

[illegible]

Method of Determination:

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

4.

Well or Diversion Identification No.*	Motor Make	Hp	Motor Serial No.	Pump Make	Pump Serial No. or Discharge Size
Well ID D0060387*	Webtrol	3.0	10S220-M3PH	Webtrol WT2510L	WT25202C3S 1.5"

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

D. FLOW MEASUREMENTS

1.

Measurement Equipment	Type	Make	Model No.	Serial No.	Size	Calibration Date
Flowmeter	Propeller	McCrometer	MT103	11-02095	3"	unknown

2. Measurements:

Measurement No 1: 30 GPM (0.07 cfs) <electrical fault, see narrative>
 Measurement No 2: 40 GPM (0.09 cfs) <electrical fault, see narrative>
 Measurement No 3: 60 GPM (0.13 cfs) <electrical fault, see narrative>

Pressure remained at 60 PSI due to pressure tank.

E. FLOW CALCULATIONS

 x Additional Computation Sheets Attached

Measured Method:

IRRIGATION:

*Theoretical: Max Flow Rate 0.08 cfs**Pump Curve: Max Flow Rate 0.10 cfs**Field Exam: Max Flow Rate 0.13 cfs**Permit: Max Flow Rate 0.26 cfs*

I suspect that the electrical faults at the time of the exam may have introduced error to the meter readings. Because of this, I recommend the max flow rate derived from the pump curve **0.10 cfs**.

STOCKWATER:

*Field Exam: 80 Head Range Cattle = 0.03 cfs, per Field Examiner's Handbook**Permit: 50 Head Range Cattle = 0.02 cfs, per Field Examiner's Handbook*I recommend issuing this license for the permitted amount, **0.02 cfs**.

F. VOLUME CALCULATIONS

1. Volume Calculations for Irrigation:

$$V_{I.R.} = (\text{Acres Irrigated}) \times (\text{Irrigation Requirement}) = 11 \text{ Acres Irrigated} \times 4.5 \text{ AF/A} = 49.5 \text{ AF}$$

$$V_{D.R.} = [\text{Diversion Rate (cfs)}] \times (\text{Days in Irrigation season}) \times 1.9835 = (0.10 \text{ cfs}) \times (260 \text{ days}) \times 1.9835 = 51.6 \text{ AF}$$

$$V = \text{Smaller of } V_{I.R.} \text{ and } V_{D.R.} = \underline{49.5 \text{ AF}}$$

2. Volume Calculations for Other Uses: STOCKWATER

Field Exam: 80 Head Range Cattle = 1.4 AFY, per Field Examiner's Handbook

Permit: 50 Head Range Cattle = 0.7 AFY, per Field Examiner's Handbook

G. NARRATIVE/REMARKS/COMMENTS**Background**

At 9:30 AM on Friday, July 31, 2015, I met Joe Watterson and his father Bill at 24 West Ranch in Star, ID. We exchanged greetings and decided to begin the inspection at the well.

System and Exam Overview

The well had a 3-inch above ground discharge for flexible tube to be connected, but no length of straight pipe was available for flow measurement using the Tyme Flyte or Panametrics. I could have attempted to use a bucket, but the intended flow rate with respect to a 5-gallon bucket would have resulted in great inaccuracy. I peeked inside the control house for the well. The electronic pressure meter read 60 psi due to the 35 gallon pressure tank. Mr. Watterson was also housing a straight length of pipe with a great number of fittings and valves, including a flow meter. He agreed to hook it up to the well hydrant so that we could get a well pump measurement.

We made three attempts, but the controller kept faulting and would soon shut off the pump. I watched the flow meter as it fluctuated; the highest measurement I was able to observe appeared to be 60 gpm, or 0.13 cfs. Mr. Watterson mentioned that the well pump tested at the time of the exam is a 3 HP. He used to have a 7 HP pump, but it burned up because it was too large for their use. He said that their operation had possibly maxed out at 60-80 gpm at its peak, but they didn't often run it that high. Joe was going to need to call the installer to come work on the controller to get it running consistently again. At the time of the exam, irrigation water was being delivered, but was not in use on this particular organic parcel (POU). The parcel was developed for primary or supplemental ground water irrigation use for organic crops. I also observed his ground water effluent filter for organic use. He said that the use was fully developed, including their organic certification, but was letting the land lie fallow at the time of the exam.

