

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

A. GENERAL INFORMATION

Permit No: 45-7656

Exam Date: 5/17/2012

1. Current Owner: ENNIS B MATTHEWS
RT 1 BOX D
OAKLEY ID 83346
(208)862-3239

2. Accompanied by: Jeff Cooper (IDWR) and I met Steve Manning of Manning Ranches prior to the exam to get directions and discuss the exam/licensing process with Mr. Manning. Manning Ranches is now the owner of the Place of Use of this right (will be listed as present owner in IDWR records).

3. SOURCE

SPRING

TRIBUTARY

SINKS

B. OVERLAP REVIEW

1. Other water rights with the same place of use: None

2. Other water rights with the same point of diversion: It appears that license 45-7620 (in the name of the BLM) may be diverted from this same spring. Note that POD and POU location appears incorrect on 45-7620.

C. DIVERSION AND DELIVERY SYSTEM1. LOCATION OF POINT(S) OF DIVERSION:

SPRING

SW1/4SW1/4SE1/4

Sec. 20, Twp 14S, Rge 23E, B.M.

CASSIA County

Method of Determination: GPS and aerial photography

2.

PLACE OF USE:

STOCKWATER

Twp	Rge	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
14S	23E	30	X																

Method of Determination: GPS and aerial photography

D. FLOW MEASUREMENTS

Not required for permits with irrigation of less than five (5) acres or permits with the total combined diversion rate for all the uses established in connection with the permit not exceeding twenty-four one hundredths (0.24) cubic feet per second per new Beneficial Use Examination Rules implemented 3/29/2012.

E. FLOW CALCULATIONSHazen-Williams Formula

$$V = 1.318 \times C_h \times R^{0.63} \times S^{0.54}$$

V = Velocity (ft/s)

C_h = Hazen-Williams Friction Coefficient = 130 (for old/plastic pipe)

R = Hydraulic Radius = Cross Sectional Area / Wetted Perimeter = D/4 (for round pipes)

for 2" dia pipe D = 2" = 0.167 ft (a portion of the exposed pipeline was observed and pipe size was measured)

$$R = 0.167/4 = 0.04167$$

S = h_f/L = Slope of Energy Grade Line = 0.0766 (obtained from approximate spring elevation of 5620 ft per quad map and approximate trough elevation of 5322 ft per quad map and estimated pipe length of 3890 ft measured via ARCMAP)

$$V = 1.318 \times 130 \times (0.04167)^{0.63} \times (0.0766)^{0.54}$$

$$V = 5.78 \text{ ft / sec}$$

$$Q = VA \text{ where } A = \pi r^2 = \pi (1/12)^2 = 0.0218 \text{ ft}^2 \text{ for 2 inch diameter pipe}$$

$$Q = (5.78 \text{ ft/sec})(0.0218 \text{ ft}^2) = 0.126 \text{ cfs}$$

Rate exceeds permitted amount of 0.07 cfs, therefore use permitted rate of 0.07 cfs

F. VOLUME CALCULATIONS

Not required for 42-111 type domestic uses per new Beneficial Use Examination Rules implemented 3/29/2012. Stockwater use can be considered a "part a" domestic use (up to 13,000 gpd).

G. NARRATIVE/REMARKS/COMMENTS

Application for Permit 45-7656 was filed on June 26, 1989 for the diversion of 0.07 cfs from a spring for stockwater use southeast of Oakley. Permit 45-7656 was approved on December 2, 1994 with a Proof of Beneficial Use due date of December 1, 1995. Proof of Beneficial Use was filed on December 27, 1995, which resulted in an advancement of the priority date to July 22, 1989. On May 17, 2012, Jeff Cooper and I met Steve Manning of Manning Ranches and then proceeded to conduct the licensing exam for permit 45-7656. Note that Manning Ranches is now the owner of the Place of Use of this right (will be listed as present owner in IDWR records).

