

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

A. GENERAL INFORMATION

Permit No: 47-7778

Exam Date: 7/5/1989

1. Current Owner: HAROLD GREEN
4764 RIVER RD
BUHL ID 83316

TED EASTMAN
RT 3
BUHL ID 83316

← 4774
River Rd.

2. Accompanied by: Nickoal Howell & Kathleen Eastman

Phone No: 208-423-6191/208-543-5480

Address: Same as Permit Holders.

Relationship to Permit Holder: Nickoal Howell is the daughter of Harold Green and Kathleen Eastman is the daughter of Ted Eastman.

3. SOURCE

GROUND WATER

B. OVERLAP REVIEW

1. Other water rights with the same place of use: 36-2038 (Banbury Pipe Co Inc.)
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

L3 NW1/4NW1/4

Sec. 4, Twp 09S, Rge 14E, B.M.

TWIN FALLS County

Method of Determination: Waypoints were collected with a Garmin GPS map 76S receiver and downloaded into an ArcMap shapefile that corresponds with 2009 aerial photography and verified the points of diversion to be in Twp 09S Rge 14E S 4 NWNW¼. See attached map.

2.

PLACE OF USE: IRRIGATION

Twp	Rge	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
09S	14E	4						5.7											5.7
								L 3											

Total Acres: 5.7

HEATING same as IRRIGATION

DOMESTIC same as IRRIGATION

Method of Determination: Waypoints were collected with a Garmin GPS map 76S receiver and downloaded into an ArcMap shapefile that corresponds with 2009 aerial photography and verified the place of use to be in Twp 09S Rge 14E S 4 NWNW¼. 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>Motor Make</u>	<u>Hp</u>	<u>Motor Serial No.</u>	<u>Pump Make</u>	<u>Pump Serial No. or Discharge Size</u>
<u>ID No.*</u>					
Artesian Hot Water Well					

*Code to correspond with No. on map and aerial photo

D. FLOW MEASUREMENTS

1.

Measurement Equipment

Well: Sparling Meter

Swimming Pool: 5 gallon bucket

2. Measurements: Well 1.44 cfs per measurement in 1989.

Swimming pool: Measurement 9/8/2011

Filled 5 gallon bucket 3 times to 5 gallon mark with the following times;

29:56 s; 0.02 cfs; measurement error of 0.5 sec of 0.2

29:12 s; 0.02 cfs; measurement error of 0.5 sec of 0.2

29:15 s; 0.05 cfs; measurement error of 0.5 sec of 0.2

Average time: 29:41 approximately 0.02 cfs.

E. FLOW CALCULATIONS

☐ Additional Computation Sheets Attached

Measured Method: See Attachment # 1

F. VOLUME CALCULATIONS

1. Volume Calculations for Irrigation:

$$V_{I.R.} = (\text{Acres Irrigated}) \times (\text{Irrigation Requirement}) = 5.7 \text{ acres} \times 4.0 \text{ afa} = 22.8 \text{ afa}$$

$$V_{D.R.} = [\text{Diversion Rate (cfs)}] \times (\text{Days in Irrigation season}) \times 1.9835 = 0.12 \text{ cfs (246)} \times 1.9835 = 58.6 \text{ afa}$$

$$V = \text{Smaller of } V_{I.R.} \text{ and } V_{D.R.} = 22.8 \text{ afa}$$

2. Volume Calculations for Other Uses:

Domestic: 0.6 for 2 homes = 1.2 AF

Fill of pool and hot tub: Hot Tub: 6W x 12L x 4.0 Avg. Depth x 7.4805 = 2154 gallons/325,850 = .007 AF

Swimming pool: 14W x 40L x 4.5 Avg. Depth x 7.4805 = 18,851 gallons

18,851 gallons/325,850 = .058 AF
Irrigation in Greenhouse: $280 \text{ ft}^2 = 0.006427 \text{ acre} \times 4.0 \text{ afa} \times \underline{.026 \text{ AF}}$
 $0.007 + 0.058 + 0.026 + 1.2 = \underline{1.3 \text{ AF}}$

See Attachment #1 for heating calculations

G. NARRATIVE/REMARKS/COMMENTS

Permit 47-7778 is for 0.06 cfs domestic; 0.27 CFS heating; and 0.12 cfs irrigation.

