

"Wells Exempt from the Permitting Process"  
Presentation Outline by  
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a. Number of exempt wells currently in Montana

1. Numbers presented are for all exempt ground water rights, not just wells. It includes developed springs and excavations below the water table for ponds/pits.
- ii. Includes any beneficial use, not just domestic
- iii. Noncompliance--Not everyone who puts in a well or other ground water developinent files for an exempt ground water right. Many simply ignorant of the after-put-to-beneficial-use requirement or assume that the well log prepared by the well driller suffices. Other western states require a form to be filed as permission to drill a well, but they don't necessarily get a water right. Compliance has been better in recent years with educational efforts. For example, between January 1, 1994 and July 1, 2007, over 100,000 well logs were filed with the Bureau of Mines and Geology, but only 32,125 exempt Certificates were issued by DNRC. Certainly compliance is greater than 32%, because well logs are filed for wells that produce more than 35 gpm, for monitoring wells, and for wells on lots that perhaps are never sold or built upon. My own best professional guess is that today, about 60-70% of newly used wells get filed on.
- iv. Total # of Certificates of Water Right since 7/1/1973 is 104,142 as of 9/1/2007.
- v. Attached Table (Pg. 3). Chose 1991 as start because that was the year the exemption was changed by the Legislature from "less than 100 gpm" to "35 gpm or less and 10 ac-ft/yr or less." At that time, the exemption was reduced over concern that it was being abused for considerable acreages of irrigation (perhaps 10 acres) and large subdivisions and trailer parks, etc. Figures for first half of 2007 may be misleading—most certificates issued in the second half of the year during and after the construction season.
- vi. Probably close to 40,000 Certificates issued under current 35gpm exemption by the end of 2007. Over half in Ravalli, Flathead, Gallatin, Lewis & Clark, and Missoula Counties. Almost 80% in top 14 counties, and conversely, only 20% in 42 counties.

b. Number expected at current rates by January 1,2020

- i. Low estimate (same amount as last 13.5 years): 32,000 more
- ii. Medium estimate (same amount as last full year x 13.5): 58,000 more
- iii. High estimate (2% growth on last full year): 78,000 more

c. Types of beneficial uses for which exempt wells are used

- i. An exempt Certificate can be issued for more than one purpose. Records indicate there are 152,328 purposes listed on the 104,142 Certificates issued since 1973, including 31 different types of purposes. Some of the more common purposes include domestic (included on 75% of all Certificates); stock watering (32%); lawn and garden (24%); irrigation (6.5%); commercial (2.6%); multiple domestic (1.9%); and fish, waterfowl, wildlife, recreation-related purposes (1.7%).
- ii. It should be noted that domestic and multiple domestic purpose automatically include  $\frac{1}{4}$  acre of lawn irrigation per household, therefore when the purpose lawn and garden or irrigation appears on the Certificate, it is for more than  $\frac{1}{4}$  acre of irrigated area.
- iii. Some of the significant but less common purposes an exempt Certificate have been issued for include agricultural spraying, fire protection, geothermal heating and cooling, industrial, mining, municipal and institutional, and oil well flooding.

d. Reasonable use of water in comparison with the current statutory limits including volume, flow rate, and any other criteria

- i. The statutory limits are for total amount of water used, or diverted. For many purposes, much of the water returns to the source. The last page of handout shows the general guidelines we use for many different water uses.
- ii. In terms of the ground water use statutory limits, the 10 acre-feet volume limitation is probably more important than the 35 gpm flow rate limitation. This is just the opposite from surface water and the reason is that the impact; from a surface water diversion are much more immediate and unattenuated upon other water users. Impacts from ground water users, especially upon surface water users, depend more on the volume of water removed from aquifer over time than the instantaneous flow rate at which it is removed. There are exceptions to this, especially in terms of ground water diversions upon other ground water diversions.

