

MEMORANDUM

TO: Water Right File 51-13106

FROM: Daniel Nelson – Analyst 3

DATE: November 13, 2020

SUBJECT: Licensing Review of Water Right 51-13106

The field exam for this right was performed by Certified Water Right Examiner Terry Scanlan of SPF Water Engineering. Mr. Scanlan recommended 3.90 cfs and 800 af of ground water for the irrigation of 200 acres.

History and Overlap:

The place of use for this permit falls within the borders of irrigation water right 2-10205 currently owned by the Idaho Water Resource Board. A large portion of this right was leased to the Bureau of Reclamation to provide mitigation water. There is still a portion of this water right that is available for lease.

At this time, the board doesn't supply any water to the lands that were originally irrigated by this water right. Therefore, no water is available to the permit holder for irrigation of the ground described as the place of use. This permit should be considered a primary water right.

This permit falls within the trust water area. Due to the size of the irrigation use, a condition was placed on the permit requiring a well recovery test and submit a report by a professional engineer, hydrologist, or hydrogeologist summarizing the hydrogeologic data collected and the aquifer properties estimated. Mr. Scanlan submitted this report with the field examination. Manuel Rauhut reviewed this information, and determined that it met the requirements of the permit and can produce the amount of water requested in the permit.

Point of Diversion Place of Use:

I don't have any issues with the points of diversion and places of use recommended by Mr. Scanlan. It should also be noted that the permit authorized 3 points of diversion, but the field examiner only found one point of diversion or well that is being used for irrigation. It should also be noted that only 200 acres were actually irrigated, so the permissible place of use condition should be removed at licensing. When I recreated the place of use in ArcMap, the acres per 40 acre tract varied slightly from the field examiner's acres. I used the acres found in our GIS shape, since it will be representative of the place of use in the Department's records. The difference in acres per 40 acre tract is probably due to rounding or the placement of the line. The total acreage will not change.

Diversion Rate:

The diversion rate was established during the well test. The water diverted during the well test was done through the pivots, so the tests do provide a reasonable diversion rate during normal operating conditions. The volume was also calculated correctly, so I have no issues with the diversion rate and volume recommend by Mr. Scanlan. There is a slight difference between the flow rate shown in Section D2 and Section F. Section F is the actual place to show the rate of diversion, and it matches the pump test records. There is only 1.5 gpm difference between the two flow rates, and they both are calculate out to approximately the recommended flow rate of 3.90 cfs. The flow rate in Section D2 should not be considered, since it is not the flow rate recommended by the field examiner and there is no evidence to confirm the flow rate. The flow rate recommended by the field examiner in Section F does have evidence to confirm the flow is accurate.

Conditions:

Conditions R64, 01M, 073, 933, and 934 should be carried forward to licensing. The condition requiring the monitoring should be removed, since the permit holder has complied with this condition. Condition 121 should be changed to condition 103 as is standard. The remaining of the conditions on the permit should be removed.

Condition X27 will be removed along with the acre limitation on the permit. The permit holder has not created a permissible place of use, so we can only license the 200 acres actually irrigated.

Memorandum

To: Dan Nelson & WR File #51-13106

From: Manuel Rauhut

Date: 11/6/2020

RE: Review of pump test required by condition on permit completed by SPF

IDWR received proof of beneficial use and a beneficial use field exam completed by Terry Scanlan with SPF Water Engineering (SPF). Also included with the field exam is a pumping test report with flow measurements (pump test) to specifically address the following condition on the permit:

"Prior to submitting the proof of beneficial use statement under this right, the right holder shall conduct a minimum 24-hour pumping and recovery test of at least one of the points of diversion authorized under this right to estimate well capacity, short-term aquifer capacity, and aquifer transmissivity. The right holder shall submit a report from a qualified professional engineer, hydrologist, or hydrogeologist summarizing the hydrogeologic data collected and aquifer properties estimated."

Review:

- The pump test was submitted concurrently with the proof of beneficial use statement rather than "prior to", but that is a technicality that is not relevant to the validity of the information provided.
- The field pump test was completed by Peter Vidmar, who is a licensed PE, and the associated report also included Terry Scanlan, who is a licensed PE & PG.
- The duration of the test meets the minimum time requirement of 24 hours (actual test duration was 24 hours and 11 minutes).
- Due to physical limitations water levels could not be measured in the pumping well, so an observation well 360 feet from the pumping well was used for water level measurements. This observation well is suitable for water level measurements as it is in close proximity to the pumping well, similar depth and a similar static water level as the pumping well (631 ft deep with a static water level of 546.5 feet). Note, that the static water level was 3.5 feet different between the two wells, but that can be attributed to ground elevation differences rather than aquifer water level differences.
- The irrigation well was in use prior to conducting the pump test. The engineer allowed the water level to recover for 3.5 hours prior to conducting the pump test. Given that the water level recovered within 10 minutes after the 24 hour pump test, the 3.5 hour waiting time was more than sufficient.

Conclusion:

- The pumping test data allowed for the calculation of well capacity, short-term aquifer capacity, and aquifer transmissivity, which suggests that the well can produce in excess of the diversion rate authorized under this permit.
- The report provided meets the requirements of the above referenced condition of the permit.

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

RECEIVED

OCT 30 2020

DEPARTMENT OF
WATER RESOURCES

A Beneficial Use Field Report is prepared by a water right examiner as the result of an examination to clearly confirm and establish the extent of the beneficial use of water established in connection with a permit during the development period authorized by the permit and any extensions of time previously approved.

A. GENERAL INFORMATIONPermit No. 51-131061. Owner Half Moon LLCPhone No. 208-322-5600Current address 911 E Winding Creek Dr Ste 150, Eagle, ID 836162. Examiner's name Terry Scanlan, CWRE 129EXAM DATE October 26, 2020

3. Accompanied by _____

Email _____

Address _____

Relationship to permit holder _____

Phone No. 208-761-01204. Source groundwater

tributary to _____

B. OVERLAP REVIEW1. Other water rights with the same place of use none2. Other water rights with the same source and point of diversion none**C. DIVERSION AND DELIVERY SYSTEM**

1. Point(s) of Diversion:

Ident. No.	Gov't Lot	¼	¼	¼	Sec	Twp	Rge	County	Method of Determination/Remarks
			NE	NE	25	6S	11E	Elmore	GIS, field exam, well report

2. Place(s) of Use:

Method of determination GIS, field exam

Twp	Rge	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
6S	11E	25	15	34	31	14	28	31	25	22									200

3. **Delivery System Diagram:** Indicate all major components and distances between components. Indicate weir size/ditch size/pipe diameter (inside), as applicable. Use the space provided or ☒ see attached.

Scale: 1" = _____

- ☒ Copy of USGS Quadrangle attached showing location(s) of point(s) of diversion and place(s) of use (**required**)
☒ Aerial photo attached (required for irrigation of 10+ acres)
☒ Photo of diversion and system attached

4.

Well or Diversion Identification No.*	Motor Make	Hp	Motor Serial No.	Pump Make	Pump Serial No. or Discharge Size
D0070643	US Motors	450	X027640398-0002	Hydroflo 14LH	10-inch; 9-stage pump

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

D. FLOW MEASUREMENTS

1.

Measurement Equipment	Type	Make	Model No.	Serial No.	Size	Calib. Date
Flow meter	Mag	Groszmar	IM3000	GT16100341	10-inch	March 2016

2. **Measurements:** _____

Totalized flow for a 24-hour pumping test indicated an average flow rate of 1753.5 gpm (2,526,800 gal / 1441 minutes).

