

---

**MEMORANDUM**

---

**Subject: Bear River Basin Plan  
Key Structures and Diversions  
COOK BROTHERS DIVERSION**

**Date:** August 7, 2000

**Diversion Description:** The Cook Brothers headgate structure consists of a concrete chute with three (3) 55-inch rectangular wooden gates. It is fed from a natural meander in the river.



*Cook Brothers headgate structure*

**Diversion Location:** The diversion is on the Bear River below the Smiths Fork confluence. The Diversion is regulated as part of the Central Division of the Bear River Compact. See location map hereafter.

Latitude      N 42° 10' 23.7"  
Longitude     W 111° 01' 38.0"

**Conveyance Description:** Open channel canal.<sup>1</sup>

**Direct Flow Water Rights:**<sup>2</sup>

Priority Date	Permit Number	Permitted Use	Acres	Flow (CFS)	Cumulative (CFS)	Comments
05-13-1883	TERR	Irrigation	175.89	2.51	2.51	
05-13-1882	TERR	Irrigation, Storage	60	0.85	3.36	
05-13-1883	TERR	Irrigation, Domestic, Storage	640	9.14	12.50	<i>For irrigation of Idaho lands</i>
05-13-1883	TERR	Irrigation, Storage	171.50	2.45	14.95	<i>For irrigation of Idaho lands</i>
05-13-1883	TERR	Irrigation, Storage	145	2.07	17.02	<i>For irrigation of Idaho lands</i>

05-13-1883	TERR	Irrigation, Domestic, Storage	1458.22	20.83	37.85	<i>For irrigation of Idaho lands</i>
05-13-1883	TERR	Irrigation, Storage	243	3.47	41.32	
05-13-1883	TERR	Irrigation, Domestic, Storage	50	0.71	42.03	<i>For irrigation of Idaho lands</i>

**Associated Storage Rights:** None

**Irrigation Practices:** Land is flood irrigated. <sup>3</sup>

**Estimated Diversion Efficiency:**

Calculated Diversion Efficiency = Conveyance Efficiency X Application Efficiency:

Conveyance Efficiency:	65%
Application Efficiency:	<u>55%</u>
<b>Overall Diversion Efficiency:</b>	<b>36%</b>

Conveyance efficiency is estimated based on total length of main canal. Application efficiency for flood irrigation and sprinkler irrigation is estimated at 55% and 85% respectively.