- iii. In terms of the consumption of water or loss to the hydrologic system, some uses are a heavier drain than others. For example, some uses are virtually 100% nonconsumptive, such as wells used to serve closed system ground source heat pumps. In these systems, water is piped from the well through a heating or air conditioning unit and reinjected back into the ground. Not all these systems are completely closed, however, some use ponds to allow the water to cool and gradually seep back into the aquifer, but they lose some water through evaporation.
- iv. Domestic and lawn and garden use--Two parts: In-household uses consume about 12%, 2% indoors from evaporation and 10% through evapotranspiration in waste water treatment. Outdoor use is much more consumptive in terms of evapotranspiration. While it varies across the state with the climate, a rough statewide average is that 50% of what is diverted is consumed in lawn and garden irrigation. For a single household with up to 5 people with a ¼ acre of lawn and garden, we have generally estimated the volume of water diverted to be about 1.7 acre-feet per year. Using these calculations above, of that amount, approximately .47 acre-feet of water is consumed per year. The amount consumed increases dramatically with the area of lawn and garden. For example if the area irrigated is one acre, we would issue a Certificate for 3.5 acre-feet and the amount consumed would be 1.37 acre-feet per year.
- v. Stockwater use: The total use standards are calculated based upon animal units on the green sheet. In terms of purely water quantity, this not a high consumptive use. Less than 10% is consumed, although that amount may be higher for dairy cows.
- vi. Commercial use: Generally this is a fairly non-consumptive use depending on the number and size of the in store restrooms and sinks.
- vii. Multiple domestic use: In some cases, single Certificates have been issued for up to ten households where they do not claim much lawn watering. Often, they also involve a cistern or storage tank that allows them to pump 35 gpm or less for longer periods, that creates storage and water pressure, and still not reach the 10-acre-feet per year threshold.
- viii. Fish, waterfowl, wildlife, and recreation-related uses: The Department has struggled mightily to try and define what a "reasonable" amount of water is for these uses. Usually, these uses involve ponds that are created through excavations deep enough to intercept the ground water table. Some times, these are attempts to reclaim abandoned gravel pits. In some cases, wells may be used to maintain water levels and make up water lost to evaporation. The design of the pond is important to the actual purpose. Wetland ponds need not be more than 3-5 feet deep and the banks should be gradually sloped. Fishponds that are expected to over winter trout

species need to be fairly deep, and with sufficient size for oxygenation purposes. In other cases, the ponds may have little more than aesthetic value to a land-owner, in which case it is pretty hard to quantify what is a reasonable size for the pond and what is unreasonable. Evaporation is the biggest factor in the consumptive loss, and again, varies with the climate. The losses range across the state from a little less than 3 feet of surface area losses to a little over 50 inches of surface area losses per year. In order to fit under the 10 acre-foot per year limit, the volume of the pond is calculated plus the loss to evaporation. To qualify for the exemption the pond is usually going to have to be less than 2 -3 acres in surface area.

e. Other pertinent information

1. Montana is one of the few western states that does not have any kind of preference for domestic and stock water users. Theoretically, a household use with a junior priority date is subordinate to, and could be shut down by, a senior priority date for any other purpose. In each of our neighboring states, they are also struggling with how to deal with the surface water ground water connection within the prior appropriation system. But even though they have a more developed practice in water rights enforcement, they do not enforce priorities against small domestic and stock water uses. Nor will it be an easy matter to do so. There would likely be all sorts of argument about whether a senior surface water right call against a junior ground water right would be a "futile call" and perhaps other legal arguments as well. A water commissioner will not be able to simply shut wells down like they can surface water diversions without considerable more hydrogeologic expertise and information, if we are going to treat these uses consistent with the prior appropriation doctrine.

Exempt Certificates of Water Right by County and Year, 1/1/1991 until 7/1/2007, by County Rank

