TECHNICAL MEMORANDUM

SUBJECT: **Green River Basin Plan II**
Basin Water Use Profile - Municipal

DATE: 5/28/2009 (Revised 3/17/11)

PREPARED BY: WWC Engineering

Introduction

The purpose of this technical memorandum is to provide water use information for the following fourteen (14) Green River Basin cities, towns, and joint power boards that supply water to their citizens or customers:

Entities that obtain their primary water supply from surface water are:

- Town of Baggs-Little Snake River
- Bridger Valley Joint Powers Board-Smith's Fork and Black's Fork
- Dixon-Little Snake River
- Town of Granger-Green River
- Kemmerer-Diamondville Joint Powers Board-Hams Fork River
- Town of LaBarge-Green River
- Pinedale-Fremont Lake Dam
- Green River/Rock Springs/ Sweetwater County Joint Powers Board-Green River

Entities that obtain their primary water supply from groundwater (and the source aquifer) are:

- Town of Bairoil (Battle Springs Formation)
- Town of Big Piney (Wasatch Formation)
- Town of Marbleton (Wasatch Formation)
- Town of Opal (Green River Formation)
- Town of Superior (Erickson Sandstone)
- Town of Wamsutter (Wasatch Formation)

One out of basin entity, the City of Cheyenne, obtains municipal water from the Little Snake River system.

In this technical memorandum, Appendix 1 provides a summary for each of the fifteen (15) municipal water suppliers. Each summary provides an estimate of the service area population, a brief description of the water supply and the water treatment facilities, the water rates, data pertaining to annual, per capita and peak day water use, and a tabulation of water rights (WWDC, 2007)(Purcell, 2001).

Methodology

Primarily, information was obtained from the municipalities' responses as reported in the WWDC's "2007 Water Supply Survey Report". The 2007 Water Supply Survey Report shows the 2007 survey responses plus the 2004 responses for the entities that did not respond to the 2007 survey. Additional information was obtained through direct communication with some of the municipalities. The impacts to surface water are best represented by depletions, as determined through the following simple relationship: Depletions = Diversions - Return Flow. The estimated surface water depletions were calculated on a monthly basis to accommodate the modeling efforts for the planning study. Therefore, monthly diversion percentages and wastewater discharge information was obtained from the 2001 municipal technical memorandum (Purcell, 2001). This information was found to be representative of actual conditions.

One Green River Basin municipality, Rock Springs, has a system to reuse a portion of their waste system effluent to irrigate the cemetery and Crossroads Park.

Municipal groundwater use in the Green River Basin has very little, if any, impact on surface water flows due to the depth of the wells. If the municipalities were releasing wastewater discharge to the surrounding streams, those streams would enjoy the benefits or accretions from that discharge. However, representatives from five (5) of the six (6) communities that use groundwater represented their wastewater system as having zero discharge. Big Piney has a minimal discharge lagoon system (Pope, 2008). WWC Engineering verified the discharge through conversations with town officials. Therefore, it was concluded that the groundwater supplies have little or no impacts on the surface water system and groundwater was not considered in the modeling efforts.

Typically, municipalities provide water to customers outside their corporate limits. Therefore, the populations of the service areas are more pertinent than the census information. Further, some of the municipalities or joint powers boards sell water to surrounding water districts. For purposes of this analysis, water sales, outside the corporate limits for domestic use is considered municipal water use and is included in the statistics for the various entities. The technical memorandum relating to domestic water use will address this issue further.

In addition, municipalities may sell water to industrial water users. For example, the Kemmerer-Diamondville Joint Powers Board and the Rock Springs/Green River/ Sweetwater County Joint Powers Board sell water to industries outside the corporate limits of their member municipalities. These water sales are not considered municipal water use in this analysis and will be addressed in the technical memorandum addressing industrial water use. Data relating to industrial water sales are readily available, while data relating to domestic water sales is often combined with the total water use for the respective municipalities**.**

Conclusions

Table 1 - Summarizes the surface water use for the eight (8) municipal surface water suppliers in the Green River Basin. Table 2 shows the Green River Basin surface water users

plus the City of Cheyenne exports from the Little Snake River Basin. If one compares the total municipal surface water in basin use in 2005 (Table 1) to the total in basin surface water municipal use from the 2001 plan, minus Cheyenne exports, one can see that the municipal use has increased. Municipal use increased from almost 6,540 acre feet in 2001 to almost 6,580 acre-feet for the basin in 2005. Cheyenne was removed from the list of municipal users as it is technically an export and does not relate to gallons per capita per day use in basin or in Cheyenne. It is simply exchange water for North Platte water delivered to Cheyenne. Cheyenne's exports from the Little Snake River Drainage will be shown in more detail later in this technical memorandum.

Table 1 - Green River Basin - 2005 Municipal Surface Water Depletions (in Acre-Feet)

City/Town	Pop.[1]	GPCPD[2,3]	River	Jan.	Feb.	Mar.	Apr.	May
Baggs	354	70	Little Snake	2.78	2.50	2.22	0.28	0.28
BV JPB[4]	4,500	83	Smith/Black Fk	16.73	16.73	16.73	20.92	29.29
Dixon	81	279	Little Snake	1.52	1.52	1.52	1.52	1.77
Granger	146	120	Green	0.20	0.20	0.20	0.39	4.51
K/D JPB[5]	3,950	68	Hams Fork	12.03	12.03	12.03	9.03	21.06
LaBarge	421	313.5	Green	7.39	5.91	5.91	5.91	11.83
Pinedale	1,800	288	Fremont Lake	23.23	5.81	11.61	29.03	46.45
GR/RS/SC[6]	35,000	129	Green	151.72	151.72	151.72	151.72	505.74
Total	**46,252**	**127**		**215.60**	**196.43**	**201.96**	**218.80**	**620.94**
City/Town	**June**	**July**	**Aug.**	**Sept.**	**Oct.**	**Nov.**	**Dec.**	**Total**
Baggs	1.11	5.00	3.89	3.05	2.22	2.22	2.78	**27.76**
BV JPB[4]	37.65	100.41	62.76	50.20	25.10	25.10	16.73	**418.37**
Dixon	3.04	4.05	3.04	2.53	1.77	1.77	1.52	**25.31**
Granger	9.81	1.57	1.18	0.59	0.39	0.20	0.39	**19.62**
K/D JPB[5]	36.10	75.22	57.17	27.08	12.03	12.03	15.04	**300.87**
LaBarge	17.74	29.57	22.18	13.31	7.39	5.91	10.35	**147.84**
Pinedale	23.23	116.14	121.94	81.30	69.68	23.23	34.84	**580.68**
GR/RS/SC[6]	758.62	1062.06	910.34	556.32	252.87	252.87	252.87	**5057.44**
Total	**887.30**	**1394.01**	**1182.48**	**734.38**	**371.47**	**323.34**	**334.53**	**6577.91**

[1]Population is Wyoming Department of Administration and Information or service area estimated population as appropriate

[2]Gallons per capita per day (GPCPD) are from the WWDC 2007 Water System Survey Report.

