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**DEPARTMENT OF
WATER RESOURCES**

**RESPONSE TO RANGEN'S PROTEST AGAINST IGWA'S
WATER RIGHT APPLICATION FOR TRANSFER NO. 79560**

Prepared for

**THE IDAHO GROUND WATER APPROPRIATORS, INC
NORTH SNAKE GROUND WATER DISTRICT
MAGIC VALLEY GROUND WATER DISTRICT
SOUTHWEST IRRIGATION DISTRICT**

Prepared by

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Boise, Idaho 83706
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December 2, 2014



**SPF WATER
ENGINEERING**

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1. OVERVIEW

Idaho Ground Water Appropriators, Inc. (IGWA) has filed Application for Transfer No. 79560 (the "Application") seeking to change the place of use of a 10 cfs portion of water right 36-7072 from the SeaPac fish hatchery at Magic Springs to the Rangen fish hatchery on Billingsley Creek, and to reflect mitigation as a nature of use. Water will be delivered from Magic Springs to the Rangen hatchery per engineering details submitted in the Fourth Mitigation Plan, CM-MP-2014-006.

This report evaluates the Application's compliance with the requirements for approval set forth in Idaho Code § 42-222. The Application should be approved if:

- (a) no other water rights are injured thereby,
- (b) the change does not constitute an enlargement in use of the original right,
- (c) the change is consistent with the conservation of water resources within the state of Idaho and is in the local public interest as de-fined in section 42-202B, Idaho Code,
- (d) the change will not adversely affect the local economy of the water-shed or local area within which the source of water for the proposed use originates, in the case where the place of use is outside of the watershed or local area where the source of water originates, and
- (e) the new use is a beneficial use.

As discussed below, the Application meets these requirements.

2. THE TRANSFER WILL NOT REDUCE THE QUANTITY OF WATER UNDER EXISTING RIGHTS

2.1. Injury to Other Rights

Rangen's protest contends "The water will be consumed in Billingsley Creek and will not return to the Snake River" and that other water rights will be injured by the transfer. Rangen asserts that if Snake River flows fall below the minimum requirements at the Murphy Gage, other irrigation water rights will be negatively impacted due to curtailment. Neither Idaho Power Company nor any other downstream water user has protested the Application.

2.2. Preventing Injury to Other Rights

Injury to Idaho Power's water rights can only occur if the Swan Falls minimum flow requirements are breached. This has not occurred, but could occur in the future.

Changing the place of use of a 10 cfs portion of water right no. 36-7072 from Magic Springs to Billingsley Creek could impact Snake River flows at Swan Falls only if a significant portion of the 10 cfs is consumed as a result of the change.

Presently, all water diverted under right no. 36-7072 flows from the SeaPac fish hatchery to the Snake River over a distance of less than one mile. Water delivered to the Rangen facility pursuant to the Application could, after leaving the Rangen facility, be consumptively used by other Billingsley Creek water users or evaporate from Billingsley Creek. If this occurred at a time when minimum stream flows at the Murphy Gage are violated, it could contribute to enforcement of the Swan Falls Agreement, which may include curtailment of other water rights.

However, appropriate stream administration and mitigation could be utilized to minimize and offset consumption of water delivered to Rangen under the Application.

2.2.1. Administration

We understand that Billingsley Creek is a managed water source with a Watermaster who regulates diversions from the Creek. When necessary to meet minimum stream flows, IDWR can instruct the watermaster to convey the Magic Springs water past Billingsley Creek diversions so that it flows directly to the Snake River, thereby preventing consumptive use of this water by other water users on Billingsley Creek. This would limit consumptive losses to evaporation that occurs between the Rangen facility and the Snake River.

2.2.2. Evaporation

Chuck Brendecke, P.E., and Sophia Sigstedt of AMEC calculated evaporation of Magic Springs water delivered to the Rangen facility on Billingsley Creek and the offsetting reach gains to Billingsley Creek and the Snake River from mitigation activities undertaken by IGWA. Of the 10 cfs delivered to Rangen under the Application, they calculate 0.039cfs of the Magic Springs portion delivered to Rangen will be evaporated. This report is attached hereto as Appendix A.

2.2.3. Mitigation Plans

IGWA's ongoing mitigation activities fully mitigates for the evaporative loss of water transferred to Billingsley Creek under the Application. The calculations performed by AMEC show IGWA's recharge, conversions, and CREP add more than ten cfs to Billingsley Creek and other reaches of the Snake River upstream from Swan Falls and downstream from Milner Dam (see AMEC Table 2). Thus, IGWA's current mitigation activities offset by a large margin the evaporation of Magic Springs water introduced to Billingsley Creek.

