0.0	3.4	13.9	11.3	9.7	13.0	15.5	11.5	12.4	0.0	0.0	90.9
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	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pecos b Dark Canyon	1.1	0.9	1.0	1.3	1.3	1.1	9.3	0.9	0.9	8.3	1.8	1.1	29.0
Pecos R at Carlsbad	1.1	0.9	1.0	1.3	1.3	1.1	9.3	0.9	0.9	8.3	1.8	1.1	29.0
Total Outflow	2.3	2.3	1.7	16.1	13.7	10.9	23.1	17.1	12.9	20.7	1.2	1.2	123.2
Flood Inflow, DS3-CB	1.2	1.2	-0.5	1.7	2.3	1.2	-0.3	2.0	-0.1	3.5	1.3	1.6	15.0
Flood Inflow, Art-CB	1.2	1.2	-0.5	1.7	3.2	1.3	-0.2	2.0	-0.1	3.5	1.3	1.6	16.1

*South Seven Rivers data missing until May 20, 1999; Gage at Rio Penasco removed from service October 1, 1999. Assumed missing values a

Table 4. Summary Table for Computations, Carlsbad to State Line - WY 99

4/29/00

	BCB - RB RM	BCB - RB USGS	Del R USGS	DC
Jan	75	20	0	0
Feb	0	24	0	0
Mar	56	89	0	0
Apr	0	601	16	0
May	548	268	35	0
Jun	13672	13490	5570	0
Jul	1632	1210	3	0
Aug	0	26	5	0
Sep	0	22	85	0
Oct	179	180	0	0
Nov	0	0	0	0
Dec	0	0	0	0
Total	16162	15930	5714	0

Summary of flood inflows, Carlsbad to State Line, TAF

Carlsbad - Red Bluff + Dark C	16.2
Delaware River (USGS Computation	5.7
Total Flood Inflow, Carlsbad to State Line	21.9

Table 5. Depletions Due to Irrigation Above Alamogordo Dam - WY 1999 (C.1.a)								
4/29/00								
	APR	MAY	JUN	JUL	AUG	SEPT	OCT	TOTAL
Precip Las Vegas FAA AP	1.66	2.87	2.53	1.54	6.97	3.22	0.02	18.81
Eff prec Las Veg FAA AP	1.54	2.50	2.24	1.44	4.10	2.75	0.02	14.59
Precip Pecos Natl Monument	1.69	1.25	1.93	3.03	5.28	2.14	0.44	15.76
Eff Precip Pecos RS	1.57	1.19	1.77	2.61	3.90	1.94	0.43	13.41
Precip Santa Rosa	3.96	2.44	0.91	2.79	2.89	1.64	0.55	15.18
Eff Precip Santa Ro	3.28	2.17	0.88	2.43	2.51	1.53	0.54	13.34
Average eff precip, ft	0.18	0.16	0.14	0.18	0.29	0.17	0.03	1.15
Consumptive use, ft	0.19	0.36	0.36	0.30	0.27	0.18	0.11	1.77
CU less eff precip, ft	0.01	0.20	0.22	0.12	0.00	0.01	0.08	0.64
Acres (most recent inventory)	11529							
Streamflow depletion, AF	7420							
1947 depletion, AF	10804							
Difference, TAF	3.4							
Adjustment to Gaged Flow - Pecos River below Alamogordo Dam =						-3.4		

Table 6. Depletions Due to Santa Rosa Reservoir Operations - WY 1999 - (C.1.b)