Application for permit 47-7778 submitted by Ted Eastman and/or Harold Green, was filed on May 13, 1982, and proof of Beneficial Use was submitted December 20, 1985.

Licensing exam was performed on 7/5/1989. Review of the file indicated that insufficient information was collected to complete the licensing exam at that time. I contacted the current property owners and revisited the site on 09/08/2011.

The point of diversion is an artesian well located on the Green property on River Road approximately 1 mile south of the Banbury Hot Springs. There are 4 water lines from the well: a 4" line for irrigation of both properties; a 2" line servicing the Eastman house, garage, greenhouse and hot tub; a 2" line serving the Green home and garage; and a 2" line dedicated to a swimming pool on the Green property.

Flow through the entire system was measured 1.44 cfs in 1989. The Eastman home is approximately 1900 ft², with a 1500 ft² garage (only half of which is heated) and a greenhouse with 280 ft². The Green home is 1950 ft², with a garage of 1000 ft² and a 14' W x 40' L X 4.5' D swimming pool.

The 2" water line servicing the Eastman property apparently flows through the home heating system and then out a patio area. As heating the patio is an incidental use of the water, additional volume wasn't added for the volume required to heat the patio (750 ft²). The hot water system is also used to heat half of garage and was historically used to heat a greenhouse (foundation is all that remains).

The 2" line servicing the Green heating system in the house also heats a patio area and sidewalks (total of 726 ft²) after being utilized in the home. Again, volumes weren't included for the patio area and sidewalks, as heating are incidental.

Mrs. Howell indicated that at full flow the swimming pool will fill in three hour, which is approximately 0.23 cfs. A constant flow rate 0.02 cfs (measured 09/08/2011) is maintained to circulate water through the pool. Potentially the pool could be used year round; therefore volume was based on a 0.02 cfs year round flow and a onetime fill volume.

Irrigation occurs on approximately 5.7 acres: 3.3 on the Eastman property and 2.4 on the Green Property. Banbury Pipeline Co. water is used to supplement irrigation on the Eastman property but not on the Green property.

In recognition of the potential to run water through both heating systems, the swimming pool and the hot tub simultaneously (potentially 0.53 cfs) and that the well can produce 1.44 cfs, I recommend permitting all beneficial uses at the flow rates requested on the permit. I've included the volume required to fill the swimming pool; the hot tub and irrigation inside the greenhouse within the domestic annual diversion volume.

Recommend permitting a flow rate of 0.06 cfs with volume of 1.3 afa for domestic use; a heating flow rate of 0.27 cfs and a volume of 26.3 afa; and an irrigation flow rate of 0.12 cfs with a volume of 22.8 afa; for a combined total of 0.40 cfs (permit limit) and of 50.4 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>
HEATING	1/01 to 12/31	0.270 CFS	26.3 AFA
IRRIGATION	3/15 to 11/15	0.120 CFS	22.8AFA
DOMESTIC	1/01 to 12/31	0.060 CFS	1.3 AFA
	<u>Totals:</u>	0.400 CFS	50.4 AFA

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

Date

Reviewer

Date

[Signature]
[Signature]

