

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

A. GENERAL INFORMATION

Permit No: 36-8233

Exam Date: 9/3/2013

1. Current Owner: RETHA ANDERSON
752 FALLS VIEW DR
TWIN FALLS ID 83301-3072
(208)733-6756

LARREY ANDERSON
752 FALLS VIEW DR
TWIN FALLS ID 83301-3072
(208) 734-7686

2. Accompanied by: Gerald Miller
Phone No: (208) 825-9000
Address: 1188 E 990 S., Eden, ID 83325
Relationship to Permit Holder: Current owner of Anderson Camp

3. **SOURCE**
GROUND WATER

B. OVERLAP REVIEW

1. Other water rights with the same place of use: 47-8232
2. Other water rights with the same point of diversion: None

C. DIVERSION AND DELIVERY SYSTEM**1. LOCATION OF POINT(S) OF DIVERSION:**

GROUND WATER SE1/4SE1/4 Sec. 1, Twp 10S, Rge 18E, B.M.
JEROME County

Method of Determination: Waypoints were collected with a Garmin GPSmap 60CSx receiver and downloaded into an ArcMap shapefile that corresponds with 2009 and 2011 aerial photography and verified the points of diversion are located as recorded. See attached map.

2.
PLACE OF USE: HEATING

Twp	Rge	Sec	NE				NW				SW				SE				
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	Totals
10S	18E	1																X	

RECREATION same as HEATING

Method of Determination: Place of use determined using 2011 aerial photography and satellite imagery; verified the place of use is located as recorded. See attached map.

3. ☒ Delivery System Diagram Attached (required). Indicate all major components and distances between components. Indicate weir size/pipe as applicable.
- ☐ Map Attached Showing Location(s) of point(s) of diversion and place(s) of use (required). Scale must be 1:24,000 or greater.
- ☐ Aerial Photo Attached (required for irrigation of 10+ acres).
- ☐ Photo of Diversion and System Attached

4.

<u>Well or Diversion</u> <u>ID No.*</u>	<u>Motor Make</u>	<u>Hp</u>	<u>Motor Serial No.</u>	<u>Pump Make</u>	<u>Pump Serial No. or Discharge</u> <u>Size</u>
		5 Hp			

D. FLOW MEASUREMENTS

1.

<u>Measurement</u> <u>Equipment</u>	<u>Type</u>	<u>Make</u>	<u>Model No.</u>	<u>Serial No.</u>	<u>Size</u>	<u>Calib. Date</u>
5 gallon bucket and Stop watch						

2. Measurements:

Two lines:

Direct Line to water slide: 3 measurements: 20.13s; 20.65s and 21.08s for an approximate flow rate of 0.03 cfs

Direct line to pool: 3 measurements: 25.65s; 26.08s and 25.83s for an approximate flow rate of 0.03 cfs

Total = 0.06 cfs**E. FLOW CALCULATIONS**

_____Additional Computation Sheets Attached

Measured Method: Theoretical yield:

$$Q = \frac{8.8 \times (Hp) \times (Eff)}{H}$$

Where: Hp = 5 Hp pump

Eff = efficiency = 70% assumed

H = total head = pumping level = (2.31 x system pressure)

assume pumping level of 400 feet (per well Larrey Anderson)

assume system pressure = 0 psi

H = 400 + (0 x 2.31) = 400

$$Q = \frac{8.8 \times 5 \times .70}{400} = 0.77 \text{ cfs}$$

F. VOLUME CALCULATIONS

1. Volume Calculations for Other Uses:

Recreational: pool and water slide operated between: May22 – September 8:

All flow is diverted into both pools and run continuously through and then discharged into ditch:

0.06 cfs x 110 days x 1.9835 = 13.09 AFHot Tub (Weekly Fill/year round): (7' w x 8' l x 4' d x 7.4805 x 52)/325,850 = 0.27AFTotal: 0.27 + 13.09 = 13.4 AF**Heating:** See Attachment #1: Volume Calculation WR 36-8233 Heating For calculations:16.4 AFA**G. NARRATIVE/REMARKS/COMMENTS**

Permit 36-8233 was permitted for 0.490 cfs Recreation and 0.440 cfs Heating.