4/29/00

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	TOTAL
Lk Sumner ga ht, avg	51.12	53.10	53.65	53.19	60.38	60.12	60.65	60.83	60.50	55.63	52.95	55.65	56.48
LS content, AF, avg	21329	24912	25990	25085	42039	41329	42786	43289	42370	30200	24625	30245	
LS area, acres, avg	1725	1922	1996	1935	2749	2716	2784	2806	2764	2244	1902	2246	
LS evap, inches	3.04	4.75	7.24	12.58	15.71	13.16	17.14	14.57	8.65	7.72	4.16	2.65	111.37
.77 LS Evap	2.34	3.66	5.57	9.69	12.10	10.13	13.20	11.22	6.66	5.94	3.20	2.04	85.75
LS Precip, inches	0.69	0.00	2.05	3.30	4.94	1.08	4.74	2.91	1.76	0.34	0.00	0.55	22.36
Net LS Evap, inches	1.65	3.66	3.52	6.39	7.16	9.05	8.46	8.31	4.90	5.60	3.20	1.49	63.39
LSum Evaploss, TAF	0.24	0.59	0.59	1.03	1.64	2.05	1.96	1.94	1.13	1.05	0.51	0.28	13.00
L S Rosa ga ht, avg	29.25	29.79	30.20	30.57	37.78	44.19	45.21	45.41	45.15	45.07	45.20	44.83	39.39
LSR content, AF, avg	50143	51420	52407	53309	72894	94140	97842	98581	97622	97328	97807	96452	
LSR area, acres, avg	2338	2392	2428	2457	3053	3582	3678	3699	3671	3663	3677	3640	.
LSR evap, inches	3.72	4.98	7.88	7.87	9.43	11.24	11.3	9.63	7.37	6.52	5.3	3.76	89.00
.77 LSR Evap	2.86	3.83	6.07	6.06	7.26	8.65	8.70	7.42	5.67	5.02	4.08	2.90	68.53
LSR precip, inches	0.63	0.00	1.25	2.18	4.76	1.37	4.83	4.48	0.84	0.42	0.00	0.62	21.38
Net LSR Evap, inches	2.23	3.83	4.82	3.88	2.50	7.28	3.87	2.94	4.83	4.60	4.08	2.28	47.15
LSR Evaploss, TAF	0.44	0.76	0.97	0.79	0.64	2.17	1.19	0.90	1.48	1.40	1.25	0.69	12.69
Total evaploss, TAF	0.67	1.35	1.56	1.82	2.28	4.22	3.15	2.85	2.61	2.45	1.76	0.97	25.69
Sum contents, AF	71472	76332	78397	78394	114933	135469	140628	141870	139992	127528	122432	126697	
1947 area, acres	3052	3150	3190	3190	4174	4600	4600	4600	4600	4537	4367	4507	
1947 evaploss, TAF	0.42	0.96	0.94	1.70	2.49	3.47	3.24	3.19	1.88	2.12	1.17	0.56	22.12
current-1947evaploss	0.25	0.39	0.62	0.13	-0.21	0.75	-0.09	-0.34	0.73	0.33	0.59	0.41	3.57
						Annual adjustment for excess evaporation =							3.6

ADJUSTMENT FOR EXCESSIVE STORAGE IN SANTA ROSA RESERVOIR

			1998 Gage	1998 Storage	1999 Gage	1999 Storage							
EndYear Sumner Sto			4250.01	19461	4256.53	32262							
EndYear S R Sto			4728.91	49355	4744.95	96890							
Sum				68816		129152							
Sto Adjustment, AF						0							
Adjustm Ex Evap, TAF						3.6	check this						
Total Adjustment,TAF						3.6							

Table 7. Carlsbad Springs New Water WY 1999 - (B.4.c)					
4/29/00					
		TAF	cfs	Totals	
Pecos R bel DC, cfs		29.0	40.1	40.1	
Dark Canyon, cfs		0	0.0	0.0	
Pecos R bel Lake Av,		17.1	23.6	23.6	
Depletion, cfs				2.0	
CID lag seep, cfs (Table 8)				9.0	
Return flow, cfs				1.0	
Lake Av lagged seep, cfs (Table 9)				17.3	
PR seepage, cfs				3.0	
Carls new water, cfs				-11.9	
Carls new wat, TAF				-8.6	
Carls new wat monthly, TAF				-0.7	

Table 8. Carlsbad Main Canal Seepage Lagged - WY 1999 - [B.4.c.(1)(e)]