9-16-2011
9/23/2011

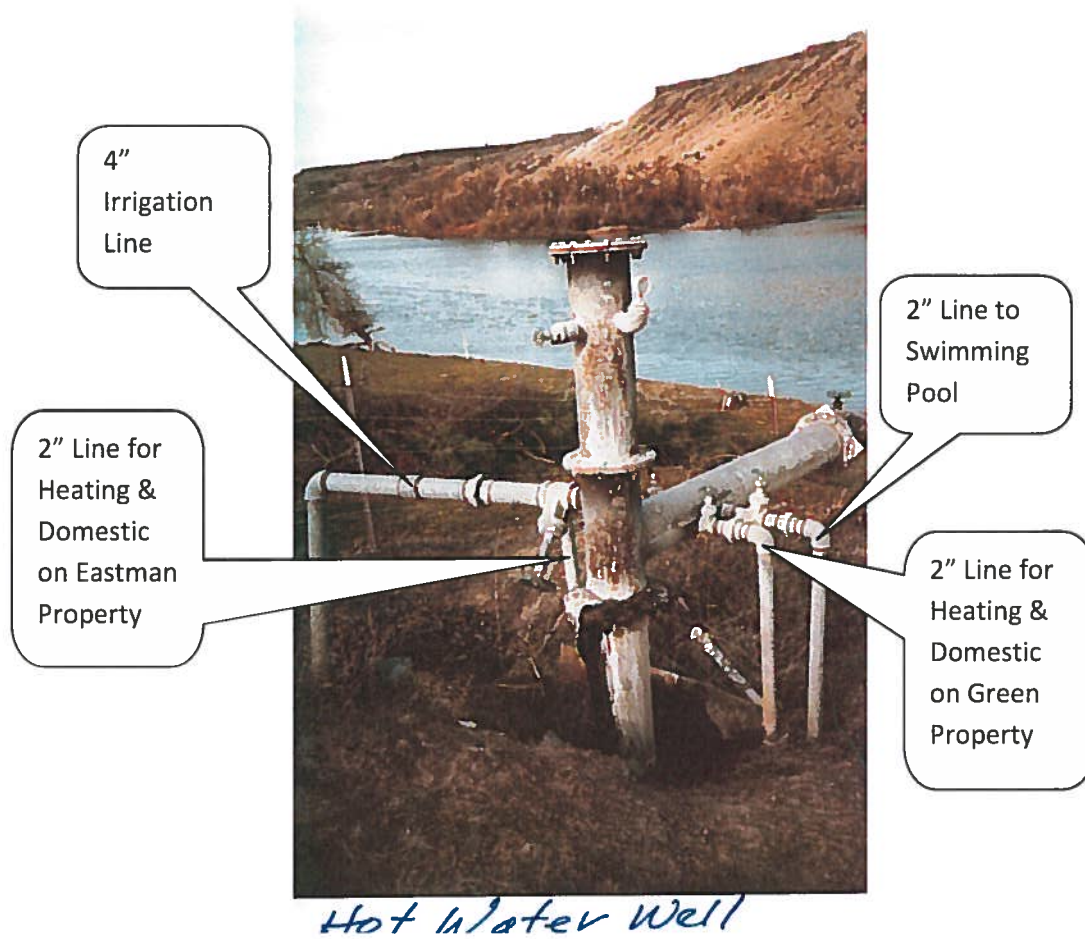


Figure 1: Artesian Well on Green Property



Figure 2: Eastman Residence, Hot Tub & Patio



Figure 3: Green Residence



Figure 4: Swimming Pool on Green Property

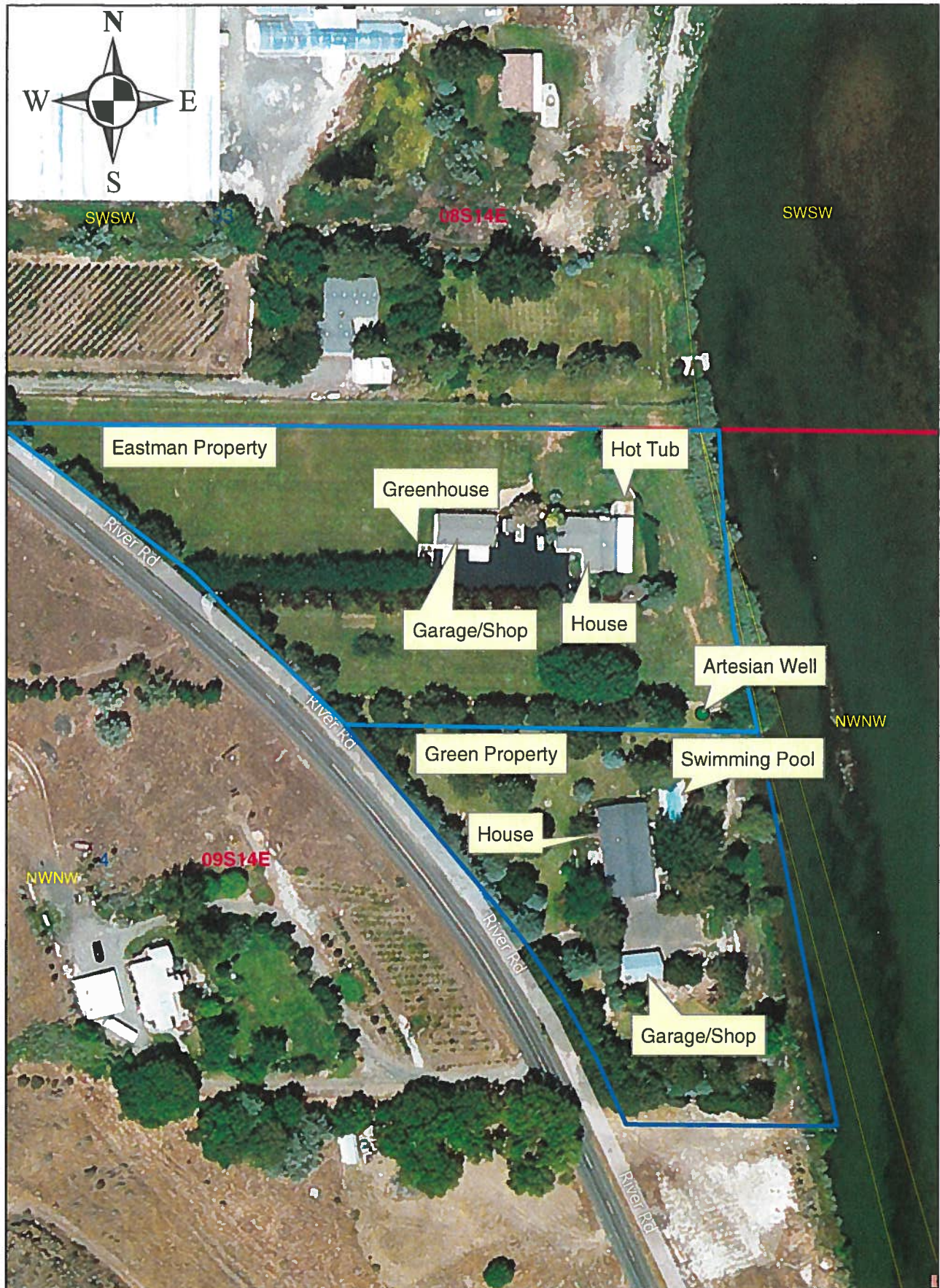


Figure 5: Irrigation on Eastman Pasture



Figure 6: Eastman Garage/Shop & Greenhouse Site

Permit 47-7778



Attachment #1:**47-7778 Rate of Flow Heating for Heating Use Analysis**

(Based on Memo #23 (Amended))

Eastman Property:BTU's for House; Garage/Shop and GreenhouseWhere House is 1900 ft²; Shop 750 ft²; and Greenhouse 280 ft², determined during 9/8/2011 Field Exam.

$$E = [e \times \Delta T] \times \text{Area}$$

e for house = 0.67 (average residence); e for Shop and Greenhouse = 1.11 (poor energy efficiency)

$$\Delta T = (t_i - t_o) = (70^\circ - (-3^\circ)) = 73^\circ \text{ } (-3^\circ \text{ Suggested Outside Design Temperature for Twin Falls})$$

$$\text{House: } E = [0.67 \times 73] \times 1900 = \underline{92,929 \text{ BTU/Hour}}$$

$$\text{Garage/Shop: } E = [1.11 \times 73] \times 750 = \underline{60,773 \text{ BTU/Hour}}$$

$$\text{Greenhouse: } E = [1.11 \times 73] \times 280 = \underline{22,688 \text{ BTU/Hour}}$$

Green Property:BTU's for House and Garage/ShopWhere House is 1950 ft² and Shop is 1000 ft² per Nickoal Howell, property manager.

$$\text{House: } E = [0.67 \times 73] \times 1950 = \underline{95,375 \text{ BTU/Hour}}$$

$$\text{Garage/Shop: } E = [1.11 \times 73] \times 1000 = \underline{81,030 \text{ BTU/Hour}}$$