E. NARRATIVE/REMARKS/COMMENTS

One well supplies two center pivot sprinkler systems that each irrigate 100 acres. The well was drilled to a total depth of 710 feet, and is completed with 20-inch casing to 110 feet, 16-inch liner from 47 to 311 feet, and 15-inch open hole to total depth.

Water is pumped from the well by a 450-hp vertical turbine pump with 600-foot setting depth on 10-inch column pipe. Pumping lift is 550 feet and discharge pressure is 50 psi. Allowing for 25 feet of column and discharge head loss, and 5 feet of miscellaneous friction loss, TDH is approximately 696 feet ($550' + 25' + 5' + (50 \text{ psi} \times 2.31'/\text{psi}) = 696'$). The pump is a 9-stage Hydroflo 14 LH (5 stages full trim, 4 stages 10.90" trim) rated for 1811 gpm (4.04 cfs) at 799 feet TDH. Pump is equipped with a variable frequency drive. Set point pressure is 50 psi. Water is discharged through 12-inch buried mainline approximately 2000 feet to the the east center pivot, and an additional 1200 feet to the west center pivot.

A 24-hour aquifer test was conducted as required by the permit. Pumping rate during 24-hour pumping test averaged 1752 gpm (3.90 cfs). Water levels were monitored in a nearby stockwater well during the test. Pump is variable speed (50 psi set-point pressure), and was running at less than full speed during 24-hour test. As a result, the measured rate is less than full capacity of the pump, but was adequate to operate both pivot sprinklers.

Attachment A - Aerial and Quadrangle Maps showing Place of Use, Point of Diversion, and System

Attachment B - Pumping Test Report with Flow Measurements

Attachment C - Well Driller's Report and Pump Information

Attachment D - Exam Photos

Has the permit holder met all conditions of permit approval, including any mitigation requirements and/or measuring device installation requirements? ☒ Yes ☐ No If no, what must be done to meet the permit requirements?

F. FLOW CALCULATIONS☐ Additional computation sheets attached

Measured Method:

totalizing flow meter for 24-hour test:

923,931,200 gallons on 10/23/20 at 16:04 hrs

926,466,400 gallons on 10/24/20 at 16:11 hrs

 $(923,931,200 - 926,466,400 \text{ gallons}) / 1447 \text{ minutes} = 1752 \text{ gallons per minute} = 3.90 \text{ cfs}$ **G. VOLUME CALCULATIONS**

1. Volume Calculations for Irrigation:

$$V_{I.R.} = (\text{Acres Irrigated}) \times (\text{Irrigation Requirement}) = 200 \text{ acres} \times 4.0 \text{ af/ac} = 800 \text{ afa}$$

$$V_{D.R.} = [\text{Diversion Rate (cfs)}] \times (\text{Days in Irrigation Season}) \times 1.9835 = 3.90 \times 246 \times 1.9835 = 1903 \text{ afa}$$

$$V = \text{Smaller of } V_{I.R.} \text{ and } V_{D.R.} = 800 \text{ afa}$$

2. Volume Calculations for Other Uses:

H. RECOMMENDATIONS

1. Recommended Amounts

Beneficial Use	Period of Use		Rate of Diversion	Annual Volume
	From	To	Q (cfs)	V (afa)
irrigation	3/15	11/15	3.90 cfs	800 afa
Totals:			3.90 cfs	800 afa

2. Recommended Amendments

☐ Change P.D. as reflected on page 1☐ Add P.D. as reflected on page 1☒ None☐ Change P.U. as reflected on page 1☐ Add P.U. as reflected on page 1☐ Other**I. AUTHENTICATION**