4/29/00													
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	TOTAL
WY 1999													
CID, TAF	0.0	0.0	3.7	15.0	12.2	10.4	14.0	16.7	12.4	13.4	0.0	0.0	97.8
days/mo	31	28	31	30	31	30	31	31	30	31	30	31	365
cfs	0.0	0.0	59.7	251.7	198.2	175.1	227.8	271.9	208.2	217.6	0.0	0.0	134.2
cfs, qtr avg			20.6			208.3			236.3			73.3	
1998		1Q	2Q	3Q	4Q								
FLOWS, cfs				203.5	35.7								
SEVEN %				14.2	2.5								
1999		1Q	2Q	3Q	4Q								
FLOWS, cfs		20.6	208.3	236.3	73.3								
SEVEN %		1.4	14.6	16.5	5.1								
LAG		3.9	8.2	13.4	10.5	Avg =	9.0	cfs					

Table 9. Lake Avalon Leakage Lagged - WY 1999 - B.4.c.(1)(g)													
4/29/00													
WY 1999	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	TOT
ga ht, avg	18.41	19.55	19.29	15.67	15.73	15.81	16.05	15.94	16.05	16.37	13.30	12.88	
cfs	26.0	31.4	30.2	12.9	13.2	13.6	14.7	14.2	14.7	16.2	1.6	0.0	
days	31	28	31	30	31	30	31	31	30	31	30	31	365
cfs avg	29.1			13.2			14.5			6.0			15.7
1998		1Q	2Q	3Q	4Q								
cfs				16.6	18.5								
1999		1Q	2Q	3Q	4Q								
cfs		29.1	13.2	14.5	6.0								
lag cfs		23.5	19.4	16.5	10.0	Avg =	17.3	cfs					

Table 10. Evaporation Loss at Lake Avalon - WY 1999													
4/29/00													
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOT
Avalon ga ht, avg, ft	18.41	19.55	19.29	15.67	15.73	15.81	16.05	15.94	16.05	16.37	13.30	12.88	
Avg area Avalon, ac.	766	847	828	594	597	601	615	609	615	634	99	33	
Panevap Brantley, in.	5.05	5.60	8.42	14.95	18.67	14.21	15.94	14.75	9.49	8.65	4.80	4.34	124.87
Lakeevap Brantley, in.	3.89	4.31	6.48	11.51	14.38	10.94	12.27	11.36	7.31	6.66	3.70	3.34	96.15
Precip Brantley, in.	0.40	0.00	0.44	1.28	3.35	0.86	1.76	1.97	0.86	0.54	0.00	0.00	11.46
Netevap, inches	3.49	4.31	6.04	10.23	11.03	10.08	10.51	9.39	6.45	6.12	3.70	3.34	84.69
Evaploss Av, TAF	0.2	0.3	0.4	0.5	0.5	0.5	0.5	0.5	0.3	0.3	0.0	0.0	4.2

Table 11. Change in Storage, Lake Avalon - 1999

(Gage heights are end of month)

4/29/00

	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	TOT
	1998	1999												
Gage EOM, ft	17.8	18.90	20.00	15.45	16.00	16.60	15.80	15.80	15.90	16.00	15.25	12.85	12.90	
Storage, AF	2347	3185	4109	819	1147	1525	1026	1026	1086	1147	704	19	21	
Change sto, TAF		0.8	0.9	-3.3	0.3	0.4	-0.5	0.0	0.1	0.1	-0.4	-0.7	0.0	-2.3