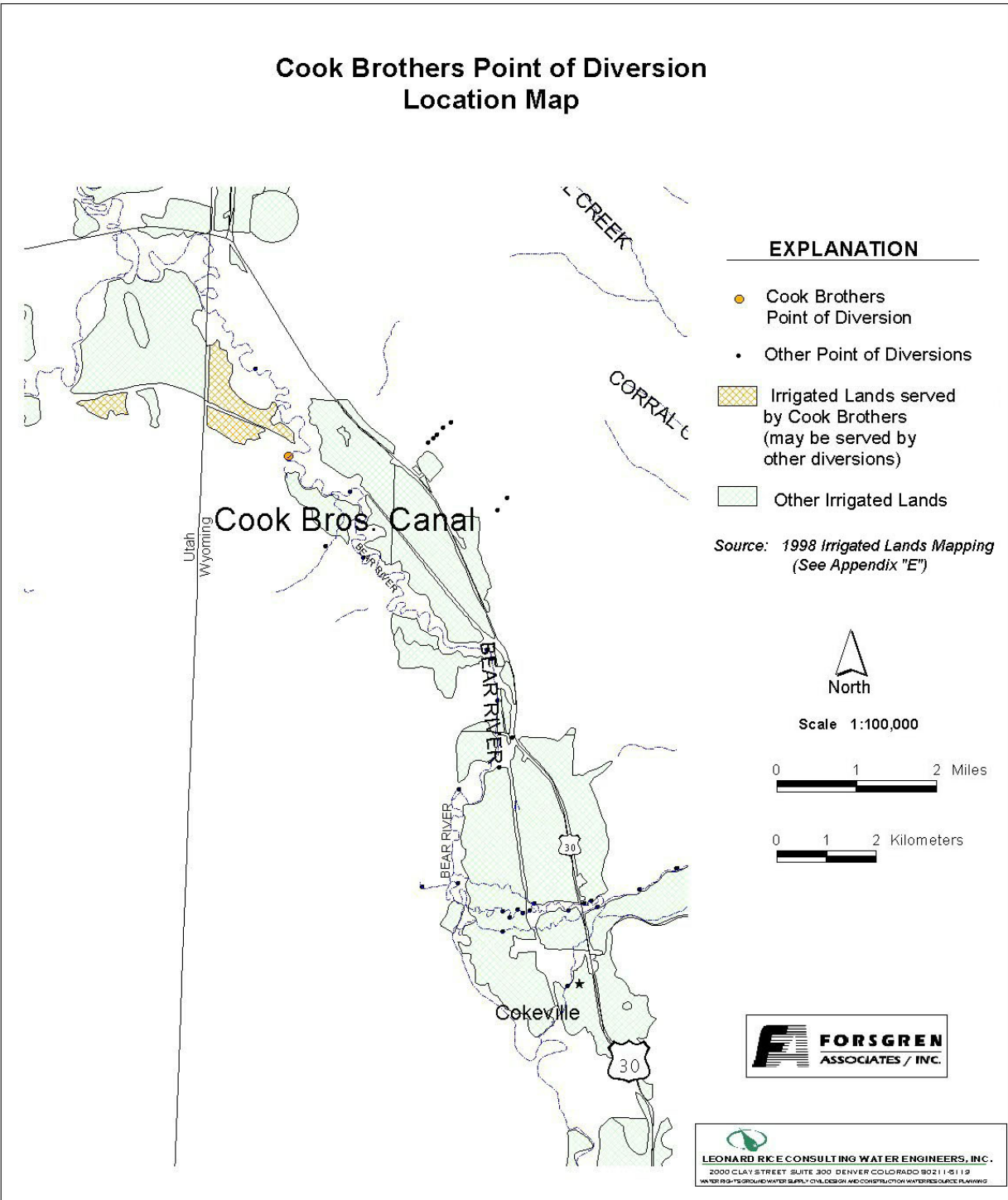
**Crop Types / Consumptive Use:** Water is used entirely to irrigate meadow grasses, primarily Timothy, Meadow Foxtail, etc. There is a small percentage of alfalfa and grains.<sup>3</sup>

**Return Flows:** Return flow is primarily returned directly to the river and/or Idaho diversions.

The following return flow pattern was adopted for modeling in this study are as follows:

<u>Month (after initial Diversion)</u>	<u>Percent of Return</u>
0	70%
1	20%
2	10%
3	<u>0%</u>
	100%

## Cook Brothers Point of Diversion Location Map



### EXPLANATION

- Cook Brothers Point of Diversion
- Other Point of Diversions
- Irrigated Lands served by Cook Brothers (may be served by other diversions)
- Other Irrigated Lands

Source: 1998 Irrigated Lands Mapping (See Appendix "E")



Scale 1:100,000

0 1 2 Miles

0 1 2 Kilometers



**LEONARD RICE CONSULTING WATER ENGINEERS, INC.**  
 2000 CLAY STREET SUITE 300 DENVER COLORADO 80211-6112  
 WATER RIGHTS GROUNDWATER SUPPLY CIVIL DESIGN AND CONSTRUCTION WATER RESOURCES PLANNING

**References:**

- 1) *USDA -Soil Conservation Service Economic Research Service-Forest Service in Cooperation with the States of Idaho, Utah, Wyoming, Irrigation Conveyance Systems, Working Paper for the Bear River Basin Type IV Study, Idaho-Utah-Wyoming, April 1976*
- 2) *Water rights summary obtained from State Engineer Interstate Reglist – revised April 14, 1999*
- 3) *Irrigation practices based on field investigation and interview with Mr. Kevin Wilde, Water Hydrographer-Commissioner – November 30, 1999.*
- 4) *State of Utah Natural Resources, Water Budget Studies – Utah, Bear River Study Area, September 1994*

