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**MEMORANDUM**

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**Subject:**     **Bear River Basin Plan**  
                  **Key Structures and Diversions**  
                  **BEAR RIVER CANAL (Below Woodruff Narrows)**

**Date:**         August 7, 2000

**Diversion Description:** The headgate structure consists of a concrete headwall with two 4-foot steel slide gates.

**Diversion Location:** Diversion is located on the Upper Bear in Wyoming downstream of the Woodruff Narrows Reservoir as shown on the location map hereafter. Irrigated lands include Utah and Wyoming.



*Bear River Canal headgate*

Latitude        N 41° 31' 31.4"  
Longitude      W 111° 01' 80.5"

**Conveyance Description:** Open channel canal, approximately 26,400 feet in length. <sup>1</sup>

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

Priority Date	Permit Number	Permitted Use	Permitted Acres	Flow (CFS)	Cumulative (CFS)	Comments
-1874	TERR	Irrigation	74	1.06	1.06	<i>Wyoming Lands</i>
-1874	TERR	Irrigation	1535	21.92	22.98	<i>Utah Lands</i>

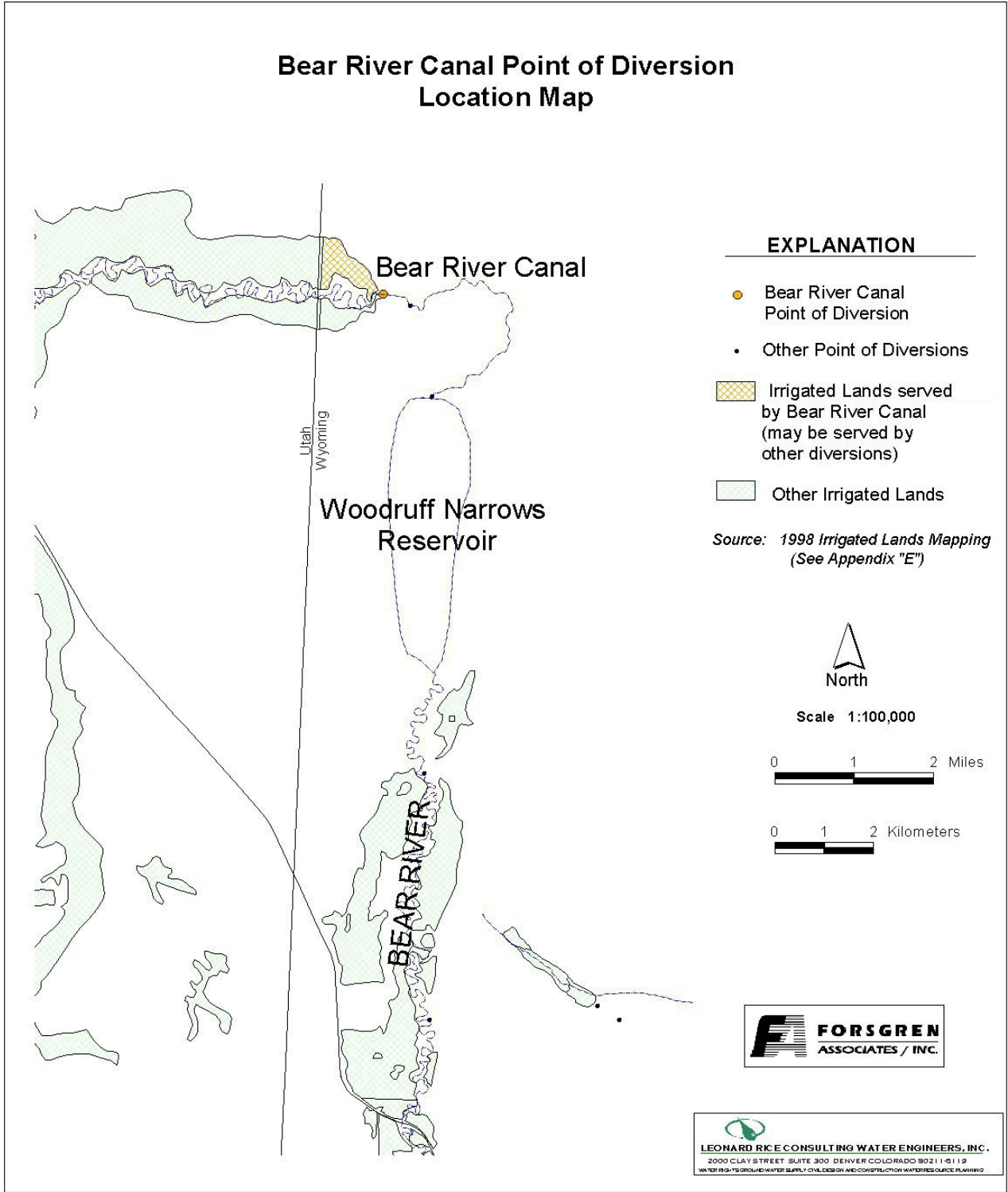
**Irrigation Practices:** Flood Irrigated. <sup>3</sup>

**Estimated Diversion Efficiency:**

Calculated Diversion Efficiency = Conveyance Efficiency X Application Efficiency:

Conveyance Efficiency:                    60%  
Application Efficiency:                    55%  
**Overall Diversion Efficiency:**         **33%**

