

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

A. GENERAL INFORMATION

Permit No: 37-8686
Exam Date: 7/24/2012 (6/23/2016)

1. Current Owner:
HEATHERLANDS HOMEOWNERS ASSN INC PO BOX 3901 KETCHUM ID 83340-3901 (208)726-3858
2. Accompanied by: Mark Koffer of Walker Water Systems and Laura Gvozdas with Sun Country Management
Phone No: Mark (208)726-5145; Laura (208)726-3858
Address: Mark: 624 Pierce Street, Twin Falls ID 83301; Laura: PO Box 1672 Sun Valley, ID 83353
Relationship to Permit Holder: Mark maintains the water system for the subdivision. Laura is the property manager

3. SOURCE: GROUND WATER**B. OVERLAP REVIEW**

1. Other water rights with the same place of use: 37-8220, 37-8686, 37-8831, 37-11238
2. Other water rights with the same point-of-diversion: 37-159B, 37-8220 and 37-8831

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

GROUND WATER SE¼SW¼ Sec. 17, Twp 03N, Rge 18E, B.M. BLAINE County Well house #1 (south) 43.58348 - 114.335582

GROUND WATER NW¼NE¼ Sec. 20, Twp 03N, Rge 18E, B.M. BLAINE County Well House #2 (north) 43.588684 - 114.338635

Method of Determination: GPS

2.

PLACE OF USE: FIRE PROTECTION and DOMESTIC

Twp	Rge	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
03N	18E	17			X											X			

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	
03N	18E	17			0.5											6.0			6.5

Total Acres: 6.5

Method of Determination:

3.

Delivery System Diagram Attached (required). Indicate all major components and distances between components.

 X Indicate weir size/pipe as applicable.

 X Map Attached Showing Location(s) of point(s) of diversion and place(s) of use (required). Scale must be 1:24,000 or greater.

 X Aerial Photo Attached (required for irrigation of 10+ acres).

 X Photo of Diversion and System Attached

4.

Well or Diversion ID No.*	Motor Make	Hp	Mode number	Pump Make	Pump Serial No. or Discharge Size
Well #1 (South Well) A004254		20	6T20-275	Berkeley	4 inch discharge size
		20	6T20-275	Berkeley	4 inch discharge size

Well #2 (North Well) A004253		20	6T20-275	Berkeley	4 inch discharge size
		20	6T20-275	Berkeley	4 inch discharge size

D. FLOW MEASUREMENTS

1.

Measurement Equipment	Type	Make	Model No.	Serial No.	Size	Calib. Date
Closed Conduit Flowmeter	Polysonic	Panametrics				3/29/2016
Closed Conduit Flowmeter	Polysonic	TymeFlyte				3/29/2016
Pressure Gage						

2. Measurements:

During the examination in 2012, the measurement equipment was not able to acquire a signal. Therefore, no measurement was secured. Finally, in 2016 another site visit occurred where measurements were conducted to determine the system capacity. There were several steps in reaching the system's capacity:

- a. Observed Well #1 diverting 105 gpm under normal conditions (after 11am, 88 psi, 62 hertz)
- b. Calibrate McCrometer on Well #1
- c. Observed Well #2 diverting 65 gpm under normal conditions (after 11am, 99 psi, 60 hertz)
- d. Calibrate McCrometer on Well #2
- e. Open a fire hydrant that uses water from Well #2 only until pressure dropped to 12 psi. Viewed the McCrometer at Well #2 during the open discharge.
- f. Open a fire hydrant that uses water from Well #1 only until pressure dropped to 12 psi. Viewed the McCrometer at Well #1 during the open discharge.

E. FLOW

x Additional Computation Sheets Attached

CALCULATIONS

a. **Observe McCrometer at Well #1 under normal conditions--** See photo 3 on page 4 of the photo narrative

b. Calibrating McCrometer at Well #1

- Connect Tymflyte equipment on open length of pipe
- Well # 1, beginning reading on the McCrometer was 756400 and ending reading was 757500

$$\begin{array}{r} 757500 \text{ gallons} \\ - 756400 \text{ gallons} \\ \hline 1,100 \text{ gallons/9 minutes} = 122.2 \text{ GPM} \end{array}$$
- The TymeFlyte showed a total of 131.1 GPM (1,180 gallons/9 minutes)
- $131.1/122.2 = 1.07$ efficiency factor for the McCrometer

c. **Observe McCrometer at Well #2 under normal conditions--** See photo 1 on page 6 of the photo narrative

d. Calibrating McCrometer at Well #2

- Connect Panametrics equipment on open length of pipe
- Well # 2, beginning reading on the McCrometer was 2871500 ending reading was 2872700

$$\begin{array}{r} 2872700 \\ - 2871500 \\ \hline 1,200 \text{ gallons/10} = 120 \text{ GPM} \end{array}$$
- The Panametrics showed a total of 137.0 GPM (1,370 gallons/10 minutes)

- $137/120 = 1.14$ efficiency factor for the McCrometer (see attached print out from the Panametric measurement)

e. Well #2; full capacity test

- 680 gpm as registered by the McCrometer- the system pressure dropped to 15 PSI
- $680 \text{ gpm} \times 1.14 \text{ efficiency factor} = 775.2 \text{ GPM}$

f. Well #1; full capacity test

- 680 gpm as registered by the McCrometer- the system pressure dropped to 12 PSI
- $680 \text{ gpm} \times 1.07 \text{ efficiency} = 727.6 \text{ GPM}$

Total capacity of the system:

$$\begin{array}{r} 775.2 \\ + 727.6 \\ \hline 1,502.8 \text{ GPM} / 448.83 = 3.35 \text{ cfs} \end{array}$$

Domestic component of the permit authorized 13 households-no irrigation. Nine homes have been developed since the development period.

Department Administrative Memorandum #22 includes a chart for in-house domestic water use. The chart allows 0.15 cfs per house (for 10 homes).

$(0.15 / 10)$ from domestic water use chart: $0.015 \times 13 = 0.195$

The permit allowed 0.17 cfs for domestic

Recommended Rate for Domestic = 0.17 cfs

Irrigation

Total irrigated acres based on an analysis of NAIP aerial imagery for years 2009, 2011, 2013 and 2015 is a total of 73.8 acres for all three rights.

Right 37-8220 allows 60.5 acres. Analysis of the imagery found irrigation of 62.5

Right 37-8686 allows 6.5 acres Analysis of the imagery found irrigation of 7.4

Right 37-8331 is for domestic only. Analysis of imagery found 3.9 irrigation of 3.9

$$62.5 + 7.4 + 3.9 = 73.8 \text{ total irrigated acres}$$

$$6.5 \times 0.02 = 0.13 \text{ cfs}$$

$$0.17 \text{ (domestic)} + 0.13 \text{ (irrigation)} \text{ cfs} = 0.30 \text{ cfs}$$

Permit 37-8686 allowed 0.17 cfs for domestic use and 0.13 cfs for irrigation

Recommended Rate for Irrigation 0.13

Brockway Engineering submitted evidence that, during the development period, one of the four pumps was 30 hp. The measurement determined that the system capacity is 3.35 cfs. According to the theoretical calculation the system capacity is 3.78 (see attached).

Permit authorized = 0.56 cfs for fire protection and a total diversion rate of 0.86

Combined, rights 37-8220 (2.82 cfs) and 37-8831 (0.17 cfs) have a diversion capacity 2.99 cfs. That leaves $2.82 + 0.17 = 2.99$.

$$3.78 - 2.99 = 0.79$$

Recommended Rate for Fire Protection: 0.79 cfs

Total Recommended Rate 0.79

Recommended Volume for Irrigation 22.8 af

2. Volume Calculations for Other Uses:

0.6 AF for in-house use X 13 houses = 7.8 af

Recommended Volume for Domestic 7.8 af**Total Recommended Volume 30.6 af****G. NARRATIVE/REMARKS/COMMENTS****History**

In May 1990, the Department of Water Resources issued water right permit 37-8220 for irrigation (1.21 cfs), domestic (0.5 cfs) and fire protection (1.114 cfs) to the Heatherlands Homeowners association with a 1986 priority date. According to the application, Heatherlands intended to develop 116 residential lots. The permit authorized irrigation of 60.5 acres only in connection with domestic use. Proof was submitted on September 12, 1994.

In September 1990, Heatherlands filed a second application for permit 37-8686 for the irrigation of 6.5 acres (0.13 cfs), domestic (0.17 cfs) and fire protection (0.56 cfs). The Department approved this application in 1995. This permit intended to cover 13 homes within the Sundance subdivision. Sundance is located to the northeast of Heatherlands. The permit specifically states that the irrigation use shall not exceed ½ acres within each lot upon which a home has been constructed. The domestic portion of the right excludes irrigation. Proof was submitted on November 18, 1996.

Heatherlands submitted a third application in August 1994 for domestic use (0.17 cfs) and was approved a couple months later. This permit, 37-8831, identified 14 lots intended for the development of townhouses. Each of these lots fell within the Heatherlands subdivision; none were within Sundance. Heatherlands submitted proof of beneficial use for 14 townhouses in November 2003.

The Heatherlands Homeowners Association (HOA) also has water right 37-159B (0.6 cfs, 105.0 af) for irrigation purposes on 30 acres. The irrigated area is outside of the POU of rights 37-8220, 37-8686 and 37-8831 but all four rights share the same points of diversion (PDs). Right 37-159B was transferred to these PDs in 1995. Right 37-159B initially diverted from the East Fork of the Big Wood and the 1995 transfer (no. 4649) changed the PDs and the source.

A combined limit will apply for all the rights diverting out of the two wells. The limit is required because the combined total rate for the four rights have a diversion rate higher than what the system can provide.

On March 23, 2017, Chuck Brockway of Brockway engineering submitted *Technical Information in Support of Diversion Rates for Licensing of 37-8220, 37-8686 and 37-8831 (Heatherlands)* (see attachment). In that document Mr. Brockway provided a 1993 capacity estimation for three 20 horse power pumps and one 30 hp pump. The total estimated 1993 capacity was estimated to be 1,574 gpm or 3.51 cfs. A theoretical calculation found this estimation to be reasonable.

1993 System Capacity (Three 20 hp pumps / One 30 hp pump)

37-159B	0.60 cfs
37-8220	2.82 cfs
37-8686	0.86 cfs
37-8831	0.17 cfs
	4.45 cfs

(system capacity is 3.51 cfs)

In addition, water right 37-11238 overlaps the POU for the domestic and irrigation rights (POU is within Lot 116 of Heatherlands Subdivision).

System

Two wells supply water for the Heatherlands and Sundance subdivisions in Blaine County. The first well, A0004254 in T3N R18E Section 20 NWNE has two 20-horse power pumps. The second point of diversion in T3N R18E Section 17 SESW also has two 20 horsepower pumps. The wells are located approximately 2,060 feet apart. Pump 2 at the second well is the lead pump. The depth to water for these two well locations is approximately 100 feet deep.

Mark Koffer from Walker Water in Twin Falls manages the water system. According to Mark they rotate through both pumps at each well to prevent them from wearing out. There is currently no storage on the system. Storage is not necessary since the pumps are variable speeds. A 6-inch mainline, buried 6 inches deep, flows through the subdivision. Four-inch lines supply water to each of the houses.

There are 94 (116 listed on permit) homes and 12 (14 on permit) townhouses within the Heatherlands subdivision. There are 9 (13 on permit) houses in the Sundance Subdivision. Aerial imagery was used to count the homes. The number of homes actually constructed at the time of this examination was 115. The CCRs limit irrigation to ½ an acre per home. Most of the homes are not metered. Between 60 and 70 percent of the residents live in the subdivision year round. There are 73.8 irrigated acres in the Heatherlands and Sundance subdivisions, including the 12 Townhouses. The average area irrigated for each lot was 0.55 acres with the maximum being almost an acre.