Additional mitigation opportunities are also available to IGWA, including securing storage water that could be released to the Snake River, or reducing consumptive use of irrigation water rights from the Snake River or from springs tributary to the Snake

River upstream from Swan Falls and downstream from Milner Dam. This latter approach could take the form of interruptible delivery agreements where irrigation could be temporarily curtailed to satisfy minimum stream flow requirements.

3. THE TRANSFER WILL NOT RESULT IN ENLARGEMENT OF WATER RIGHT 36-7072

Rangen's protest claims the Application will result in an enlargement of water right no. 36-7072. The purpose of the Application, however, is to continue using water for fish propagation, a use that is considered non-consumptive by IDWR. Water right 36-7072 is currently authorized for fish propagation at the SeaPac fish hatchery. At the Rangen facility, the right will also be used for non-consumptive fish propagation. Consequently, there will be no enlargement in the right.

4. THE TRANSFER IS CONSISTENT WITH THE CONSERVATION OF WATER RESOURCES WITHIN THE STATE OF IDAHO

Rangen's protest claims the Application is not consistent with the conservation of water resources within the state. However, Rangen does not state how the inconsistency will occur.

Water Right 36-7072 is currently used for fish production within Idaho. The Application moves a portion of the water right to the Rangen facility where it will continue to be used for fish production within Idaho. The use of water at Rangen is not expected to be wasteful. Therefore, the Application is consistent with the conservation of water resources within the State of Idaho.

5. THE TRANSFER IS IN THE LOCAL PUBLIC INTEREST

Rangen's protest claims the Application will be detrimental to fish and wildlife, fish rearing and spawning habitat, fish passage, waterfowl habitat, and aesthetic beauty and therefore is not in the best interest of the general public of the State of Idaho. However, Rangen does not state how or where these detrimental impacts will occur.

Rangen will benefit from a significant increase in water available for fish production. Discharge from Rangen and will return to Billingsley Creek. Additional flow in Billingsley Creek is expected to improve conditions for fish and wildlife. Improved economic conditions at Rangen and increased flows in Billingsley Creek will benefit the people in the Hagerman area. Therefore, the use is in the local public interest.

6. THE TRANSFER WILL NOT ADVERSELY AFFECT THE LOCAL ECONOMY

The transfer will have significant benefits to the local economy. Additional water provided to Rangen allows the facility to improve its economic output. In addition, the transfer provides mitigation needed to prevent the curtailment of ground water rights. Both of these measures benefit the local economy.

7. MITIGATION AND FISH PROPAGATION ARE ESTABLISHED BENEFICIAL USES

Both fish propagation and mitigation are established beneficial uses in the State of Idaho. Therefore, the Application meets the criterion that the use be recognized as a beneficial use.

**APPENDIX A
AMEC REPORT**

MEMORANDUM

To: Scott King P.E., SPF Water Engineering

From: Chuck Brendecke P.E., Sophia Sigstedt

Subject: Evaporation from Magic Springs Deliveries to Rangen Hatchery

Date: December 2, 2014

This memorandum summarizes calculations by AMEC to determine the potential evaporation of Magic Springs water delivered to the Rangen hatchery facility on Billingsley Creek and the offsetting reach gains to Billingsley Creek and the Snake River from other mitigation activities undertaken by the Idaho Groundwater Appropriators (IGWA). The calculations demonstrate that evaporation of Magic Springs water in Billingsley Creek is more than offset by gains to Billingsley Creek and the Snake River resulting from other IGWA mitigation activities.

Methodology

Evaporation of Magic Springs water in Billingsley Creek was calculated from ETIdaho 2012 Open Water-Shallow Systems (ponds, streams) Precipitation deficit and from estimates of creek length and width derived from aerial imagery. Total evaporation from the surface of Billingsley Creek was then calculated as the product of net evaporation and creek surface area, calculated as creek length times average creek width.

Evaporation of Magic Springs water in Billingsley Creek was then calculated as the product of total evaporation and the proportion of Billingsley Creek flow represented by Magic Springs water. This proportion was taken as the amount of Magic Springs water delivered to Rangen divided by the sum of Magic Springs deliveries and gaged flows of Billingsley Creek near Hagerman. Details of all of the foregoing calculations are shown in Table 1 at the back of this memo.

