Milner-King Hill Reach Gains

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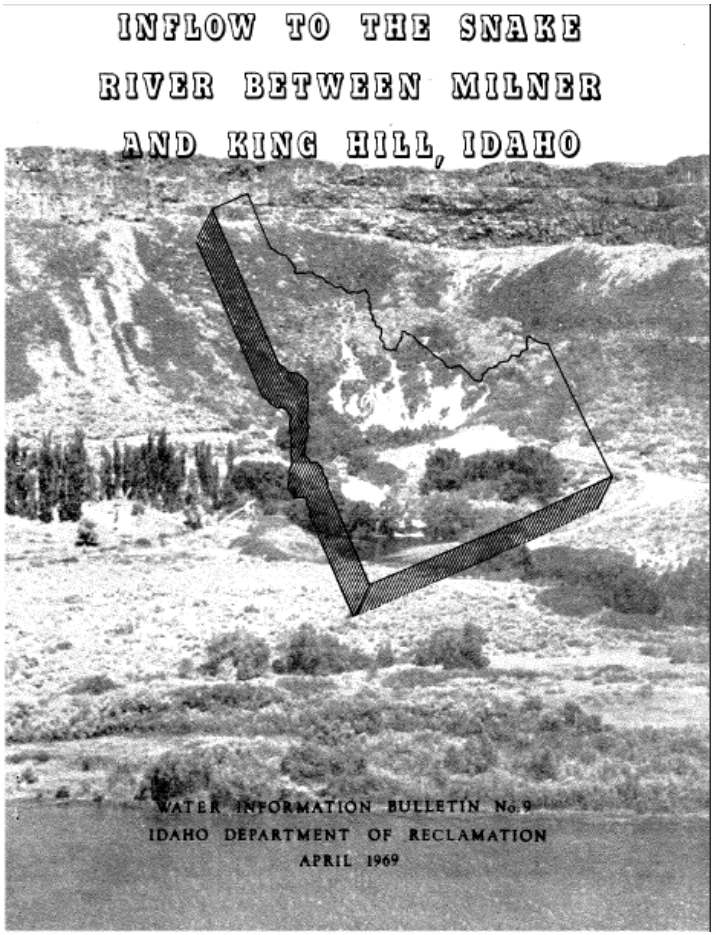
Justification for Subtracting 10% off of the gains between Kimberly and King Hill

- September 2009 ESHMC meeting
  - The committee agreed to abandon the steady state river and spring targets used in version 1.1 and subtract out 10% assumed underflow from the south side form the gaged spring reach gains.
- ESHMC wishes to revisit September decision and develop better justification

Outline

- Historical computations of south-side gains
  - Thomas (1969)
  - Kjelstrom (1986)
  - Kjestrom (1995)
- Current IDWR (2010)

