United States Department of the Interior

BUREAU OF RECLAMATION
Snake River Area Office
214 Broadway Avenue
Boise, Idaho 83702-7298

IN REPLY REFER TO:

SRAO-6410
WTR 4.10

August 21, 1995

Mr. Robert Henggeler
Chairman
Payette River Water Users Association
102 N Main St
Payette ID 83661

Subject: Payette Flood Control Rule Curves

Dear Mr. Henggeler:

Thank you for your letter of August 10, 1995, concerning the carryover refill comparison for Cascade Reservoir prepared as part of our review of current rule curves for the Payette system. The purpose of the refill study was to show the relative effects on refill capability of carrying over 429,000 acre-ft at Cascade on November 1 versus carrying over 500,000 acre-ft., for each year in the 1961 to 1995 period. Some key assumptions were made in the study:

- Reservoir contents were started at maximum carryover on Nov. 1 (either 429,000 AF or 500,000 AF), regardless of whether this would have been attainable or not.

- Actual historic reservoir operations were changed to reflect current operating strategies, where applicable. For example, winter releases were assumed to be 200 cfs, rather than higher (or lower) releases that occurred in some years.

The refill study calculated the accrual to the reservoir to be the maximum contents achieved for the water year minus the November 1 carryover, plus any water that was released in excess of 200 cfs during the winter. Your letter alerted us to an error in the calculated accrual to Cascade Reservoir in 1977. It was the only water year in which the maximum contents occurred on October 1 (471,000 AF), rather than the following spring (375,200 AF on April 12.) In the case of 1977, the model used the maximum content on Oct. 1 (incorrectly), instead of the Apr. 12 content, when calculating the accrual. This resulted in an overestimation of accrual. The corrected accrual amount in 1977 is only 14,713 acre-ft, assuming the reservoir release would have been held at 200 cfs during the Nov. 1 to Apr. 11 period. This accrual added to the 429,000 AF carryover would result in a refill to 443,713 AF, and added to the proposed 500,000 AF carryover level would show 514,713 AF. The other years in the study were checked for similar errors and none were detected.

Your letter also asked how far above full pool the reservoir would have reached in 1987, 1992, and 1994 under the 500,000 AF carryover option. Actual operations would not allow surcharge and this extra volume would be passed as spill. If it were possible to store this spill, the following levels would have been attained:

1987:	693,838 AF
1992:	697,000 AF
1994:	668,000 AF

Enclosed is an updated graph of the carryover/refill comparison reflecting the corrections to 1977 data, as well as a computation sheet showing how the accrual for 1977 was calculated. We hope this helps clarify any questions you may have had, but feel free to contact our office if you have additional questions or concerns.

Sincerely,

Jerrold Gregg
Area Manager

Enclosures

7-1654 (1-89)
Bureau of Reclamation

COMPUTATION SHEET

BY	DATE	PROJECT	SHEET ____ OF ____
CHKD BY	DATE	FEATURE	
DETAILS	Carryover/Refill Comparison		

Calculation of 1977 Cascade Refill

Nov. 1 contents: 435800

maximum spring contents: 375200 (Apr. 12)