Field Examiner's Signature

Terry M. Scanlan

Date

10/30/2020

SEAL

Reviewer

Date

Attachment A

Aerial and Quadrangle Maps showing Place of Use, Point of Diversion, and System

Legend



Irrigation Well



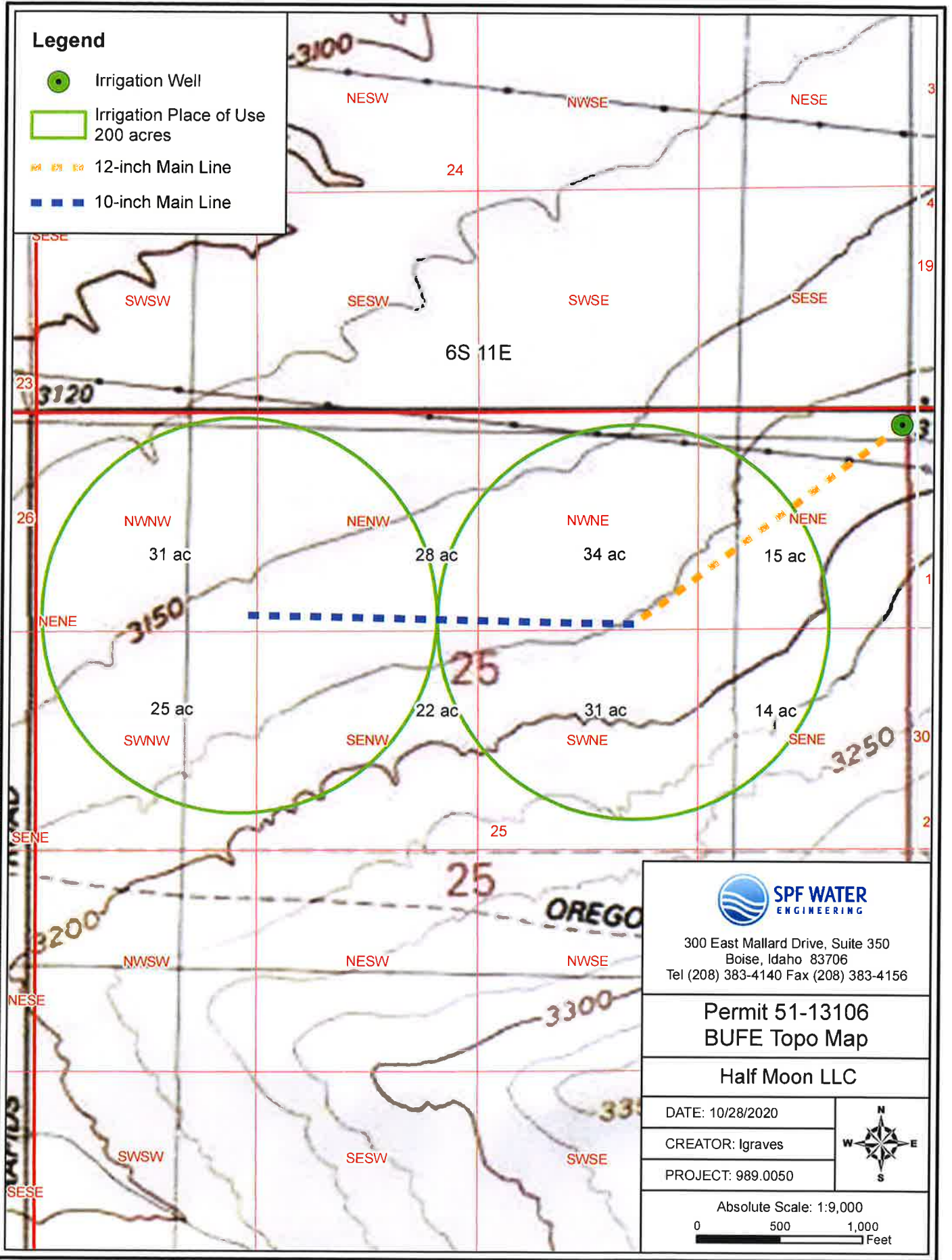
Irrigation Place of Use
200 acres



12-inch Main Line



10-inch Main Line



**SPF WATER
ENGINEERING**

300 East Mallard Drive, Suite 350
Boise, Idaho 83706
Tel (208) 383-4140 Fax (208) 383-4156

**Permit 51-13106
BUFE Topo Map**

Half Moon LLC

DATE: 10/28/2020

CREATOR: Igraves

PROJECT: 989.0050



Absolute Scale: 1:9,000

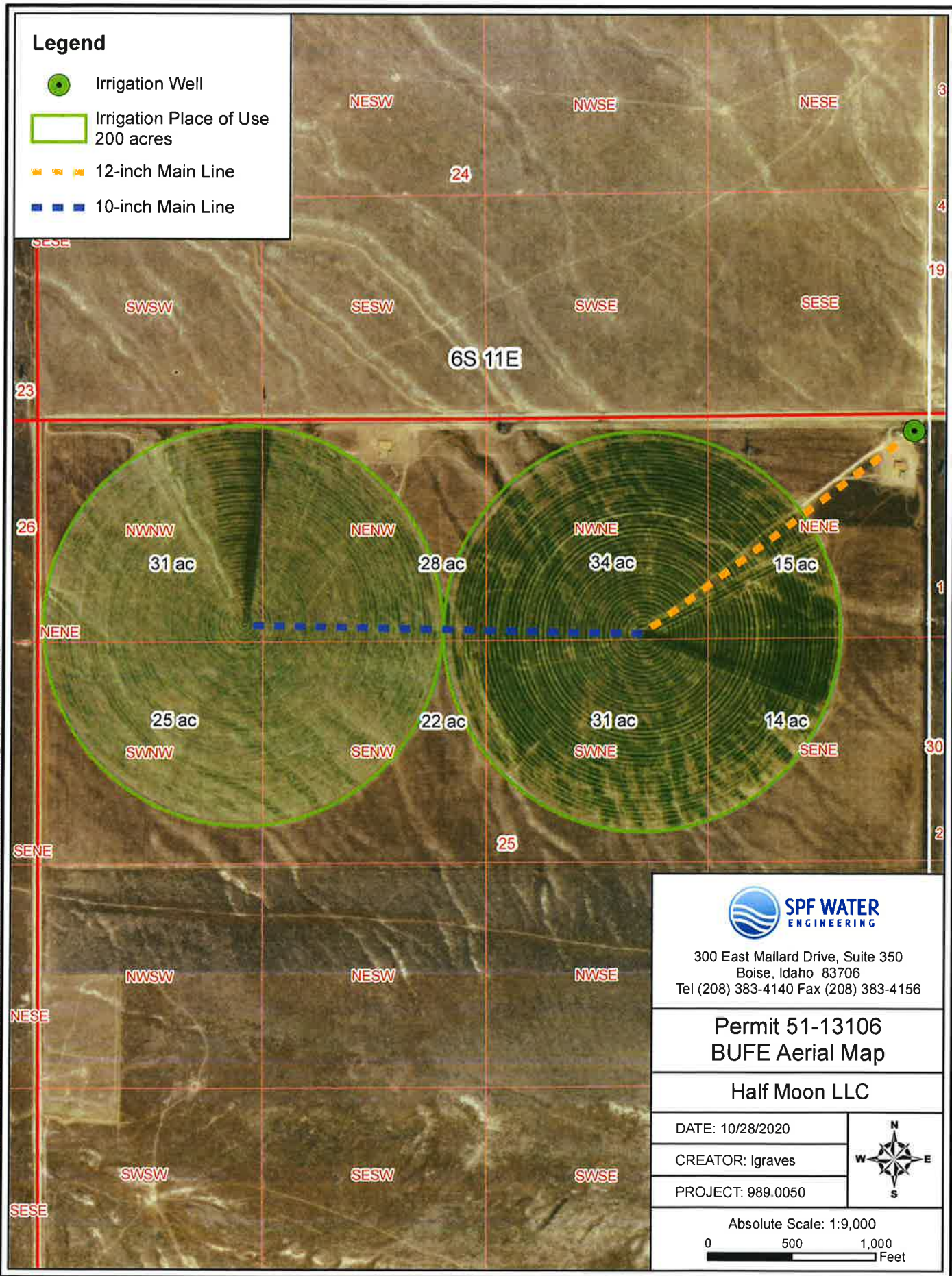
0 500 1,000
Feet

 Irrigation Well

 Irrigation Place of Use
200 acres

12-inch Main Line

 10-inch Main Line



300 East Mallard Drive, Suite 350
Boise, Idaho 83706
Tel (208) 383-4140 Fax (208) 383-4156

Permit 51-13106
BUFE Aerial Map

Half Moon LLC

DATE: 10/28/2020

CREATOR: Igraves

PROJECT: 989.0050



Absolute Scale: 1:9,000

0 500 1,000 Feet

Attachment B
Pumping Test Report with Flow Measurements

MEMORANDUM

DATE: October 30, 2020
TO: Idaho Department of Water Resources
FROM: Peter Vidmar, P.E. and Terry Scanlan, P.E., P.G.
CC: SPF File 989.0050
RE: Half Moon Ranch Aquifer Test – Permit 51-13106



BACKGROUND

Permit 51-13106 contains the following condition.

Prior to submitting the proof of beneficial use statement under this right, the right holder shall conduct a minimum 24-hour pumping and recovery test of at least one of the points of diversion authorized under this right to estimate well capacity, short term aquifer capacity, and aquifer transmissivity. The right holder shall submit a report from a qualified professional engineer, hydrologist, or hydrogeologist summarizing the hydrogeologic data collected and aquifer properties estimated.

A pumping test of the Half Moon Ranch irrigation well was conducted on October 23 and 24, 2020 in fulfillment of this condition.

TEST DESCRIPTION

The test was conducted by pumping the irrigation well through the pivot irrigation system for slightly more than 24 hours. Testing was conducted by Peter Vidmar, P.E., of SPF Water Engineering.

The pumping well (Attachment A) was drilled in 2016 to a total depth of 710 feet, and is completed with 20-inch casing to 110 feet, 16-inch liner from 47 to 311 feet, and 15-inch open hole to total depth. Static water level was 550 feet.

The pump used for testing consists of the installed 450-hp vertical turbine pump with a 600-foot setting depth. The pump discharges through buried mainline to center-pivot sprinklers that irrigate 200 acres. The pump is variable speed, with speed modulated to maintain a constant discharge pressure of 50 psi. Pump capacity at full speed is estimated at approximately 2200 gpm, but the rate while pumping to the two installed pivots is approximately 1750 gpm.

An attempt was made to measure water levels in the pumping well. An access port is available, but due to the tight fit between the pump column and borehole, a well sounder could not reach the water table.

As an alternative, an observation well located 360 feet to the northeast was used for water level measurements. The observation well consists of a 631-foot deep stockwater well that was constructed in 2011 (Attachment B). The pump was removed from the well to allow access for installation of a pressure transducer and an electric-line well sounder for manual water-level measurement. The pressure transducer consisted of a Solinst Levellogger installed on stainless-steel cable to a depth of approximately 600 feet and a Solinst Barologger to compensate for barometric pressure changes. The well sounder was a 1000-foot non-stretch Waterline. Static water level was 546.5 feet below top of casing at the start of testing.

Flow rate during testing was measured using the magnetic flow meter (10-inch Growsmart IM3000). Totalized flow measurements were utilized for test analysis. Instantaneous flow rates were recorded, but were approximately 5% less than the rate determined from totalized flow.

Due to a miscommunication with the farm manager, the irrigation well was running to one pivot (approximately 860 gpm) when SPF staff arrived on site for testing. The well was turned off, and water levels were allowed to recover for 3.5 hours prior to testing.