County	Year																	cnty total	cum total
	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007		
Ravalli	202	288	450	300	265	329	293	269	254	259	197	239	336	343	330	567	133	5054	13.20%
Flathead	249	208	300	281	204	102	376	183	190	173	158	168	238	551	384	582	133	4480	
Gallatin	167	223	289	263	295	126	247	203	212	242	191	241	75	455	243	247	226	3945	
Lewis & Clark	156	137	168	192	224	128	171	177	201	224	147	112	267	349	233	334	116	3336	
Missoula	138	213	319	241	209	223	193	153	154	168	127	140	182	166	200	392	73	3291	52.40%
Yellowstone	50	72	91	76	85	99	89	106	117	111	102	105	109	149	108	242	86	1797	
Lincoln	72	39	77	110	59	50	148	57	79	74	53	54	91	209	99	254	70	1595	
Madison	41	55	55	48	90	38	76	45	59	62	26	57	33	140	115	113	80	1133	
Park	37	39	100	57	105	32	70	51	53	72	49	68	18	112	74	70	71	1078	
Lake	76	66	101	104	81	46	150	64	51	28	16	19	29	50	35	79	14	1009	
Jefferson	74	43	45	52	47	48	54	61	69	68	36	18	75	97	79	110	26	1002	
Carbon	32	37	59	64	47	70	51	52	70	40	36	71	45	86	57	116	53	986	
Cascade	48	42	73	47	61	45	62	45	54	62	61	68	47	56	52	92	49	964	
Sanders	34	32	61	86	63	47	95	39	50	42	28	28	30	81	59	111	42	928	79.70%
Stillwater	30	29	38	45	35	44	57	38	48	63	33	43	44	57	51	61	41	757	81.70%
Silver Bow	97	91	44	39	37	32	38	40	34	45	14	6	21	54	24	32	15	663	
Beaverhead	42	25	24	32	34	25	44	23	36	38	20	10	48	78	60	77	30	646	
Broadwater	15	9	12	17	25	19	24	30	27	33	19	6	31	74	73	100	35	549	86.60%
Fergus	15	14	24	15	16	29	20	18	36	21	43	39	30	30	34	66	21	471	
Granite	10	22	25	15	23	25	20	16	24	18	21	20	24	38	37	57	18	413	
Mineral	12	18	21	14	25	25	24	26	33	29	13	14	22	25	34	64	12	411	89.90%
Musselshell	15	28	25	16	15	14	16	23	18	20	20	25	14	33	29	36	9	356	
Powell	24	10	14	20	28	16	17	19	20	29	12	4	17	26	30	42	16	344	
Deer Lodge	28	7	15	12	29	17	24	22	30	22	8	9	22	36	19	23	8	331	
Sweet Grass	9	15	16	18	14	13	18	15	19	20	24	23	18	14	20	22	11	289	93.40%
Richland	10	9	10	14	22	9	19	10	10	17	8	8	5	15	16	27	9	218	
Hill	20	14	10	6	15	8	12	15	14	7	17	13	5	11	13	13	2	195	
Custer	1	2	8	13	9	23	16	8	5	7	4	12	7	17	12	24	8	176	
Meagher	12	10	7	6	16	4	6	6	7	10	15	10	4	14	12	20	14	173	
Teton	5	9	7	6	6	2	6	2	4	17	9	5	6	11	4	59	5	163	
Dawson	6	9	9	6	9	7	5	3	11	12	3	11	8	10	12	39	2	162	
Judith Basin	3	2	10	1	3	4	7	5	8	10	20	18	7	9	13	23	9	152	
Rosebud	2	4	3	12	4	1	8	12	7	0	9	4	4	6	12	14	4	106	
Big Horn	8	6	3	3	6	1	5	5	5	9	5	7	7	10	5	10	5	100	
Powder River	3	5	4	6	2	1	4	3	5	9	3	5	7	9	10	12	6	94	
Valley	4	2	2	12	10	4	6	8	10	6	3	4	2	5	5	9	2	94	
Sheridan	2	0	8	6	8	12	7	6	6	3	3	6	2	2	3	10	5	89	
Garfield	2	5	6	5	6	5	9	6	4	6	1	4	5	4	5	8	4	85	
McCone	3	5	2	8	2	6	6	5	3	3	3	6	2	0	4	12	7	77	
Roosevelt	1	1	5	9	8	6	3	5	2	6	2	7	3	0	3	7	0	68	
Phillips	3	1	9	2	2	3	0	2	1	2	3	9	2	2	3	19	5	68	
Golden Valley	1	3	1	0	3	3	1	3	3	2	4	3	4	8	2	18	4	63	
Carter	4	5	5	3	3	2	3	1	4	5	1	6	4	2	3	6	1	58	
Fallon	2	1	2	4	3	3	0	4	2	2	1	2	1	3	7	8	2	47	
Glacier	2	1	1	0	0	2	3	1	7	4	3	3	2	2	0	9	1	41	
Chouteau	4	3	4	1	2	1	0	3	1	5	2	1	1	2	1	7	2	40	
Pondera	0	2	1	0	0	0	2	0	2	1	6	1	2	2	1	18	2	40	
Blaine	8	5	1	2	3	0	2	0	3	1	2	1	1	1	1	8	0	39	
Wheatland	2	3	3	3	1	2	1	3	5	0	3	3	1	2	1	4	2	39	
Wibaux	2	1	1	2	1	0	2	1	3	4	2	1	1	4	1	5	3	34	
Treasure	6	1	0	4	4	1	1	0	0	2	1	3	1	2	2	5	0	33	
Daniels	1	0	3	4	8	3	4	1	1	1	0	0	1	0	0	5	0	32	
Prairie	1	1	1	2	2	0	1	0	1	5	0	2	1	1	0	5	2	25	
Petroleum	1	1	2	0	0	0	0	1	0	0	1	0	2	0	1	4	0	13	
Toole	3	1	1	0	0	0	0	2	0	0	1	0	1	0	0	2	0	11	
Liberty	0	1	2	0	0	0	1	1	0	0	3	0	0	0	0	0	1	9	
yriy total	1795	1875	2577	2304	2274	1755	2517	1897	2072	2119	1592	1742	1965	3463	2631	4299	1495	38372	

# WATER CONVERSION TABLE

<b>GPM = Gallons per minute</b>	<b>CFS = Cubic feet per second</b>	<b>AF = Acre-feet</b>
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1 Cubic foot of water equals .....	7.48	Gallons
.....	1,728	Cubic Inches
1 AF of water equals .....		1 foot of water on 1 acre
.....	325,851	Gallons
.....	43,560	Cubic feet
1 CFS equals .....	448.8	GPM
.....	1.98	AF per day
.....	40	Miner's inches
1 GPM equals .....	1,440	Gallons per 24 hour day
.....	1.61	AF per year
1 Surface Acre equals .....	Size of area in square feet ÷ 43,560	