Table 12. Data Required for River Master Manual Calculations, Water Year 1999													
6/24/00													
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	TOTAL
STREAMFLOW GAGING RECORDS, TAF													
Pecos R b Sumner Dam	1.3	1.2	5.2	5.6	5.6	6.6	10.7	29.4	6.2	23.0	0.7	1.3	96.8
Fort Sumner Main C	0.0	0.0	4.3	5.1	3.6	5.5	5.7	4.9	5.4	5.3	0.0	0.0	39.7
Pecos R nr Artesia	5.8	5.9	5.8	4.4	26.5	14.6	10.3	25.4	4.5	18.9	5.5	5.0	132.5
Rio Penasco at Dayton*	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0				0.2
Fourmile Draw nr Lakewood	0.0	0.0	0.0	0.0	0.7	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.9
South Seven Rivers nr Lkwd*						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	1.8	1.8	2.8	15.2	12.1	10.4	24.1	15.9	13.8	18.0	0.7	0.3	116.6
Pecos bel Avalon Dam	0.0	0.0	0.0	0.0	0.1	0.0	7.9	0.0	0.0	8.0	1.2	0.0	17.1
Carlsbad Main Canal	0.0	0.0	3.7	15.0	12.2	10.4	14.0	16.7	12.4	13.4	0.0	0.0	97.8
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	1.1	0.9	1.0	1.3	1.3	1.1	9.3	0.9	0.9	8.3	1.8	1.1	29.0
Pecos R at Red Bluff	3.4	3.1	3.3	3.3	3.3	16.6	13.7	3.7	3.6	12.6	4.9	3.7	75.2
Delaware R nr Red Bluff	0.1	0.1	0.1	0.0	0.0	5.6	0.1	0.0	0.3	0.0	0.1	0.1	6.6
*out of service for part of year - assumed zero where no data is shown													
GAGE HEIGHTS													
Avalon gage ht, end mo	18.90	20.00	15.45	16.00	16.60	15.80	15.80	15.90	16.00	15.25	12.85	12.90	
Avalon gage ht, avg	18.41	19.55	19.29	15.67	15.73	15.81	16.05	15.94	16.05	16.37	13.30	12.88	
Alamogordo ga ht, end mo	52.24	53.77	53.68	53.25	60.60	58.21	60.68	60.91	60.49	51.89	53.74	56.53	
Alamogordo gage ht, avg	51.12	53.10	53.65	53.19	60.38	60.12	60.65	60.83	60.50	55.63	52.95	55.65	
Lake S Rosa ga ht, end mo	29.58	29.96	30.43	32.59	41.96	45.56	45.05	45.05	45.08	45.14	45.26	44.95	
Lake S Rosa ga ht, avg	29.25	29.79	30.20	30.57	37.78	44.19	45.21	45.41	45.15	45.07	45.20	44.83	
PRECIPITATION, INCHES													
Brantley Lake	0.40	0.00	0.44	1.28	3.35	0.86	1.76	1.97	0.86	0.54	0.00	0.00	11.46
Las Vegas FAA AP	0.13	0.00	0.77	1.66	2.87	2.53	1.54	6.97	3.22	0.02	0.02	0.11	19.84
Pecos National Monument	0.51	0.01	0.92	1.69	1.25	1.93	3.03	5.28	2.14	0.44	0.02	0.25	17.47
Santa Rosa	1.15	0.00	1.19	3.96	2.44	0.91	2.79	2.89	1.64	0.55	0.00	1.25	18.77
Lake Santa Rosa	0.63	0.00	1.25	2.18	4.76	1.37	4.83	4.48	0.84	0.42	0.00	0.62	21.38
Sumner Lake	0.69	0.00	2.05	3.30	4.94	1.08	4.74	2.91	1.76	0.34	0.00	0.55	22.36
PAN EVAPORATION, INCHES													
Lake Santa Rosa	3.72	4.98	7.88	7.87	9.43	11.24	11.3	9.63	7.37	6.52	5.3	3.76	89.00
Lake Sumner	3.04	4.75	7.24	12.58	15.71	13.16	17.14	14.57	8.65	7.72	4.16	2.65	111.37
Brantley Lake	5.05	5.60	8.42	14.95	18.67	14.21	15.94	14.75	9.49	8.65	4.80	4.34	124.87
OTHER REPORTS													
Base Acme-Art, TAF (USGS)	3.4	3.5	2.9	2.4	4.0	2.9	3.5	3.4	2.2	1.9	2.9	2.9	36.0
Pump depl Ac-Artesia, TAF	0.0	0.0	0.3	0.7	0.3	0.3	0.5	0.6	0.5	0.1	0.0	0.0	3.4
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 2000

NEW MEXICO'S AND TEXAS'S OBJECTIONS

Both states objected to the USGS estimate of Base Inflow, Acme to Artesia, which was used by the River Master in the Preliminary Report. These were the only objections filed by the states.

