

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
IN-OFFICE REVIEW/BENEFICIAL USE FIELD REPORT

A. GENERAL INFORMATIONPermit No: 63-34128

Exam Date: 10/4/2016

1. Does this qualify for an in-office field exam (IDAPA 035.02.r)? X Y N
- Irrigation of 5 acres or less
 - Storage of up to 14.6 AF for stockwater purposes only
 - Any use other than irrigation or storage, if the combined diversion rate is 0.24 cfs or less
 - Other < >

PLEASE NOTE: An in-house exam was started on this permit, but a field examination was required to verify the water uses. The Department's current aerial photography, was not adequate to verify the uses.

2. Current Owner: Name: Kieth O'Neal Helmick
Owner of Record Correct? X Y N
Address of Record Correct? Y N
If No: Address

Tax parcel data shows Keith O'Neil Helmick as the owners of the property.

Mr. Helmick accompanied us on the field examination.

3. Beneficial Use Fees have been paid: X Y N Receipt No: C0

4. SOURCE TRIBUTARY
Spring Lester Creek

Method of Determination: GPS and Visual Inspection.

Change in Source: Y X N

B. OVERLAP REVIEW

1. Other water rights with the same place of use: NO Overlap

Water Right No.	Source	Purpose of Use	Basis
63-15028	Lester Creek	Stockwater	Decree

Comments: Water right 63-15028 is an in-stream stockwater right from Lester Creek for the same ranch. The same cattle using this permit can drink directly from the creek or from the stockwater trough filled by the spring. The stockwater trough from the spring is further up the hill, which allows the cattle to stay further up the hill when there is good feed in that area.

2. Other water rights with the same point of diversion: NO Overlap

Water Right No.	Source	Purpose of Use	Basis
NONE			

Comments: There are no other rights diverted from this spring. The in-stream stockwater right 63-15028 is approximately 1,380 feet east of the spring in a different 40 acre tract.

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

Source	Govt. Lot	¼	¼	¼	Sec.	Twp.	Rge.		County
Spring		NW	NE	SW	11	1N	9E	B.M.	ELMORE
								B.M.	
								B.M.	

Method of Determination: GPS and Visual Inspection.Change in POD? X N Amendment Required? X N**2. PLACE OF USE:** Use: Domestic and Stockwater

TWP	RGE	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
1N	9E	11									S							D	
		Lot #																	
Total Acres =																			

Method of Determination: GPS and Visual InspectionChange in POU? X N Amendment Required? X N x Delivery System Diagram Attached (required). Indicate all major components and distances between components.

Indicate weir size/pipe as applicable.

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

4. Well or Diversion Identification No.*	Motor Make	Hp-CC	Motor Serial No.	Pump Make	Pump Serial No. or Discharge Size
Re-lift Pump	Honda 4 Stroke	25 cc	AY5* GCalt-25759	Honda - WX 10	WATJ-1247213

*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
NONE						

2. Measurements: A Mannings Equation was used for the stockwater and a pump curve for the domestic use.

E. FLOW CALCULATIONS

____ Additional Computation Sheets Attached

Measured Method:

This system gravity flows downhill approximately 450 feet to a stockwater trough that is filled with gravity pressure on the line, and the line then continues down the hill to a spigot approximately 2,184 feet from the spring. At the spigot, a small 25 cc pump is used to pump the water up to a 300 gallon underground water storage tank approximately 40 feet higher in elevation than the spring. From the storage tank, the water is then gravity fed to a 5th wheel trailer. I used the standard Mannings Equation to determine the flow rate of the spring to the stockwater trough, and found that approximately 0.04 cfs could be delivered to the trough. I used the pump curve for the pump for the domestic use. The pump curve shows that a total of 27.6 gpm or 0.06 cfs can be pumped up to the storage tank. The stock tank is higher in elevation than the pump, so in order for the pump to operate at capacity, the water tank cannot be diverting water. Therefore, the 0.06 cfs diverted for the domestic use is the maximum capacity of the system.

Stockwater:**Mannings = 0.06 cfs****Permit = 0.05 cfs****Stockwater recommendation = 0.05 cfs****Domestic:****Pump Curve = 0.06 cfs****Permit = 0.04 cfs****Domestic Recommendation = 0.04 cfs.****Total Capacity:****Pump Curve = 0.06 cfs****Permit = 0.05 cfs****System Capacity Recommendation = 0.05 cfs**

I am recommending the diversion rates as requested in the permit.