Reach gains resulting from IGWA's historical and ongoing mitigation activities in Water District 130 were derived from ESPAM2.1 model runs done by the Idaho Department of Water Resources (IDWR) for the Amended Final Order approving IGWA's first mitigation plan, dated May 16, 2014. These model runs are described in Finding of Fact 7 of the Amended Final Order. Model files associated with the runs are available on the IDWR website at:

http://www.idwr.idaho.gov/browse/legal/rangen/Data_Accomp_4_11_14_Order/.

IGWA mitigation activities contributing to gains in springs discharges below Milner include CREP, voluntary dry-ups, conversions, and recharge undertaken by IGWA and SWID. Some of these activities, have been underway since 2005. The IDWR modeling represented the effects of these historical activities for a five-year period starting with 2014. Current gains can reasonably be expected to be slightly larger in magnitude, since these activities are ongoing.

The gains from these IGWA mitigation activities to selected springs were contained in the IDWR model files. The files did not include post-processed output for all modeled springs, so the picture drawn from the files is conservative in that it underestimates the gains from IGWA mitigation activities. The only Billingsley Creek spring outputs contained in the IDWR model files were those for the Rangen model cell and the cell representing Three Springs. There are five additional drain cells in the model that discharge to Billingsley Creek. These include cells representing Potter, Big Springs, and Florence springs, among others. Time did not permit the extraction of these additional gains outputs, but it is reasonable to assume that in total they exceed those of Three Springs.

The post-processed gains that were contained in the IDWR files were summarized for three sets of springs: 1) Three Springs (a surrogate for all the non-Rangen springs discharging to Billingsley Creek), 2) springs represented in the model as serving the Thousand Springs and Malad hydropower facilities, and 3) other large springs entering the Snake River below Milner. Gains from all three groups of springs enter the Snake River above Swan Falls and are thus offsetting the evaporation of Magic Springs water in Billingsley Creek relative to the minimum flows at Swan Falls. Table 2 at the back of this memo summarizes the gains for these groups of springs.

Conclusions

Comparison of evaporation calculated in Table 1 and gains shown in Table 2 indicate that the non-Rangen gains from IGWA mitigation activities dwarf the evaporation of Magic Springs water in Billingsley Creek. In fact, any individual group of spring gains is more than adequate to offset the evaporation. Accordingly, we conclude that there can be no adverse effect on Swan Falls minimum flows from the evaporation of Magic Springs water introduced into Billingsley Creek.

Table 1

Billingsley Creek Surface Water Evaporation Calculation														
ETIadho 2012 Hagerman 2 SW (NWS-103932)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	annual (in/yr)	annual (ft/yr)
Open Water-Shallow Systems (ponds, streams)	Precipitation Deficit (in/month)													
Billingsley Creek Length (km)	13													
Billingsley Creek Width (ft)	25													
Billingsley Creek surface area (ft ²)	1,066,273													
Potential Billingsley Creek Evaporation (ft ³ /yr)	3,166,532													
Potential Billingsley Creek Evaporation (all/yr)	72.69													
Potential Billingsley Creek Evaporation (cfs)	0.10													
13134600 Billingsley Creek nr Hagerman, ID ³														
Discharge measurements Water October 2011 to September 2012 (cfs)	Date Discharge													
	3/6/2012 15.70													
Magic Springs Transfer (cfs)	10													
Magic Springs Transfer portion of Billingsley Crk Flow	39%													
Potential Magic Springs Transfer Evaporation (all/yr)	28.3													
Potential Magic Springs Transfer Evaporation (cfs)	0.039													

<http://data.kimberly.uidaho.edu/ETIdaho/stcrstats.py?station=103932&cover=55&stats=Deficit>

³<http://wdr/water/usgs/gow/wy2012/pdfs/13134600.2012.pdf>

Table 2

	Year 1 (4/2014- 3/2015)	Year 2 (4/2015- 3/2016)	Year 3 (4/2016- 3/2017)	Year 4 (4/2017- 3/2018)	Year 5 (4/2018- 3/2019)
<i>ESPAM 2.1 Predicted Mitigation Benefit to Spring Cell(s) ¹ (cfs)</i>					
Three Springs	1.37	1.48	1.57	1.63	1.68
Malad & Thousand Springs	9.17	9.92	10.51	10.95	11.30
Box Canyon Springs	7.49	8.10	8.57	8.92	9.20
Crystal Springs	5.17	5.60	5.92	6.17	6.36
Clear Lake Springs	4.54	4.91	5.19	5.40	5.57
Blue Lake Springs	3.69	3.94	4.13	4.27	4.37

¹http://www.idwr.idaho.gov/browse/legal/rangen/Data_Accmp_4_11_14_Order/ "2005_2013Transient.xlsx"