Application for Permit 36-8233 was submitted by Larrey and/or Retha Anderson on February 22, 1984, and Proof of Beneficial Use was submitted December 17, 1991.

On September 3, 2013, I met with the current owner of Anderson Camp, Gerald Miller, to conduct a field exam for purposes of licensing this permit. Low temperature geothermal water is pumped from a well (5 Hp pump; pumping level at approximately 400') and can be diverted into three separate lines (see system diagram). Typically, water is only diverted from two of the lines, one that provides flow to the water slide and the other to the pool. The third line provides water to the main building for heating and a hot tub. According to Mr. Miller the heating system and hot tub are both still operable, but he doesn't currently utilize either. He told me it's cheaper to use the natural gas furnace in the store than to pump from the well and the camp doesn't usually have enough "off-season" campers to justify maintaining the hot tub. Mr. Anderson purchased the camp in 1992, and he stated that he operated the heating system and hot pool yearly prior to 2005 when he sold the camp and is unsure if the either was in operation after that. He repurchased the camp in 2010 and has been attempting to rebuild his customer base and has not used the heating system or hot tub since resumed ownership of the camp in 2010.

The flow rates on the permit appear to have been calculated by IDWR staff and were based on estimated fill rates for the pool (recreation) and a calculated energy budget based on the heating being utilized in several buildings. The applicant had withdrawn his initial proof of beneficial use after department staff attempted a field exam and applicant indicated he intended to expand the heating use further. However, the applicant never did develop any additional heating beyond that which he had already developed in the main building (store/restaurant) prior to filing his initial proof of beneficial use.

I wasn't able to obtain an independent measurement for the heating system as there was no access port or sufficient space for a polysonic measurement, the system isn't currently in use and likely hasn't been used since 2005. Still, the system was developed and used for at least 15 years. The heating volume was calculated at 16.4 AFA using calculations from Department memorandums (see attachment #1). Since I have a measurement of output capacity from the well, and was not able obtain an independent measurement from the heating system, I'm recommending a flow rate of 0.06 cfs for heating.

The pool and water slide are in operation from Memorial Day weekend to Labor Day and all flow from the well is diverted to the pool and slide 24/7 when they are in operation. The season of use applied for was year round and I believe that is appropriate as the hot tub use is recreational and when used, was in operation in the fall, winter and spring, along with the pool and water slide in use during the summer months. Volume for recreational use was calculated at 13.4 AFA (see volume calculations above).

Overlap review indicates potential overlap with two rights: 36-8232 and 36-7251. Right 36-7251 is a domestic right that appears to be appurtenant to private property to the northeast of the camp on a lot that according to the taxlot layer is owned by Shirley N. Long. Right 36-8232 is a domestic, commercial and irrigation right that is appurtenant to the campground and the source is a cold water well next to the recreation building. The commercial component provides fresh water to the restrooms, showers, r.v. hookups and laundry room. The domestic component provides water to an apartment on the second floor of the main building. Irrigation is for 1.0 acre.

Recommend licensing a flow rate of 0.06 cfs and a volume of 16.4 AFA for heating; a flow rate of 0.06 cfs and a volume of 13.4 AFA for recreation, with a combined flow rate of 0.06 cfs and a combined volume of 29.8 AFA.