Thomas, 1969 Water Information Bulletin 9



Inflows from the South Side

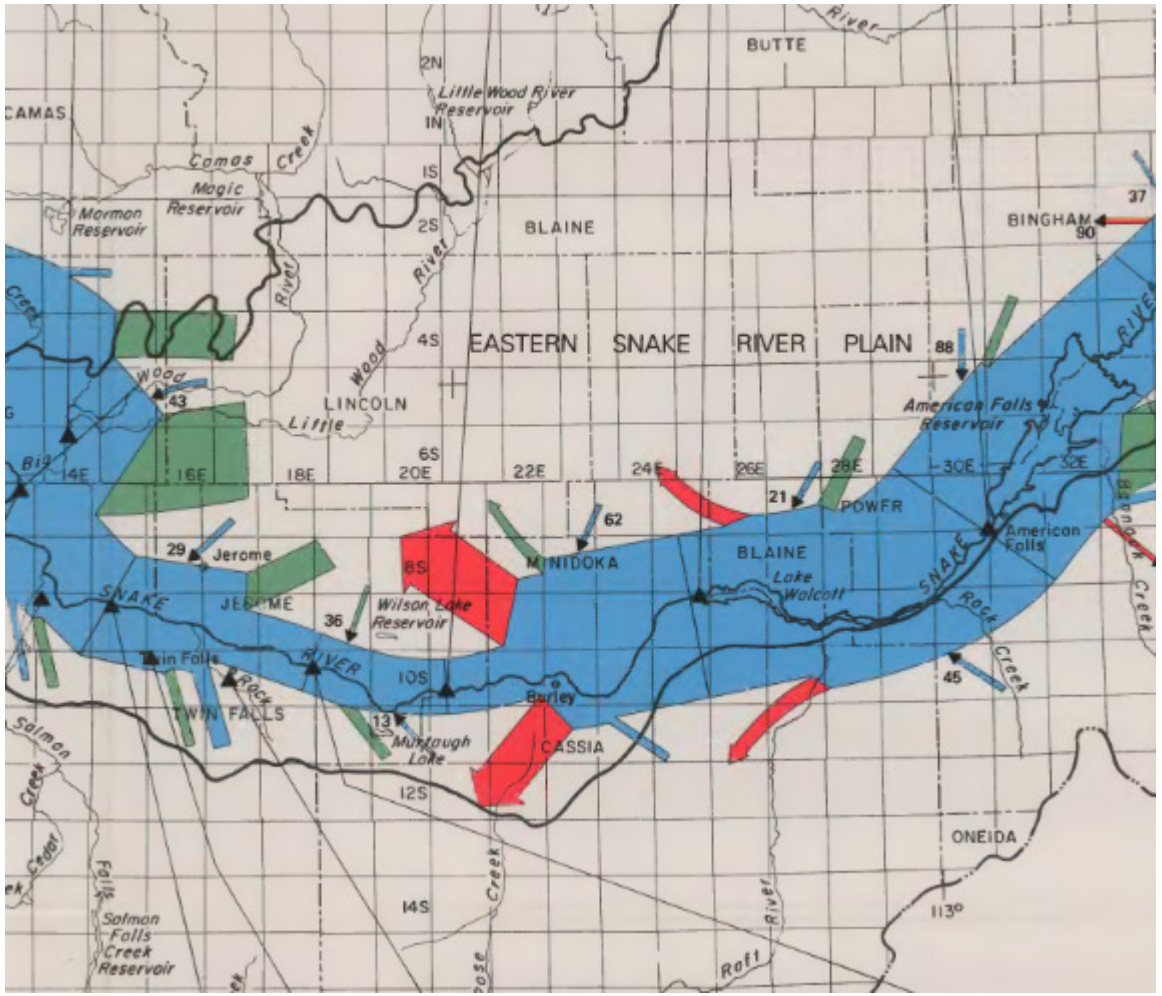
Thomas, 1969 WIB 9 pg 23-25

Pg 23-Most of the flow entering the study reach from the south side is return flow from water that has previously been utilized for irrigation.

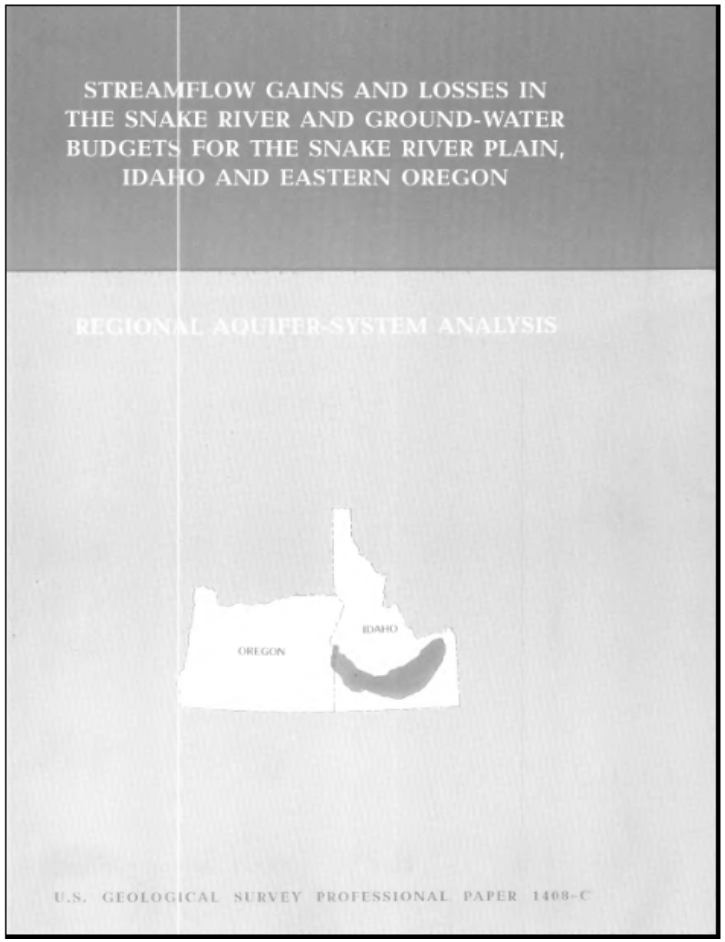
Pg 24-About two-thirds of the total return flow into the study reach from the south side enters the Snake River in the lower channels of Rock Creek, Cedar Draw, Deep Creek, and Salmon Falls Creek, and above the Kimberly gage, 0900.