F. VOLUME CALCULATIONS**1. Volume Calculations for Irrigation:**

$$V_{I.R.} = (\text{Acres Irrigated}) \times (\text{Irrigation Requirement}) = \underline{\hspace{2cm}}$$

$$V_{D.R.} = [\text{Diversion Rate (cfs)}] \times (\text{Days in Irrigation season}) \times 1.9835 = \underline{\hspace{2cm}}$$

$$V = \text{Smaller of } V_{I.R.} \text{ and } V_{D.R.} = \underline{\hspace{2cm}}$$

2. Volume Calculations for Other Uses:**Domestic Use:**

There is no yard or outside irrigation associated with this permit, so I am recommending the domestic portion of this permit be limited to 0.6 af as suggested in Administrative Processing Memorandum #22.

Stockwater Uses:

He runs approximately 120 heifers on this property. They currently don't keep livestock on this property on a year round basis due to snow and weather. However, this is private ground, so he can keep animals in the area for along as he deems fit. There is no set season he can have cattle up in this area, so the year round limitation is suitable. The following are my calculations for the stockwater volume:

$$(12 \text{ gpd} \times 120 \text{ head} \times 365 \text{ days}) / 325850 = 1.6 \text{ af}$$

PLEASE NOTE: No volume is required, because this permit is limited in conditions to 13,000 gpd. 13,000 gpd should be more than enough to supply the water for this ranch.

G. PURPOSE OF USEIrrigation ☒ Y ☐ N # Stock _____ Domestic # of Homes 1

Other: < >

Change in Purpose of Use? ☐ Y ☐ NMethod of Determination: Taxlot data and conversations with owner.

If Yes: From Use _____ To Use _____ Amount _____ CFS _____ AFA _____

H. NARRATIVE/REMARKS/COMMENTS

This permit is qualified for an in-house exam, but I was unable to see enough information in the Department's available aerial photography to verify the uses. Therefore, a field examination was done on this permit.

This system gravity flows downhill approximately 450 feet to a stockwater trough that is filled with gravity pressure on the line, and the line then continues down the hill to a Berry Hydrant approximately 2,184 feet from the spring. At the spigot, a small 25 cc pump is used to pump the water up to a 300 gallon underground water storage tank approximately 40 feet higher in elevation than the spring. From the storage tank, the water is then gravity fed to a 5th wheel trailer. The spring was developed using a french drain style system with a large perforated drain pipe buried in the spring area with a pipeline coming out of the drain pipe to the stockwater system.

It is unlikely that cattle are kept at this location all year. The cattle being run on this place are heifers, so I am sure they will be moved down to a more temperate climate once the snow starts to fall or they start to calf. This is private property, so the cattle are kept on the ranch for as long as mother nature allows them to be kept there. Decreed water right 63-15028 allowed year round use, so I think it would be detrimental to the rancher if we reduced the stockwater season to try and match the weather patterns. There is good feed in this area, so the rancher will keep them up there as long as possible without risking losses due to the weather.

Conditions 1-3 (N13, R05, and X01) will be carried forward to licensing. Conditions 4 (X02) and 5 (26A) will be removed at licensing per standards. Condition 6 (121) will be changed to 103 as is standard. No additional conditions should be needed.

Have conditions of permit approval been met? ☒ Yes ☐ No**I. RECOMMENDATIONS****1. Recommended Amounts**

<u>BENEFICIAL USE</u>	<u>PERIOD OF USE</u>	<u>DIVERSION RATE</u>	<u>ANNUAL VOLUME</u>
Domestic	01/01 to 12/31	0.04 CFS	
Stockwater	01/01 to 12/31	0.05 CFS	

Totals: 0.05 CFS

PLEASE NOTE: No volume is required, because this permit is limited in conditions to 13,000 gpd. 13,000 gpd should be more than enough to supply the water for this ranch.

