



July 10, 2013

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WATER RESOURCES
WESTERN REGION

Steve Lester
Water Rights Supervisor
Idaho Department of Water Resources
2735 Airport Way
Boise, ID 83705

Subject: Application for Transfer No. 78689

Dear Steve:

In response to your letter to Gaylon Ball and Echanove Drive LLC dated July 3, 2013, this letter provides additional information related to application for transfer No. 78689. Your letter contained three questions, which are answered below.

- 1. Will reduced use of the community well coupled with use of your new well result in well interference for any well? This includes the community irrigation well and any other nearby wells (domestic, irrigation, etc.).*

The new point of diversion proposed by the transfer will reduce the currently authorized 1.378 cfs rate of diversion from the community well by 0.38 cfs (170 gpm) and increase the rate of diversion from new well by 0.38 cfs. As a result, there will be no net change in diversion rate from the aquifer.

The new Ball irrigation well is approximately 400 feet south of the community well. It was recently test pumped at 660 gpm for 2 hours with 14 feet of drawdown, which is a specific capacity of 47 gpm/ft of drawdown. This high yield is common for Dry Creek Valley aquifers. A test well for Hidden Springs located approximately 1500 feet southeast of the new well was tested at 410 gpm with 12 feet of drawdown (specific capacity = 34 gpm/ft). Other local wells generally have similar, or lower, specific capacities. The transmissivity of confined aquifers in gpd/ft can be estimated by multiplying specific capacity by a factor of 2000. Therefore, estimated aquifer transmissivity based on the specific capacities of the new Ball irrigation well and the Hidden Springs test well is in the range of 68,000 to 94,000 gpd/ft.

Interference drawdown will increase slightly at wells south of the community well, and decrease slightly at wells north of the community well. The estimated magnitude of the interference impact can be calculated using a Theis analysis. Using the Theis

equation, interference drawdown at a well can be calculated based on the distance from a pumping well. There is positive drawdown from increased pumping of the new well and negative drawdown from reduced pumping of the community well. For the Dry Creek aquifer, an aquifer transmissivity of 50,000 gpd/ft and an aquifer storativity of 0.0001 are reasonably conservative hydraulic parameters for a Theis analysis. A graph of calculated drawdowns for various radii and times of pumping is attached, and example analyses are provided below.

- a. A theoretical well is located 150 feet east of the new well and 500 feet southeast of the community well. Drawdown at 150 feet from continuous pumping for 60 days at a rate of 170 gpm is 5.0 feet. Drawdown at 500 feet from continuous pumping for 60 days at a rate of 170 gpm is 4.1 feet. The net well interference from the change is 0.9 feet (i.e., 5.0 feet – 4.1 feet = 0.9 feet).
- b. A theoretical well is located 1000 feet south of the new well and 1400 feet south of the community well. Drawdown at 1000 feet from continuous pumping for 60 days at a rate of 170 gpm is 3.6 feet. Drawdown at 1400 feet from continuous pumping for 60 days at a rate of 170 gpm is 3.3 feet. The net well interference from the change is 0.3 feet (i.e., 3.6 feet – 3.3 feet = 0.3 feet).
- c. A theoretical well is located 1000 feet north of the new well and 500 feet north of the community well. Drawdown at 1000 feet from continuous pumping for 60 days at a rate of 170 gpm is 3.6 feet. Drawdown at 500 feet from continuous pumping for 60 days at a rate of 170 gpm is 4.1 feet. The net well interference from the change is -0.5 feet (i.e., 3.6 feet – 4.1 feet = -0.5 feet).

As demonstrated in the examples above, the effect of decreased pumping at the community well will offset most of the well interference impact from pumping of the new well. The net interference impact to wells located more than a few hundred feet from the new well will be negligible.

2. *What impacts will there be to the community irrigation system if 0.38 cfs under your groundwater rights no longer contribute to that system?*

Following the transfer, the community well will be operated at a lower discharge rate to limit diversion rate to the 1.0 cfs amount authorized by the remaining water rights. Pumping water level will be higher in the community well due to the lower pumping rate, thereby decreasing power use.

Groundwater from the community well flows to an irrigation pond, and then is pumped into the pressurized distribution system. The distribution system reportedly has low pressure during peak use periods. By eliminating the 0.38 cfs of use by Ball and Echanove Drive LLC, the pressures within the distribution system are expected to

increase. This should provide a benefit to the users of the community irrigation system.

3. *Please explain how you intend to continue using Dry Creek water. Will this be through the community system? If so, how will you prevent use on your property of ground water delivered through that system? How will you divert from the creek if not via the community system? A change in point of diversion from the creek also requires an approved transfer.*

Ball and Echanove Drive LLC both plan to continue using the community pressurized irrigation system at times when Dry Creek water is available. At times when Dry Creek water is not available, they plan to close the valve to the community pressurized irrigation system and utilize the new Ball irrigation well.

There may be times when both Dry Creek water and community well water are being diverted to the irrigation pond. In such cases, Ball and Echanove Drive LLC will need to limit their daily use of water from community system to the volume of Dry Creek water that is available for diversion into the irrigation pond under their water rights.

Please contact me with any questions.

Sincerely,



Terry M. Scanlan, P.E.

Cc: Gaylon Ball

File: 406.0030

Theis Worksheet

Project: _____
Project Number: _____

Assumed Parameter Values

Q=	170	(gpm)
T=	50,000	(gpd/ft)
S=	0.0001	(dimensionless)

Time (days)	Time (minutes)	Radius (ft)				
		150	500	1,000	1,400	2,000
0.01	14	1.64	0.73	0.29	0.14	0.03
0.1	144	2.53	1.60	1.07	0.82	0.57
0.2	288	2.80	1.87	1.33	1.08	0.81
0.4	576	3.07	2.14	1.60	1.34	1.07
0.8	1152	3.34	2.41	1.87	1.61	1.33
1.0	1440	3.43	2.49	1.95	1.69	1.42
2.0	2880	3.70	2.76	2.22	1.96	1.69
7.0	10080	4.19	3.25	2.71	2.45	2.17
15.0	21600	4.49	3.55	3.01	2.75	2.47
30.0	43200	4.76	3.82	3.28	3.02	2.74
60.0	86400	5.03	4.09	3.55	3.29	3.01
120.0	172800	5.30	4.36	3.82	3.56	3.28
180.0	259200	5.45	4.52	3.98	3.71	3.44
365.0	525600	5.73	4.79	4.25	3.99	3.71