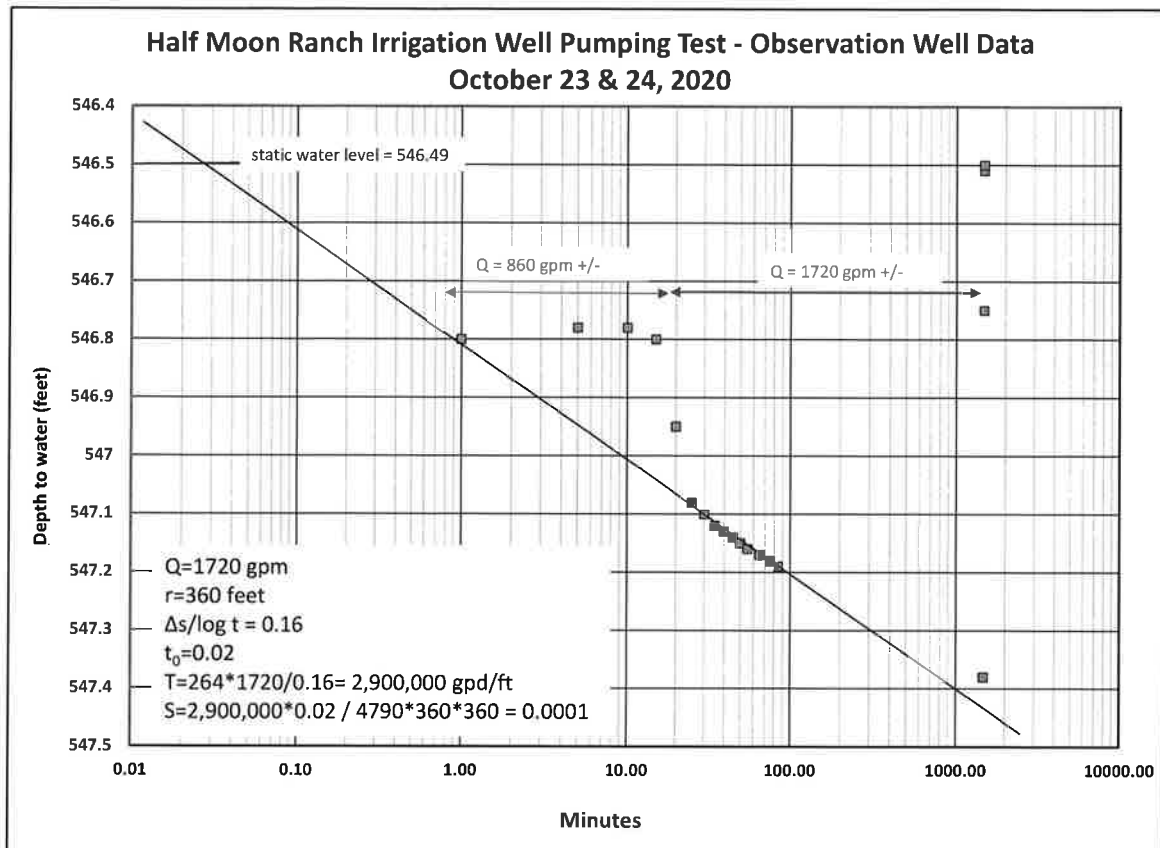
Test pumping began at 3:35 pm on October 23 by starting the well pump with one center pivot sprinkler operating at approximately 875 gpm. After 20 minutes, the second pivot was started at a rate of approximately 1750 gpm. The 1750 gpm rate was maintained until 4:11 pm on October 24 (24 hours and 11 minutes), after which the pump was turned off and water levels recovered.

The water level in the observation well recovered to essentially static level within 10 minutes of ending the test. The transducer was left in the observation well until October 26.

When SPF attempted to remove the transducer on October 26, it was found to be stuck in the borehole. The transducer connection eventually broke, allowing removal of the stainless-steel cable but not the transducer. As a result, the transducer data from the test was lost.

ANALYSIS

Test data are provided in Attachment C. A semi-log plot is provided as Figure 1.



The aquifer transmissivity calculated from drawdown data is approximately 3,000,000 gpd/ft. Storativity is calculated at 0.0001.

The rate of water-level recovery from pumping was too rapid to provide suitable manual data for recovery analysis. Water level was within 0.01 feet of the pre-test static water level within 3 minutes of turning off the pump.

DISCUSSION

The pumping test data indicate that the aquifer responds to pumping as a highly transmissive confined aquifer. Although drawdown data for the pumping well are not available, the observation well data suggest that the pumping well can likely produce the observed 1750 gpm pumping rate with less than 10 feet of drawdown. The well can potentially produce in excess of 5000 gpm, although actual well capacity is probably limited to less than 3000 gpm by the size of the pump that can be installed in the 15-inch diameter borehole.

The test demonstrates that the aquifer has capacity to easily produce the 4 cfs diversion rate authorized under permit 51-13106, and can likely produce substantially more water on a short-

term basis. Long-term sustainable yield from the aquifer cannot be determined from a 24-hour pumping test. Sustainable yield is best determined through annual water-level monitoring.

51-13106 Pumping Test Report
Attachment A
Pumping Well Driller's Report

IDAHO DEPARTMENT OF WATER RESOURCES WELL DRILLER'S REPORT

1. WELL TAG NO. D 0070643

Drilling Permit No. 972116-878173

Water right or injection well # 51-13106

2. OWNER:

Name Half Moon Ranch

Address 911 E. Winding Creek Dr., Ste. 150

City Eagle State ID Zip 83616

3. WELL LOCATION:

Twp. 6 North ☐ or South ☒ Rge. 11 East ☒ or West ☐
Sec. 25 1/4 NE 1/4 NE 1/4

Gov't Lot _____ County Elmore

Lat. 42 ° 52.779 (Deg. and Decimal minutes)

Long. 115 ° 5.244 (Deg. and Decimal minutes)

Address of Well Site 2.54 m. W of Twin Falls county line on N.

Bell Rapids Rd City Glenns Ferry

Lot _____ Bk. _____ Sub. Name _____

4. USE:

☐ Domestic ☐ Municipal ☐ Monitor ☒ Irrigation ☐ Thermal ☐ Injection
☐ Other _____

5. TYPE OF WORK:

☒ New well ☐ Replacement well ☐ Modify existing well
☐ Abandonment ☐ Other _____

6. DRILL METHOD:

☒ Air Rotary ☐ Mud Rotary ☐ Cable ☐ Other _____

7. SEALING PROCEDURES:

Seal material	From (ft)	To (ft)	Quantity (lbs or ft³)	Placement method/procedure
Bentonite	0	47	2,850 lbs	Poured

8. CASING/LINER:

Diameter (nominal)	From (ft)	To (ft)	Gauge/Schedule	Material	Casing	Inner	Threaded	Welded
20	+2	110	.250	Steel	☒	☐	☐	☒
16	47	311	.375	Steel	☒	☐	☐	☒

Was drive shoe used? ☐ Y ☒ N Shoe Depth(s) _____

9. PERFORATIONS/SCREENS:

Perforations ☐ Y ☐ N Method _____

Manufactured screen ☐ Y ☒ N Type _____

Method of installation _____

From (ft)	To (ft)	Slot size	Number/ft	Diameter (nominal)	Material	Gauge or Schedule
-----------	---------	-----------	-----------	--------------------	----------	-------------------

Length of Headpipe _____ Length of Tailpipe _____

Packer ☐ Y ☐ N Type _____

10. FILTER PACK:

Filter Material	From (ft)	To (ft)	Quantity (lbs or ft³)	Placement method
-----------------	-----------	---------	-----------------------	------------------