Change in storage = 375200 - 435800 = -60,600 AF

Outflow Nov 1 - Apr. 11 = 139577 AF

min. outflow Nov 1 - Apr 11

200 cfs × 162 days = 64,264 Af

Net extra release = 139577 - 64264 = 75313 AF

Accrual = change in storage + extra release

= -60,600 + 75313 = 14,713 AF

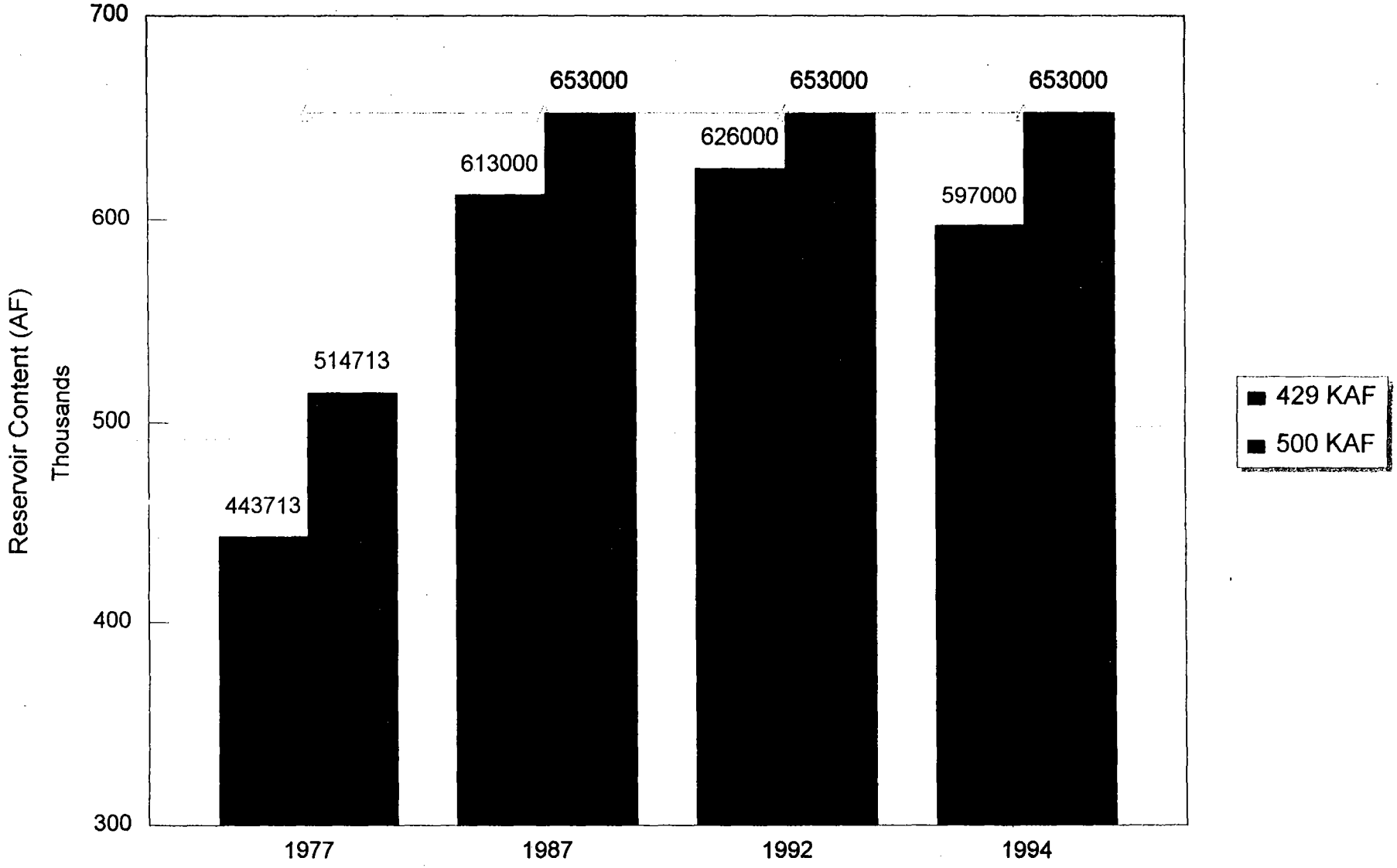
Refill Levels:

at 429 KAF carryover: 429 + 14.7 = 443,700 AF

at 500 KAF carryover: 500 + 14.7 = 514,700 Af

Carryover/Refill Comparison

429 KAF vs 500 KAF



All other years in 1961-1995 period will refill under both options

CASCADE RESERVOIR STORABLE INFLOW (1000 ACFT)
NOV-MAY + JUN INFLOW IN EXCESS OF OUTFLOW

77	33.1	
94	154.0	
92	188.7	
88	191.4	
87	195.0	
90	243.7	
91	248.1	
79	259.6	
73	270.6	
61	275.8	
66	291.2	
62	307.6	
85	334.3	
89	362.1	
60	370.5	
68	389.9	
59	398.9	
93	407.4	
64	409.0	—— MEDIAN
81	414.8	
63	440.1	
75	442.5	
80	461.0	
58	496.6	
70	505.5	
78	542.3	
84	547.0	
86	555.6	
67	557.6	
76	562.9	
83	564.7	
69	569.2	
72	622.9	
65	709.1	
71	714.5	
82	751.6	
74	900.9	