MEMORANDUM

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

Date: August 7, 2000

Diversion Description: The Booth headgate structure consists of a concrete headwall with two 48-inch culverts and 48-inch slide gates. The outlet appears to be partially buried, creating a maintenance problem. Scuba divers were reportedly hired during the past year to clean out the culverts.

Booth Ditch headgate

Diversion Location: Diversion is on the Upper Bear in Wyoming. Irrigated lands are located in Wyoming as shown on the location map hereafter.

Latitude N 41° 09' 26.9"
Longitude W 110° 52' 55.2"

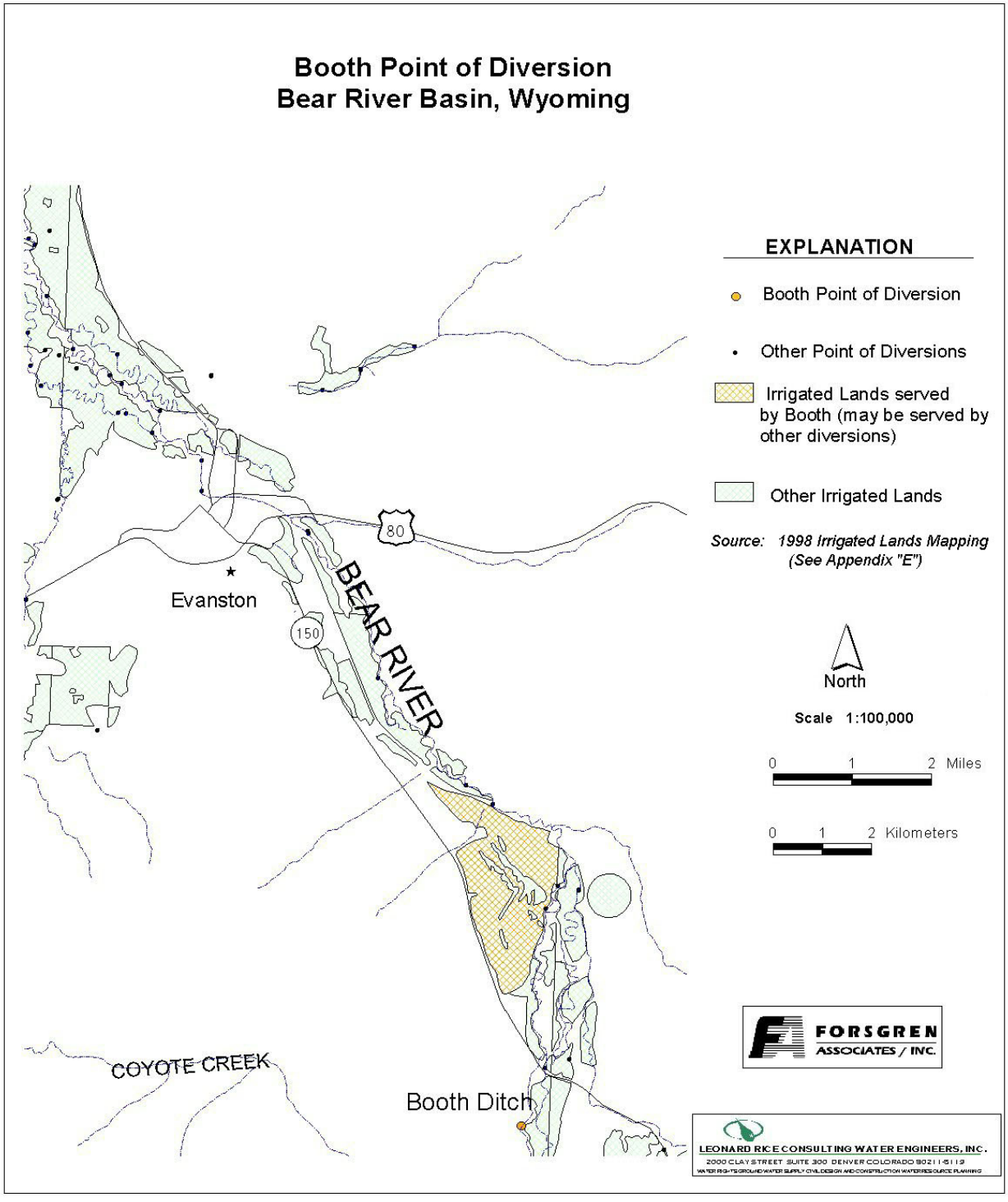
Conveyance Description: Open channel ditch, approximately 15,840 feet in length. [1]

Direct Flow Water Rights:[2]

Priority Date	Permit Number	Permitted Use	Permitted Acres	Flow (CFS)	Cumulative (CFS)	Comments
10-23-1889	TERR	Irrigation	787	11.24	11.24	
10-23-1889	TERR	Irrigation	66	0.94	12.18	

Associated Storage Rights:

Reservoir	Shareholder	Volume (Acre-ft)	Est. % of Shares Used this Diversion[3]	Comments
Sulphur Creek	Alex Jamison	823	100%	By Exchange


Booth Point of Diversion
Bear River Basin, Wyoming
EXPLANATION
Booth Point of Diversion
Other Point of Diversions
Irrigated Lands served by Booth (may be served by other diversions)
Other Irrigated Lands
Source: 1998 Irrigated Lands Mapping (See Appendix "E")
North
Scale 1:100,000
0 1 2 Miles
0 1 2 Kilometers
Evanston
80
150
BEAR RIVER
COYOTE CREEK
Booth Ditch
FORSGREN ASSOCIATES / INC.
LEONARD RICE CONSULTING WATER ENGINEERS, INC.
2000 CLAY STREET SUITE 300 DENVER COLORADO 80211-5113

Irrigation Practices: Land is all flood irrigated.. [3]

Estimated Diversion Efficiency: Conveyance losses are relatively high due to porous nature of soils in the higher reaches of the Upper Bear.