The system consists of a spring box at a spring that leads to a buried pipeline to a trough. Using ARCMAP it is estimated that the pipeline is approximately 3,890 feet long from the spring to the trough. A small section of exposed pipeline was observed during the field exam and the pipeline consists of 2 inch diameter plastic pipe. An estimate of the system capacity using the Hazen-Williams Formula indicates that the system could divert almost twice the permitted rate of 0.07 cfs. The permit was issued with the point of diversion being described in the NENWNE of Section 29 (T14S, R23E). However, the spring is actually located within the SWSWSE of Section 20 (T14S, R23E). Note that it appears that the fence line that is probably supposed to separate Sections 20 and 29 is located a couple of hundred feet north of the actual Section 20 and 29 section line. For this reason, a licensing amendment was solicited from the permit holder to correct the point of diversion. The signed licensing amendment and fee was recently received allowing for the licensing of 45-7656.

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>
STOCKWATER	01/01 to 12/31	0.070 CFS	N/A
<u>Totals:</u>		0.070 CFS	N/A

2. Recommended Amendments

☒ Change P.D. as reflected above ☐ Add P.D. as reflected above ☐ None

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

I. AUTHENTICATION

Field Examiner's Name [Signature] Date 5/15/2013

Reviewer [Signature] Date 6/21/2013

45-7656 Point of Diversion and Place of Use Photos

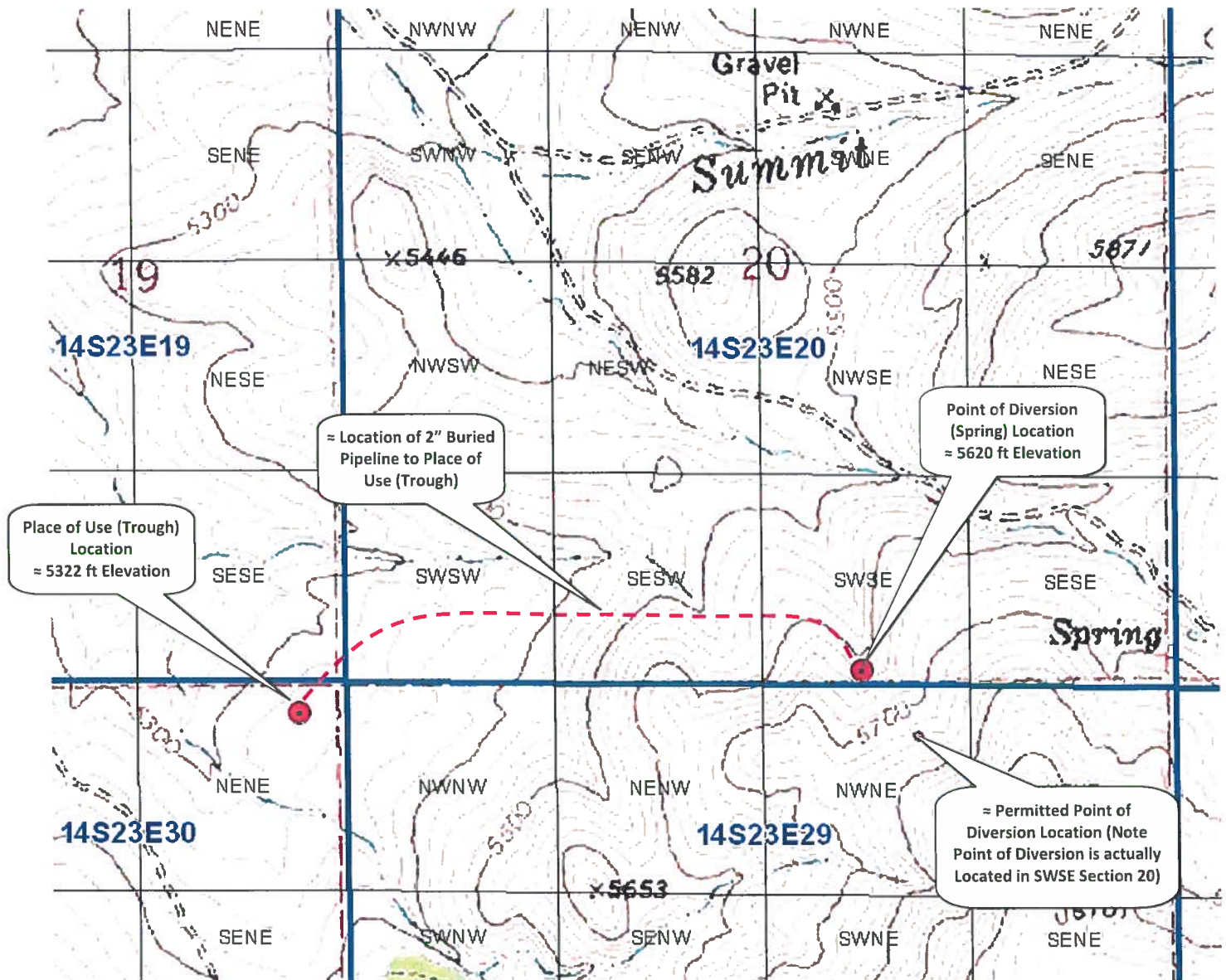


ABOVE: View of Jeff Cooper (IDWR) GPSing the spring box at the spring that serves as the source and point of diversion for 45-7656.

BELOW: View of stock trough that serves as the place of use for 45-7656. Note the cattle indicating active stock water use.