Next, we went to the corrals to the cattle watering system. Two hoses and two hydrants are used to fill four large troughs. At the time of the exam, the cows (80 head) were grazing in an irrigated pasture to the south of the POU.

Subsequent Research:

After doing some additional research on the capacity of the pump, I believe that the 60 gpm reading observed from the fluctuating needle was not an accurate depiction of steady state pump operating conditions. Mr. Watterson emailed me a pump curve after the exam. It turned out to be the pump curve for the 7 HP pump. He said he no longer had his records of the 3 HP pump. I reviewed my photos to find additional information about the system. I researched the model number WT2510L and found that it is a Webtrol 2 HP, 3 phase submersible well pump. I emailed Mr. Watterson to notify him of my finding, and I requested that he supply alternate information on his well pump if he disagreed with my findings. Joe confirmed the data I sent to him with Mr. Gene Coonse (Conse Well Drilling).

Following the exam (9/8/2015), I followed up with Mr. Watterson to gather some additional information on how his irrigation is typically executed. The field is configured into hills-and-furrows, but he uses drip lines to supply water consistently. By dividing the field into zones, he allows approximately 6 feet of space between each crop type planted (low crop density on the field). Because the drip lines are very efficient, only a low flow rate is needed. Mr. Watterson utilizes the entire irrigation season; he plants some crops later in the year than others.

Measurements and Methodology

To verify the volumetric flow results from the fluctuating McCrometer flow meter, I looked up manufacturer's pump curve. With friction assumed to be negligible, and a lift distance estimated using the well-drilling log, the pump curve calculation is close to the measurement results.

Conditions

- Conditions 046 and X02 have been removed per standard licensing practice.
- Condition 121 was changed to 103 for licensing.
- One condition specific to this permit was modified to reflect that irrigation from the well should only be used for organic crops. Regular crops should be irrigated using water from Farmers Union Ditch Co.

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>
IRRIGATION	03/01 to 11/15	0.100 CFS	49.5 AF
STOCKWATER	01/01 to 12/31	0.020 CFS	0.70 AF
<u>Totals:</u>		0.100 CFS	50.2 AF