[3]GPCPD in the Total row is calculated from the total water use divided by the total municipal populations

[4]BV JPB-Bridger Valley Joint Powers Water Board

[5]K/D JPB-Kemmerer, Diamondville Joint Powers Water Board

[6]GR/RS/SC-Green River, Rock Springs, Sweetwater County Joint Powers Water Board

Figure 1 shows the 2005 distribution of the surface water depletions among the eight municipal users who depend on surface water for municipal use. From the graph it is easy to see that the Green River, Rock Springs, Sweetwater County Joint Powers Board supply the bulk of the municipal water in the basin, over 75%.

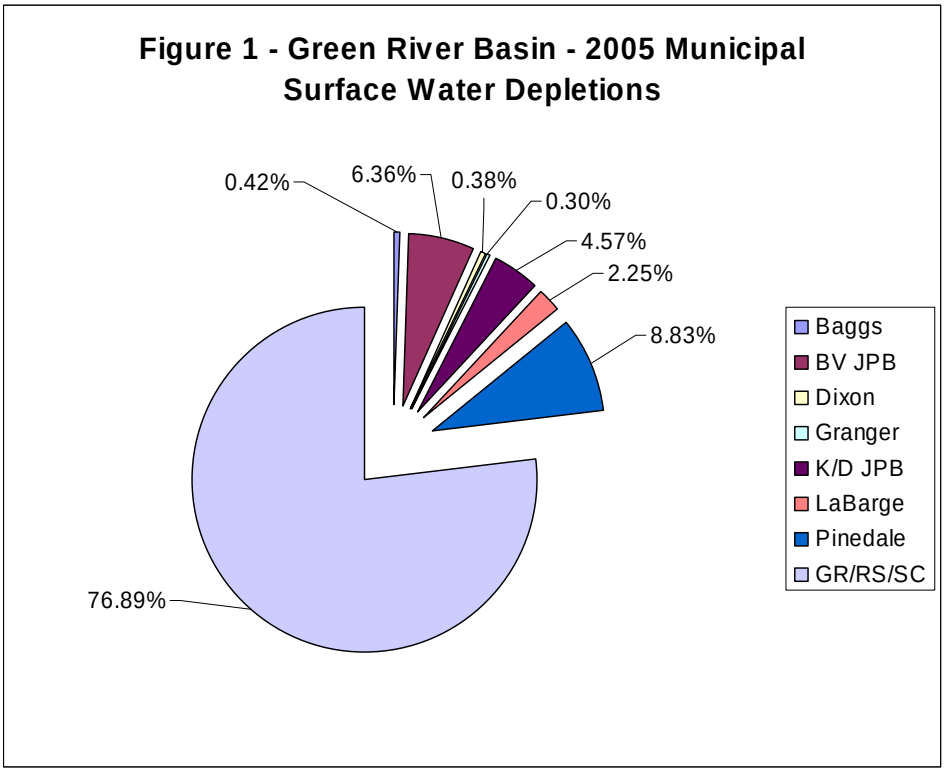


Table 2 summarizes the 2005 groundwater use for the six (6) municipal groundwater suppliers in the Green River Basin. Table 3 shows the municipal groundwater use for the six (6) municipal suppliers as shown in the 2001 municipal use technical memorandum. If one compares the 2005 use of 884 acre feet annually to the 812 acre feet use in 2001, there is only a slight increase, about 9%.

Comparison of the surface depletions and the groundwater depletions once again shows that the bulk of the growth in the basin has been in the larger cities.

Table 2- Green River Basin- Municipal Groundwater Users- 2007 Plan

City/Town	Wells	Depth	Population[1]	GPCPD[2,3]	Total
		Feet			Acre-Feet/Year
Bairoil	5	35-51	96	350	38
Big Piney	7	90-900	455	90	46
Marbleton	8	580-830	811	787	715
Opal	3	400-480	99	150	17
Superior	3	1700	239	146	39
Wamsutter	3	1365-1905	265	100	30
Total	**29**		**1965**	**402**	**884**

[1] Population is WDA&I estimates for 2005

[2]Gallons per capita per day(GPCPD) are from the WWDC 2007 Water System Survey Report.

[3]GPCPD in the Total row is calculated from the total water use divided by the total municipal population

Table 3 - Green River Basin-Municipal Groundwater Users - 2001 Plan

City/Town	Wells	Depth	Population	GPCPD	Total
		Feet			Acre-Feet/Year
Bairoil	3	35-51	250	314	88
Big Piney	4	90-900	496	90	50
Marbleton	5	580-830	635	787	560
Opal	3	400-480	100	120	13
Superior	3	1700	300	133	45
Wamsutter	3	1365-1905	310	161	56
Total	**21**		**2091**	**347**	**812**

Source: Municipal Use Technical Memorandum 2001 Green River Basin Plan

Figure 2 shows the 2005 distribution of the groundwater depletions among the six (6) municipal users who depend on groundwater for municipal use.