11. FLOWING ARTESIAN:

Flowing Artesian? ☐ Y ☒ N Artesian Pressure (PSIG) _____

Describe control device _____

12. STATIC WATER LEVEL and WELL TESTS:

Depth first water encountered (ft) 580' Static water level (ft) 550'

Water temp. (°F) cold Bottom hole temp. (°F) _____

Describe access port WELL CAP

Well test:

Drawdown (feet)	Discharge or yield (gpm)	Test duration (minutes)
N/A		

Test method:

Pump	Bailer	Air	Flowing artesian
☐	☐	☐	☐

Water quality test or comments: _____

13. LITHOLOGIC LOG and/or repairs or abandonment:

Bore Dia. (in)	From (ft)	To (ft)	Remarks, lithology or description of repairs or abandonment, water temp.	Water	
				Y	N
24	0	108	SANDY CLAY w/ GRAVEL		X
	108	110	FRACTURED GRAY BASALT		X
19	110	216	FRACTURED GRAY BASALT		X
	216	220	CLAY & GRAVEL		X
	220	311	GRAY SAND		X
15	311	330	BLACK SANDSTONE		X
	330	580	GRAY BASALT		X
	580	584	RED ASH & CINDERS	X	
	584	710	FRACTURED GRAY BASALT	X	

RECEIVED

JUL 18 2016

WATER RESOURCES
WESTERN REGION

Completed Depth (Measurable): 707'

Date Started: 3/24/16

Date Completed: 7/11/16

14. DRILLER'S CERTIFICATION:

I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

Company Name Eising Drilling & Pump Co Inc Co No. 669

*Principal Driller Craig Eising Date 7/14/16

*Driller [Signature] Date _____

*Operator II [Signature] Date 7/14/16

Operator I _____ Date _____

* Signature of Principal Driller and rig operator are required.

51-13106 Pumping Test Report
Attachment B
Observation Well Driller's Report

IDAHO DEPARTMENT OF WATER RESOURCES WELL DRILLER'S REPORT

860759

1. WELL TAG NO. D 0057962

Drilling Permit No. _____
Water right or injection well # _____

2. OWNER:

Name Juan Gutierrez
Address P.O. Box 154
City Glenns Ferry State ID. Zip 83623

3. WELL LOCATION:

Twp. 6 North ☐ or South ☒ Rge. 12 East ☒ or West ☐
Sec. 30 19 SW 1/4 NW 1/4 SW 1/4

Gov't Lot _____ County Elmore
Lat. 42 ° 52.7833 (Deg. and Decimal minutes)
Long. -115 ° 5.1667 N side of (Deg. and Decimal minutes)
Address of Well Site P.O. Box 154, North Bell Rapids Road,
NE of Old Oregon Trail Hwy City Glenns Ferry
(Give at least name of road + distance to road or landmark)
Lot. _____ Blk. _____ Sub. Name _____

4. USE:

☒ Domestic ☐ Municipal ☐ Monitor ☐ Irrigation ☐ Thermal ☐ Injection
☐ Other _____

5. TYPE OF WORK:

☐ New well ☒ Replacement well ☐ Modify existing well
☐ Abandonment ☐ Other _____

6. DRILL METHOD:

☒ Air Rotary ☐ Mud Rotary ☐ Cable ☐ Other _____

7. SEALING PROCEDURES:

Seal material	From (ft)	To (ft)	Quantity (lbs or ft ³)	Placement method/procedure
Bentonite #5	0	405'	5900 lbs	Overbore Pour

8. CASING/LINER:

Diameter (nominal)	From (ft)	To (ft)	Gauge/Schedule	Material	Casing	Liner	Threaded	Welded
6 5/8"	+2'	405'	.250	Steel	☒	☐	☐	☒

Was drive shoe used? ☒ Y ☐ N Shoe Depth(s) 405 feet

9. PERFORATIONS/SCREENS:

Perforations ☐ Y ☒ N Method _____
Manufactured screen ☐ Y ☒ N Type _____
Method of installation _____

From (ft)	To (ft)	Slot size	Number/ft	Diameter (nominal)	Material	Gauge or Schedule
-----------	---------	-----------	-----------	--------------------	----------	-------------------

Length of Headpipe _____ Length of Tailpipe _____
Packer ☐ Y ☒ N Type _____

10. FILTER PACK:

Filter Material	From (ft)	To (ft)	Quantity (lbs or ft ³)	Placement method
-----------------	-----------	---------	------------------------------------	------------------

11. FLOWING ARTESIAN:

Flowing Artesian? ☐ Y ☒ N Artesian Pressure (PSIG) _____
Describe control device _____

12. STATIC WATER LEVEL and WELL TESTS:

Depth first water encountered (ft) 540' Static water level (ft) 536'
Water temp. (°F) NA Bottom hole temp. (°F) _____
Describe access port Through top of well seal

Well test:

Drawdown (feet)	Discharge or yield (gpm)	Test duration (minutes)
<u>na</u>	<u>na</u>	<u>90</u>
<u>LOST CIRCULATION</u>		

Test method:

Pump	Bailer	Air	Flowing artesian
☐	☐	☒	☐

Water quality test or comments: _____

13. LITHOLOGIC LOG and/or repairs or abandonment:

Bore Dia. (in)	From (ft)	To (ft)	Remarks, lithology or description of repairs or abandonment, water temp.	Water	
				Y	N
10"	0	8'	Topsoil		X
10"	8'	12'	Silty sand		X
10"	12'	26'	Tan clay		X
10"	26'	30'	Gravel		X
10"	30'	91'	Tan clay		X
10"	91'	94'	Blue clay		X
8"	94'	101'	Blue clay		X
8"	101'	127'	Gray lava		X
8"	127'	138'	Gray and brown lava		X
8"	138'	139'	Void		X
8"	139'	153'	Gray and brown lava soft broken up with wateralc		X
8"	153'	156'	Lost circulation		X
8"	156'	207'	Medium broken up		X
8"	207'	254'	Hard broken up		X
8"	254'	265'	Soft		X
8"	265'	276'	Medium		X
8"	276'	402'	Medium soft		X
8"	402'	403'	Hard		X
6"	403'	420'	Gray lava		X
6"	420'	437'	Brown lava		X
6"	437'	442'	Broken up lost circulation		X
6"	442'	509'	Soft		X
6"	509'	515'	Broken up soft		X
6"	515'	607'	Medium	X	
6"	607'	631'	Very soft	X	

RECEIVED

APR 04 2011

WATER RESOURCES

WESTERN REGION
Completed Depth (Measurable): 615 feet

Date Started: Mar 7, 2011 Date Completed: Mar 21, 2011

14. DRILLER'S CERTIFICATION:

I/We certify that all minimum well construction standards were complied with at the time the rig was removed.

Company Name Hiddleston Drilling Co. No. 35

*Principal Driller [Signature] Date 3/31/2011

*Driller _____ Date _____

*Operator II [Signature] Date 4-1-11

Operator I _____ Date _____

* Signature of Principal Driller and rig operator are required.

51-13106 Pumping Test Report
Attachment C
Test Data

Half Moon Ranch Irrigation Well Test - October 23 and 24, 2020

Tested by Peter Vidmar (SPF Water Engineering).