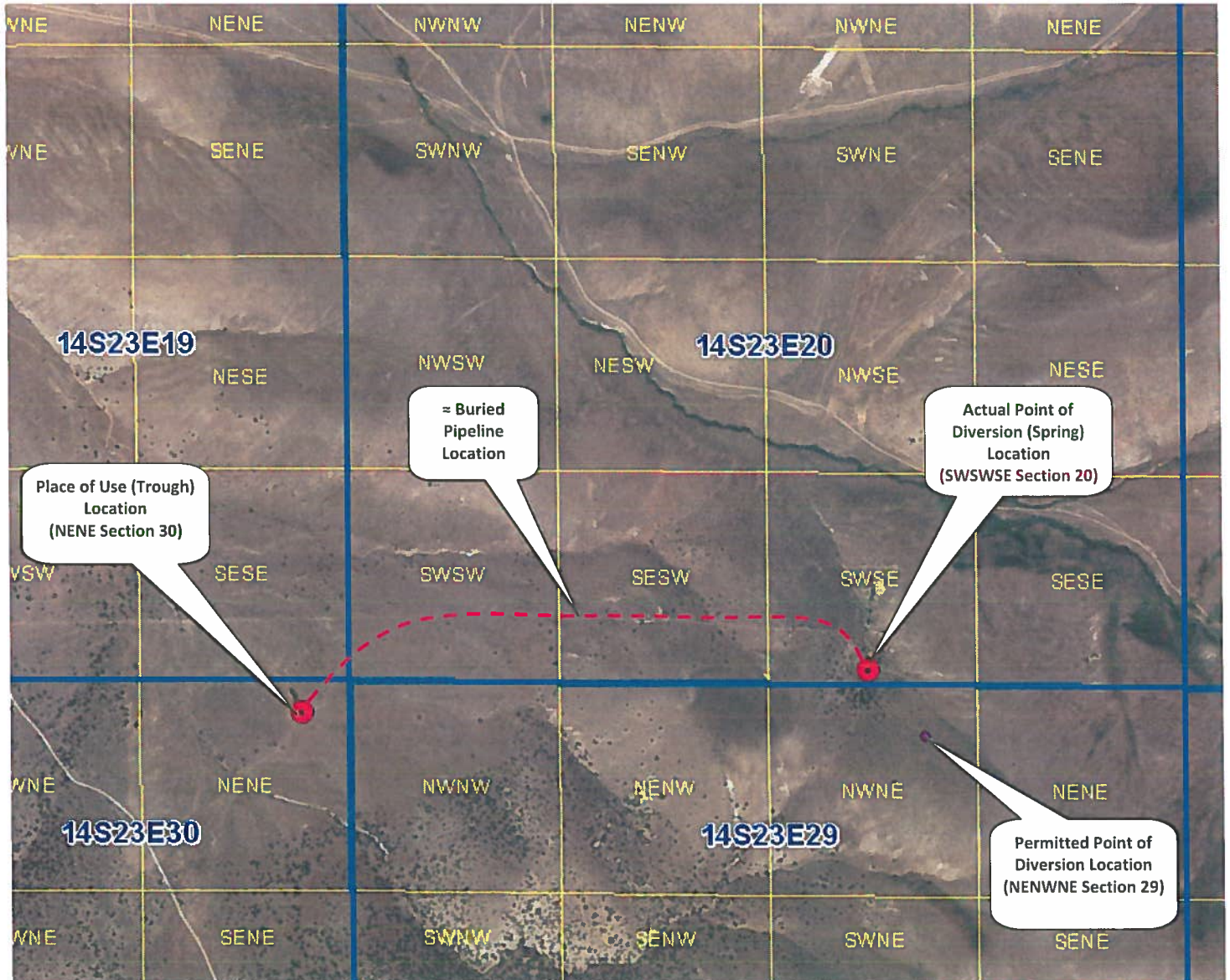


45-7656 System Diagram



45-7656 Point of Diversion and Place of Use Map

2011 Aerial Photography



Major Loss Calculation for Water in Pipes using Hazen-Williams Friction Loss Equation

Hazen-Williams friction loss equation is valid for water at temperatures typical of city water supply systems (40 to 75 °F; 4 to 25 °C).

To: [LMNO Engineering home page](#) [Trouble printing?](#)
[Design of Circular Water Pipes Calculator](#) [Table of Hazen-Williams Coefficients \(C\)](#) [Unit Conversions](#)

$$V = k C R_h^{0.63} S^{0.54} \text{ where } S = \frac{h_f}{L} \text{ \& } Q = VA \text{ \& } R_h = \frac{D}{4} \text{ for circular pipe}$$

Click to Calculate

Calculate:

- ☒ Discharge and Velocity
- ☐ Pipe Diameter (Q known)
- ☐ Pipe Diameter (V known)
- ☐ Energy (Head) Loss (Q known)
- ☐ Energy (Head) Loss (V known)
- ☐ Pipe Length (Q known)
- ☐ Pipe Length (V known)
- ☐ Hazen-Williams Coefficient (Q known)
- ☐ Hazen-Williams Coefficient (V known)

Select Units:

- ☒ Use feet and seconds units
- ☐ Use meters and seconds units

Discharge, Q (ft³/s):
 Velocity, V (ft/s):
 Pipe Diameter, D (ft):
 Pipe Length, L (ft):
 Hazen Williams Coefficient, C:
 Energy (Head) Loss, hf (ft):
 Energy Slope, S (ft/ft):

© 1998 LMNO Engineering, Research, and Software, Ltd.

k = 1.318

0.12673575792120292

5.785972201127978

0.167 ✓

3890 ✓

130 ✓

298 ✓

0.07660668380462725



k is a unit conversion factor:

k=1.318 for English units (feet and seconds). k=0.85 for SI units (meters and seconds)

R_h =hydraulic radius=D/4 for circular pipe

The Hazen-Williams method is only valid for water flowing at ordinary temperatures (about 40 to 75 °F). For other liquids or gases, the [Darcy-Weisbach method](#) should be used. Major loss (h_f) is the energy (or head) loss (expressed in length units - think of it as energy per unit weight of fluid) due to friction between the moving fluid and the duct. It is also known as friction loss. The Darcy-Weisbach method is generally considered more accurate than the Hazen-Williams method. However, the Hazen-Williams method is very popular, especially among civil engineers, since its friction coefficient (C) is not a function of velocity or duct diameter. Hazen-Williams is simpler than Darcy-Weisbach for calculations where you are solving for flowrate, velocity, or diameter. More [Discussion and References](#).