**BEAR RIVER WYOMING DIVERSIONS  
MONTHLY DIVERSION RECORDS**

**COOK BROTHERS CANAL**

YEAR	MAY			JUNE			JULY			AUGUST			SEPTEMBER		
	Total of Daily Ave for Month	Average CFS	Monthly Total Ac-Ft	Total of Daily Ave for Month	Average CFS	Monthly Total Ac-Ft	Total of Daily Ave for Month	Average CFS	Monthly Total Ac-Ft	Total of Daily Ave for Month	Average CFS	Monthly Total Ac-Ft	Total of Daily Ave for Month	Average CFS	Monthly Total Ac-Ft
1970	0	0.0	0.0	1535	51.2	3044.6	973	31.4	1929.9	533	17.2	1057.2	480	16.0	952.1
1971	42	1.4	83.3	1143	38.1	2267.1	989	31.9	1961.7	720	23.2	1428.1	1115	37.2	2211.6
1972	639	20.6	1267.4	1451	48.4	2878.0	527	17.0	1045.3	493	15.9	977.9	627	20.9	1243.6
1973	222	7.2	440.3	1620	54.0	3213.2	749	24.2	1485.6	237	7.6	470.1	214	7.1	424.5
1974	673	21.7	1334.9	1653	55.1	3278.7	1253	40.4	2485.3	142	4.6	281.7	864	28.8	1713.7
1975	0	0.0	0.0	1590	53.0	3153.7	714	23.0	1416.2	440	14.2	872.7	776	25.9	1539.2
1976	147	4.7	291.6	1641	54.7	3254.9	1111	35.8	2203.6	343	11.1	680.3	154	5.1	305.5
1977	1188	38.3	2356.4	1059	35.3	2100.5	670	21.6	1328.9	987	31.8	1957.7	381	12.7	755.7
1978	245	7.9	486.0	1804	60.1	3578.2	1123	36.2	2227.4	750	24.2	1487.6	622	20.7	1233.7
1979	44	1.4	87.3	155	5.2	307.4	113	3.6	224.1	62	2.0	123.0	51	1.7	101.2
1980	0	0.0	0.0	1381	46.0	2739.2	728	23.5	1444.0	384	12.4	761.7	669	22.3	1326.9
1981	1486	47.9	2947.4	1056	35.2	2094.5	589	19.0	1168.3	547	17.6	1085.0	679	22.6	1346.8
1982	75	2.4	148.8	2103	70.1	4171.2	556	17.9	1102.8	170	5.5	337.2	834	27.8	1654.2
1983	453	14.6	898.5	2250	75.0	4462.8	481	15.5	954.0	68	2.2	134.9	75	2.5	148.8
1984	1275	41.1	2528.9	1942	64.7	3851.9	633	20.4	1255.5	6	0.2	11.9	0	0.0	0.0
1985	301	9.7	597.0	1458	48.6	2891.9	652	21.0	1293.2	349	11.3	692.2	432	14.4	856.9
1986	587	18.9	1164.3	2105	70.2	4175.2	461	14.9	914.4	340	11.0	674.4	613	20.4	1215.9
1987	1135	36.6	2251.2	1495	49.8	2965.3	59	1.9	117.0	640	20.6	1269.4	509	17.0	1009.6
1988	971	31.3	1926.0	1509	50.3	2993.1	335	10.8	664.5	919	29.6	1822.8	299	10.0	593.1
1989	725	23.4	1438.0	1648	54.9	3268.8	1084	35.0	2150.1	1194	38.5	2368.3	1396	46.5	2768.9
1990	975	31.5	1933.9	1017	33.9	2017.2	517	16.7	1025.5	382	12.3	757.7	613	20.4	1215.9
1991	819	26.4	1624.5	1136	37.9	2253.2	497	16.0	985.8	670	21.6	1328.9	1146	38.2	2273.1
1992	1160	37.4	2300.8	1124	37.5	2229.4	642	20.7	1273.4	844	27.2	1674.0	539	18.0	1069.1
1993	416	13.4	825.1	1597	53.2	3167.6	677	21.8	1342.8	1276	41.2	2530.9	241	8.0	478.0
1994	1427	46.0	2830.4	1440	48.0	2856.2	1174	37.9	2328.6	809	26.1	1604.6	526	17.5	1043.3
1995	1270	41.0	2519.0	1719	57.3	3409.6	732	23.6	1451.9	448	14.5	888.6	596	19.9	1182.1
1996	1212	39.1	2404.0	1858	61.9	3685.3	689	22.2	1366.6	337	10.9	668.4	1069	35.6	2120.3
1997	1547.2	49.9	3068.8	1543.1	51.4	3060.7	711.9	23.0	1412.0	387.7	12.5	769.0	576.3	19.2	1143.1
1998	986.3	31.8	1956.3	2138.7	71.3	4242.0	1064.9	34.4	2112.2	624.7	20.2	1239.1	810.1	27.0	1606.8

**AVERAGES**

**23.1 1418.2**

**50.8 3020.2**

**22.5 1383.6**

**16.8 1032.1**

**19.6 1163.6**