Figure 2 - Municipal Groundwater Depletions - 2005

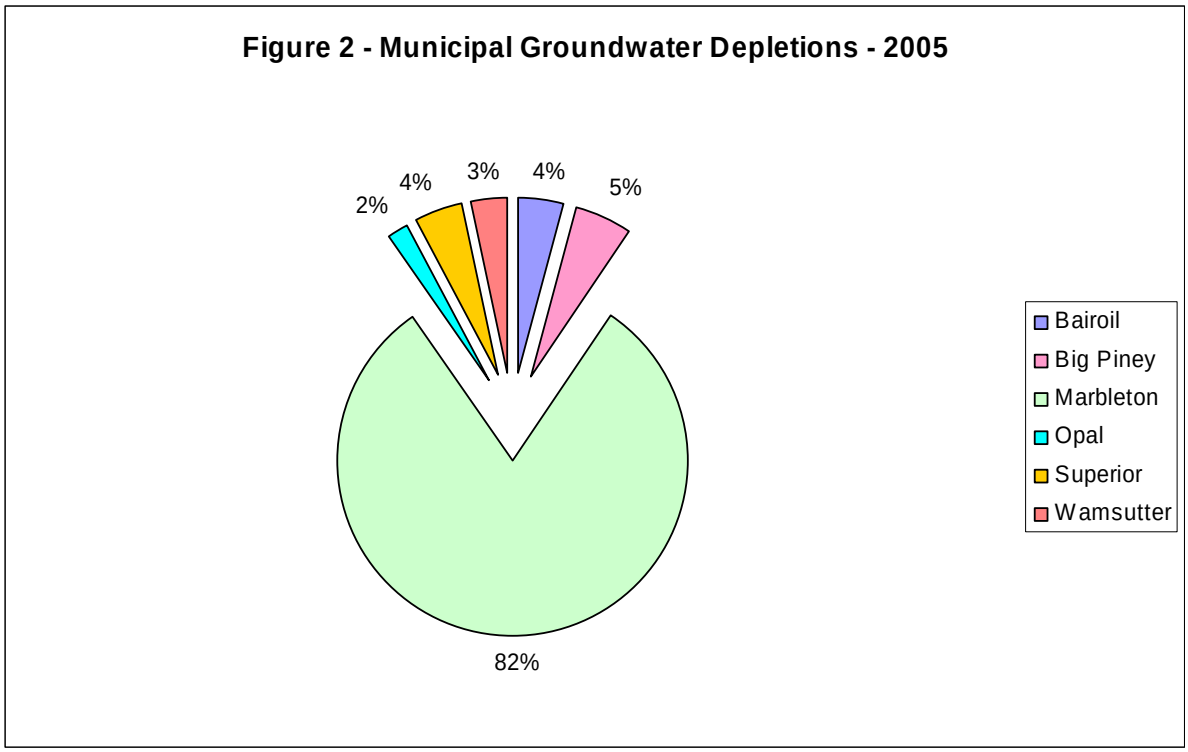


Table 4 provides a comparison of reported existing peak day demand with the reported system capacity and the capacity of the direct flow and storage water rights for the fourteen (14) suppliers in the Green River Basin.

Table 4 is offered as an indication that the water suppliers have sufficient system and water right capacity to meet their existing demands, as well as the opportunity to meet the demands of some future growth. However, the suppliers may have other water supply problems in the form of system rehabilitation needs. Further, simply having water rights does not necessarily mean those water rights can meet the demands in drought years. There must be water

available at the points of diversion. In addition, the water rights must have priority dates that can withstand water rights regulation in times of shortage.

This analysis is based on current water use, 2005. In most cases, water use is based on data reported in the WWDC 2007 Municipal Water System Survey Report in order to present the current-day situation. However, water users may have a situation that cannot be described with present information. The Green River/Rock Springs/ Sweetwater County Joint Powers Board depletes more water, approximately 9,000 acre-feet per year, than the other thirteen (13) in-basin water suppliers combined, approximately 3,170 acre-feet per year. Recently, the Joint Powers Board completed a comprehensive expansion of its water treatment and supply facilities, which removed "bottlenecks" in the previous water supply system.

Table 4 - Comparison of Existing Use and System Capacity -2005

Supplier	Peak Day Demand	System Capacity	Water Right Capacity (GW or Direct Flow)	Storage Rights
	AFD = Acre-feet Per Day			Acre-Feet
Baggs	0.68	1.33	1.24	None
Bairoil	0.77	3.05	0.41	None
Big Piney	0.41	2.65	3.76	None
Bridger Valley JPB[1]	6.60	12.10	15.56	1,500
Dixon	0.08	0.97	0.97	None
Granger	0.31	3.09	13.01	None
Green River/Rock Springs/ Sweetwater Co. JPB	70.58	97.00	79.30	None
Kemmerer-Diamondville JPB	6.14	12.83	17.07	1,770
LaBarge	1.54	1.77	2.64	None
Marbleton	2.15	2.20	5.40	None
Opal	0.06	0.41	0.46	None
Pinedale	9.21	44.20	11.48	17,439
Superior	0.28	1.60	3.36	None
Wamsutter	0.83	3.09	1.51	None

[1]The Bridger Valley Joint Powers Board has water rights for 1500 acre-feet of storage in State Line Reservoir,
however, contract limits annual use to 800 acre feet.

It is interesting to note that the largest Green River system municipal water user is not located in the Green River Basin. The City of Cheyenne diverted an average of approximately 15,300 acre-feet of water per year from the Little Snake River Basin to the North Platte River Basin in the period 2003 through 2007 (Chapman, 2008). The water is ultimately exchanged for North Platte River Basin water that is conveyed to Cheyenne to meet its needs in the South Platte River Basin. The fourteen (14) water suppliers located in the Green River Basin deplete approximately 7,464 acre-feet of water per year on an annual basis. Figures 1 and 2 show graphically the breakout of use by municipal supplier.

Table 5 shows the Cheyenne municipal water average annual exports from the Green River

Basin Planning area for the period from 1995 to 1997 and the period 2003 to 2007. From comparison of the two averages it can be seen that Cheyenne's diversions out of basin have increased over time but have not reached the maximum allowed by their water rights. The increase in diversion amounts to 6.4%. Cheyenne's potential average yield from the Little Snake River system is 21,000 acre-feet however this declines to about 16,400 acre-feet in drought conditions. The Little Snake River water is diverted into Hog Park Reservoir which has a water right of 22,656 acre-feet and is the limiting water right under a one fill limitation.

Table 5- City of Cheyenne Diversions Municipal Surface Water Export Comparison

	Period	
	1995-1997[1]	2003-2007[2]
Month	Acre-Feet	
January	22	0
February	8	0
March	6	7
April	145	570
May	4,132	7,685
June	9,683	6,853
July	372	166
August	12	0
September	4	0
October	2	0
November	1	0
December	1	0
Total	**14,388**	**15,281**