New Mexico objected to the estimate of Base Inflow for the month of May, 1999. New Mexico's estimate is 4,950 acre–feet, instead of USGS's estimate of 3,140 acre–feet. This difference of 1,810 acre–feet translates to a New Mexico estimate of 37,430 acre–feet for the year and to a Final Calculated Departure of 1.7 TAF. New Mexico furnished an analysis that included a graphical display.

Texas also objected to estimates of Base Inflow, but for the months of February, March, August, and September. Texas reported that they had done a spreadsheet analysis, based on linear interpolation, but did not furnish the spreadsheet or a graphical display of their estimates. Instead, Texas requested the River Master to reevaluate the base flow calculations.

The Table below shows the estimates of USGS, New Mexico, Texas, the River Master. Texas's base flow estimates total 34,561 acre–feet, or 1,059 acre–feet less than those of USGS. Texas also computed that the Flood Inflow, Alamogordo to Artesia, should be 41.3 TAF, or 3.5 TAF more than the value in the Preliminary Report. The River Master could not determine how Texas concluded that the flood inflow for the Alamogordo to Artesia Reach was 41.3 TAF, rather than the 37.8 TAF in the Preliminary Report, and concluded that there was an error somewhere in Texas's figures. In any event, the River Master was able to reevaluate the base flows for the months where Texas expressed concern, February, March, August, and September.

RIVER MASTER'S ANALYSIS AND CONCLUSIONS

New Mexico's objections are based on the rainfall that occurred during the Month of May. New Mexico furnished a graph for May that displays their judgment about the base flow at the Acme and Artesia gages (see graph that follows). I concur with New Mexico that the rainfall, which clearly increases total flow at both gages, would raise base flow some. However, in my opinion, New Mexico's estimate for base flow at Artesia rises too sharply, and I conclude that the base flow increase for the month of May is about half of New Mexico's estimate. Thus, for the month of May, I find that the base inflow, Acme to Artesia, is 4,045 acre–feet. This finding is based conceptually on a graphical interpolation, where the final line is as shown on the attached graph (see "RM estimate" on the graph for the month of May). The numerical value is set by accepting 50% of New Mexico's estimated increase (3,140 + 1,810/2 = 4,045).

I was unable to evaluate Texas' estimates for February and March due to the absence of a graphical display or the spreadsheet analysis. Based on previous years' experiences in hydrograph scalping, it appears that the differences between Texas and USGS estimates is probably due to curvature of base flow lines. While there may be merit in Texas's estimates, all of the estimates involve judgment and engineering methods are limited. I believe that the estimates of USGS for the months of February and March are reasonable and defensible and have retained them.