In addition to the individual lots within the two subdivisions there is a 2.5 acre common area. This includes a clubhouse, swimming pool and tennis courts. The land that surrounds the activity area is irrigated. Right 37-159B diverts from the same two wells as the three permits. Right 37-159B is used to irrigate non-residential common areas only, including the area around the clubhouse, swimming pool and tennis courts so there is an overlap for irrigation. Note that the irrigation around the clubhouse, pool and tennis courts was added to the POU for right 37-159B in a 2016 transfer.

IDWR Stub-in policy

According to licensing memo #1 *Beneficial use shall be based on development with the service area during the authorized development period of the permit and shall include stubbed-in lots for domestic proposes.*

A 6 inch main line supplies water to 4" pipes for all lots within the Heatherlands and Sundance subdivisions. In December 1999, Heatherlands submitted a request for extension of time to submit beneficial use. In that document there is an explanation of the work that had been completed at that time. The description given is that the developer stubbed out the AU water lines prior to association incorporation in December 1979. The estimated cost was \$21,000.

Volume

See page # 2 of this report for actual volume readings and calculations. In 2012-2013 the subdivision recorded a maximum diversion from the two wells of 323 af. (see attachment: Heatherlands Flow Meter readings in gallons) The volume of water diverted includes the domestic and irrigation rights 37-8220, 37-8686 and 37-8331 and the 30 acres of irrigation allowed under right 37-159B.

DEQ Sanitary Survey Findings

Idaho Department of Environmental Quality (DEQ) Source Water Assessment Summary Report: HEATHERLANDS SUBD (PWS# ID5070023):

This report evaluates HEATHERLANDS SUBD (PWS# ID5070023) WELL 2 A0004254 located in BLAINE county. The system serves approximately 225 people through 90 connections. The report was completed in September 2000.

This report evaluates HEATHERLANDS SUBD (PWS# ID5070023) WELL 1 A0004253 located in BLAINE county. The system serves approximately 225 people through 90 connections. The report was completed in November 2000.

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A licensing amendment is required for 37-8686 to add a place of use.

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>
FIRE PROTECTION	01/01 to 12/31	0.56 CFS	
DOMESTIC	01/01 to 12/31	0.23 CFS	12.6 AF
IRRIGATION	04/15 to 10/30	0.07 CFS	8.8 AF
	<u>Totals:</u>	0.86 CFS	

2. Recommended Amendments

☐ Change P.D. as reflected above
 ☐ Add P.D. as reflected above
 ☐ Change Beneficial Use
☐ Change P.U. as reflected above
 ☒ Add P.U. as reflected above
 ☐ None

I. AUTHENTICATION

Field Examiner's Name  Date 12/1/2017

Reviewer _____ Date _____

Subdivision Name	Lot	Block	YEAR BUILT
COBIA TOWNHOUSES	SUBLOT 1		2002
COBIA TOWNHOUSES	SUBLOT 2		2002
FORT SILVERADO (TOWNHOUSES)	SUBLOT 1		1994
FORT SILVERADO (TOWNHOUSES)	SUBLOT 2		1994
H.B.S. TOWNHOUSES	SUBLOT 115A		1996
H.B.S. TOWNHOUSES	SUBLOT 115B		1996
MARIPOSA TOWNHOUSES	SUBLOT 1		1991
MARIPOSA TOWNHOUSES	SUBLOT 2		1991
PEACEFUL VISTA TOWNHOUSES	SUBLOT 1		1994
PEACEFUL VISTA TOWNHOUSES	SUBLOT 2		1994
SHAUN (TOWNHOUSES)	SUBLOT 1		2000
SHAUN (TOWNHOUSES)	SUBLOT 2		2000
HEATHERLANDS SUB	2	2	0
HEATHERLANDS SUB	3	2	1982
HEATHERLANDS SUB	4	2	1981
HEATHERLANDS SUB	5	2	2004
HEATHERLANDS SUB	6	2	1988
HEATHERLANDS SUB	7	2	0
HEATHERLANDS SUB	8	2	1992
HEATHERLANDS SUB	9	2	1999
HEATHERLANDS SUB	10	2	0
HEATHERLANDS SUB	11	2	1990
HEATHERLANDS SUB	12	2	1999
HEATHERLANDS SUB	13	2	1985
HEATHERLANDS SUB	14	2	1986
HEATHERLANDS SUB	16	2	0
HEATHERLANDS SUB	33	2	1998
HEATHERLANDS SUB	34	2	1985
HEATHERLANDS SUB	35	2	1989
HEATHERLANDS SUB	36	2	1997
HEATHERLANDS SUB	37	2	0
HEATHERLANDS SUB	38	2	1988
HEATHERLANDS SUB	39	2	1989
HEATHERLANDS SUB	40	2	0
HEATHERLANDS SUB	41	2	1995
HEATHERLANDS SUB	42	2	1990
HEATHERLANDS SUB	43	2	1985
HEATHERLANDS SUB	44	2	2000
HEATHERLANDS SUB	AM 15A	2	1990
HEATHERLANDS SUB	17	3	1987
HEATHERLANDS SUB	18	3	1981
HEATHERLANDS SUB	19	3	1981
HEATHERLANDS SUB	20	3	0
HEATHERLANDS SUB	21	3	0
HEATHERLANDS SUB	22	3	0
HEATHERLANDS SUB	23	3	1996
HEATHERLANDS SUB	24	3	1987
HEATHERLANDS SUB	25	4	2013
HEATHERLANDS SUB	26	4	1991
HEATHERLANDS SUB	27	4	1989
HEATHERLANDS SUB	28	4	1987
HEATHERLANDS SUB	29	4	0
HEATHERLANDS SUB	30	4	1997

Subdivision Name	Lot	Block	YEAR BUILT
HEATHERLANDS SUB	31	4	1987
HEATHERLANDS SUB	32	4	2008
HEATHERLANDS SUB	45	5	2000
HEATHERLANDS SUB	46	5	2000
HEATHERLANDS SUB	49	5	1990
HEATHERLANDS SUB	50	5	1991
HEATHERLANDS SUB	51	5	1989
HEATHERLANDS SUB	52	5	1989
HEATHERLANDS SUB	53	5	2003
HEATHERLANDS SUB	54	5	1990
HEATHERLANDS SUB	55	5	1981
HEATHERLANDS SUB	56	5	1986
HEATHERLANDS SUB	57	5	2005
HEATHERLANDS SUB	58	5	1986
HEATHERLANDS SUB	59A	5	1990
HEATHERLANDS SUB	AM 47A	5	1997
HEATHERLANDS SUB	AM 48A	5	1980
HEATHERLANDS SUB	60	6	1994
HEATHERLANDS SUB	61	6	2001
HEATHERLANDS SUB	62	6	0
HEATHERLANDS SUB	63	6	2001
HEATHERLANDS SUB	64	6	0
HEATHERLANDS SUB	65	6	2002
HEATHERLANDS SUB	66	6	1993
HEATHERLANDS SUB	67	6	1983
HEATHERLANDS SUB	68	6	1985
HEATHERLANDS SUB	69	6	1987
HEATHERLANDS SUB	70	6	1992
HEATHERLANDS SUB	71	6	1989
HEATHERLANDS SUB	72	6	1992
HEATHERLANDS SUB	73	6	0
HEATHERLANDS SUB	74	6	1987
HEATHERLANDS SUB	75	6	1991
HEATHERLANDS SUB	76	6	1992
HEATHERLANDS SUB	77	6	1994
HEATHERLANDS SUB	78	6	1995
HEATHERLANDS SUB	79	6	1995
HEATHERLANDS SUB	80	6	1991
HEATHERLANDS SUB	81	6	2000
HEATHERLANDS SUB	82	6	1985
HEATHERLANDS SUB	83	6	1992
HEATHERLANDS SUB	101	6	2000
HEATHERLANDS SUB	102	6	1993
HEATHERLANDS SUB	103	6	1990
HEATHERLANDS SUB	104	6	1990
HEATHERLANDS SUB	84	7	1984
HEATHERLANDS SUB	85	7	1990
HEATHERLANDS SUB	86	7	2004
HEATHERLANDS SUB	87	7	1991

THEORETICAL HORSEPOWER EQUATION WORKSHEET (cjh 1/92)

Water Right Nos. 37-8220, 37-8686, 37-8831 and 37-159B
 Reviewer: Dan Nelson and Sandy Thiel
 Date of Review: 3/24/2017

P/D No.:	Well #1 pump #1	Well #1 pump #2	Well #2 pump #1	Well #2 pump #2	30 hp pump
PUMP HORSEPOWER	20	20	20	20	30
BOOSTER HORSEPOWER	0	0	0	0	0
PUMPING LEVEL	80	80	80	80	80
DISCHARGE PRESSURE	12	12	12	12	12
RATE OF FLOW (cfs)	0.84	0.84	0.84	0.84	1.26
	377	377	377	377	565

The above calculates the formula =

$$Q = \frac{8.8 * (\text{Efficiency}) * \text{hp}}{\text{depth to water} + 2.31 * (\text{psi}) + \text{friction}}$$

Assumptions: 70 efficiency.
 No Friction

Examiners Notes:

The efficiency was changed to 0.514 to attain the flow rate at the pumping level described by the owner. The pumping level has to be less than 100 feet, because the wells are only 100 feet deep. The two competing pumps in the same well causes the pump efficiency to drop due to the competition for water in the well.

	gpm	cfs	
all 20 Hp Pumps =	1508	3.36	
1-30Hp & 3 20HP =	1696	3.78	
Brockway =	20Hp +30 Hp	792	
	2 - 20hp pumps =	754	
	<u>Total =</u>	<u>1545.811</u>	3.44
Just for Assumption=	2 - 30hp pumps	1130.716	
	2 - 20hp pumps =	754	
	<u>Total =</u>	<u>1884.527</u>	4.20

Technical Information in Support of Diversion Rates for Licensing of 37-8220, 37-8686, and 37-8831 (Heatherlands)

C. G. Brockway, P.E.

March 23, 2017

1993 pump curves

IDWR measured the capacity of two well sources during a field exam in June 2016 for the above-referenced water rights. However, the installed well pumps as of the water right proof dates (1994, 1996, and 2003) were different than those in place when the 2016 field exam was made. The pumps in place as of 1993 were confirmed by Walker Water Systems, who was the system manager at the time and continues to function in that capacity today (see attached letter and pump curves provided by Walker). Two submersible pumps were installed in each well:

Well #1

Pump 1: Jacuzzi S6X3, 20HP

Pump 2: Jacuzzi S6X7, 30HP

Well #2

Pumps 1 and 2: Berkeley 6S2AH5, 20HP

As is the case today, the pumps were connected in parallel. In a parallel configuration, the composite pump curve is found by adding the flow from each pump for the range of total dynamic head.

System curve

The point at which the system would have operated in 1993 is the intersection of the composite pump curve and the system curve. The system curve describes the head required to push a given flow through the system, and takes the form

$$H = KQ^2$$

where H is the total head, Q is the flow rate, and K is a constant. Two concurrent head and flow values are needed to calculate K . Based on the IDWR 2016 field exam measurements, K may be calculated for each well pump system. The flow was measured by IDWR using an ultrasonic meter, and the head includes the following components:

Total head = Pumping lift + Pressure head at surface + Drop pipe losses + Velocity head

Each component of head is described below.

Pumping lift

The pumping water level was not measured by IDWR staff during the full-capacity tests, but was measured and reported at the time of drilling (see attached well drilling records). Based on the specific capacity (gpm/ft) at the time of drilling, the pumping lift was calculated for the discharge delivered during the 2016 field exam.