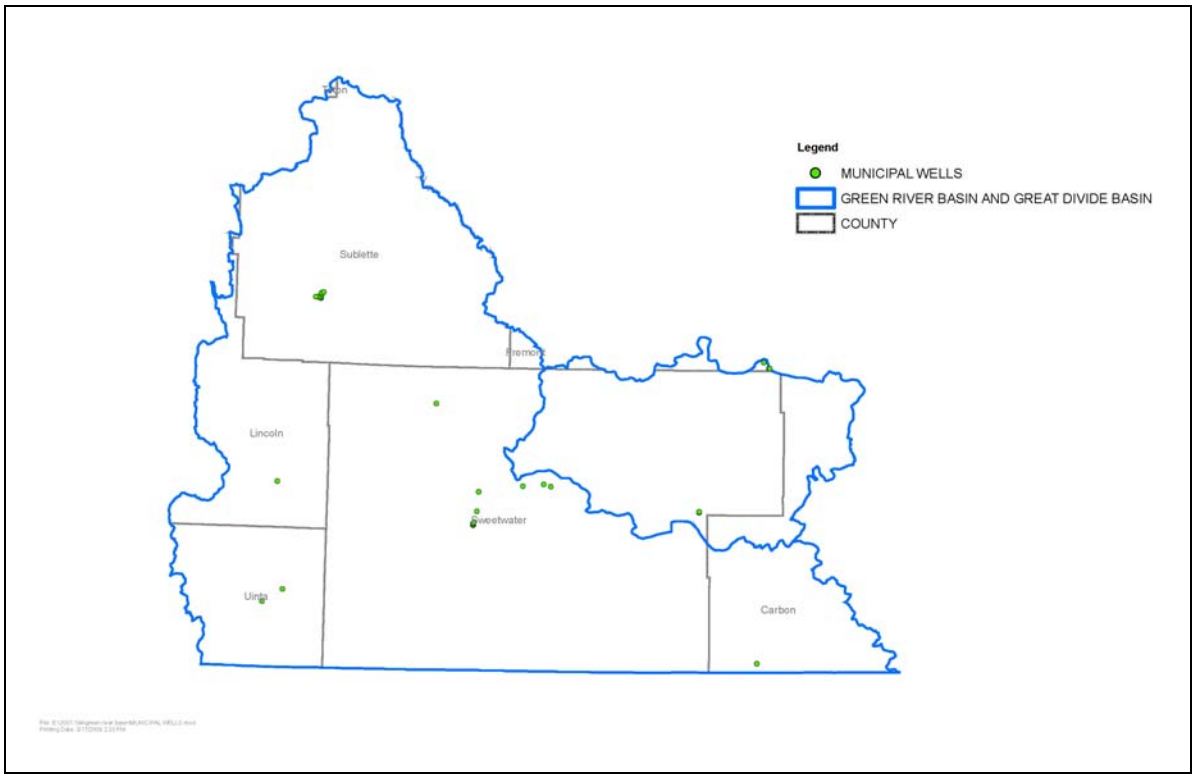
Source: [1]Purcell Consulting Technical Memorandum,Green River Basin Plan, Basin Water Use Profile - Municipal, 2001
[2]Cheyenne Board of Public Utilities, phone conversation, May 2008

The Green River Basin municipal water suppliers are faced with similar problems. They must provide sufficient water of good quality to promote the quality of life their users expect. They must plan for the future to be able to meet the demands of potential future growth. Some of the municipalities are seeking additional growth through economic development efforts, while others are dealing with impacts from energy exploration and development.

The water suppliers must comply with state and federal water quality standards, which are being constantly revised and are becoming more stringent. Compliance is becoming more and more costly. Typically, the budgets for water system improvements, operation and maintenance are based on revenues from the sale of water. They must sell water to meet their financial obligations.

Figure 3 shows the locations of the municipal groundwater wells in the Green River Basin planning area.

Figure 3 - Municipal Wells



Source: Wyoming Framework Water Plan, 2007

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APPENDIX 1

Green River Basin Planning Study
Municipality Summary

Purpose:

Appendix 1 includes a brief summarization of each municipal water supply system within the Green River Basin Planning area or depending on Green River Planning Area water for a portion of their supply. These summaries follow the format developed by Purcell Consulting in the "Green River Basin Plan, Basin Water Use Profile – Municipal" (Purcell, 2001).

Green River Basin Planning Study
Municipality Summary

Entity: Town of Bairoil Service Area Population: 115 (2007 WWDC Survey)
96 (WDA&I, 2005)

Water Supply: Five (5) groundwater wells varying in depth between 35 and 580 feet. In addition, emergency supplies are provided by Amoco's Battle Springs wells.

Water Treatment: Disinfection/chlorination.

Wastewater Treatment: A zero discharge lagoon system.

Monthly Water Rates: $17.00 as a flat rate regardless of use.

Annual Water Use: (2007 WWDC Survey)

Diverted:	14.7 MG =	45.1 AF
Consumed:	14.7 MG =	45.1 AF (100%)
Returned:	0 MG =	0 AF (0)

Per Capita Use: (2007 WWDC Survey)

Diverted:	350 GPCPD
Consumed:	350 GPCPD

Peak Day Demand: (reported) 250,000 GPD = 0.39 CFS = 0.77 AFD

Water Supply System Capacity: (reported) 300,000 GPD = 0.46 CFS = 0.92 AFD

Municipal Water Rights:

Permit No.	Source	Priority	Amount	Remarks
UW 1379	Ground	12/3/1964	15 gpm	Depth-45 feet.
UW 5476	Ground	4/16/1970	12 gpm	Depth-35 feet.
UW 52094	Ground	11/26/1979	5 gpm	Depth-51 feet.
UW 147820	Ground	10/17/2002	60 gpm	Depth 580 feet.

Water Right Capacity: 92 gpm = 0.20 cfs = 0.41 AFD. In addition, the Town receives water from Amoco's Battle Springs wells, Permit Nos. UW 71036 - UW 71041. Each of these six (6) wells produce approximately 875 gpm. Therefore, Bairoil has access to water rights to match its system capacity as needed.

Green River Basin Planning Study
Municipality Summary

Entity: Town of Baggs

Service Area Population: 425 (2007 WWDC Survey)

Water Supply: Little Snake River through direct diversions and infiltration gallery.

Water Treatment: Conventional water treatment plant.

Wastewater Treatment: Lagoon system with discharges to the Little Snake River.

Monthly Water Rates: $40.00 for the first 8,000 gallons, plus $3.75 for each additional 1,000 gallons.

Annual Water Use: (2007 WWDC Survey)

Diverted: 26.3 MG = 80.69 AF
Consumed: 15.31 MG = 46.97 AF (58.2%)
Returned: 10.99 MG = 33.73 AF (41.8%)

Per Capita Use: (average annual gallons per capita per day)

Diverted: 121 GPCPD
Consumed: 70 GPCPD

Peak Day Demand: 220,000 GPD = 0.34 CFS = 0.675 AFD (2007 WWDC Survey)

Water Supply System: Capacity (reported) 300 GPM = 0.67 CFS = 1.33 AFD

Municipal Water Rights:

Permit No.	Source	Priority	Amount	Remarks
620 Enl.	L. Snake	2/9/1901	0.59 cfs	Summer use only.
28995	L. Snake	11/5/1984	0.746 cfs	Winter use only.
UW 15173	Ground	5/11/1972	15.0 gpm	Baggs No. 1 Well
UW 37522	Ground	3/28/1977	60.0 gpm	Jebens Park No. 1 Well*

*This permit is for park watering only

Municipal Water Right Capacity:

Surface Water: 0.59 CFS = 1.17 AFD (summer use)
Groundwater: 15 GPM = 0.07 AFD
Total: = 1.24 AFD

Green River Basin Planning Study
Municipality Summary

Entity: Town of Big Piney Service Area Population: 408 (2007 WWDC Survey)

Water Supply: Seven (7) groundwater wells varying in depth between 120 to 901 feet.

Water Treatment: Disinfection/chlorination.