Calculated Diversion Efficiency = Conveyance Efficiency X Application Efficiency:

Conveyance Efficiency:	50%
Application Efficiency:	55%
Overall Diversion Efficiency:	**27%**

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, Redtop, etc.[3]

Return Flows: Excess return flow is primarily intercepted by the Evanston Water Ditch.

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

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

Other Operational Information: The Booth Ditch has a relatively secure water right as well as significant storage rights from the Sulphur Creek Reservoir (by exchange). They typically try to flow as much water as possible, which benefits other downstream users through return flows. [3]

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 – November 12,1999.*

4) *State of Utah Natural Resources, Water Budget Studies – Utah, Bear River Study Area, September 1994*

BEAR RIVER WYOMING DIVERSIONS
MONTHLY DIVERSION RECORDS

BOOTH

	MAY			JUNE			JULY			AUGUST			SEPTEMBER		
YEAR	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	50	1.6	99.2	451	15.0	894.5	471	15.2	934.2	455	14.7	902.5	380	12.7	753.7
1972	117	3.8	232.1	488	16.3	967.9	445	14.4	882.6	463	14.9	918.3	109	3.6	216.2
1973	134	4.3	265.8	418	13.9	829.1	351	11.3	696.2	260	8.4	515.7	195	6.5	386.8
1974	247	8.0	489.9	451	15.0	894.5	427	13.8	846.9	375	12.1	743.8	188	6.3	372.9
1975	117	3.8	232.1	288	9.6	571.2	482	15.5	956.0	353	11.4	700.2	421	14.0	835.0
1976	233	7.5	462.1	392	13.1	777.5	391	12.6	775.5	129	4.2	255.9	120	4.0	238.0
1977	242	7.8	480.0	333	11.1	660.5	142	4.6	281.7	112	3.6	222.1	18	0.6	35.7
1978	87	2.8	172.6	609	20.3	1207.9	501	16.2	993.7	365	11.8	724.0	286	9.5	567.3
1979	180	5.8	357.0	505	16.8	1001.7	369	11.9	731.9	178	5.7	353.1	24	0.8	47.6
1980	0	0.0	0.0	477	15.9	946.1	377	12.2	747.8	320	10.3	634.7	149	5.0	295.5
1981	100	3.2	198.3	393	13.1	779.5	295	9.5	585.1	293	9.5	581.2	37	1.2	73.4
1982	156	5.0	309.4	495	16.5	981.8	542	17.5	1075.0	278	9.0	551.4	379	12.6	751.7
1983	121	3.9	240.0	112	3.7	222.1	560	18.1	1110.7	424	13.7	841.0	308	10.3	610.9
1984	63	2.0	125.0	476	15.9	944.1	520	16.8	1031.4	204	6.6	404.6	97	3.2	192.4
1985	94	3.0	186.4	295	9.8	585.1	514	16.6	1019.5	193	6.2	382.8	290	9.7	575.2
1986	121	3.9	240.0	460	15.3	912.4	358	11.5	710.1	230	7.4	456.2	210	7.0	416.5
1987	188	6.1	372.9	451	15.0	894.5	409	13.2	811.2	443	14.3	878.7	173	5.8	343.1
1988	217	7.0	430.4	535	17.8	1061.2	222	7.2	440.3	91	2.9	180.5	132	4.4	261.8
1989	181	5.8	359.0	343	11.4	680.3	262	8.5	519.7	149	4.8	295.5	123	4.1	244.0
1990	224	7.2	444.3	323	10.8	640.7	368	11.9	729.9	316	10.2	626.8	154	5.1	305.5
1991	160	5.2	317.4	366	12.2	726.0	449	14.5	890.6	208	6.7	412.6	209	7.0	414.5
1992	231	7.5	458.2	332	11.1	658.5	223	7.2	442.3	164	5.3	325.3	67	2.2	132.9
1993	113	3.6	224.1	319	10.6	632.7	260	8.4	515.7	289	9.3	573.2	210	7.0	416.5
1994	228	7.4	452.2	262	8.7	519.7	196	6.3	388.8	152	4.9	301.5	115	3.8	228.1
1995	98	3.2	194.4	244	8.1	484.0	330	10.6	654.5	232	7.5	460.2	137	4.6	271.7
1996	264	8.5	523.6	138	4.6	273.7	205	6.6	406.6	235	7.6	466.1	258	8.6	511.7
1997	279.7	9.0	554.8	281	9.4	557.4	277.1	8.9	549.6	185.7	6.0	368.3	152.4	5.1	302.3
1998	224	7.2	444.3	234.6	7.8	465.3	350.9	11.3	696.0	109.8	3.5	217.8	56.7	1.9	112.5
1999	125	4.0	247.9	196	6.5	388.8	301	9.7	597.0	101	3.3	200.3	95	3.2	188.4
AVERAGES		**5.1**	**314.3**		**12.3**	**729.6**		**11.8**	**724.9**		**8.1**	**499.8**		**5.9**	**348.3**

*Notes: *1. No published records are available for this diversion for 1970*
2. Older 1889 water right - Also use Sulphur Creek storage by exchange .