	Well #1	Well #2
Static water level	39 feet	40 feet
Pumping test at time of drilling, flow and drawdown	515 gpm at 17.7 feet	530 gpm at 10 feet 968 gpm at 19.2 feet
Specific capacity	29.1 gpm/ft	51.7 gpm/ft (average from above two measured points)
Discharge during 2016 exam full-capacity test	728 gpm	775 gpm
Predicted drawdown during 2016 exam	$728 / 29.1 = 25.0$ feet	$775 / 51.9 = 15.0$ feet
Predicted pumping level (lift)	64.0 feet	55.0 feet

Pressure head at surface

This value was measured by IDWR during the full-capacity tests. Pressure was 12 psi or 27.7 feet at Well #1 and 15 psi or 34.6 feet at Well #2.

Drop pipe losses

Pump drop pipe losses during the full-capacity test were calculated using standard methods assuming Darcy-Weisbach friction, 4-inch galvanized pipe for each pump, and appropriate minor loss coefficients for the discharge piping and valving. The Well #1 and #2 depths are 97 feet and 100 feet, respectively. Pumps appear to be set at 80 feet.

	Well #1	Well #2
Drop pipe length	80 feet	80 feet
Pipe diameter & type	4" Sch 40 (3.99" I.D.)	4" Sch 40 (3.99" I.D.)
Full-capacity test flow rate	728 gpm	775 gpm
Flow rate per pump	364 gpm	387.5 gpm
Drop pipe velocity	9.34 ft/s	9.94 ft/s
Velocity head	1.36 feet	1.54 feet
Friction factor (calculated based on Re)	0.0180	0.0179
Minor loss coefficient	4.8	4.8
Check valve 2.1		
90-deg (2) 1.6		
Tee (side) 1.1		
Total drop pipe loss	12.4 feet	14.0 feet

Total head

The total head for each pumping system during the 2016 full-capacity test is as follows:

$$H (\text{Well \#1}) = 64.0 + 27.7 + 12.4 + 1.4 = 105.5 \text{ feet}$$

$$H (\text{Well \#2}) = 55.0 + 34.6 + 14.0 + 1.5 = 105.1 \text{ feet}$$

Calculated system curves

The head and flow points described above from the full-capacity tests may be used to find K and determine the system curves, as follows:

$$\text{Well \#1: } H_{sys} = 40.10Q^2$$

$$\text{Well \#2: } H_{sys} = 35.25Q^2$$

Where H_{sys} is in feet and Q is in cfs.

1993 capacity estimation

The composite pump curves and the calculated system curves are shown in the attached tables and graphs. The intersection of the curves represents the point at which the system would have operated had IDWR conducted its field exam in 1993 and followed same procedure used in 2016. For Well #1, the 1993 system capacity is estimated to be 792 gpm compared to the 2016 capacity of 728 gpm. For Well #2, the 1993 system capacity is estimated to be 782 gpm compared to the 2016 capacity of 775 gpm. The total capacity in 1993 is estimated to be 1,574 gpm or 3.51 cfs. It is recommended that the permits be licensed with this rate as the combined-use limit, as it better represents the true system capacity with the installed pumps at the time of the proof.





Walker

WATER SYSTEMS

Since 1947

Magic Valley
Wood River
FAX

208.733.4744
208.726.5145
208.736.0795

walkerwatersystems.com
walkerws@mindspring.com

624 Pierce Street Twin Falls, ID 83301 RCE-1335

Laura, c/o Sun Country Management

February 13, 2017

RE: HEATHERLANDS PUMPS

Dear Laura:

After some research into our records, we found that the following were the pumps that were installed at Heatherlands in 1993.

Pumphouse #1:

- Jacuzzi S6X3 20HP 200GPM
- Jacuzzi S6X7 30HP 300GPM

Pumphouse #2:

- Berkeley 6S2AH5 20HP 300GPM
- Berkeley 6S2AH5 20HP 300GPM

I hope this information is what you need. If you have any questions, please give me a call.

Sincerely,

Mark Koffer

Walker Water Systems, Inc.

WELL DRILLER'S REPORT

By: mciscell 2012-12-21

USE ADDITIONAL SHEETS IF NECESSARY - FORWARD THE WHITE COPY TO THE DEPARTMENT

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES

USE TYPEWRITER OR
BALLPOINT PEN

WELL DRILLER'S REPORT

State law requires that this report be filed with the Director, Department of Water Resources
within 30 days after the completion or abandonment of the well.

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1. WELL OWNER Name <u>Heatherlands Subdivision</u> <u>% Chuck Ketterman</u> Address <u>Edwards, Howard & Martens Box 186</u> <u>Ketchum, ID 83340</u> Owner's Permit No. <u>37-85-C-0004-000</u>	7. WATER LEVEL Static water level <u>40</u> feet below surface Flowing? ☐ Yes ☒ No G.P.M. flow <u> </u> p.s.i. Artesian closed-in pressure <u> </u> p.s.i. Controlled by: ☐ Valve ☐ Cap ☐ Plug Temperature <u>46</u> °F. Quality <u> </u> Describe artesian or temperature zones below <u> </u>																																																																																		
2. NATURE OF WORK <u>W.R. 37-08220</u> ☒ New well ☐ Deepened ☐ Replacement ☐ Abandoned (describe abandonment procedures such as materials, plug depths, etc. in lithologic log)	8. WELL TEST DATA ☒ Pump ☐ Bailer ☐ Air ☐ Other <u> </u> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th>Discharge G.P.M.</th> <th>Pumping Level</th> <th>Hours Pumped</th> </tr> <tr> <td><u>530+</u></td> <td><u>50'</u></td> <td><u>8</u></td> </tr> </table> <u>Pumped 968 GPM from 59'2" for 1/2 hour.</u>	Discharge G.P.M.	Pumping Level	Hours Pumped	<u>530+</u>	<u>50'</u>	<u>8</u>																																																																												
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3. PROPOSED USE ☐ Domestic ☐ Irrigation ☐ Test ☒ Municipal ☐ Industrial ☐ Stock ☐ Waste Disposal or Injection ☐ Other <u> </u> (specify type)	9. LITHOLOGIC LOG <u>70040</u> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Bore Diam.</th> <th colspan="2">Depth</th> <th rowspan="2">Material</th> <th colspan="2">Water</th> </tr> <tr> <th>From</th> <th>To</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>16</td> <td>0</td> <td>2</td> <td>Surface</td> <td></td> <td></td> </tr> <tr> <td></td> <td>2</td> <td>12</td> <td>Boulders & Gravel & Clay</td> <td></td> <td></td> </tr> <tr> <td></td> <td>12</td> <td>16</td> <td>Gravel & clay</td> <td></td> <td></td> </tr> <tr> <td></td> <td>16</td> <td>19</td> <td>Bigger gravel & Clay</td> <td></td> <td></td> </tr> <tr> <td>12</td> <td>19</td> <td>44</td> <td>Clay & gravel</td> <td></td> <td></td> </tr> <tr> <td></td> <td>44</td> <td>47</td> <td>Gravel & sand</td> <td>X</td> <td></td> </tr> <tr> <td></td> <td>47</td> <td>54</td> <td>Clay & gravel</td> <td></td> <td>X</td> </tr> <tr> <td></td> <td>54</td> <td>57</td> <td>Sand</td> <td></td> <td></td> </tr> <tr> <td></td> <td>57</td> <td>59</td> <td>Clay & gravel</td> <td></td> <td></td> </tr> <tr> <td></td> <td>59</td> <td>74</td> <td>Gravel & clay</td> <td>X</td> <td></td> </tr> <tr> <td></td> <td>74</td> <td>76</td> <td>Clay & gravel</td> <td>X</td> <td></td> </tr> <tr> <td></td> <td>76</td> <td>100</td> <td>Gravel & clay</td> <td>X</td> <td></td> </tr> </tbody> </table>	Bore Diam.	Depth		Material	Water		From	To	Yes	No	16	0	2	Surface				2	12	Boulders & Gravel & Clay				12	16	Gravel & clay				16	19	Bigger gravel & Clay			12	19	44	Clay & gravel				44	47	Gravel & sand	X			47	54	Clay & gravel		X		54	57	Sand				57	59	Clay & gravel				59	74	Gravel & clay	X			74	76	Clay & gravel	X			76	100	Gravel & clay	X	
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4. METHOD DRILLED ☒ Rotary ☒ Air ☐ Hydraulic ☐ Reverse rotary ☐ Cable ☐ Dug ☐ Other <u> </u>	10. Work started <u>7/26/85</u> finished <u>8/12/85</u>																																																																																		
5. WELL CONSTRUCTION Casing schedule: ☒ Steel ☐ Concrete ☐ Other <u> </u> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Thickness</th> <th>Diameter</th> <th>From</th> <th>To</th> </tr> </thead> <tbody> <tr> <td><u>375</u> inches</td> <td><u>12 3/4</u> inches</td> <td><u>2</u> feet</td> <td><u>100</u> feet</td> </tr> <tr> <td>_____ inches</td> <td>_____ inches</td> <td>_____ feet</td> <td>_____ feet</td> </tr> <tr> <td>_____ inches</td> <td>_____ inches</td> <td>_____ feet</td> <td>_____ feet</td> </tr> <tr> <td>_____ inches</td> <td>_____ inches</td> <td>_____ feet</td> <td>_____ feet</td> </tr> </tbody> </table> Was casing drive shoe used? ☒ Yes ☐ No Was a packer or seal used? ☐ Yes ☒ No Perforated? ☒ Yes ☐ No How perforated? ☐ Factory ☒ Knife ☐ Torch Size of perforation <u>1 1/2</u> inches by <u>1/2</u> inches <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Number</th> <th>From</th> <th>To</th> </tr> </thead> <tbody> <tr> <td><u>1868</u> perforations</td> <td><u>61</u> feet</td> <td><u>95</u> feet</td> </tr> <tr> <td>_____ perforations</td> <td>_____ feet</td> <td>_____ feet</td> </tr> <tr> <td>_____ perforations</td> <td>_____ feet</td> <td>_____ feet</td> </tr> </tbody> </table> Well screen installed? ☐ Yes ☒ No Manufacturer's name <u> </u> Type <u> </u> Model No. <u> </u> Diameter <u> </u> Slot size <u> </u> Set from <u> </u> feet to <u> </u> feet Diameter <u> </u> Slot size <u> </u> Set from <u> </u> feet to <u> </u> feet Gravel packed? ☐ Yes ☒ No ☐ Size of gravel <u> </u> Placed from <u> </u> feet to <u> </u> feet Surface seal depth <u>20</u> Material used in seal: ☒ Cement grout ☐ Bentonite ☐ Puddling clay ☐ Slurry pit Sealing procedure used: ☐ Temp. surface casing ☐ Overbore to seal depth Method of joining casing: ☐ Threaded ☒ Welded ☐ Solvent Weld ☐ Cemented between strata Describe access port <u> </u>	Thickness	Diameter	From	To	<u>375</u> inches	<u>12 3/4</u> inches	<u>2</u> feet	<u>100</u> feet	_____ inches	_____ inches	_____ feet	_____ feet	_____ inches	_____ inches	_____ feet	_____ feet	_____ inches	_____ inches	_____ feet	_____ feet	Number	From	To	<u>1868</u> perforations	<u>61</u> feet	<u>95</u> feet	_____ perforations	_____ feet	_____ feet	_____ perforations	_____ feet	_____ feet	11. DRILLERS CERTIFICATION <u>RR</u> I/We certify that all minimum well construction standards were complied with at the time the rig was removed. Firm Name <u>Walker Water Systems, Inc.</u> Firm No. <u>15</u> <u>624 Pierce Street</u> Address <u>Twin Falls, Idaho 83301</u> Date <u>8/21/85</u> Signed by (Firm Official) <u>Frederick B. Welch</u> and <u> </u> (Operator) <u>Frederick B. Welch</u>																																																		
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6. LOCATION OF WELL Sketch map location <u>must</u> agree with written location. N <table border="1" style="width: 100px; height: 100px; border-collapse: collapse;"> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td></tr> </table> W E S Subdivision Name <u> </u> <u>Heatherlands</u> Lot No. <u>36 & 37</u> Block No. <u>2</u> County <u>Blaine</u> SE 1/4 SW 1/4 Sec. <u>17</u>, T. <u>3</u> N., R. <u>18</u> E., S.										USE ADDITIONAL SHEETS IF NECESSARY - FORWARD THE WHITE COPY TO THE DEPARTMENT																																																																									