Wastewater Treatment: A lagoon system with discharge of 122,000 gallons per day

Monthly Water Rates: $20.00 for the first 6,000 gallons, plus increasing costs for each additional 1,000 gallons. Monthly bill for the use of 20,000 gallons = $31.05.

Annual Water Use: (2007 WWDC Survey)

Diverted:	13.40 MG =	41.1 AF
Consumed:	12.61 MG =	38.7 AF (94%)
Returned:	.79 MG =	2.4 AF (6%)

Per Capita Use: (average annual gallons per capita per day)

Diverted:	90 GPCPD
Consumed:	85 GPCPD

Peak Day Demand: 133,920 GPD = 0.21 CFS = 0.41 AFD (2007 WWDC Survey)

Water Supply System Capacity: 600 GPM = 1.33 CFS = 2.65 AFD (2007 WWDC Survey)

Municipal Water Rights:

Permit No.	Source	Priority	Amount	Remarks
UW 104	Ground	1/14/1959	100 gpm	Depth-120 feet.
UW 107	Ground	1/24/1959	100 gpm	Depth-130 feet.
UW 1202	Ground	5/5/1964	75 gpm	Depth-332 feet.
UW 33546	Ground	4/15/1976	100 gpm	Depth-442 feet.
UW 58788	Ground	9/15/1981	100 gpm	Depth-901 feet.
UW 116643	Ground	6/21/1999	150gpm	Depth-350 feet.
UW 135772	Ground	3/15/2001	100 gpm	Depth 162 feet.
UW 187268	Ground	6/2/2008	100 gpm	

Water Right Capacity: 825 gpm = 1.83 cfs = 3.63 AFD Green River Basin Planning Study
Municipality Summary

Entity: Bridger Valley Joint Powers Board

Service Area Population: 4,500 (2007 WWDC Survey)

Lyman	2,200
Mountain View	1,200
Fort Bridger, Blacks Fork, Lower Bench Districts, plus retail customers.	1,100
Total	4,500

Water Supply:

The Bridger Valley Joint Powers Board (BVJPB) diverts its direct flow rights from the Black's Fork River into the Bridger Valley Robertson Pipeline, which delivers the water to Smith's Fork Creek. The deliveries from the Black's Fork River, storage water from State Line Dam and direct flow rights from Smith's Fork Creek are diverted from the creek and piped to a water treatment plant with an estimated capacity of 3.3 MGD.

The Town of Lyman diverts water from three (3) springs.

Water Treatment: The BVJPB has a conventional water treatment plant. Lyman disinfects and filters water from the springs.

Wastewater Treatment: Lyman and Mountain View have treatment facilities which discharge to the streams.

Monthly Water Rates: Lyman-$25.00 for the first 10,000 gallons, plus $2.10 for each additional 1,000 gallons. Mountain View -$18.00 for the first 10,000 gallons, plus $1.80 for each additional 1,000 gallons. (2007 WWDC Survey)

Annual Water Use: (2007 WWDC Survey)

Diverted:	BVJPB:	292.0 MG = 896.1 AF
	Lyman Springs	85.5 MG = 262.4 AF
	Total	377.5 MG = 1158.5 AF
Consumed:	Total	173.65 MG = 532.9 AF (46%)
Returned:	Total	203.85 MG = 625.59 AF (54%)

Per Capita Use: (average annual gallons per capita per day)

Diverted:	Total JPB Service Area	180 GPCPD
Consumed:	Total JPB Service Area	83 GPCPD

Peak Day Demand: (2007 WWDC Survey)

BVJPB system (reported): 1.5 MGD = 4.6 AFD

Lyman springs (water rights):	0.6 MGD = 2.0 AFD
Total Service Area	2.1 MGD = 6.6 AFD

Water Supply System Capacity: (2007 WWDC Survey)

BVJPB system (reported):	3.3 MGD = 10.1 AFD
Lyman springs (water rights):	0.6 MGD = 2.0 AFD

Municipal Water Rights:

Water rights shared and used through the JPB:

Permit No.	Source	Priority	Amount	Remarks
26356*	State Line Dam	6/29/1978	1,111 AF	BV Pipeline
26355	Smith's Fork Creek	6/29/1978	3.24 cfs	BV Pipeline
Numerous	Black's Fork River	1891-1915	2.21 cfs	Cannot exceed 460.15 AF/YR (105 days beginning May 15)
12810	Blacks Fork River	11/4/1914	0.10 cfs	Robertson Pipeline

* This is a secondary permit for the delivery of storage from State Line Dam. The dam is located in Utah and has a Utah water right permit for the reservoir.. By contract, the JPB's use of storage is limited to 800 acre feet per year in the following manner: June-200 AF; July- 300 AF; August-200 AF; and September-100 AF.

Lyman water rights:

Permit No.	Source	Priority	Amount	Remarks
15027	Spring Creek	3/29/1918	0.704 cfs	Lyman Pipeline
2174 Enl.	Spring Creek	3/2/1910	0.60 cfs	Lyman Pipeline
17993	Bradshaw Spring	10/23/1931	0.127 cfs	Lyman Pipeline
24193	Forman Spring (FS)	1/8/1974	0.22 cfs	F.S. Pipeline
S.C. 400	Ground	10/15/1936	650 gpm	1200 ft. deep.
UW 8064	Ground	2/3/1971	275 gpm	9 ft. deep.

Municipal Supply System/Water Right Capacity:
BVJPB-Storage: 800 AFY
BVJPB-Direct flow: 5.55 CFS = 11.01 AFD
Lyman-Springs: 1.65 cfs = 3.27 AFD

Green River Basin Planning Study
Municipality Summary

Entity: City of Cheyenne

Service Area Population: The City of Cheyenne is located in the South Platte River Basin. The city serves a population of approximately 65,000 people. However, the city does not service anyone in the Green River Basin.

Water Supply: A component of the city's water supply system is the Stage I and Stage II Projects. The projects consist of collection and transmission systems in the Little Snake River Drainage. Water is collected on several tributaries of the Little Snake River and delivered to a tunnel which transports the water under the Continental Divide to Hog Park Reservoir in the North Platte River Basin. Storage in Hog Park Reservoir is released to replace water diverted to Cheyenne through the Rob Roy supply components of the Stage I and II Projects, which transports from the North Platte River Basin to the South Platte River Basin .

Monthly Water Rates: $2.87 for the first 1000 gallons base rate plus $4.31 for each 1,000 gallons of usage.

Annual Water Use: Based on information from Cheyenne, the city diverted an average of 15,308 acre- feet per year from 2003 to 2007 from the Little Snake Basin. The city typically actively diverts water from late April to early July with the bulk of the water diverted in May and June. The diversions are typically shut off in early July due to water rights regulation.

Water Supply System Capacity: The estimated potential annual average yield of the Stage I and Stage II Projects is 21,000 acre-feet per year. Under drought conditions, this yield drops to 16,400 acre-feet per year.