Pump: 450-hp vertical turbine, 600-foot setting depth, variable speed, electric motor

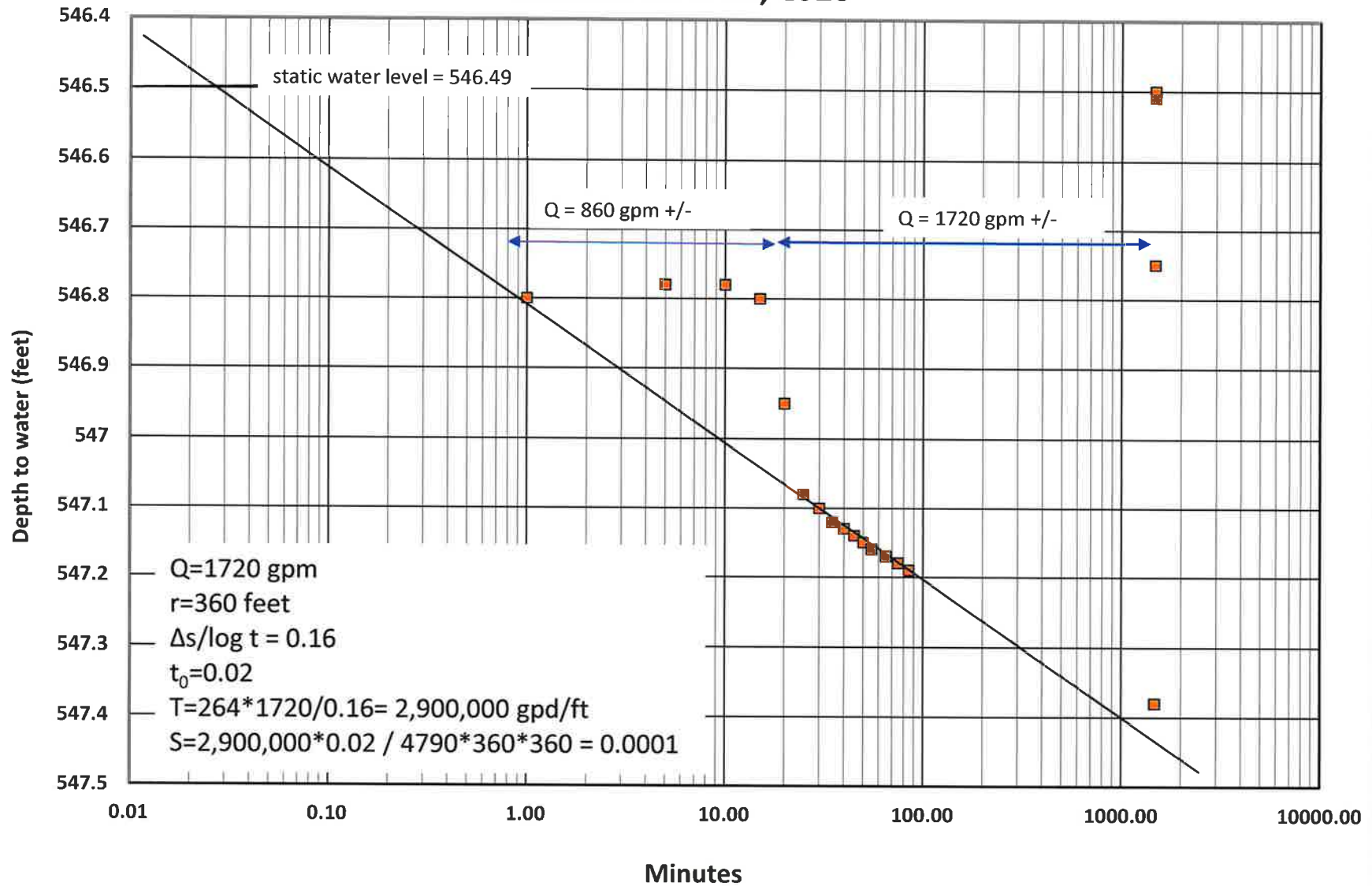
Flow rates measured by 10-inch Growsmart magnetic flow meter

Observation well water level measured with 100-foot non-stretch Waterline sounder

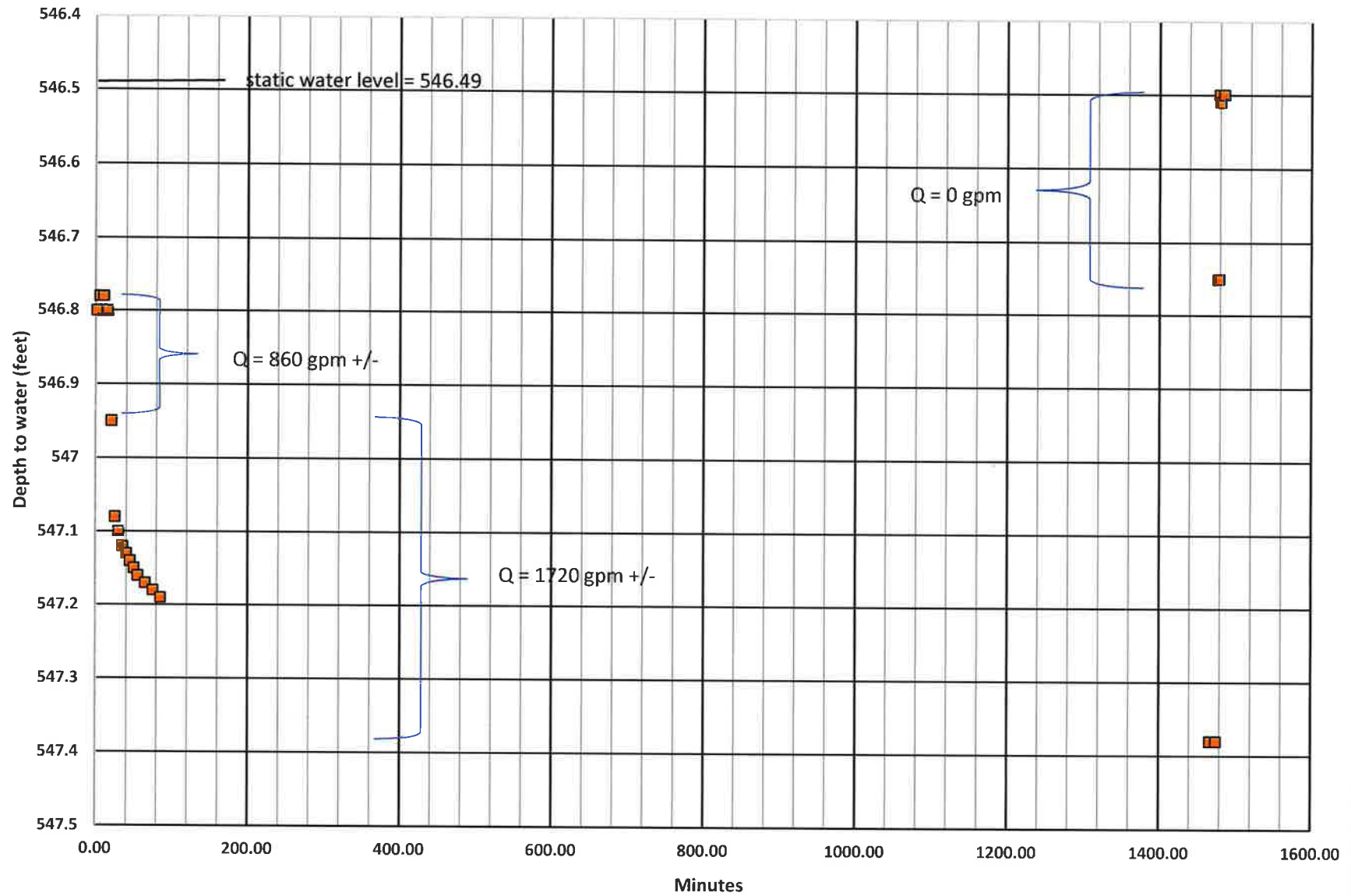
Observation well measurement point top of well casing, 1.6 feet above ground surface