Have conditions of permit approval been met? ☒ Yes ☐ No

H. RECOMMENDATIONS

1. Recommended Amounts

<u>BENEFICIAL USE</u>	<u>PERIOD OF USE</u>	<u>DIVERSION RATE</u>	<u>ANNUAL VOLUME</u>
RECREATION	1/01 to 12/31	0.06 CFS	16.4 AF
HEATING	1/01 to 12/31	0.06 CFS	13.4 AF
<u>Totals:</u>		0.06 CFS	29.8 AF

2. Recommended Amendments

___ Change P.D. as reflected above ___ Add P.D. as reflected above x None

___ Change P.U. as reflected above ___ Add P.U. as reflected above ___ Other

I. AUTHENTICATION

Field Examiner's Name Brian M. M. M. Date 9-17-13

Reviewer [Signature] Date 10/8/13



Figure 1: Water Slide



Figure 2: Water Slide Pool



Figure 3: Pool



Figure 4: Store/Restaurant

36-8233 System Diagram



State of Idaho
Department of Water Resources
Attachment To Water Right License
36-8233

This map depicts the HEATING place of use boundary for this water right at the time of this approval and is attached to the approval document solely for illustrative purposes.

18E



-  Point of Diversion
-  Place Of Use Boundary
-  Townships
-  PLS Sections
-  Quarter Quarters

0 0.01 0.02 0.04 Miles



State of Idaho
Department of Water Resources
Attachment To Water Right License
36-8233

This map depicts the RECREATION place of use boundary for this water right at the time of this approval and is attached to the approval document solely for illustrative purposes.

18E



-  Point of Diversion
-  Place Of Use Boundary
-  Townships
-  PLS Sections
-  Quarter Quarters

0 0.01 0.02 0.04 Miles



Attachment #1: Volume calculation WR 36-8233 Heating

The annual volume requirement was calculated using a Memorandum from Rick Sterling to Terry Blau dated March 25, 1988 and Administrative Memorandum from Norm Young dated September 28, 1992 titled Rate of flow for heating use. The memorandums contain equations for calculating the annual water requirements for geothermal heating. The equations are listed below with an explanation of the variables; data was taken from the field exam and the National Oceanic and Atmospheric Administration (NOAA).

Explanation of values used in calculations:

Square footage of Store/Restuarant is 8116 sq/ft . Heat Load value (258,010) represents value for a normally insulated home as store is insulated with R-13. The temperature of the geothermal source was measured at 99.6°F. The temperature in the Store is expected to be 70 °F. The annual heating degree days were taken from the TWIN FALLS WSO, IDAHO weather station because it is closest in elevation and proximity (<http://www.wrcc.dri.edu/summary/Climsmsid.html>).

Temperature Drop Across System Calculation: $\Delta T_s = 0.3(S - T)$

Where:

ΔT_s = Temperature drop across system

S = Geothermal source temperature

T = Temperature required by system

Values used:

$$S = 99.6 \text{ }^{\circ}\text{F}$$

$$T = 70 \text{ }^{\circ}\text{F}$$

$$\Delta T_s = 0.3(S - T) = \boxed{8.9}^{\circ}\text{F}$$

Volume Calculation:

$$V = \frac{HL \times DD \times 24 \times C_D}{\Delta t_1 \times k \times C \times \Delta t_2}$$

Where:

V = Annual volume of geothermal water required

HL = Peak heating load in BTU/hr (taken from graph)

DD = Annual heating degree-days

24 = 24 hrs/day

C_D = Empirical correction factor for heating effect vs. 65 °F degree-days

Δt_1 = Design temperature difference

k = Correction factor to account for losses, use 0.90

C = Constant to correct for desired units, 2.72×10^6 BTU/AF-°F

$\Delta t_2 = \Delta T_s$ = Temperature drop across system (calculated above)

Values used:

$$HL = 258,010 \text{ BTU/hr}$$

$$DD = 6,700 \text{ }^{\circ}\text{F}$$

$$24 = 24 \text{ hrs/day}$$

$$C_D = 0.63$$

$$\Delta t_1 = 73 \text{ }^{\circ}\text{F}$$

$$k = 0.9$$

$$C = 2,720,000 \text{ BTU/AF-}^{\circ}\text{F}$$

$$\Delta t_2 = 8.88 \text{ }^{\circ}\text{F}$$

$$V = \frac{HL \times DD \times 24 \times C_D}{\Delta t_1 \times k \times C \times \Delta t_2} = \boxed{16.4} \text{ afa}$$