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SEP 6 1985

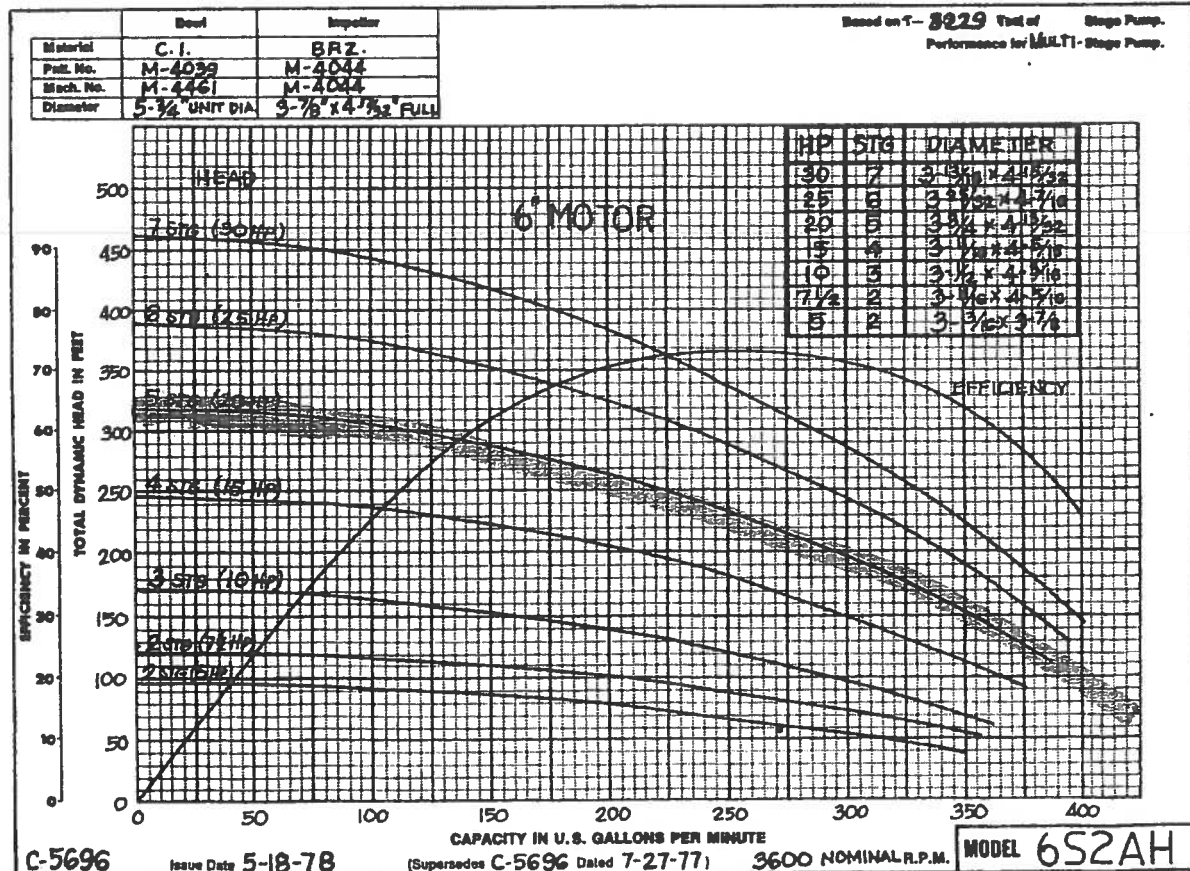
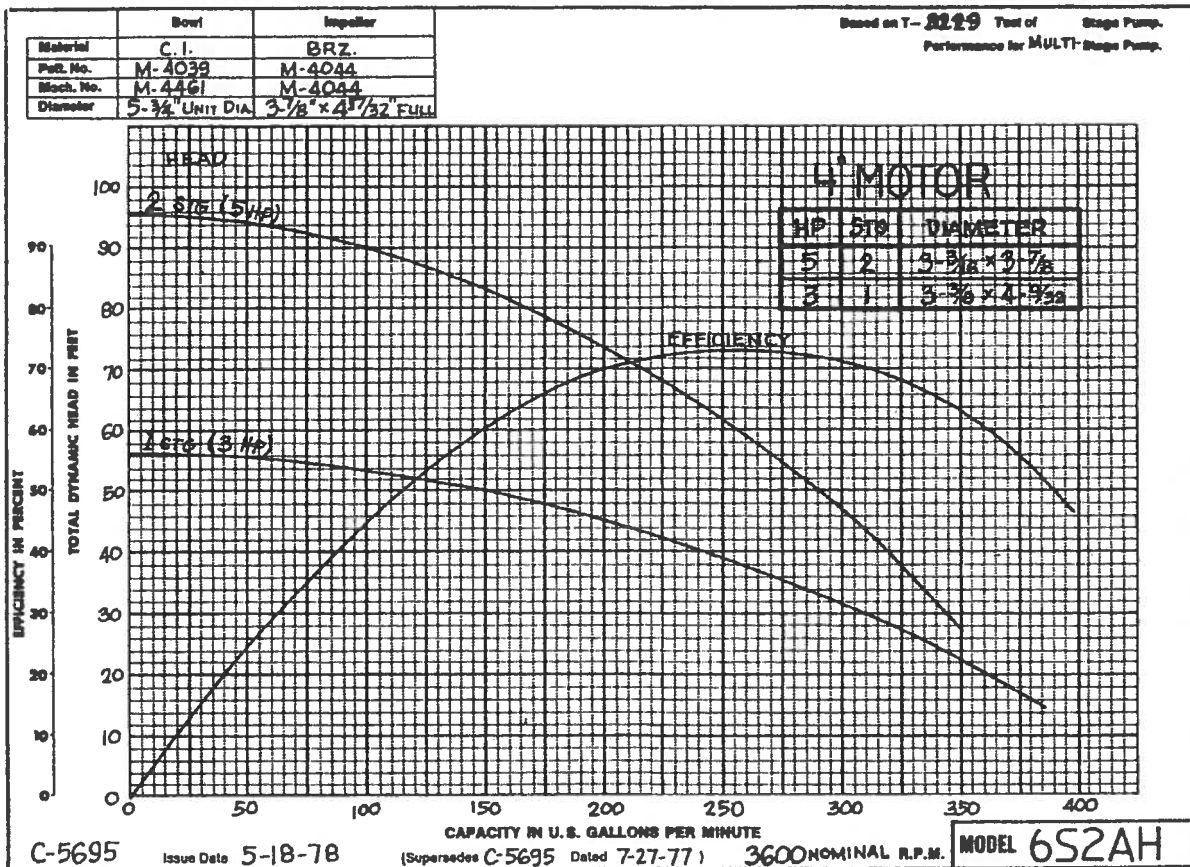
MICROFILMED

Will # 1993



BERKELEY PUMP COMPANY
SUBMERSIBLE TURBINE PUMPS
6" AND 7" BOWLS
PERFORMANCE CURVES

CURVE	2500
DATE	6-5-78
PAGE	1.81
SUPERSEDES	
NEW	



**6" Submersible
Turbines**

3450 RPM - 60 CYCLE

PUMP MODEL NO.		Motor HP Rtg.	Max. Pump Dia. in.(1)	TOTAL DYNAMIC HEAD IN FEET																																				Shut- Off Head Feet	Tapping Disch. Tapping In.(2)
Single Phase	Three Phase			20	30	40	50	60	70	80	90	100	125	150	175	200	225	250	275	300	325	350	375	400	450	500	550	600	650	700	800	900	1000								
CAPACITIES IN U.S. GALLONS PER MINUTE																																									
358L3-S	358L3-T	3	5 1/4"			124	119	113	108	103	97	91	75	53																				186	3						
558L4-S	558L4-T	5						129	125	122	118	115	108	97	88	73	57	32																	288	3					
758L5-S	758L5-T	7 1/2								128	123	120	114	107	101	93	86	77	67	56	39															394	3				
1058L6-S	1058L6-T	10										131	126	122	117	113	108	103	98	92	87	81	75	68											550	3					
	1658L11XP-T	15											136	133	130	126	123	120	116	113	110	106	103	99	92	84	75	65	53	33				805	3						
	2058L15XP-T	20	5 1/2"													134	132	129	127	125	123	120	118	116	111	106	101	95	90	83	68	48	17	1075	3						
	2558L17XP-T	25																							111	106	101	95	90	83	68	48	17	1075	3						
558M2-S	558M2-T	5			233	222	211	200	188	176	164	150	99																						153	4					
758M3-S	758M3-T	7 1/2						234	226	218	210	203	195	175	152	118	60																			226	4				
1058M4-S	1058M4-T	10							235	228	222	216	210	195	180	164	145	120	74																	288	4				
	1558M6-T	15	6"								238	234	230	221	211	202	193	183	172	160	147	132	113	90	54									444	4						
	2058M8-T	20													230	223	216	210	203	195	188	181	173	165	158	134	103	56					600	4							
	2558M10XP-T	25																		207	201	196	190	184	177	163	148	130	108	74			760	4							
	3058M12XP-T	30																							209	204	199	194	183	172	161	147	133	116	59	910	4				
758H2-S	758H2-T	7 1/2	6 1/4"			274	264	252	240	226	210	194	140																						158	4					
1058H3-S	1058H3-T	10						264	257	250	242	234	212	188	148	94																			230	4					
	1558H4-T	15										274	262	247	230	210	188	158	118	54															320	4					
	2058H5-T	20															250	238	222	205	186	163	128	78											410	4					
558X1-S	558X1-T	5	6 3/4"	405	385	312	252	170	82																										76	4					
758X2-S	758X2-T	7 1/2				387	365	340	315	287	255	217	175																						132	4					
1058X2-S	1058X2-T	10					425	405	385	362	337	312	280	172																					158	4					
	1558X3-T	15								410	400	385	370	335	285	220	148																		245	4					
	2058X4-T	20									427	417	407	382	353	321	282	240	183	134	87														328	4					
	2558X6-T	25														387	346	325	302	277	246	217	182	152	112									470	4						
	3058X7-T	30																355	335	316	283	273	248	223	193	130								545	4						

(1) Well inside diameter and straightness should be checked to insure adequate clearance exists before the pump is installed.

(2) Indicates recommended riser pipe size furnished as standard.

While the capacities quoted are based on tests of typical pumps and are given in good faith, they do NOT represent GUARANTEED PERFORMANCES. Please refer to factory if Certified Performance Curve is required. For High Capacity or Low Head conditions refer to N.P.S.H. curve. The maximum setting using Schedule 40 pipe is 600 feet. For settings deeper than 600 feet, use Schedule 40 pipe for the bottom 600 feet of riser pipe, and Schedule 80 for the remainder.

CHECK VALVES. If the pump setting exceeds 100 feet, install a check valve at the first joint in the riser pipe above the pump. Always use an additional check valve at the surface if the pump is part of a pressure system, or if the pressure head exceeds 500 feet. If the setting exceeds 500 feet, install a third check valve (non-slam type) in the riser pipe at two-thirds of the setting above the pump.