Date and Time (MST)	t (min)	t' (min)	t/t'	Observation Well DTW (ft)	Drawdown (ft)	Totalizer (gallons)	Remarks
10/23/2020 12:00							pump running at 820 gpm; turn off
10/23/2020 15:29				546.49			
10/23/2020 15:32						923,899,000	
10/23/2020 15:35	0						pump on; 1200 gpm instantaneous while filling lines
10/23/2020 15:36	1			546.8	0.31		
10/23/2020 15:40	5			546.78	0.29		
10/23/2020 15:45	10			546.78	0.29		
10/23/2020 15:52	17						stable at 860 gpm instantaneous
10/23/2020 15:50	15			546.8	0.31		
10/23/2020 15:55	20			546.95	0.46		
10/23/2020 15:57	22						start second pivot
10/23/2020 16:00	25			547.08	0.59		
10/23/2020 16:04	29					923,931,200	1680 gpm instantaneous
10/23/2020 16:05	30			547.1	0.61		
10/23/2020 16:10	35			547.12	0.63		
10/23/2020 16:12	37						1682 gpm instantaneous
10/23/2020 16:15	40			547.13	0.64		
10/23/2020 16:20	45			547.14	0.65		
10/23/2020 16:25	50			547.15	0.66		
10/23/2020 16:30	55			547.16	0.67		
10/23/2020 16:40	65			547.17	0.68		
10/23/2020 16:43	68					923,998,700	1682 gpm instantaneous, 1730 gpm totalizer since 16:04
10/23/2020 16:47	72					924,025,200	1682 gpm instantaneous; 72 minute average = 1752 gpm
10/23/2020 16:50	75			547.18	0.69		
10/23/2020 17:00	85			547.19	0.70		
10/24/2020 16:02	1467			547.38	0.89		
10/24/2020 16:05	1470					926,458,000	1620 gpm instantaneous
10/24/2020 16:10	1475			547.38	0.89		
10/24/2020 16:11	1476	0				926,466,400	pump off, 24-hour average flow rate 1752 gpm; 24.6-hour average 1739 gpm
10/24/2020 16:13	1478	2	739	546.75	0.26		Recovery
10/24/2020 16:14	1479	3	493	546.5	0.01		
10/24/2020 16:15	1480	4	370	546.51	0.02		
10/24/2020 16:20	1485	9	165	546.5	0.01		

Half Moon Ranch Irrigation Well Pumping Test - Observation Well Data October 23 & 24, 2020



Half Moon Ranch Irrigation Well Pumping Test - Observation Well Data October 23 & 24, 2020



Attachment C
Well Driller's Report and Pump Information

PUMP & WELL INFORMATION

TO: TERRY SCANLON		TODAY'S DATE: 10/27/2020					
SPF WATER ENGINEERING		PUMP ORIGINALLY SOLD TO: HALF MOON RANCH					
INSIDE DIA. OF WELL:		MOTOR INFORMATION:					
DEPTH OF WELL:	660'	HP:	450	PHASE:	3	RPM:	1800
STATIC WATER LEVEL:	540'	VOLTS:	460	SRC	X	NRR	
DRAWDOWN:		MAKE:	U.S. PREMIUM EFFICIENT				
SPEED OF PUMP:							

PUMP INFORMATION

SERIAL #	LP-17007	HEAD BRAND	GOULD'S	SETTING:	600 FT OF 10" X 3" X 1-15/16"		
DESIGN CAPACITY:	1811	GPM		COLUMN TUBE & SHAFT ASSEMBLY			
TOTAL DYNAMIC HEAD:	799	TDH					
HP REQUIRED:	433 BHP	EFFICIENCY:	84%				
OIL LUBE OR WATER LUBE?:	OIL LUBE						
BOWL BRAND:	HYDROFLO						
MODEL & # OF STAGES:	14LH 9 STAGE						
# IMPELLERS AT F.D:	5	# TRIMMED:	4	TO:	10.900		
BASKET OR CONE STRAINER?:							
INFORMATION IS FROM, DATE:				1/20/1900			
INFORMATION IS GIVEN BY:				TAWNA ROOT			



LAYNE PUMPS, INC
P.O. BOX 640
TWIN FALLS, ID 83303
208-733-3284 FAX 208-423-5137

Company: Layne Pumps, Inc
Name:
Date: 3/13/2017



Pump:

Size: 14LH (9 stage)
Type: Vertical
Synch Speed: 1800 rpm
Curve: 121110
Specific Speeds:
Ns: ---
Nss: ---
Dimensions:
Suction: 10 in
Discharge: 12 in
Vertical Turbine:
Bowl Size: 14 in
Max Lateral: 0.875 in
Thrust K Factor: 8.41 lbf/ft

Search Criteria:

Flow: 1800 US gpm Head: 790 ft

Fluid:

Water
Density: 62.32 lb/ft³
Viscosity: 0.9946 cP
NPSHa: ---
Temperature: 68 °F
Vapor Pressure: 0.3391 psi a
Atm Pressure: 14.7 psi a

Motor:

Standard: NEMA
Enclosure: WP1
Sizing Criteria: Max Power on Design Curve
Size: 450 hp
Speed: 1800 rpm
Frame: 449T

Pump Limits:

Temperature: 140 °F
Pressure: 300 psi g
Sphere Size: 0.5 in
Power: 600 hp
Eye Area: 25.3 in²

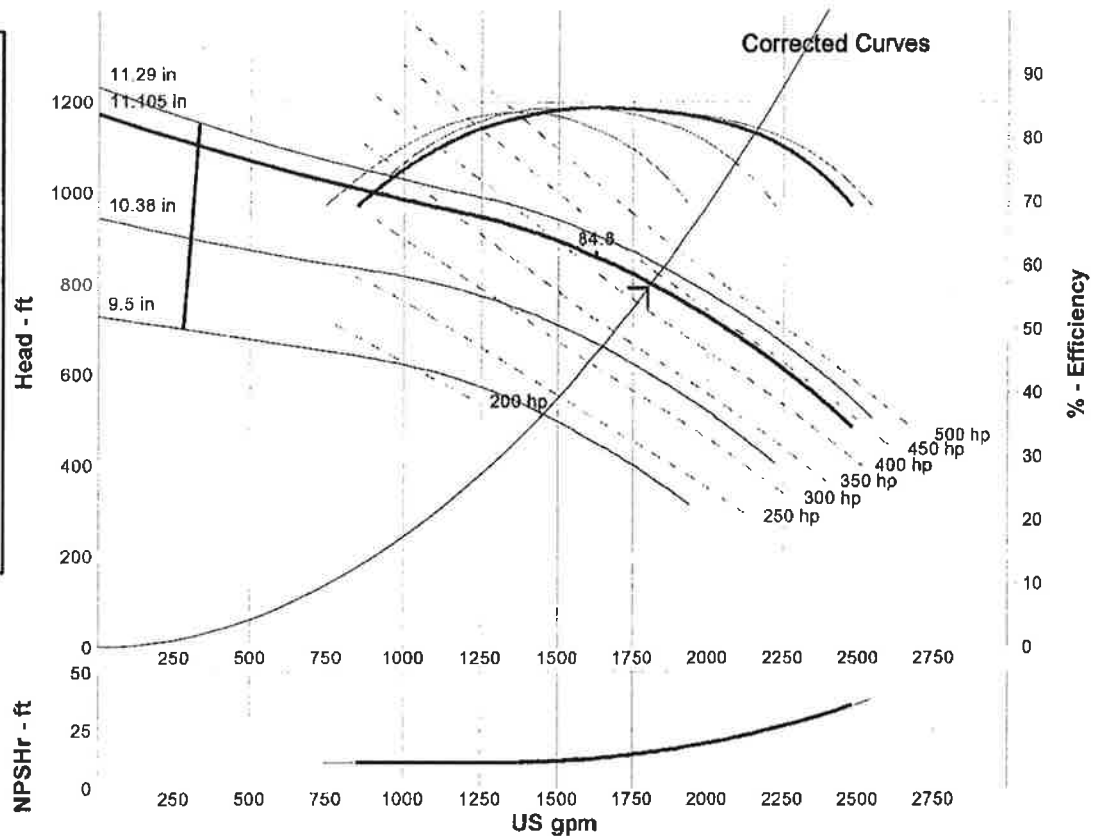
Pump Selection Warnings:

Pump shutoff dP exceeds limit for the pump.