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

Ashley Newbry, Associate Engineer

Field Examiner's Name

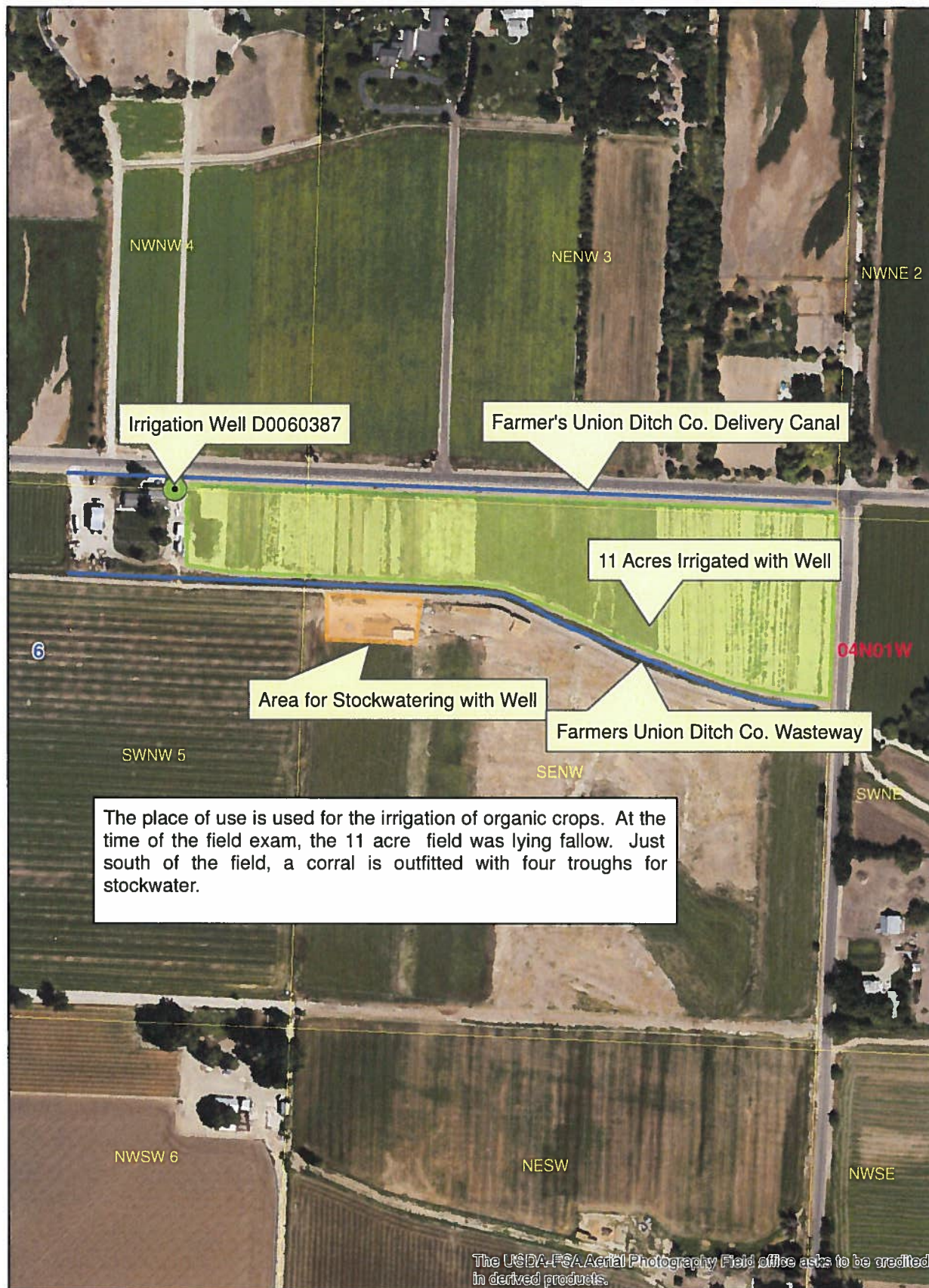
Ashley Newbry

Date

9/8/2015

Reviewer

Date



The place of use is used for the irrigation of organic crops. At the time of the field exam, the 11 acre field was lying fallow. Just south of the field, a corral is outfitted with four troughs for stockwater.

The USDA-FSA Aerial Photography Field office asks to be credited in derived products.

63-33626

THEORETICAL HORSEPOWER EQUATION WORKSHEET

Water Right No.: 63-33626
 Reviewer: Ashley Newbry
 Date of Review: 8/14/2015

P/D No.:	Scenario 1	Scenario 2	Scenario 3
PUMP HORSEPOWER (HP)	2	2	2
BOOSTER HORSEPOWER (HP)	0	0	0
PUMPING LEVEL (FT)	130	140	150
DISCHARGE PRESSURE (PSI)	5	10	15
RATE OF FLOW (CFS)	0.087	0.076	0.067
RATE OF FLOW (GPM)	39.1	33.9	29.9
TOTAL DYNAMIC HEAD (FT)	141.55	163.1	184.65