Well #1: Current vs. 1993 capacity

CGB 3/23/2017

1993 pumps:

(1) Jacuzzi 20S6X3 (20HP)

(1) Jacuzzi 30S6X3 (30HP)

Pump curves:

(red = extrapolated using quadratic)

TDH (ft)	Q (gpm) 20S6X3	Q (gpm) 30S6X3
400		193
375		223
350		248
325		273
300	87	293
275	134	316
250	183	335
225	240	355
200	282	372
175	321	386
150	353	400
125	382	410
100	407	421

Pumps in parallel: add flows for a given head

TDH (ft)	Q (gpm) 20S6X3	Q (gpm) 30S6X3	Composite Q (gpm)
300	87	293	380
275	134	316	450
250	183	335	518
225	240	355	595
200	282	372	654
175	321	386	707
150	353	400	753
125	382	410	792
100	407	421	828

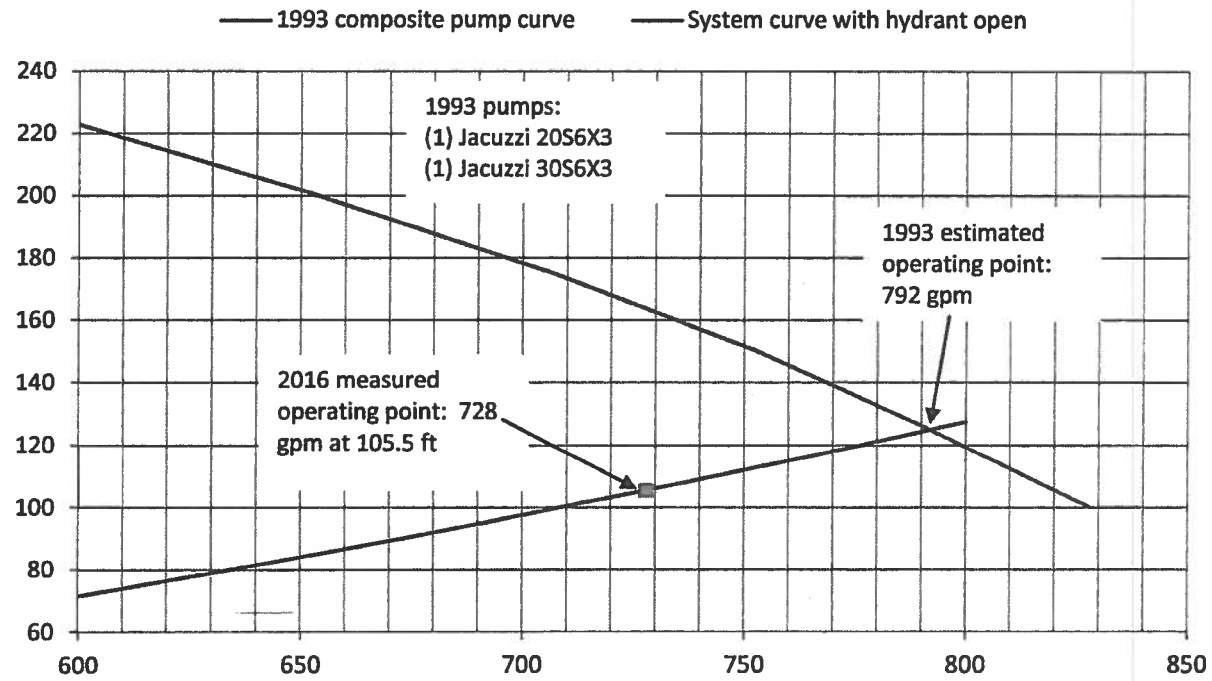
System curve with hydrant

open (min. pressure condition)

IDWR 2016 measurement

Q (gpm)	Hsys (ft)
600	72
620	77
640	82
660	87
680	92
700	98
728	105.5
740	109
750	112
760	115
770	118
780	121
790	124
800	127

Heatherlands Well #1 Pump Capacity Comparison



Well #2: Current vs. 1993 capacity

CGB 3/23/2017

1993 pumps:

(2) Berkeley 6S2AH 5-stage 20HP

1993 pump

Manufacturer's curve:

TDH	
6S2AH	Q (gpm)
265	200
249	225
233	250
215	275
197	300
177	325
153	350
126	375
95	400

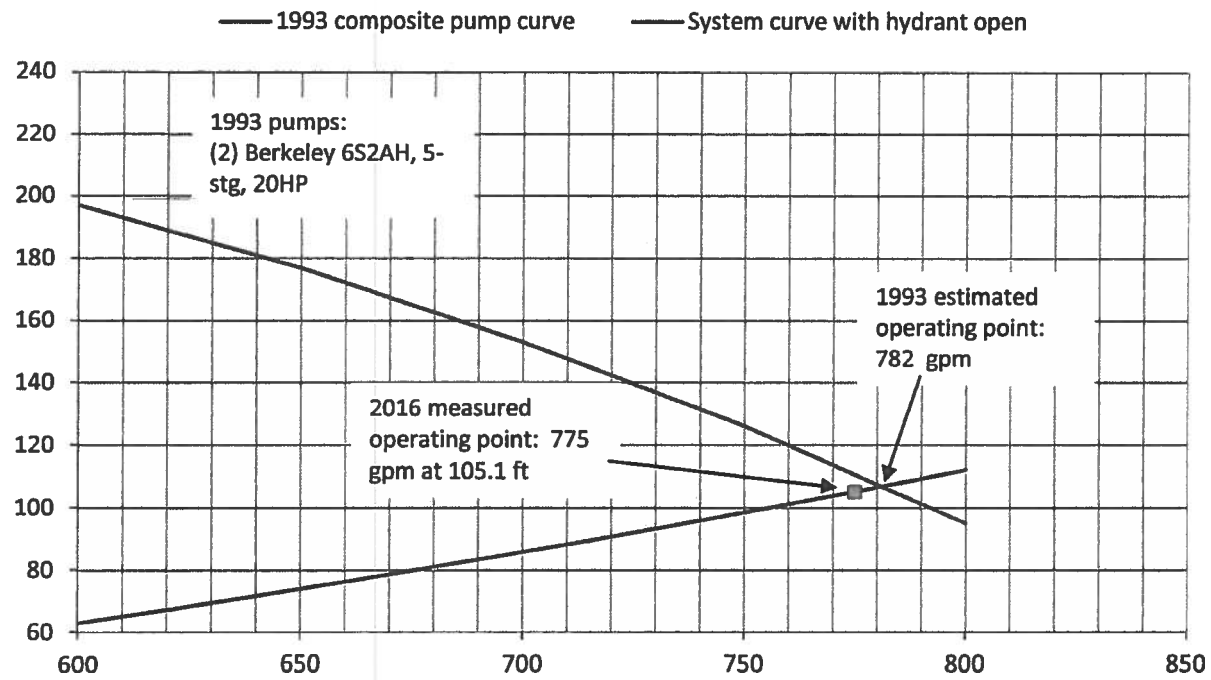
Pumps in parallel: add flows for
a given head

Composite	
TDH (ft)	Q (gpm)
265	400
249	450
233	500
215	550
197	600
177	650
153	700
126	750
95	800

System curve with hydrant
open (min. pressure condition)

IDWR 2016 measurement	
Q (gpm)	Hsys (ft)
600	63
620	67
640	72
660	76
680	81
700	86
720	91
740	96
760	101
775	105.1
780	106
790	109
800	112

Heatherlands Well #2 Pump Capacity Comparison



THEORETICAL HORSEPOWER EQUATION WORKSHEET (cjh 1/92)

Water Right Nos. 37-8220, 37-8686, 37-8831 and 37-159B
 Reviewer: Dan Nelson and Sandy Thiel
 Date of Review: 3/24/2017

P/D No.:

PUMP HORSEPOWER
 BOOSTER HORSEPOWER

PUMPING LEVEL

DISCHARGE PRESSURE

RATE OF FLOW (cfs)

Well #1	Well #2	Well #3	Well #3	Well #3
20	20	20	20	30
0	0	0	0	0
80	80	80	80	80
12	12	12	12	12
0.84	0.84	0.84	0.84	1.26
377	377	377	377	565

all 20 Hp Pumps = 1508 3.36
 1-30Hp & 3 20HP = 1696 3.78

Brockway = 20Hp +30 Hp 792
 2 - 20hp pumps = 754
Total = 1545.811 3.44

The above calculates the formula =

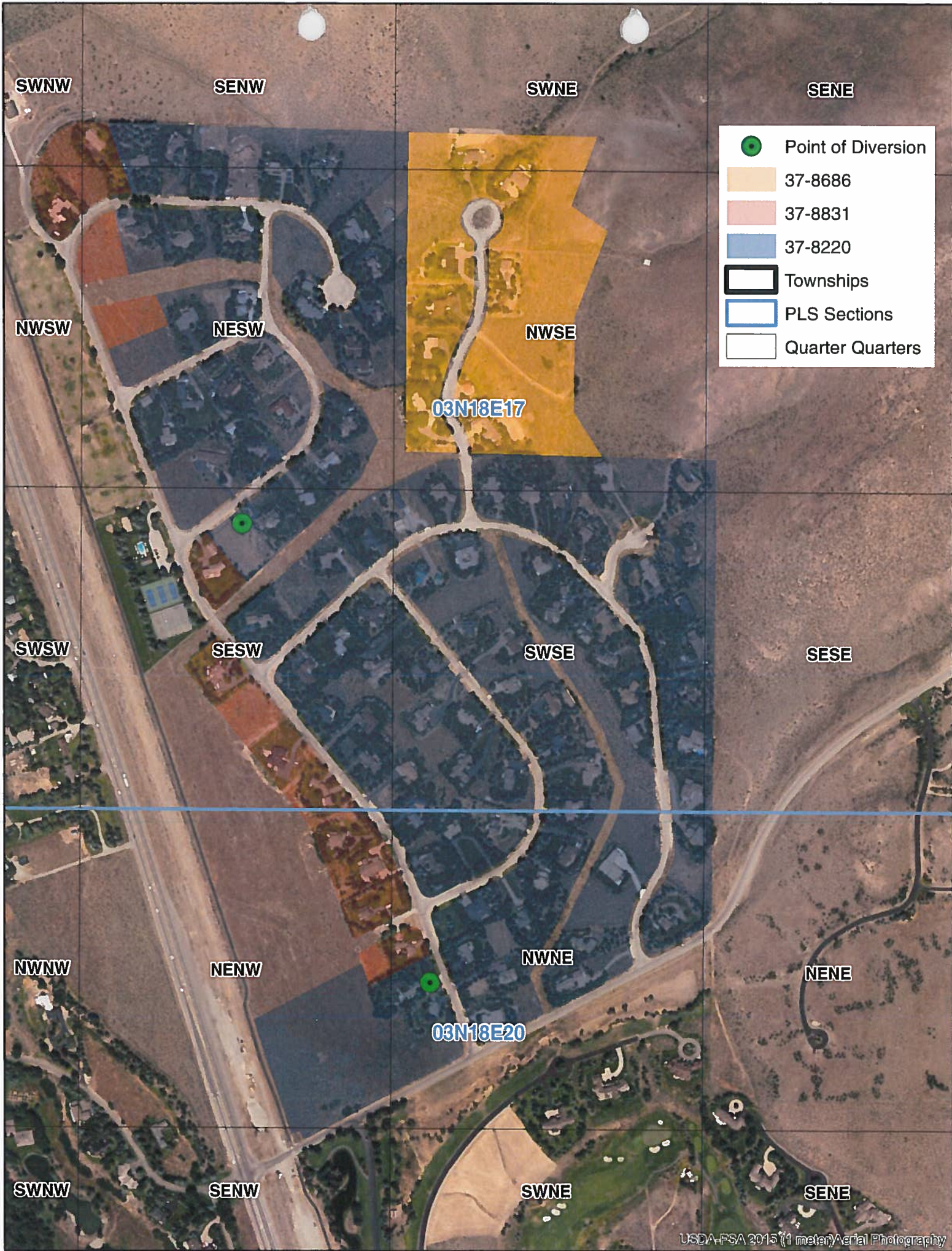
$$Q = \frac{8.8 * (\text{Efficiency}) * \text{hp}}{\text{depth to water} + 2.31 * (\text{psi}) + \text{friction}}$$

Assumptions: %70 efficiency.
 No Friction

Examiners Notes:

The efficiency was changed to 0.514 to attain the flow rate at the pumping level described by the owner. The pumping level has to be less than 100 feet, because the wells are only 100 feet deep. The two competing pumps in the same well causes the pump efficiency to drop due to the competition for water in the well.