Curve Corrections:

Factors: Head x 0.988 Eff x 1.02
Curve corrections may affect the minimum flow requirement. Consult pump manufacturer for more information.

Duty Point	
Flow:	1811 US gpm
Head:	799 ft
Eff:	84.3%
Power:	433 hp
NPSHr:	15.5 ft
Design Curve	
Shutoff Head:	1174 ft
Shutoff dP:	508 psi
Min Flow:	326 US gpm
BEP:	84.8% @ 1629 US gpm
NOL Power:	444 hp @ 2107 US gpm
Max Curve	
Max Power:	475 hp @ 2159 US gpm



Performance Evaluation:

Flow US gpm	Speed rpm	Head ft	Efficiency %	Power hp	NPSHr ft
2160	1780	656	80.6	443	23.8
1800	1780	803	84.4	432	15.3
1440	1780	909	84	393	11.5
1080	1780	973	77.4	342	11.1
720	1780	1034	64.3	295	11.1

Attachment D
Exam Photos



Irrigated lands



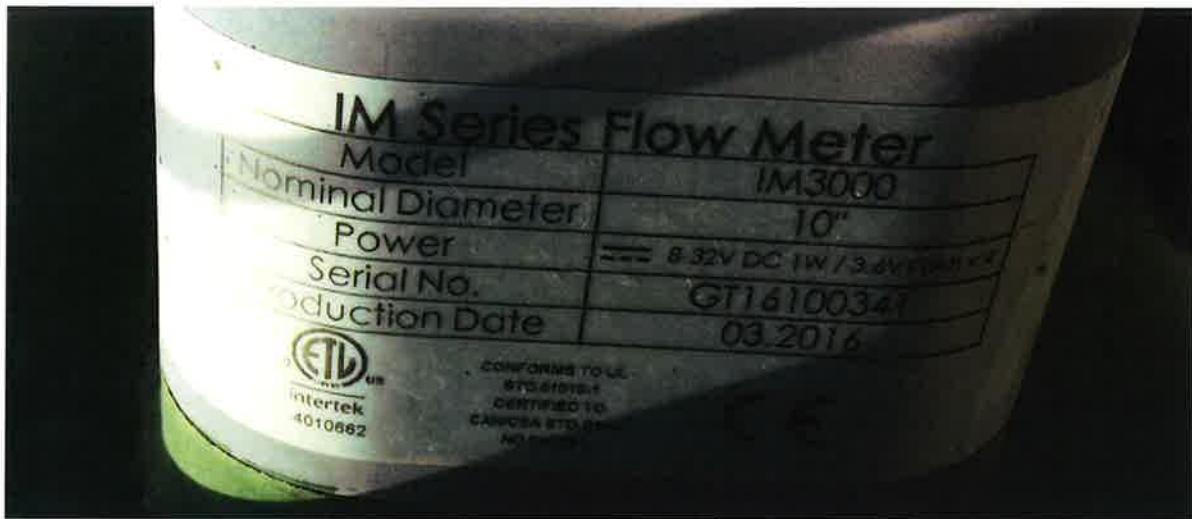
Well with 450-hp vertical turbine pump and discharge piping



Discharge piping and well pump.



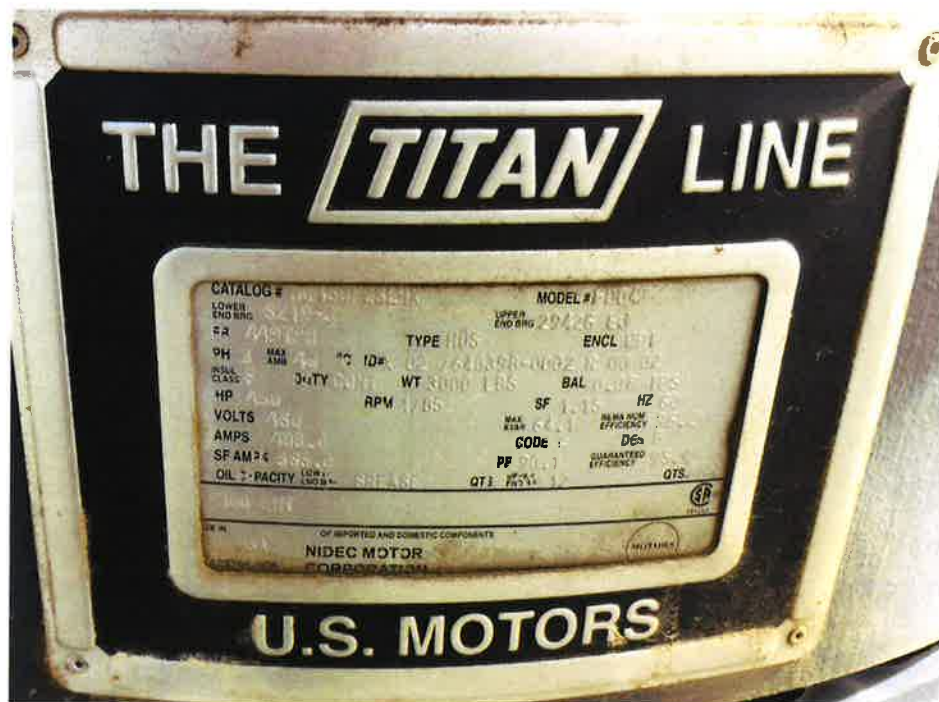
magnetic flow meter on discharge pipe



Flow meter nameplate



Flow meter totalizer



Well pump motor nameplate



Well pump VFD



SPF WATER
ENGINEERING

RECEIVED

OCT 30 2020

DEPARTMENT OF
WATER RESOURCES

October 30, 2020

Dan Nelson
Idaho Department of Water Resources
322 East Front Street
Boise, ID 83702-7371

Subject: 51-13106 – Proof of Beneficial Use and Beneficial Use Field Report

Dear Dan:

Enclosed on behalf of Half Moon LLC is a Statement of Completion for Submitting Proof of Beneficial Use and a Beneficial Use Field Report for permit 51-13106.

The permit authorizes 200 acres of irrigation from ground water in eastern Elmore County, south of Bliss Reservoir. The exam found irrigation of 200 acres. The irrigation rate to the place of use was measured at 3.90 cfs using a totalizing flow meter over a 24-hour period. Pump capacity exceeds 3.90 cfs, but was limited to 3.90 cfs by the vfd used to maintain a constant discharge pressure at the pump.

A 24-hour pumping test was required as a condition of the permit. A pumping test report is attached to the field report.

Please contact me with any questions.

Sincerely,

Terry M. Scanlan

Terry M. Scanlan, P.E., P.G.
Principal Engineer/Hydrogeologist

Cc: Jim Chambers – Half Moon LLC

Enclosures

SPF file number: 989.0050