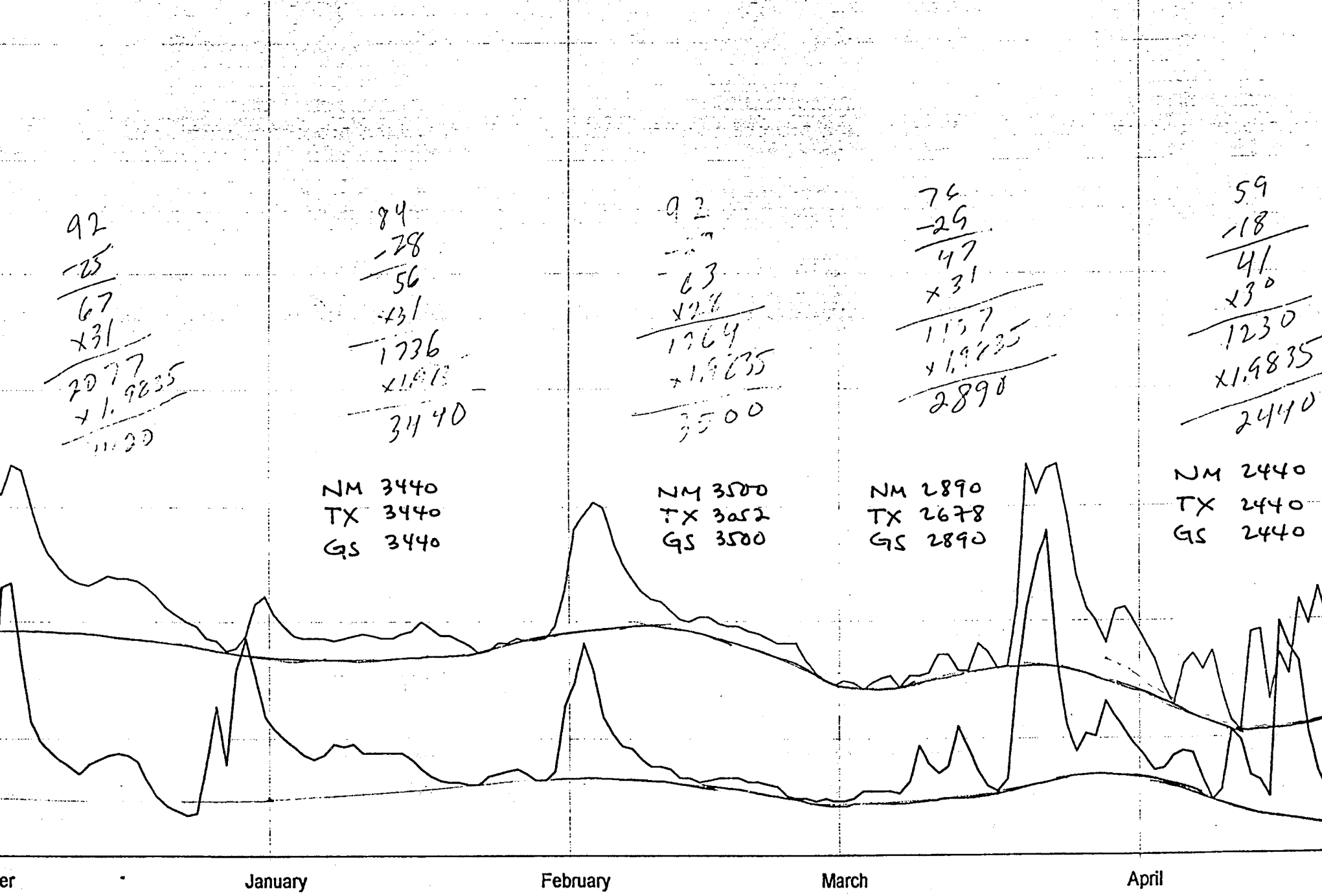
On the other hand, for the months of August and September, I could not understand why the USGS estimates of base flow at Acme were not tangent to the lower points of the hydrograph, and I re–evaluated the base flows in those months (see graph at "TX Assumed"). My re–evaluation indicated that base inflow was about as computed by Texas for that period, so I accept Texas' estimates for August and September.

	USGS	NM	TX	RM
Jan	3,440	3,440	3,440	3,440
Feb	3,500	3,500	3,052	3,500
Mar	2,890	2,890	2,768	2,890
Apr	2,440	2,440	2,440	2,440
May	3,140	4,950	3,140	4,045
Jun	2,920	2,920	2,920	2,920
Jul	3,500	3,500	3,500	3,500
Aug	3,630	3,630	3,441	3,441
Sep	2,500	2,500	2,200	2,200
Oct	1,910	1,910	1,910	1,910
Nov	2,860	2,860	2,860	2,860
Dec	2,890	2,890	2,890	2,890
Total	35,620	37,430	34,561	36,036

As shown in the table, the River Master's value for base inflow is 36.0 TAF.