AVG
 0.08
 34.30

The above calculates the formula =

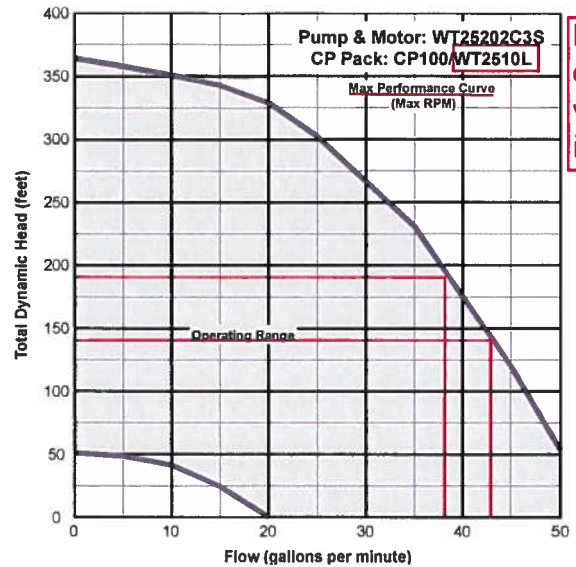
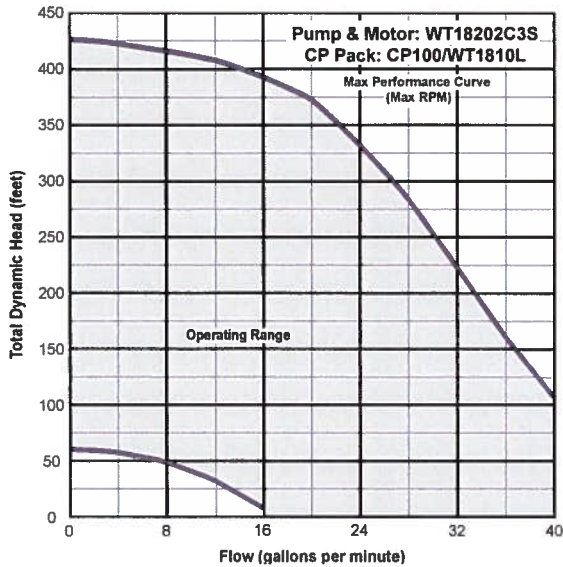
$$Q = \frac{8.8 * (\text{Efficiency}) * \text{hp}}{\text{depth to water} + 2.31 * (\text{psi}) + \text{friction}}$$

Assumptions: %70 efficiency.
 No Friction

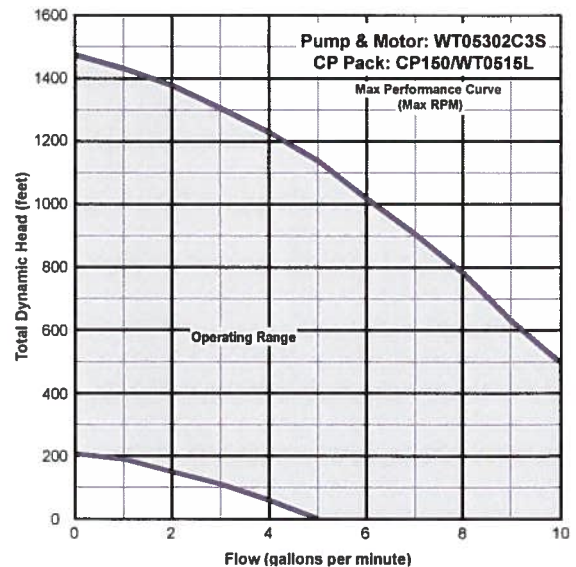
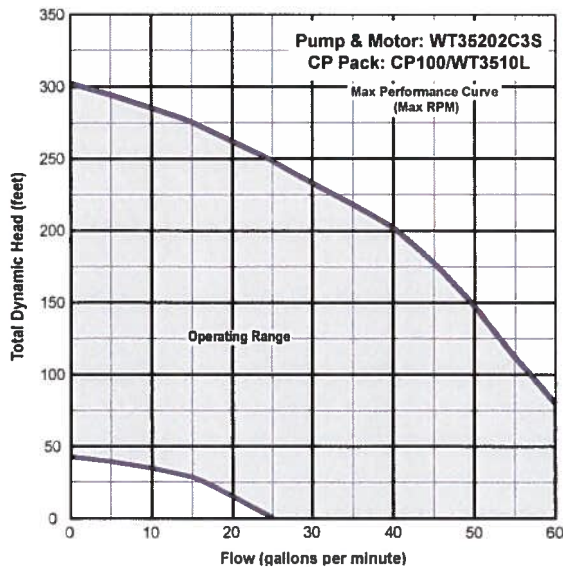
Examiners Notes:

I estimated the lift distances based on well log. Discharge pressure is estimated because this value brings us closest to the GPM and TDH values on the manufacturer's pump curve.
 *Well discharges into a pressure tank.