Just for Assumption= 2 - 30hp pumps 1130.716
 2 - 20hp pumps = 754
Total = 1884.527 4.20



- Point of Diversion
- 37-8686
- 37-8831
- 37-8220
- Townships
- PLS Sections
- Quarter Quarters

INNER LINING
? NO LING.

INNER LINING
? NO LING.

KIND OF FLUID
? WATER

SENSOR MOUNTING
? U

TYPE OF SENSOR
? SMALL

DATA CHANGE
? NO

SPACING
4.176 IN U

06-23 11:0600
+003.00 % AI2

PRT PERIOD Thickness
01 MIN 0.17

11:27+123.368E 00GPM 00R
+00000 *10 G 00R
-00000 *10 G 00R

11:28+120.462E 00GPM 00R
+00011 *10 G 00R
-00000 *10 G 00R

11:29+124.953E 00GPM 00R
+00023 *10 G 00H
-00000 *10 G 00H

11:30+118.084E 00GPM 00R
+00034 *10 G 00R
-00000 *10 G 00R

11:31+110.423E 00GPM 00R
+00047 *10 G 00H
-00000 *10 G 00H

11:32+146.615E 00GPM 00H
+00059 *10 G 00R
-00000 *10 G 00R

11:33+152.955E 00GPM 00R
+00074 *10 G 00R
-00000 *10 G 00R

11:34+149.521E 00GPM 00R
+00089 *10 G 00R
-00000 *10 G 00R

11:35+145.558E 00GPM 00R
+00104 *10 G 00H
-00000 *10 G 00H

11:36+140.803E 00GPM 00R
+00118 *10 G 00R
-00000 *10 G 00R

06-23 11:3600 *R
+948.00E 10PH

06-23 11:3600 *R
+948.00E 10PH

670000 IN

PIPE MATERIAL
CS.SS

INNER LINING
? NO LING.

INNER LINING
? NO LING.

KIND OF FLUID
? WATER

SENSOR MOUNTING
? U

TYPE OF SENSOR
? SMALL

DATA CHANGE
? NO

SPACING
4.176 IN U

06-23 11:0600
+003.00 % AI2

PRT PERIOD Thickness
01 MIN 0.17

11:27+123.368E 00GPM 00R
+00000 *10 G 00R
-00000 *10 G 00R

11:28+120.462E 00GPM 00R
+00011 *10 G 00R
-00000 *10 G 00R

11:29+124.953E 00GPM 00R
+00023 *10 G 00H
-00000 *10 G 00H

11:30+118.084E 00GPM 00R
+00034 *10 G 00R
-00000 *10 G 00R

11:31+110.423E 00GPM 00R
+00047 *10 G 00H
-00000 *10 G 00H

11:32+146.615E 00GPM 00H
+00059 *10 G 00R
-00000 *10 G 00R

11:33+152.955E 00GPM 00R
+00074 *10 G 00R
-00000 *10 G 00R

11:34+149.521E 00GPM 00R
+00089 *10 G 00R
-00000 *10 G 00R

11:35+145.558E 00GPM 00R
+00104 *10 G 00H
-00000 *10 G 00H

11:36+140.803E 00GPM 00R
+00118 *10 G 00R
-00000 *10 G 00R

06-23 11:3600 *R

37-8686

6/24/2016

Panametric measurement

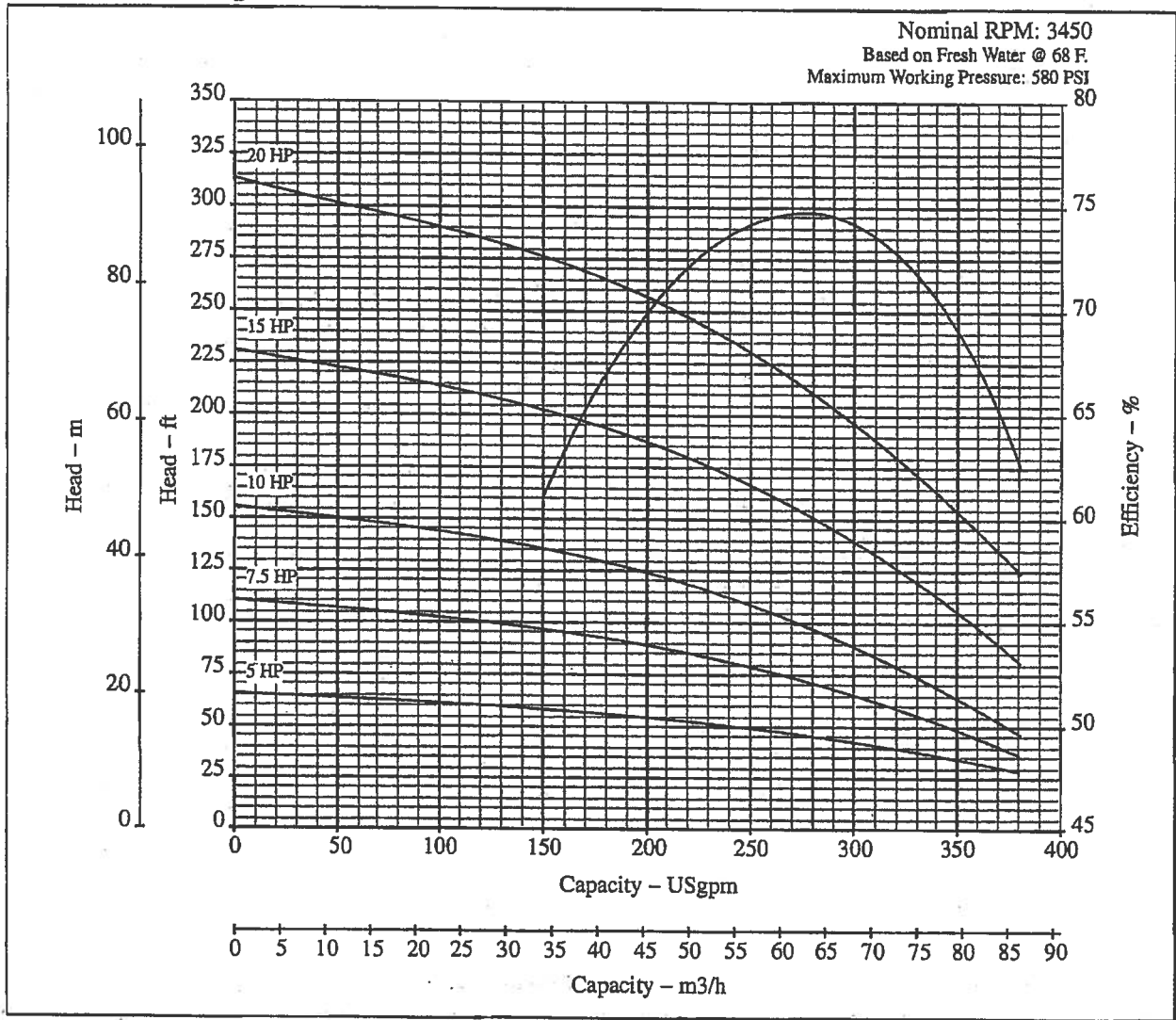
File Title: C:\Users\sthie\\Desktop\LOG15.LOG
File Name: C:\Users\sthie\\Desktop\LOG15.LOG
Start Time: 6/23/2016 12:41
End Time: 6/23/2016 12:51
Interval: 60
Records: 10
Cyclic Flags: 2
Error Flags: 8208

Date/Time	Velocity (ft/s)	Volume (gal/m)	(+)Total (Ac-Ft)	Error #
6/23/2016 12:41	1.178510612	107.3503873	0.05714409	0
6/23/2016 12:42	1.247374278	113.6231703	0.05747981	0
6/23/2016 12:43	1.330467568	121.1921279	0.057831	0
6/23/2016 12:44	1.31133365	119.4492216	0.05819636	0
6/23/2016 12:45	1.634844639	148.917798	0.05858645	0
6/23/2016 12:46	1.392510644	126.8436241	0.05899801	0
6/23/2016 12:47	1.347896071	122.7796881	0.05938212	0
6/23/2016 12:48	1.346294003	122.6337559	0.05975698	0
6/23/2016 12:49	1.343348254	122.365428	0.06012892	0
6/23/2016 12:50	1.405213709	128.0007447	0.06051379	0
	Average gpm	123.3155946		
	cfs	0.274767368		



SUBMERSIBLE
TURBINE

6T-275



6.88"

P

MD

OUTLINE DIMENSIONS / WEIGHTS

HP	stages	Motor size	P length	M* length	MD* dia.	Mtr. wt.	Pump wt.
5	1	6"	18.98	27.00	5.51	95	56
7.5	2	6"	23.98	27.60	5.51	114	75
10	3	6"	28.98	29.80	5.51	127	95
15	4	6"	33.98	30.40	5.51	130	114
20	5	6"	38.98	35.50	5.51	160	133

Note: dimensions = inches; weight = U.S. lbs.

M* Maximum length (Pentair Motor)
MD* Motor diameter (Pentair Motor)

SPECIFICATIONS

Minimum Well I.D.	6.0 Inches
Minimum Submergence @ BEP (above inlet)	10.0 Feet
Capacity Range	125 - 380 GPM
Discharge	4" F NPT
See manufacturer's data for motor cooling requirements	

SUPERSEDES
All Previous

Date 04/01/05
Section **6T**
Page 7.01

Heatherlands Flow meter readings

Heatherlands I

7/19/12	49454500
8/28	60756300
9/13	64665200
10/25	68446800
11/27	68469100
1/23/13	68518100
2/20	68545000
3/20	68584800
8/30	08694600

Heatherlands II

7/19/12	45294500
8/28	63674700
9/13	70454600
10/25	79959700
11/27	80142800
12/26	80493900
1/23/13	80494000
2/20	80494500
3/20	80494500
5/22	82569900
6/26	90313200
7/30	99798400
8/27	06596900

Heatherlands Flow Meter Readings in Gallons

Well 1		Difference	Days	Volume per day	
7/19/2012	49454500				
8/28/2012	60756300	11301800	41	275654	
9/13/2012	64665200	3908900	17	229935	
10/25/2012	68446800	3781600	43	87944	
11/27/2012	68469100	22300	34	656	
1/23/2013	68518100	49000	62	790	
2/20/2013	68545000	26900	29	928	
3/20/2013	68584800	39800	29	1372	
8/30/2013	108694600	40109800	164	244572	
Total		59240100	419		
Well 2				51605338 gallons per year	
7/19/2012	45294500				
8/28/2012	63674700	18380200	41	448298	
9/13/2012	70454600	6779900	17	398818	
10/25/2012	79959700	9505100	43	221049	
11/27/2012	80142800	183100	34	5385	
12/26/2012	80493900	351100	30	11703	
1/23/2013	80494000	100	29	3	
2/20/2013	80494500	500	29	17	
3/20/2013	80494500	0	29	0	
5/22/2013	82569900	2075400	64	32428	
6/26/2013	90313200	7743300	36	215092	
7/30/2013	99798400	9485200	35	271006	
8/27/2013	106596900	6798500	29	234431	
Total		61302400	416		
				53786962 gallons per year	
Total from both wells				105392299 gallons per year	
				323 afa	

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT

State law requires that this report be filed with the Director, Department of Water Resources, within 30 days after the completion or abandonment of the well.