## Bear River Canal Point of Diversion Location Map



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 mixed meadow grasses, primarily Meadow Foxtail, etc.<sup>3</sup>

**Return Flows:** Return flow is intercepted in Utah.

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

<u>Month</u> <u>(after initial Diversion)</u>	<u>Percent of Return</u>
0	50%
1	25%
2	15%
3	10%
	100%

**Other Operational Information:** The Bear River Canal is regulated by the Utah Commissioner as a matter of practicality. Most of the irrigated lands (over 95%) are located in Utah.<sup>3</sup>

**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. Don Shoemaker, Water Hydrographer-Commissioner – October 29, 1999.*
- 4) *State of Utah Natural Resources, Water Budget Studies – Utah, Bear River Study Area, September 1994*

**BEAR RIVER WYOMING DIVERSIONS  
MONTHLY DIVERSION RECORDS**

**BEAR RIVER CANAL  
(Below Woodruff Narrows)**

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															
1971	572	18.5	1134.5	3002	100.1	5954.4	933	30.1	1850.6	327	10.5	648.6	393	13.1	779.5
1972	879	28.4	1743.5	3076	102.5	6101.2	896	28.9	1777.2	236	7.6	468.1	122	4.1	242.0
1973	1084	35.0	2150.1	1707	56.9	3385.8	728	23.5	1444.0	74	2.4	146.8	120	4.0	238.0
1974	1179	38.0	2338.5	2615	87.2	5186.8	794	25.6	1574.9	84	2.7	166.6	367	12.2	727.9
1975	253	8.2	501.8	3147	104.9	6242.0	2305	74.4	4571.9	0	0.0	0.0	761	25.4	1509.4
1976	1330	42.9	2638.0	2527	84.2	5012.2	621	20.0	1231.7	95	3.1	188.4	388	12.9	769.6
1977	614	19.8	1217.9	938	31.3	1860.5	499	16.1	989.8	85	2.7	168.6	49	1.6	97.2
1978	1112	35.9	2205.6	2706	90.2	5367.3	1142	36.8	2265.1	37	1.2	73.4	207	6.9	410.6
1979	1483	47.8	2941.5	1712	57.1	3395.7	455	14.7	902.5	18	0.6	35.7	0	0.0	0.0
1980	665	21.5	1319.0	1072	35.7	2126.3	872	28.1	1729.6	92	3.0	182.5	177	5.9	351.1
1981	855	27.6	1695.9	2042	68.1	4050.2	863	27.8	1711.7	106	3.4	210.2	137	4.6	271.7
1982	1382	44.6	2741.2	2654	88.5	5264.1	1257	40.5	2493.2	34	1.1	67.4	0	0.0	0.0
1983	836	27.0	1658.2	2358	78.6	4677.0	1215	39.2	2409.9	273	8.8	541.5	19	0.6	37.7
1984	738	23.8	1463.8	1705	56.8	3381.8	564	18.2	1118.7	49	1.6	97.2	118	3.9	234.0
1985	1656	53.4	3284.6	2535	84.5	5028.1	885	28.5	1755.4	93	3.0	184.5	90	3.0	178.5
1986	1225	39.5	2429.8	1973	65.8	3913.4	947	30.5	1878.3	75	2.4	148.8	90	3.0	178.5
1987	2167	69.9	4298.2	2638	87.9	5232.4	548	17.7	1086.9	31	1.0	61.5	30	1.0	59.5
1988	2200	71.0	4363.6	1795	59.8	3560.3	200	6.5	396.7	90	2.9	178.5	90	3.0	178.5
1989	934	30.1	1852.6	2182	72.7	4327.9	868	28.0	1721.7	204	6.6	404.6	40	1.3	79.3
1990	526	17.0	1043.3	2222	74.1	4407.3	560	18.1	1110.7	108	3.5	214.2	165	5.5	327.3
1991	1046	33.7	2074.7	2892	96.4	5736.2	1014	32.7	2011.2	104	3.4	206.3	173	5.8	343.1
1992	1894	61.1	3756.7	2186	72.9	4335.9	105	3.4	208.3	105	3.4	208.3	0	0.0	0.0
1993	2155	69.5	4274.4	2702	90.1	5359.3	736	23.7	1459.8	82	2.6	162.6	555	18.5	1100.8
1994	2121	68.4	4206.9	2634	87.8	5224.5	456	14.7	904.5	0	0.0	0.0	0	0.0	0.0
1995	1080	34.8	2142.1	2083	69.4	4131.6	533	17.2	1057.2	858	27.7	1701.8	569	19.0	1128.6
1996	1913	61.7	3794.4	2681	89.4	5317.7	471	15.2	934.2	372	12.0	737.9	250	8.3	495.9
1997	1629	52.5	3231.1	2036	67.9	4038.3	556.5	18.0	1103.8	0	0.0	0.0	0	0.0	0.0
1998	1325.7	42.8	2629.5	2370	79.0	4700.8	1246	40.2	2471.4	0	0.0	0.0	285.7	9.5	566.7
1999	1182	38.1	2344.5	2500	83.3	4958.7	746	24.1	1479.7	0	0.0	0.0	437	14.6	866.8

**AVERAGES**      **40.1**   **2464.7**      **76.7**   **4561.3**      **25.6**   **1574.2**      **4.0**   **248.4**      **6.5**   **385.3**

Notes: \*1. No published records are available for this diversion for 1970