4" WT SERIES SUBDRIVE SYSTEM CURVES



Note: No efficiency values included



Total Dynamic Head is equal to vertical lift, maximum operating pressure and friction loss. These curves are for general guidance only, individual curves are available upon request. A certified curve may be requested for an additional cost. Webtrol will build pumps to fit your specific needs, contact factory for pricing.

63-33626



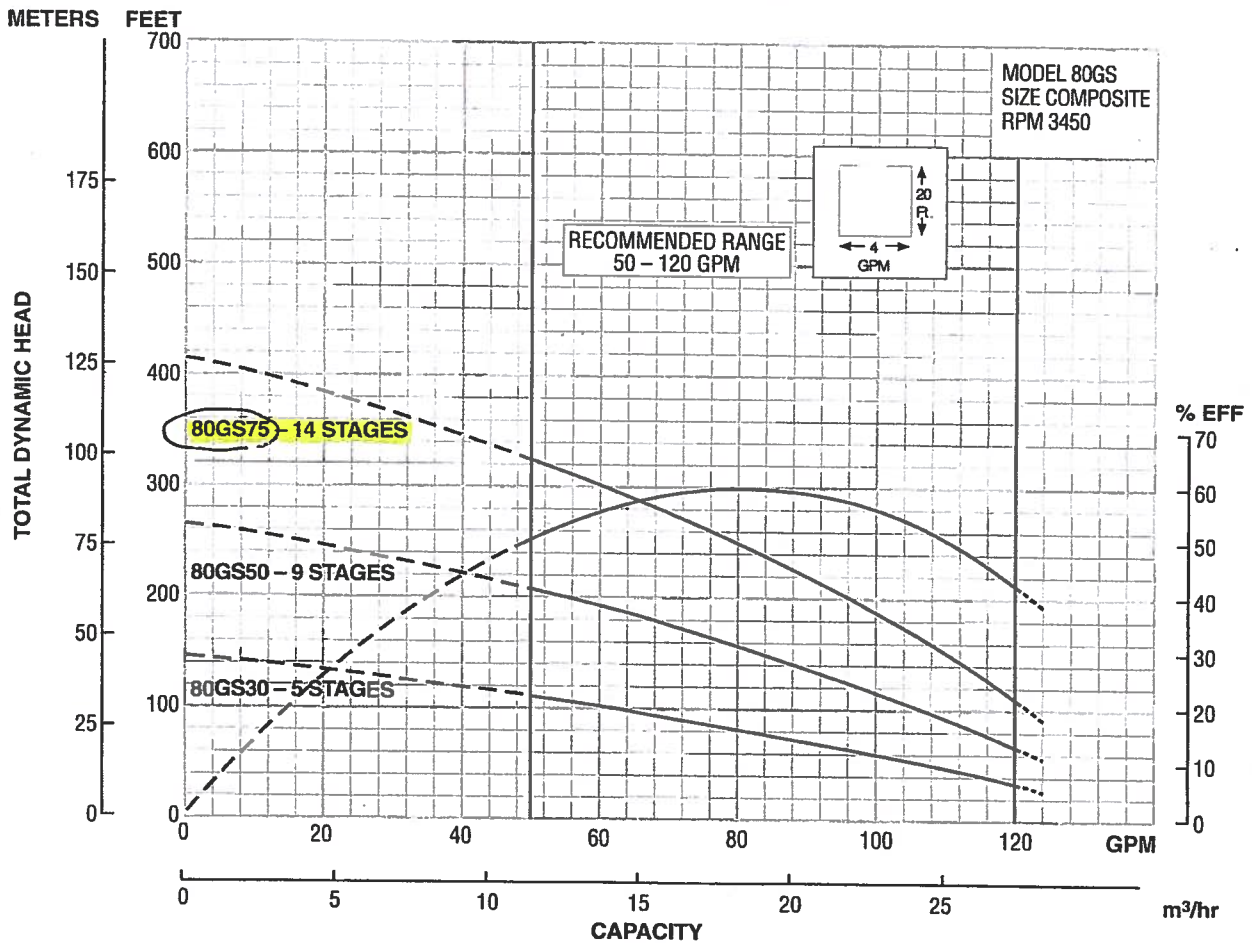
"WT" Series 4 Inch Submersible Pump Price Pages