Municipal Water Rights: The attached tabulation depicts the water rights for the Little Snake Diversion Pipeline, which diverts water from various tributaries to the Little Snake River and is delivered to the Hog Park Reservoir through the tunnel under the Continental Divide. It should be noted that the system serves to divert water during the spring runoff and these water rights are not exercised on an annual or irrigation season basis.

Water Right Capacity: The total permitted capacity of Hog Park Reservoir is 22,656 acre-feet, which is the limiting water right under the one-fill limitation.

Green River Basin Planning Study
Municipality Summary

Entity: Town of Dixon

Service Area Population: 75 (2007 WWDC Survey)

Water Supply: Little Snake River through infiltration gallery.

Water Treatment: Disinfection/chlorination and filtration.

Wastewater Treatment: Evaporation pond with intermittent discharge into a slew. Minimal, if any, direct discharge to the Little Snake River.

Monthly Water Rates: $27.50 for the first 15,000 gallons, plus $1.50 for each additional 1,000 gallons.

Annual Water Use: (1999 average)

Diverted: 7.6 MG = 23.42 AF
Consumed: 7.6 MG = 23.42 AF (100%)
Returned: 0.0 MG = 00.00 AF (0%)

Per Capita Use: (average annual gallons per capita per day)

Diverted: 279 GPCPD
Consumed: 279 GPCPD

Peak Day Demand: 26,849 GPD = 0.0414 CFS = 0.0824 AFD (2007 WWDC Survey)

Water Supply System Capacity: 220 GPM = 0.49 CFS = 0.973 AFD (2007 WWDC Survey)

Municipal Water Rights:

Permit No.	Source	Priority	Amount	Remarks
23143	L. Snake	11/7/1967	0.49 cfs	Dixon Mun. Water System.

Municipal Water Right Capacity:

Surface Water: 0.49 CFS = 0.973 AFD

Green River Basin Planning Study
Municipality Summary

Entity: Town of Granger

Service Area Population: 170 (2007 WWDC Survey)

Water Supply: Direct diversion from the Green River. The water is transported approximately 15- 20 miles in the FMC Pipeline and the Granger Pipeline.

Water Treatment: Conventional treatment plant.

Wastewater Treatment: A zero discharge lagoon system.

Monthly Water Rates: $30.00, a flat rate regardless of use.

Annual Water Use: (2007 WWDC Survey)

Diverted:	18.25 MG = 56.0 AF
Consumed:	18.25 MG = 56.0 AF (100%)
Returned:	0 MG = 0 AF (0)

Per Capita Use: (average annual gallons per capita per day)

Diverted:	120 GPCPD
Consumed:	120 GPCPD

Peak Day Demand: 100,000 GPD = 0.155 CFS = 0.307 AFD (2007 WWDC Survey)

Water Supply System Capacity: 700 GPM = 1.56 CFS = 3.09 AFD (2007 WWDC Survey)

Municipal Water Rights:

Permit No.	Source	Priority	Amount	Remarks
Territorial	Ham's Fork	1882	0.57 cfs	Granger Pipeline
4104 Enl.	Green River	3/23/1920	6.0 cfs	Diverted 6/1-8/31, Westvaco
6674 Enl.	Green River	11/8/1978	0.56 cfs	Enl. Westvaco Pipeline

Water Right Capacity:

Ham's Fork:	All year:	0.57 cfs = 1.13 AFD
Green River:	January 1 - May 31:	0.56 cfs = 1.11 AFD
	June 1 - August 31:	6.56 cfs = 13.01 AFD
	Sept.1 - Dec. 31	0.56 cfs = 1.11 AFD

Green River Basin Planning Study
Municipality Summary

Entity: Green River/Rock Springs/ Sweetwater County Joint Powers Board

Service Area Population: 35,000 (Bracken, 2008)

Water Supply: Green River, through direct diversion.

Water Treatment: A conventional water treatment plant with a capacity of 32 MGD (98.2 AFD) serves the entire service area.

Water Supply Pipeline: A pipeline with a capacity of 15 MGD (23 cfs = 46 AFD) from the water treatment plant serves Rock Springs, Reliance, White Mountain, Clearview and Ten-Mile.

Wastewater Treatment: Rock Springs and Green River have conventional wastewater treatment facilities which discharge into the Green River.

Monthly Water Rates: Rock Springs-$13.09 for the first 2,000 gallons, plus $2.95 per 100 cubic feet or $3.93 for each additional 1,000 gallons. Green River-$15.31 for the first 2,000 gallons, plus $2.02 for each additional 100 cubic feet or $2.69 per 1000 gallons.

Annual Water Use: (2007 WWDC Survey)

Diverted:	3,285.0 MG = 10,081.28 AF
Consumed:	1,839.6 MG = 5,645.52 AF (56%)
Returned:	1,445.4 MG = 4,435.76 AF (44%)

Per Capita Use: (average annual gallons per capita per day)

Diverted:	230 GPCPD
Consumed:	129 GPCPD

Peak Day Demand: (2007 WWDC Survey)

Total Service Area	23.0 MGD = 70.58 AFD

Water Supply System Capacity: (2007 WWDC Survey)

Total Service Area	31.68 MGD = 97.2 AFD

Municipal Water Rights:

Water rights shared by Rock Springs and Green River through the JPB:

Permit No.	Source	Priority	Amount	Remarks
Territorial	Green River	1871	4.0 cfs	Green River Pipeline (GRP)
4620 Enl.	Green River	9/4/1928	6.0 cfs	Enl. GRP
6415 Enl.	Green River	10/27/1971	10.0 cfs	Enl. GRP
6672 Enl.	Green River	5/31/1978	10.0 cfs	Enl. GRP
6982 Enl.	Green River	11/30/1989	10.0 cfs	Enl. GRP

Green River water rights:

Permit No.	Source	Priority	Amount	Remarks
22817	Green River	2/16/1962	0.04 cfs	Lawns and parks.
22818	Green River	2/16/1962	0.01 cfs	Lawns and parks.
23623	Green River	9/23/1970	0.05 cfs	Town park.
25660	Green River	6/6/1977	0.44 cfs	Ball parks.

Rock Springs water rights:

Permit No.	Source	Priority	Amount	Remarks
UW 10431	Ground	9/15/1971	50 gpm	Recreation complex.
UW 45012	Ground	9/7/1978	350 gpm	Golf course/lawns.
UW 46552	Ground	1/23/1979	325 gpm	Golf course/lawns.

Municipal Supply System/Water Right Capacity:

Surface Water: 40 CFS = 79.3 AFD

Comments:

1. Historically, Rock Springs has provided water to SF Phosphates. Presently, the Joint Powers Board is providing water to Simplot Phosphates. Simplot bought out SF Phosphates. The amount of water provided to Simplot Phosphates is not included in the above totals.