Location Corrected by (To):
T03N R18E Sec. 20 SWNWNE
By: mciscell 2012-12-21

Pump house #1

1. WELL OWNER Name <u>Kirkman Development Inc</u> Address <u>Box 1328 Ketchum ID</u> Owner's Permit No. _____	7. WATER LEVEL Static water level <u>39</u> feet below land surface. Flowing? ☐ Yes ☒ No G.P.M. flow _____ Artesian closed-in pressure _____ p.s.i. Controlled by: ☐ Valve ☐ Cap ☐ Plug Temperature _____ °F. Quality _____																																																																						
2. NATURE OF WORK ☒ New well ☐ Deepened ☐ Replacement ☐ Abandoned (describe method of abandonment) _____	8. WELL TEST DATA ☒ Pump ☐ Sailer ☐ Air ☐ Other _____ <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th>Discharge G.P.M.</th> <th>Pumping Level</th> <th>Hours Pumped</th> </tr> <tr> <td><u>515</u></td> <td><u>56' 8"</u></td> <td><u>6</u></td> </tr> </table>	Discharge G.P.M.	Pumping Level	Hours Pumped	<u>515</u>	<u>56' 8"</u>	<u>6</u>																																																																
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3. PROPOSED USE ☐ Domestic ☐ Irrigation ☐ Test ☒ Municipal ☐ Industrial ☐ Stock ☐ Waste Disposal or Injection ☐ Other _____ (specify type)	9. LITHOLOGIC LOG <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Mole Diam.</th> <th colspan="2">Depth</th> <th rowspan="2">Material</th> <th colspan="2">Water</th> </tr> <tr> <th>From</th> <th>To</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td><u>16</u></td> <td><u>0</u></td> <td><u>3</u></td> <td><u>TOP SOIL + GRAVEL</u></td> <td></td> <td>☒</td> </tr> <tr> <td><u>16</u></td> <td><u>3</u></td> <td><u>20</u></td> <td><u>GRAVEL + CLAY</u></td> <td></td> <td>☒</td> </tr> <tr> <td><u>12</u></td> <td><u>20</u></td> <td><u>45</u></td> <td><u>" " "</u></td> <td></td> <td>☒</td> </tr> <tr> <td><u>12</u></td> <td><u>45</u></td> <td><u>51</u></td> <td><u>CLAY AND GRAVEL</u></td> <td></td> <td>☒</td> </tr> <tr> <td><u>12</u></td> <td><u>51</u></td> <td><u>65</u></td> <td><u>COURSE SAND + GRAVEL</u></td> <td></td> <td>☒</td> </tr> <tr> <td><u>12</u></td> <td><u>65</u></td> <td><u>77</u></td> <td><u>COURSE SAND</u></td> <td></td> <td>☒</td> </tr> <tr> <td><u>12</u></td> <td><u>77</u></td> <td><u>80</u></td> <td><u>LARGE GRAVEL</u></td> <td></td> <td>☒</td> </tr> <tr> <td><u>12</u></td> <td><u>80</u></td> <td><u>84</u></td> <td><u>GRAVEL + CLAY</u></td> <td></td> <td>☒</td> </tr> <tr> <td><u>12</u></td> <td><u>84</u></td> <td><u>92</u></td> <td><u>LARGE GRAVEL</u></td> <td></td> <td>☒</td> </tr> <tr> <td><u>12</u></td> <td><u>92</u></td> <td><u>97</u></td> <td><u>GRAVEL + CLAY</u></td> <td></td> <td>☒</td> </tr> </tbody> </table>	Mole Diam.	Depth		Material	Water		From	To	Yes	No	<u>16</u>	<u>0</u>	<u>3</u>	<u>TOP SOIL + GRAVEL</u>		☒	<u>16</u>	<u>3</u>	<u>20</u>	<u>GRAVEL + CLAY</u>		☒	<u>12</u>	<u>20</u>	<u>45</u>	<u>" " "</u>		☒	<u>12</u>	<u>45</u>	<u>51</u>	<u>CLAY AND GRAVEL</u>		☒	<u>12</u>	<u>51</u>	<u>65</u>	<u>COURSE SAND + GRAVEL</u>		☒	<u>12</u>	<u>65</u>	<u>77</u>	<u>COURSE SAND</u>		☒	<u>12</u>	<u>77</u>	<u>80</u>	<u>LARGE GRAVEL</u>		☒	<u>12</u>	<u>80</u>	<u>84</u>	<u>GRAVEL + CLAY</u>		☒	<u>12</u>	<u>84</u>	<u>92</u>	<u>LARGE GRAVEL</u>		☒	<u>12</u>	<u>92</u>	<u>97</u>	<u>GRAVEL + CLAY</u>		☒
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4. METHOD DRILLED ☐ Rotary ☐ Air ☐ Hydraulic ☐ Reverse rotary ☒ Cable ☐ Dug ☐ Other _____	10. DRILLER'S CERTIFICATION I/We certify that all minimum well construction standards were complied with at the time the rig was removed. Firm Name <u>Ken Smith Well Drilling</u> Firm No. <u>265</u> Address <u>Box 1328 Ketchum ID</u> Date <u>MAY 28, 2012</u> Signed by (Firm Official) <u>Ken Smith</u> and (Operator) <u>Ray Jones</u>																																																																						
5. WELL CONSTRUCTION Casing schedule: ☒ Steel ☐ Concrete ☐ Other _____ Thickness _____ Diameter _____ From _____ To _____ <u>315</u> inches <u>12</u> inches + <u>1</u> feet <u>97</u> feet Was casing drive shoe used? ☒ Yes ☐ No Was a packer or seal used? ☐ Yes ☒ No Perforated? ☒ Yes ☐ No How perforated? ☐ Factory ☒ Knife ☐ Torch Size of perforation <u>3/8</u> inches by <u>15</u> inches Number _____ Length _____ <u>12</u> perforations <u>75</u> feet <u>95</u> feet _____ perforations _____ feet _____ feet _____ perforations _____ feet _____ feet Well screen installed? ☐ Yes ☒ No Manufacturer's name _____ Type _____ Model No. _____ Diameter _____ Slot size _____ Set from _____ feet to _____ feet Diameter _____ Slot size _____ Set from _____ feet to _____ feet Gravel packed? ☐ Yes ☐ No ☐ Size of gravel _____ Placed from _____ feet to _____ feet Surface seal depth <u>20</u> feet Material used in seal: ☒ Cement grout ☐ Pudding clay ☐ Well cuttings Sealing procedure used: ☐ Slurry pit ☒ Temp. surface casing ☐ Overbore to seal depth Method of joining casing: ☐ Threaded ☒ Welded ☐ Solvent Weld Describe access port <u>2" galv. pipe with cap</u>	11. LOCATION OF WELL Section map location must agree with written location. Subdivision Name _____ Lot No. _____ Block No. _____ County <u>Blaine</u> NE <u>20</u> T. <u>3</u> N. R. <u>18</u> W.																																																																						

USE ADDITIONAL SHEETS IF NECESSARY - FORWARD THE WHITE COPY TO THE DEPARTMENT

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
WELL DRILLER'S REPORT

USE TYPE _____ OR
BALLPOINT PEN

State law requires that this report be filed with the Director, Department of Water Resources
within 30 days after the completion or abandonment of the well.

RECEIVED
AUG 30 1985

Pump
House #2

1. WELL OWNER Name <u>Heatherlands Subdivision</u> <u>% Chuck Ketterman</u> Address <u>Edwards, Howard & Martens Box 186</u> <u>Ketchum, ID 83340</u> Owner's Permit No. <u>37-85-C-0004-000</u>	7. WATER LEVEL Static water level <u>40</u> feet below surface. Flowing? ☐ Yes ☒ No G.P.M. <u>968</u> Artesian closed-in pressure _____ p.s.i. Controlled by: ☐ Valve ☐ Cap ☐ Plug Temperature <u>46</u> °F. Quality _____ Describe artesian or temperature zones below _____																																																																																		
2. NATURE OF WORK <u>W.R. 37-08220</u> ☒ New well ☐ Deepened ☐ Replacement ☐ Abandoned (describe abandonment procedures such as materials, plug depths, etc. in lithologic log)	8. WELL TEST DATA ☒ Pump ☐ Sailer ☐ Air ☐ Other _____ <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th>Discharge G.P.M.</th> <th>Pumping Level</th> <th>Hours Pumped</th> </tr> <tr> <td><u>530+</u></td> <td><u>50'</u></td> <td><u>8</u></td> </tr> </table> <u>Pumped 968 GPM from 59'2" for 1 1/2 hour.</u>	Discharge G.P.M.	Pumping Level	Hours Pumped	<u>530+</u>	<u>50'</u>	<u>8</u>																																																																												
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6. LOCATION OF WELL Sketch map location must agree with written location. Subdivision Name <u>Heatherlands</u> Lot No. <u>36 & 37</u> Block No. <u>2</u> County <u>Blaine</u> SE 1/4 SW 1/4 Sec. <u>17</u>, T. <u>3</u> N. R. <u>18</u> E. N.E.	10. Work started <u>7/26/85</u> finished <u>8/12/85</u>																																																																																		

USE ADDITIONAL SHEETS IF NECESSARY -- FORWARD THE WHITE COPY TO THE DEPARTMENT

37-8686

PHOTOGRAPHER AND DATE OF PHOTOS: Clay Webster, Cherie Palmer, Sandy Thiel, June 23, 2016
FILE NUMBERS 37-8220, 37-8686 and 37-8831



Well House 1



Well House 2



Irrigation Large
station
(22 sprinkler zone)
around
tennis courts





Well house # 1 Testing



Well house 1 at max capacity pressure
dropped to 12 PSI



Control Panel at Well
house #1 Pump 1
running as lead



Control Panel at Well house #1 Pump 2 running as lead



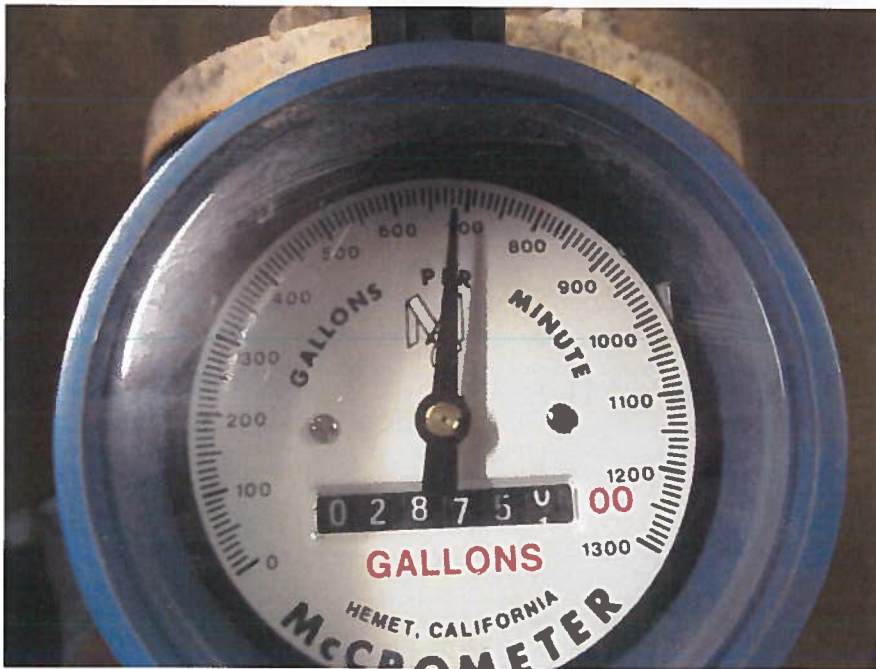
Inline pressure gage at Well house #1



Beginning of Macrometer test at Well house #1 Tested at 93% accurate



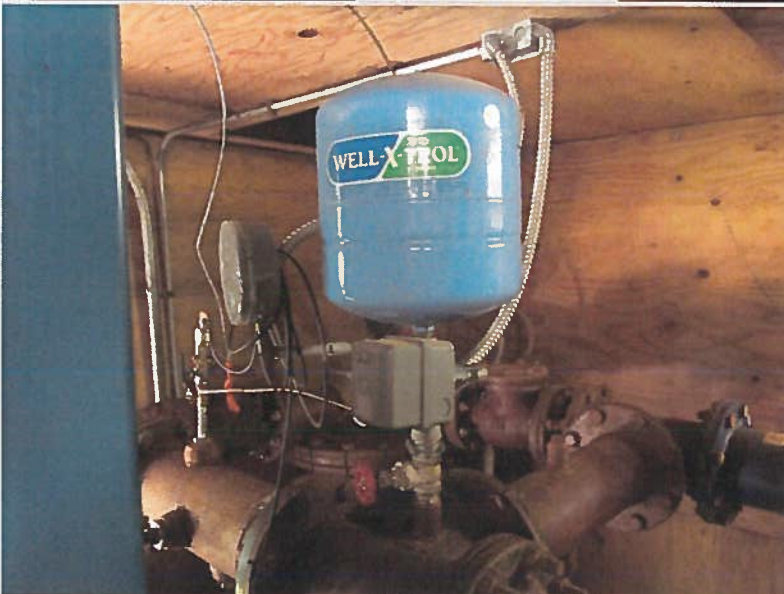
Beginning of
Macrometer test in
Well house #2