Pg 24-Inflow to the study reach from all measurable south-side surface flows, including the channels mentioned, was determined by rounds of measurements to be 1,650 cfs in September 1958, 1,160 cfs in March 1959, and 1,280 cfs in August 1959. Unmeasured inflow from the south side through seeps or inaccessible charnels is estimated to be 150 cfs.

Kjelstrom 1986 HA 680



Kjelstrom 1995 1408-C



Kjelstrom 1995 1408-C pg C26

Annual streamflow gains in the Snake River from north-side ground-water discharge within this reach *(Milner-King Hill)* were estimated by water-budget analysis (Thomas, 1969, p. 26) for water years 1902-66 and were extended by Kjelstrom (1986) to 1980. Kjelstrom (1986) correlated total estimated north-side ground-water discharge with measured discharge at 10 spring sites for the period 1951-80. That correlation was used instead of water-budget analysis to estimate total north-side discharge since 1950.

Kimberly-Buhl

Kjelstrom 1995 1408-C pg C27

The Snake River gained about 880,000 acre-ft from ground water between Kimberly and Buhl (pl. 1, sites 10 and 11, respectively) in water year 1980; about 810,000 acre-ft was from the north side. …. The difference, assumed to be south-side gain, appears to be greater during the irrigation season. Average annual south-side gain from 1951 to 1980 was 80,000 acre-ft.

810/880 = 92% from ESPA

Buhl-Hagerman (Lower Salmon Falls)
Kjelstrom 1995 1408-C pg C27

The Snake River gained about 2,650,000 acre-ft from ground water between Buhl and Hagerman … in water year 1980. On the basis of measured spring discharge, about 2,510,000 acre-ft was estimated to be from the north side. ….. North-side spring discharge is typically greatest in October and least in the spring.

2510/2650 = 94.7% from ESPA

Hagerman (Lower Salmon Falls)-King Hill Kjelstrom 1995 1408-C pg C28

The Snake River gained about 1,020,000 acre-ft from ground water between Hagerman and King Hill … in water year 1980. Most of the gain was from spring discharge along the north side. …..

Water Budget Analysis, 2010

- TFSS diversions 2000-2008
  - Subtract
    - ET (all irrigated lands within TFSS service area)
      - Hydromet 2000-2008
      - METRIC ET 2000, 2002, 2006
    - Returns
    - Base flow from perennial streams
      - Mud Creek
      - Rock Creek
      - Cedar Draw
      - Deep Creek
      - Salmon Falls Creek
- Compute percentage of gains

year	TFSS div less returns	ET	Div - Returns - CU	Gains	% of gains
2000	1,053,690	433,820	619,870	3,278,000	19%
2001	919,079	470,074	449,006	3,120,000	14%
2002	916,255	458,010	458,245	3,109,900	15%
2003	950,334	458,575	491,759	3,012,900	16%
2004	909,615	448,684	460,931	2,994,600	15%
2005	833,554	386,264	447,290	2,876,500	16%
2006	904,207	474,146	430,061	3,020,500	14%
2007	952,460	515,551	436,909	2,918,600	15%
2008	994,206	483,685	510,522	2,951,500	17%
Average	937,045	458,756	478,288	3,031,389	16%

year	TFSS div less returns	METRIC ET	Div - Returns - CU	Gains	% of gains
2000	1,053,690	516,201	537,489	3,278,000	16%
2002	916,255	471,742	444,513	3,109,900	14%
2006	904,207	545,876	358,331	3,020,500	12%
Average	958,051	511,273	446,778	3,136,133	14%

END