4. **Final Calculated Departure.**

The Preliminary Report's Final Calculated Departure was 1.3 TAF. New Mexico arrived at 1.7 TAF and Texas at 0.6 TAF. After considering the states' objections, the Final Determination is 1.4 TAF.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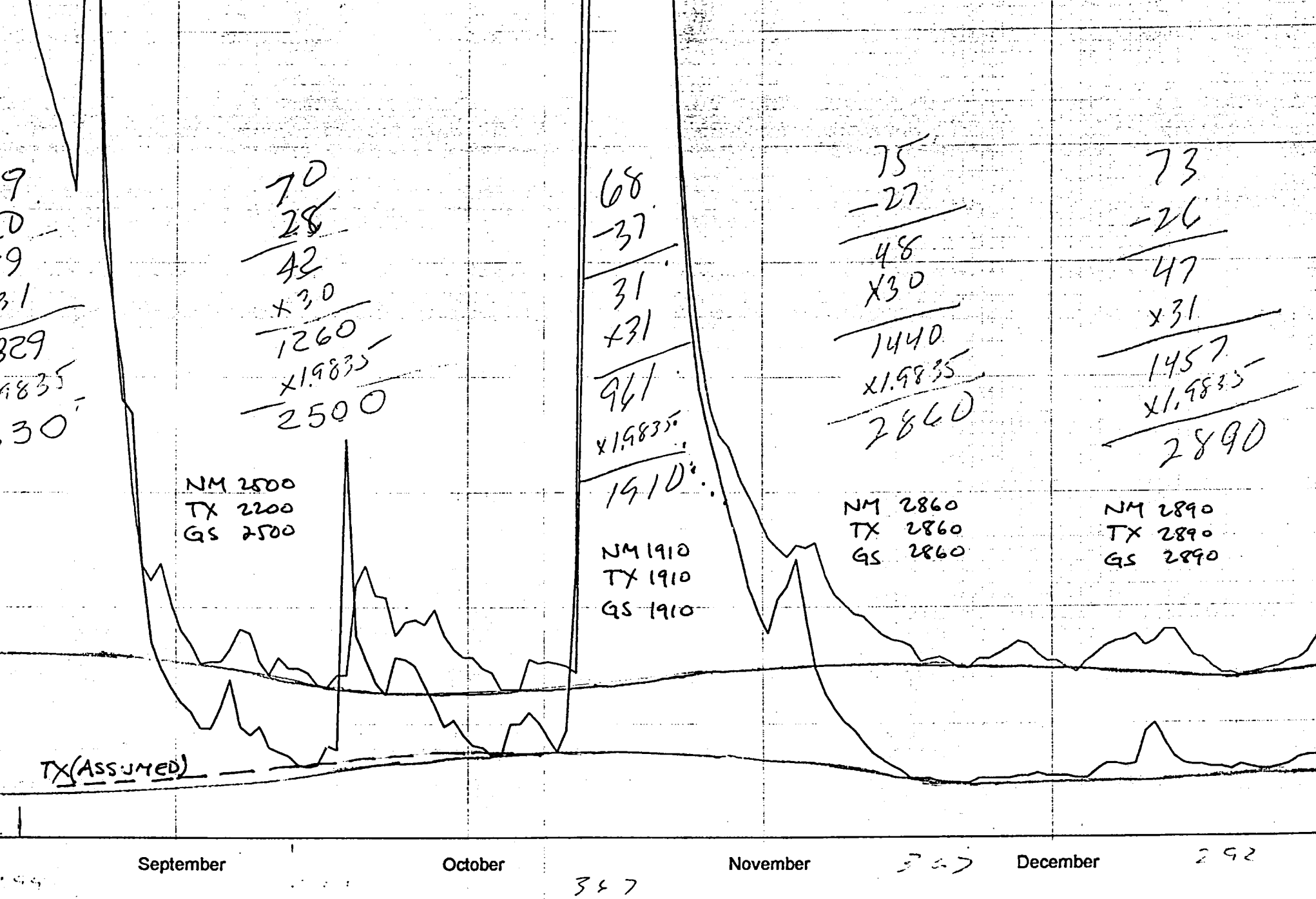
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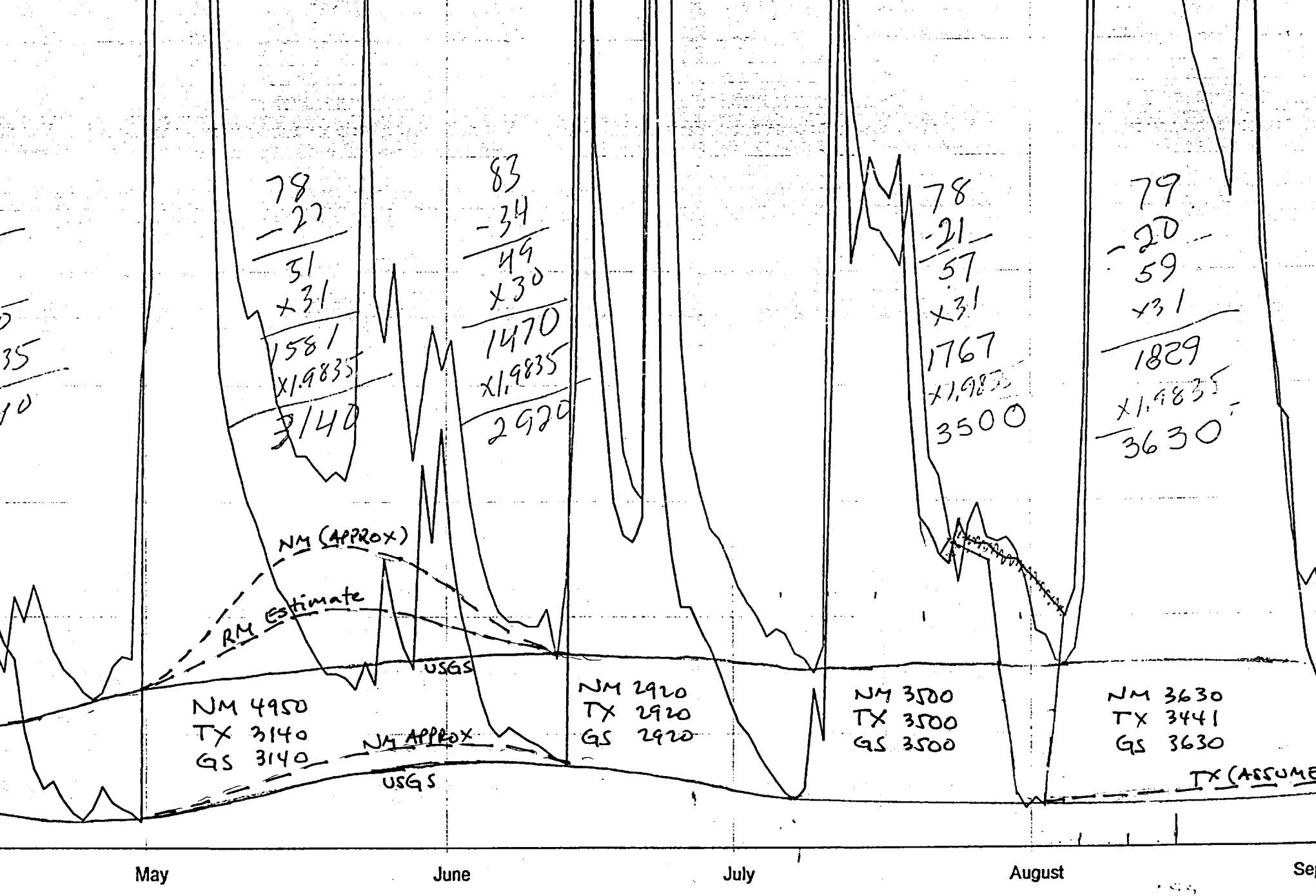
September
October
November
December



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Acme w/ one day forward lag — Artesia w/ Pumping