2. Green River has surface water rights totalling 0.54 CFS (1.07AFD), which are used for lawn water for parks. Rock Springs has three (3) wells with water rights totalling 725 GPM (3.19 AFD), which are used for lawn watering of parks and golf courses.

Green River Basin Planning Study
Municipality Summary

Entity: Kemmerer-Diamondville Joint Powers Board

Service Area Population: 3,950 (2007 WWDC Survey)

Water Supply: Direct diversion from the Ham's Fork River.

Water Treatment: Disinfection/chlorination and filtration.

Wastewater Treatment: The Joint Powers Board operates a conventional wastewater treatment facility which discharges back to the Ham's Fork River.

Monthly Water Rates: $20.00 flat rate plus $1.90 for each 1,000 gallons (2007 WWDC Survey)

Annual Water Use: (2007 WWDC Survey)

Diverted:	301.1 MG = 924.1 AF
Consumed:	135.5 MG = 415.8 AF (45%)
Returned:	165.6 MG = 508.3 AF (55%)

Per Capita Use: (2007 WWDC Survey)

Diverted:	150 GPCPD
Consumed:	68 GPCPD

Peak Day Demand: 2.0 MGD = 3.09 CFS = 6.14 AFD (2007 WWDC Survey)

Water Supply System Capacity: 4.18 MGD = 6.47 CFS = 12.82 AFD (2007 WWDC Survey)

Municipal Water Rights:

Kemmerer's Water Rights:

Permit No.	Source	Priority	Amount	Remarks
5302 Res.	Kemmerer No. 1 Res.	5/24/1935	1,058 AF	Kemmerer Pipeline
9776 Res.	Enl. Kemmerer Res.	1/12/1990	710.78 AF	Kemmerer Pipeline
1601	Ham's Fork	10/13/1897	1.39 cfs	Kemmerer Pipeline
3825 Enl.	Ham's Fork	10/01/1917	3.06 cfs	Kemmerer Pipeline
19392	Ham's Fork	5/27/1940	2.00 cfs	Kemmerer Pipeline
18392	Kemmerer Springs	7/30/1934	0.04 cfs	Cities Pipeline

Diamondville's Water Rights:

Permit No.	Source	Priority	Amount	Remarks
18392	Kemmerer Springs	7/30/1934	0.04 cfs	Cities Pipeline
1674	Ham's Fork	11/19/1897	0.60 cfs	Diamondville P/L
30760	Ham's Fork	12/27/1989	0.96 cfs	Diamondville P/L
31809	Little Canyon Drnge.	3/22/1996	0.111 cfs	Green Belt P/L
UW 43357	Ground	5/26/1977	25 gpm	Lawns and parks.
UW 82449	Ground	4/30/1990	25 gpm	Lawns and parks.

Municipal Supply System/Water Right Capacity:

Kemmerer-Storage:	1,769.78 AFY
Kemmerer-Ham's Fork direct flow rights:	6.45 cfs = 12.79 AFD
Diamondville-Ham's Fork direct flow rights:	1.56 cfs = 3.09 AFD

Green River Basin Planning Study
Municipality Summary

Entity: Town of LaBarge

Service Area Population: 500 (2007 WWDC Survey)

Water Supply: Infiltration gallery diverting from the Green River.

Water Treatment: Disinfection/chlorination.

Wastewater Treatment: A lagoon system which discharges back to the Green River.

Monthly Water Rates: $17.14, a flat rate regardless of use. (2007 WWDC Survey)

Annual Water Use: (2007 WWDC Survey)

Diverted:	100.4 MG = 308.0 AF
Consumed:	57.2 MG = 175.6 AF (57%)
Returned:	40.2 MG = 132.4 AF (43%)

Per Capita Use: (2007 WWDC Survey)

Diverted:	550 GPCPD
Consumed:	313.5 GPCPD

Peak Day Demand: 0.5 MGD = 0.77 CFS = 1.54 AFD (2007 WWDC Survey)

Water Supply System Capacity: 640 GPM = 1.42 CFS = 2.83 AFD (2007 WWDC Survey)

Municipal Water Rights:

Permit No.	Source	Priority	Amount	Remarks
24979	Green River	12/8/1975	1.33 cfs	LaBarge P/l

Municipal Supply System/Water Right Capacity: 1.33 cfs = 2.64 AFD

Green River Basin Planning Study
Municipality Summary

Entity: Town of Marbleton Service Area Population: 720 (2007 WWDC Survey)

Water Supply: Eight (8) groundwater wells varying in depth between 200 to 1016 feet.

Water Treatment: None.

Wastewater Treatment: A zero discharge lagoon system.

Monthly Water Rates: $21.15, a flat rate regardless of use.

Annual Water Use: (Purcell , 2000)

Diverted:	182.5 MG =	560.1 AF
Consumed:	182.5 MG =	560.1 AF (100%)
Returned:	0 MG =	0 AF (0)

Per Capita Use: (Purcell, 2000)

Diverted:	787 GPCPD
Consumed:	787 GPCPD

Peak Day Demand: (reported) 700,000 GPD = 1.08 CFS = 2.15 AFD

Water Supply System Capacity: (reported) 500 GPM = 1.11 CFS = 2.2 AFD

Municipal Water Rights:

Permit No.	Source	Priority	Amount	Remarks
UW 32773	Ground	4/13/1976	250 gpm	Depth-605 feet.
UW 32774	Ground	4/13/1976	100 gpm	Depth-586 feet.
UW 59011	Ground	11/10/1981	150 gpm	Depth-820 feet.
UW 70447	Ground	6/25/1985	160 gpm	Depth-800 feet.
UW 92099	Ground	5/21/1993	20 gpm	Depth-155 feet, park irrigation.
UW 105267	Ground	3/14/1997	160 gpm	Depth-827 feet.
UW 134478	Ground	4/9/2001	150 gpm	Depth-1016 feet.
UW 147766	Ground	9/23/2002	18 gpm	Depth-200 feet.

Water Right Capacity: 1008 gpm = 2.24 cfs = 4.44 AFD

Note: Town referred us to Weston Engineering and they did not have any better numbers and Marbleton failed to respond to the WWDC Surveys.

Green River Basin Planning Study
Municipality Summary

Entity: Town of Opal

Service Area Population: 102 (2007 WWDC Survey)

Water Supply: Three (3) groundwater wells varying in depth between 400 to 480 feet.

Water Treatment: Disinfection/chlorination.

Wastewater Treatment: A zero discharge lagoon system.

Monthly Water Rates: $21.00 for the first 10,000 gallons, plus $3.00 for each additional 1,000 gallons.