Find Temperature Drop Across System:
 $\Delta T_s = 0.3(s - t)$; where s = source temperature (112°; determined during 9/8/2011 Field Exam) and
 t = inside temperature (70°)

$$\Delta T_s = 0.3(112^\circ - 70^\circ) = \underline{12.6^\circ \text{ F}}$$

Find Flow Rate:

$$\text{Rate} = E / (500 \times \Delta T_s)$$

Eastman Property:

$$\text{House: } 92,929 / (500 \times 12.6) = 14.75 \text{ gpm} = \underline{0.03 \text{ CFS}}$$

$$\text{Garage/Shop: } 60,773 / (500 \times 12.6) = 9.6 \text{ gpm} = \underline{0.02 \text{ CFS}}$$

$$\text{Greenhouse: } 22,688 / (500 \times 12.6) = 3.6 \text{ gpm} = \underline{0.01 \text{ CFS}}$$

$$\text{Hot Tub: } 6W \times 12L \times 4.0 \text{ Avg. Depth} \times 7.4805 = 2154 \text{ gallons}$$

$$\text{Fills in 30 minutes: } 2154/30 = 71.8 \text{ gpm}/448.83 = \underline{0.16 \text{ cfs}}$$

Green Property:

$$\text{House: } 95,375 / (500 \times 12.6) = 15.14 \text{ gpm} = \underline{0.03 \text{ CFS}}$$

$$\text{Garage/Shop: } 81,030 / (500 \times 12.6) = 12.86 \text{ gpm} = \underline{0.03 \text{ CFS}}$$

$$\text{Swimming pool: } 14W \times 40L \times 4.5 \text{ Avg. Depth} \times 7.4805 = 18,851 \text{ gallons}$$

18,851 gallons/325,850 = .058 AF

Fills in 3 hours: 18,851/180 = 104.73 gpm/448.83 = 0.23 CFS

Constant flow through pool measured at 0.02 CFS;

Total Flow Rate: 0.51 cfs

Heating Volume Analysis

$$\text{Volume} = \frac{\text{HL} \times \text{DD} \times 24 \times C_D}{\Delta t_1 \times K \times C \times \Delta t_2}$$

Where:

Δt_1 = inside minus outside temperature = $70^\circ - (-3^\circ \text{ (value for Twin Falls)}) = 73^\circ$

HL = peak heat load required = 32 for home; 46 for garage/shop; 137 for Greenhouse

DD = annual heating degree days = 6146

C_D = 0.6 for home and garage; 0.85 for greenhouse

K = 0.90

C = 2.72×10^6 (acre feet conversion)

Δt_2 = temperature drop across system; using 12.6 (ΔT_s)

Eastman Property:

$$\text{House: } \frac{(32)(1900)(6146)(24)(0.6)}{(63)(0.90)(2.7 \times 10^6)(12.6)} = \underline{2.77 \text{ AF}}$$

$$\text{Garage/Shop: } \frac{(46)(750)(6146)(24)(0.6)}{(63)(0.90)(2.72 \times 10^6)(12.6)} = \underline{1.57 \text{ AF}}$$

$$\text{Greenhouse: } \frac{(137)(280)(6146)(24)(0.85)}{(63)(0.90)(2.72 \times 10^6)(12.6)} = \underline{2.48 \text{ AF}}$$

Total = **6.82 AF**

Green Property:

$$\text{House: } \frac{(32)(1950)(6146)(24)(0.6)}{(63)(0.90)(2.72 \times 10^6)(12.6)} = \underline{2.84 \text{ AF}}$$

$$\text{Garage Shop: } \frac{(46)(1000)(6146)(24)(0.6)}{(63)(0.90)(2.72 \times 10^6)(12.6)} = \underline{2.10 \text{ AF}}$$

Swimming pool (Heating):

Constant flow through pool measured at 0.02 CFS;

$0.02 \text{ cfs} \times 1.9835 \text{ afd} \times 365 = \underline{14.5 \text{ AF}}$

Total = **19.4 AF**

Total both properties = 26.3 AFA