Notes: 1. Standard control box 2. CRC Control box 3. Deluxe control box 4. MonoDrive controller 5. SubDrive controller 6. Magnetic starter 7. Pump control panel 8. 6" Motor adapter available

"WT" Series	Wire	HP	Volts	Phase	Complete Pump Model No.	2015 List Price	Weight (lbs.)	Length (in.)	Pump End Model No. ⁸	2015 List Price	Weight (lbs.)	Length (in.)	Motor Model No.	2015 List Price	Weight (lbs.)	Length (in.)	Optional Control Model No.	2015 List Price	Weight (lbs.)
1 1/2		230	1		WT25152C	\$1,515.00	36	28.2					10S215-M	\$695.00	28	13.6	31S215-M ¹	\$140.00	7
		200	3		WT25158C3	\$1,447.00	32	26.4					31VSM150-M ⁴	\$1,569.00	21		31VSM150-M ⁴	\$1,569.00	21
		230	3		WT25152C3	\$1,447.00	32	26.4	WT2515L	\$820.00	8	14.6	10S815-M3PH	\$627.00	24	11.8	80X396-M ⁶	\$768.00	7
		460	3		WT25154C3	\$1,447.00	32	26.4					10S215-M3PH	\$627.00	24	11.8	80X396-M ⁶	\$768.00	7
		575	3		WT25155C3	\$1,447.00	32	26.4					10S415-M3PH	\$627.00	24	11.8	80X396-M ⁶	\$768.00	7
2		230	1		WT25202C	\$1,792.00	42	31.6					10S515-M3PH	\$627.00	24	11.8	AVAILABLE UPON REQUEST	-----	
		200	3		WT25208C3	\$1,660.00	37	30.1	WT2520L	\$978.00	9	16.5	10S220-M	\$784.00	33	15.1	31S220-M ¹	\$243.00	7
		230	3		WT25202C3	\$1,660.00	37	30.1					10S820-M3PH	\$682.00	28	13.6	31S220-DM ³	\$340.00	7
		230	3		WT25202C3	\$1,660.00	37	30.1					10S220-M3PH	\$682.00	28	13.6	31VSM150-M ⁴	\$1,569.00	21
		230	3		WT25202C3	\$1,375.00	35	26.2	WT2510L	\$693.00	7	12.6	10S220-M3PH	\$682.00	28	13.6	80X396-M ⁶	\$768.00	10
3		460	3		WT25204C3	\$1,660.00	37	30.1	WT2520L	\$978.00	9	16.5	10S420-M3PH	\$682.00	28	13.6	80X396-M ⁶	\$768.00	10
		575	3		WT25205C3	\$1,660.00	37	30.1					10S520-M3PH	\$682.00	28	13.6	80X5404-M ⁷	\$1,413.00	55
		230	1		WT25302C	\$2,352.00	52	39.5					10S230-M	\$1,185.00	41	19.1	AVAILABLE UPON REQUEST	-----	
		200	3		WT25308C3	\$2,126.00	46	36.5	WT2530L	\$1,177.00	11	20.4	10S830-M3PH	\$949.00	35	16.1	31S230-DM ³	\$396.00	8
		230	3		WT25302C3	\$2,126.00	46	36.5					10S230-M3PH	\$949.00	35	16.1	80X397-M ⁶	\$768.00	10
25 Series 1 1/2" Discharge		230	3		WT25302C3	\$1,769.00	43	30.6	WT2515L	\$820.00	8	14.6	10S230-M3PH	\$949.00	35	16.1	80X5418-M ⁷	\$1,413.00	55
		460	3		WT25304C3	\$2,126.00	46	36.5	WT2530L	\$1,177.00	11	20.4	10S430-M3PH	\$949.00	35	16.1	80X397-M ⁶	\$768.00	10
		575	3		WT25305C3	\$2,126.00	46	36.5					10S530-M3PH	\$949.00	35	16.1	80X5412-M ⁷	\$1,392.00	55
																	AVAILABLE UPON REQUEST	-----	