<b>QUICK CONVERSIONS</b>			
<b>MI X 11.22 = GPM</b>	<b>CFS X 40 = MI</b>	<b>GPM ÷ 11.22 = MI</b>	<b>AF/DAY ÷ 1.98 = CFS</b>
<b>MI ÷ 40 = CFS</b>	<b>CFS X 448.8 = GPM</b>	<b>GPM ÷ 448.8 = CFS</b>	<b>AF/DAY X 226.67 = GPM</b>
<b>MI X .0495 = AF/DAY</b>	<b>CFS X 1.98 = AF/DAY</b>	<b>GPM ÷ 226.67 = AF/DAY</b>	<b>AF/DAY ÷ .0495 = CFS</b>

<b>GENERAL WATER REQUIREMENTS</b>			
<b>DOMESTIC USE</b>			
1 home - up to 5 people .....	1 AF/YR	Shop use .....	1 AFNR
1 acre lawn & garden .....	2.50 AF/season	1 acre shelter belt .....	2.50 AF/season
<b>STOCKWATER USE</b>			
An animal unit (AU) is a measurement of livestock numbers. A cow and calf pair is one animal unit. Weaned animals are counted as one unit each.			
Number of AUs X .017 = AF/YEAR			
Number of AUs X .017 ÷ 365 x Days = AF/Number of days			
1 Buffalo	1.5 AU	1 Elk	300 Chickens
1 Horse	1.5 AU	5 Deer	50 Geese
1 Dairy Cow	1.5 AU	3 Llamas	50 Ducks
1 Beef Cow	1 AU	3 Pigs	100 Turkeys
2 Emu or 2 Ostrich	1 AU	5 Sheep	100 Rabbits
<b>OTHER USES</b>			
Crop Spraying..... Gallons/Acre/YR X acres ÷ 325851 = AF/YR			

# Planning Guide for Water Use

<u>TYPE OF USE</u>	<u>GALLONS/DAY</u>	<u>TYPE OF USE</u>	<u>GALLONS/DAY</u>
Airports: (per passenger)	3-5	Livestock continued:	
Apartments: multiple-family (per resident)	60	6 Goat	15
Bathhouses: (per bather)	10	3 Hogs	15
Camps:		Horse	22.5
Construction, semipermanent (per worker)	50	3 Llamas	15
Day with no meals served (per camper)	15	5 Sheep	15
Luxury (per camper)	100-150	Motels:	
Resorts, day and night with limited plumbing (per camper)	50	With bath, toilet, & kitchen (per bed space)	50
Tourist with central bath and toilet facilities (per person)	35	With bed and toilet (per bed space)	40
Cottages: with seasonal occupancy (per resident)	50	Parks:	
Courts: tourist with individual bath units (per person)	50	Overnight with flush toilets (per camper)	25
Clubs:		Trailers with individual bath units, no sewer connection (per trailer)	25
Country (per resident member)	100	Trailers with individual baths connected to sewer (per person)	50
Country (per nonresident member present)	25	Picnic facilities:	
Dwellings:		With bathhouses, showers, and flush toilets (per picnicker)	20
Boardinghouses (per boarder)	50	With toilet facilities only (per picnicker)	10
Additional kitchen requirements for nonresident boarders	10	Restaurants:	
Luxury (per person)	100-150	With toilet facilities (per patron)	7-10
Multiple-family apartments (per resident)	40	Without toilet facilities (per patron)	3
Rooming houses (per resident)	60	With bars and cocktail lounge (additional quantity per patron)	2
Single family (per resident)	75	Schools:	
Estates (per resident)	100-150	Boarding (per pupil)	75-100
Factories:		Day with cafeteria, gymnasium & showers (per pupil)	25
(per person per shift)	15-35	Day with cafeteria, but no gymnasium or showers (per pupil)	20
Highway Rest Areas: (per person)	5	Day without cafeteria, gymnasium or showers (per pupil)	15
Hotels:		Service Stations: (per vehicle)	10
Private baths (two persons per room)	60	Stores: (per toilet room)	400
Without private baths (two persons per room)	50	Swimming Pools: (per swimmer)	10
Institutions:		Theaters:	
Non-hospital (per person)	75-125	Drive-in (per car space)	5
Hospitals (per bed)	250-400	Movie (per auditorium seat)	5
Churches (per person @ 104 days/yr)	20	Workers:	
Laundries: self-service (gallons per washing per customer)	50	Construction (per person per shift)	50
Livestock:		School or Offices (per person per shift)	15
Cattle	15		
Dairy Cows (drinking and servicing)	22.5		
300 Chickens	15		
100 Turkeys	15		