Well 1 Panel both
pumps maxed out
pressure 31.3 PSI then
15 PSI



Beginning of
Macrometer test in
Well house #2



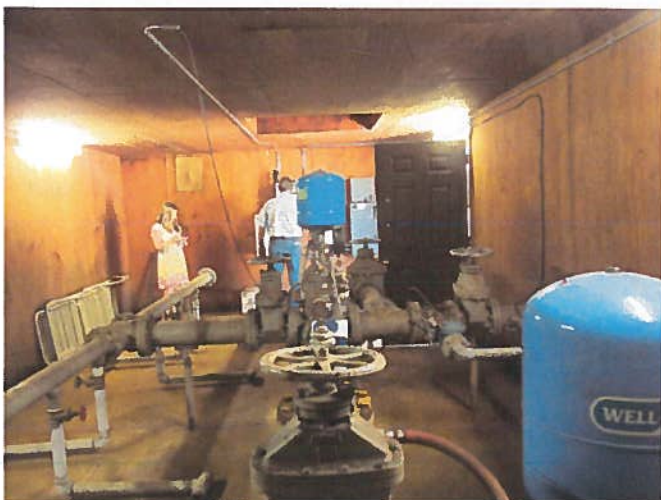
Pressure tank at Well
house #2



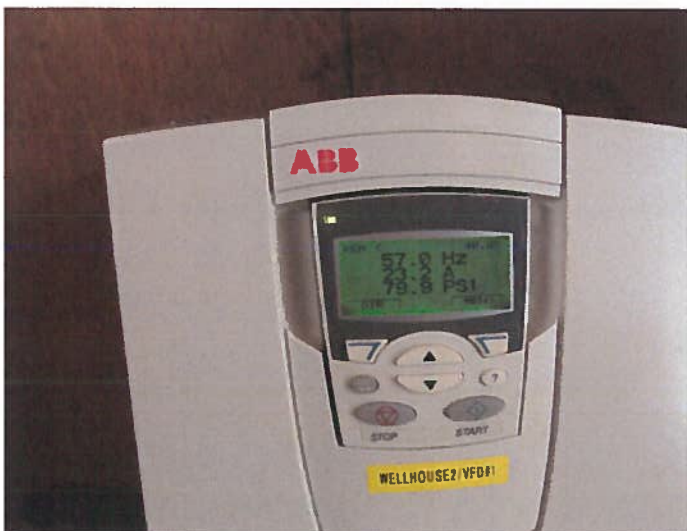
Setting up panametrics
at well house # 2



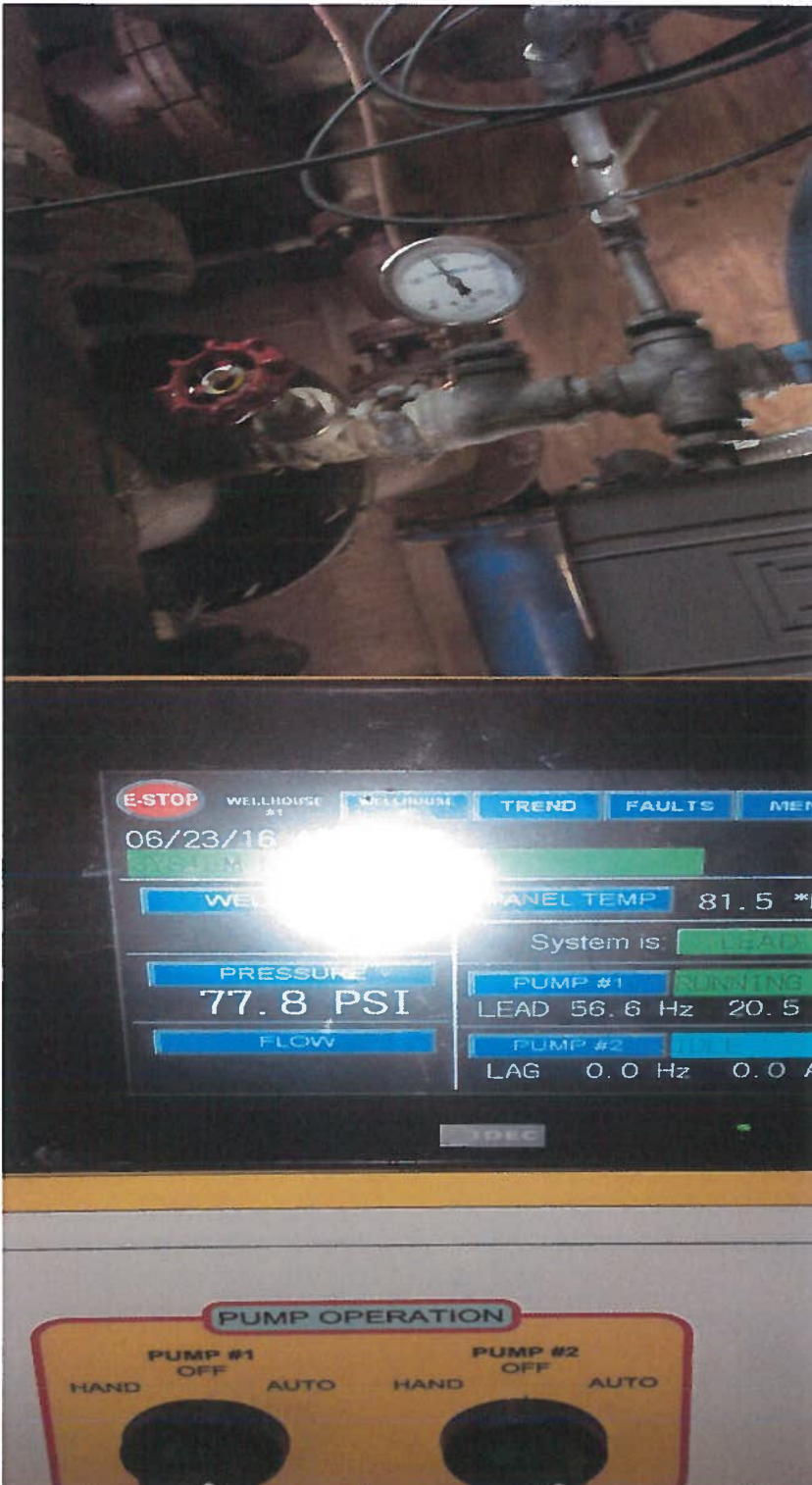
Wellhouse # 2 Line on
left is discharge line
right is service line



Well house #2



Variable Flow Drive
Well house #2



Pressure gage at Well house #2

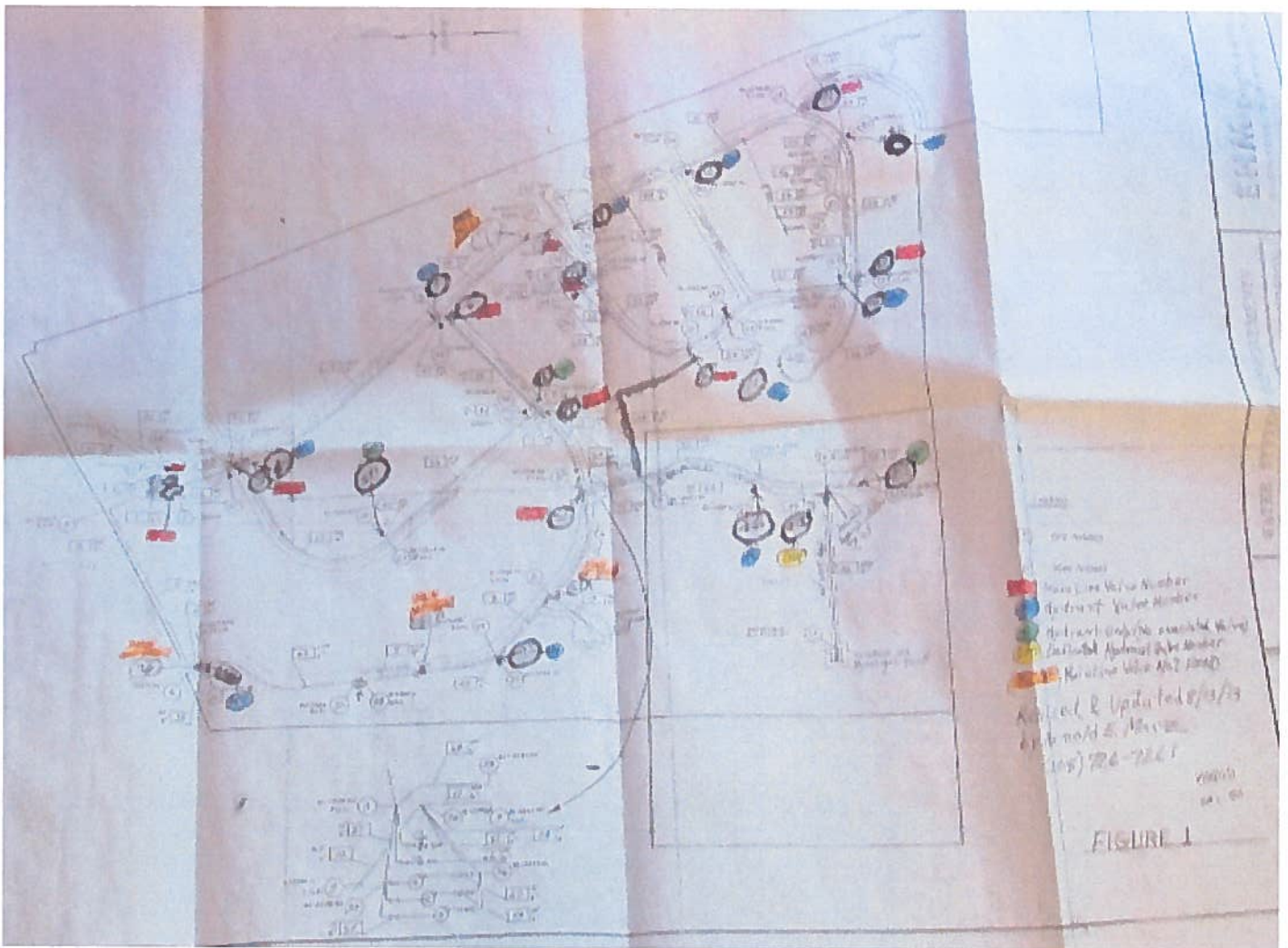
Well house # 2 Pump 1
lead pump 77.8 PSI



Well house # 2 both
pumps maxed out
Pressure dropped to 12
PSI



Variable Flow Drive at
Well house # 2 with
Wellhouse #1 as lead



As-built for improvements with fire hydrants shown as green and blue dots