62-33626

Complete pumps above include: Pump, motor, motor lead and crimp connectors.
3 Wire prices do not include control box.
Magnetic starters sold separately.
Prices subject to change without notice.



DIMENSIONS AND WEIGHTS

HP	Stages	W.E. Order No.	Motor Order No.	PH	Motor Volts	Motor Length	W.E.① Length	L.O.A.②	W.E. and Motor Weight
3	5	80GS30	S09940	1	230	23.5	51.4	44.9	61.9
			S09978		200				
			S09970	3	230	20.6	21.4	42.0	52.9
			S09975		460				
			S09979		575				
5	9	80GS50	S10940	1	230	29.5	29.4	58.9	81.9
			S10978		200				
			S10970	3	230	23.6	29.4	53.0	65.9
			S10975		460				
			S10979*		575				
7½	14	80GS75	S119784	3	200	29.6	42.8	72.4	83.9
			S119704		230				
			S119754		460				

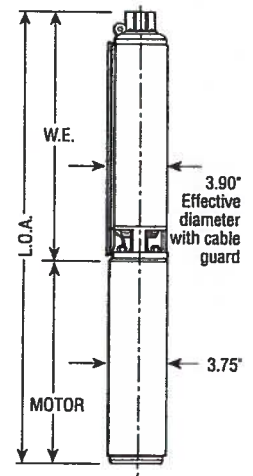
NOTES:

For complete pump, order water end and motor.

① W.E. = water end or pump without motor.

② L.O.A. = length of assembly - complete pump - water end and motor.

* Non-stock motors have a 6 week lead time.