Annual Water Use: (2007 WWDC Survey)

Diverted:	2.0 MG =	6.16 AF
Consumed:	2.0 MG =	6.16 AF (100%)
Returned:	0 MG =	0 AF (0)

Per Capita Use: (2007 WWDC Survey)

Diverted:	150 GPCPD
Consumed:	150 GPCPD

Peak Day Demand: 20,400 GPD = 0.0315 CFS = 0.0626 AFD (2007 WWDC Survey)

Water Supply System Capacity: 92 GPM = 0.204 CFS = 0.407 AFD (2007 WWDC Survey)

Municipal Water Rights:

Permit No.	Source	Priority	Amount	Remarks
UW 69347	Ground	1/31/1985	35 gpm	Depth-480 feet.
UW 71847	Ground	1/29/1986	35 gpm	Depth-450 feet.
UW 76028	Ground	7/20/1987	35 gpm	Depth-400 feet.

Water Right Capacity: 105 gpm = 0.23 cfs = 0.46 AFD

Green River Basin Planning Study
Municipality Summary

Entity: Town of Pinedale

Service Area Population: 1,800 (2007 WWDC Survey)

Water Supply: Fremont Lake Reservoir, located on Pine Creek. The water is delivered to town through an intake structure in the reservoir and gravity pipelines, approximately 2 miles in length.

Water Treatment: Disinfection/chlorination.

Wastewater Treatment: A lagoon system which discharges back to Pine Creek.

Monthly Water Rates: $20.00 a flat rate regardless of use. (2007 WWDC Survey)

Annual Water Use: (1998)

Diverted:	365.0 MG =	1,120.1 AF
Consumed:	175.2 MG =	537.6 AF (48%)
Returned:	189.8 MG =	582.5 AF (52%)

Per Capita Use: (2007 WWDC Survey)

Diverted:	600 GPCPD
Consumed:	288 GPCPD (48%)

Peak Day Demand: 3.0 MGD = 4.63 CFS = 9.21 AFD (2007 WWDC Survey)

Water Supply System Capacity: 14.4 MGD = 22.3 CFS = 44.2 AFD (2007 WWDC Survey)

Municipal Water Rights:

Permit No.	Source	Priority	Amount	Remarks
4452 Res.	Fremont Res.	9/10/1931	9,844.12 AF	
8937 Res.	Fremont Res.	2/2/1977	7,594.5 AF	
1817	Pine Creek	5/6/1898	0.37 cfs	Diverted 6/1-8/31, 68.28 AF
1817	Pine Creek	5/6/1898	1.60 cfs	Diverted 5/17-9/28, 131.3 AF
392 Enl.	Pine Creek	12/1/1898	0.11 cfs	Diverted 6/1-8/31, 19.6 AF
626 Enl.	Pine Creek	2/25/1901	0.12 cfs	Diverted 6/1-8/31, 21.49 AF
1631 Enl.	Pine Creek	11/8/1906	0.07 cfs	Diverted 6/1-8/31, 11.89 AF
1631 Enl.	Pine Creek	11/8/1906	1.51 cfs	Diverted 5/17-9/28, 123.5 AF
18601	Pine Creek	1/30/1935	0.17 cfs	
5289 Enl.	Pine Creek	1/2/1941	1.75 cfs	

Water Right Capacity:

Storage in Fremont Lake: 17,438.62 AFY

Direct flows rights:	January 1 - May 16:	1.92 cfs =	3.81 AFD
	May 17- June 1:	5.03 cfs =	9.97 AFD
	June 1 - August 31:	5.79 cfs =	11.48 AFD
	Sept.1 - Sept. 28	5.03 cfs =	9.97 AFD
	Sept. 29 - Dec. 31	1.92 cfs =	3.81 AFD

Green River Basin Planning Study
Municipality Summary

Entity: Town of Superior

Service Area Population: 250 (2007 WWDC Survey)

Water Supply: Three (3) groundwater wells with approximate depths of 1,700 feet.

Water Treatment: Conventional water treatment plant.

Wastewater Treatment: A zero discharge lagoon system.

Monthly Water Rates: $35.00, a flat rate regardlesss of use. (2007 WWDC Survey)

Annual Water Use: (2007 WWDC Survey)

Diverted:	14.6 MG =	44.8 AF	
Consumed:	14.6 MG =	44.8 AF	(100%)
Returned:	0 MG =	0 AF	(0)

Per Capita Use: (2007 WWDC Survey)

Diverted:	146 GPCPD
Consumed:	146 GPCPD

Peak Day Demand: 90,000 GPD = 0.14 CFS = 0.28 AFD (2007 WWDC Survey)

Water Supply System Capacity: 360 GPM = 0.80 CFS = 1.6 AFD (2007 WWDC Survey)

Municipal Water Rights:

Permit No.	Source	Priority	Amount	Remarks
UW 66540	Ground	1/27/1984	150 gpm	Depth-1,720 feet.
UW 69481	Ground	3/4/1985	300 gpm	Depth-1,700 feet.
UW 83437	Ground	8/20/1990	250 gpm	Depth-1,720 feet.
UW 87220	Ground	2/26/1992	60 gpm	Depth-968 feet.

Water Right Capacity: 760 gpm = 1.69 cfs = 3.36 AFD

Green River Basin Planning Study
Municipality Summary

Entity: Town of Wamsutter

Service Area Population: 800 (2007 WWDC Survey) 265 (WDA&I, 2008)

Water Supply: Three (3) groundwater wells varying in depth between 1,365 feet and 1,905.

Water Treatment: Disinfection/chlorination.

Wastewater Treatment: A zero discharge lagoon system.

Monthly Water Rates: $40.00, a flat rate regardless of use. (2007 WWDC Survey)

Annual Water Use: (2007 WWDC Survey)

Diverted: 29.2 MG = 89.6 AF
Consumed: 29.2 MG = 89.6 AF (100%)
Returned: 0 MG = 0 AF (0)

Per Capita Use: (2007 WWDC Survey)

Diverted: 100 GPCPD
Consumed: 100 GPCPD

Peak Day Demand: 270,000 GPD = 0.42 CFS = 0.83 AFD (2007 WWDC Survey)

Water Supply System Capacity: 217 GPM = .48 CFS = .96 AFD (2007 WWDC Survey)

Municipal Water Rights:

Permit No.	Source	Priority	Amount	Remarks
SC 118	Ground	5/4/1902	10 gpm	Depth-1,365 feet.
SC 119	Ground	1/15/1912	15 gpm	Depth-1,905 feet.
SC 120	Ground	8/20/1921	67 gpm	Depth-1,801 feet.
UW 113188	Ground	11/25/1998	250 gpm	Depth-2,010 feet.

Water Right Capacity: 342 gpm = 0.76 cfs = 1.51 AFD