Curve for the 7hp pump discussed in exam narrative.
63-33626

Model 80GS



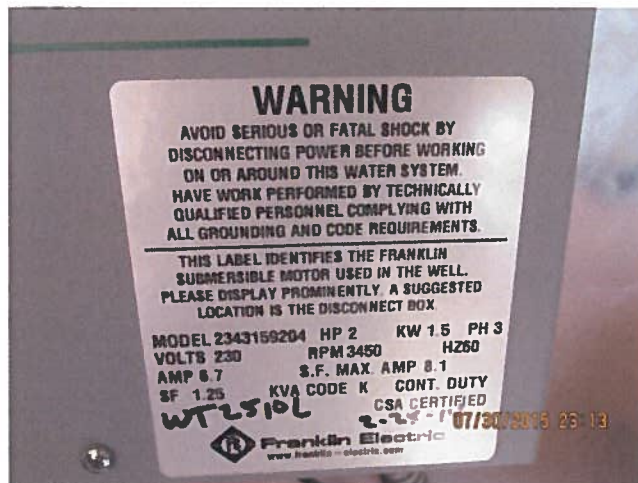
SELECTION CHART

Horsepower Range 3 – 7½, Recommended Range 50 – 120 GPM, 60 Hz, 3450 RPM

Pump Model	HP	PSI	Depth to Water in Feet/Ratings in GPM (Gallons per Minute)																							
			20	40	60	80	100	120	140	160	180	200	240	260	280	300	340	360	380	400	440	460	480	500	540	560
80GS30	3	0		114	100	84	64																			
		20	94	77	56																					
		30	74	52																						
		40	50																							
		50																								
		60																								
Shut-off PSI			54	45	36	28	19																			
80GS50	5	0				114	106	98	89	79	68	55														
		20		112	104	96	87	76	66	50																
		30	110	102	94	85	74	62																		
		40	100	92	84	72	61																			
		50	90	83	71	57																				
		60	81	70	54																					
Shut-off PSI			106	97	88	80	71	62	54	45	36	28														
80GS75	7½	0						117	112	107	102	96	83	76	69	61										
		20				116	111	106	100	94	88	82	67	59	50											
		30				115	110	105	99	93	87	81	73	57												
		40		114	109	104	98	92	86	80	72	65														
		50	113	108	103	97	91	85	79	71	64	55														
		60	107.5	102.5	96.5	90	84	78	70	63	53															
Shut-off PSI			168	160	151	142	134	125	116	108	99	90	73	64	56	47										

63-33626

PHOTOGRAPHER AND DATE OF PHOTOS ASHLEY NEWBRY • July 31, 2015
 FILE NUMBER 63-33626



The blue-capped well (left) houses a 2-Hp pump (right). Mr. Watterson connected a length of straight pipe which included valves, fittings, a water filter, and a flow meter (left).



The McCrometer flow meter along the length of straight pipe is pictured at left. Inside the control house, a pressure tank (left) and pressure gage (center) were connected to the automatic control system.



Farmer's Union Irrigation Co. shares are delivered via a canal that runs along the north edge of the place of use (left). The place-of-use is displayed in the background; Farmer's Union wasteway is shown in the foreground (right).



Four large stockwater troughs are located in the corral (left). Two of them are shown at right. All stockwater is supplied via the well.

Newbry, Ashley

From: Joe Watterson [jwatterson@gmail.com]
Sent: Monday, August 17, 2015 9:45 AM
To: Newbry, Ashley
Subject: Re: PUMP CURVE

Thanks, Ashley. That confirms what Gene Coonse said.

Thanks
Joe

Sent from my iPhone

On Aug 14, 2015, at 8:55 AM, Newbry, Ashley <Ashley.Newbry@idwr.idaho.gov> wrote:

Joe,

I believe I found the pump that you have, but I think it is 2 HP (see attached), 3 phase. Within the next few days, let me know if you disagree, otherwise I will proceed with this data for your water right license.

Thanks,
Ashley

From: Joe Watterson [<mailto:jwatterson@gmail.com>]
Sent: Tuesday, August 11, 2015 4:08 PM
To: Newbry, Ashley
Subject: Re: PUMP CURVE

Going to have to get it from Coonse.

Thanks

Sent from my iPhone

On Aug 11, 2015, at 4:28 PM, Newbry, Ashley <Ashley.Newbry@idwr.idaho.gov> wrote:

Hello Joe,

This is the pump curve for your 7.5 HP pump – the one that you mentioned burned out. Do you now have the same make/model in 3 HP, or a different manufacturer?

Thank you,
Ashley

From: Joe Watterson [<mailto:jwatterson@gmail.com>]
Sent: Tuesday, August 11, 2015 2:53 PM
To: Newbry, Ashley
Subject: Fwd: PUMP CURVE

Hey Ashley,

I actually found it in my inbox.

Thanks!

Sent from my iPhone

Begin forwarded message:

From: "Coonse Drilling & Pump" <bgcoonse@gmail.com>
Date: May 3, 2012 at 3:34:18 PM CDT
To: joe@24westranch.com
Subject: PUMP CURVE

Hi Joe -

I have attached the manufacturer pump curve for the 80GS75. Let us know if you need any additional information.

Regards,

Beverly Coonse

Coonse Well Drilling & Pump Co., Inc.
15851 Gunfire Road
Caldwell, ID 83607

Office (208) 454-0190
Fax (208) 454-2743

<Webtrol Pump WT2510L.pdf>

<Webtrol Pump Catalog 2015_marked.pdf>

<IMG_1347.JPG>