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 ☐ None

Other: < >

J. AUTHENTICATION – DANIEL A. NELSON – STAFF HYDROLOGIST

Field Examiner's Name

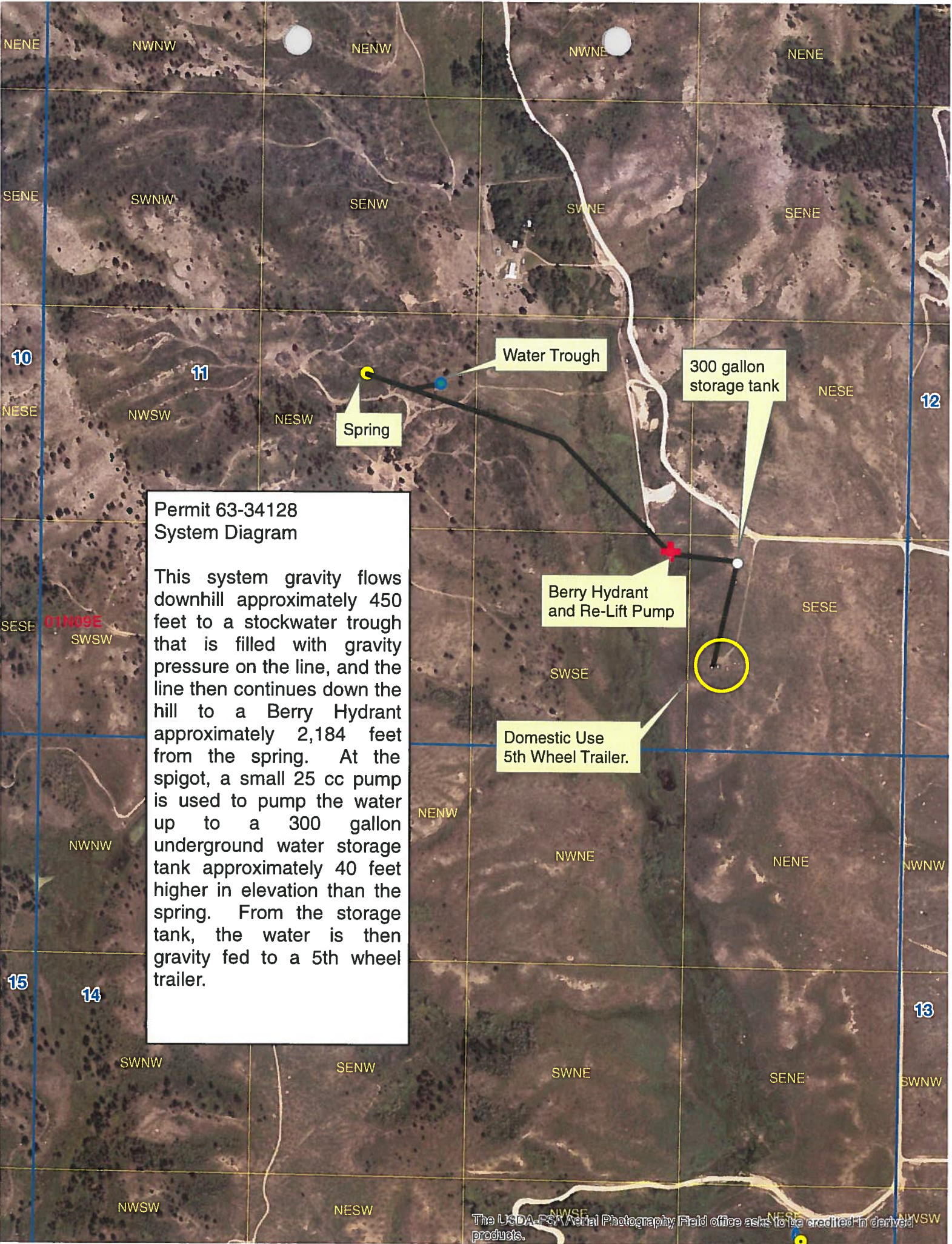


Date

10-12-16.

Reviewer

Date



**Permit 63-34128
System Diagram**

This system gravity flows downhill approximately 450 feet to a stockwater trough that is filled with gravity pressure on the line, and the line then continues down the hill to a Berry Hydrant approximately 2,184 feet from the spring. At the spigot, a small 25 cc pump is used to pump the water up to a 300 gallon underground water storage tank approximately 40 feet higher in elevation than the spring. From the storage tank, the water is then gravity fed to a 5th wheel trailer.

HONDA

Power

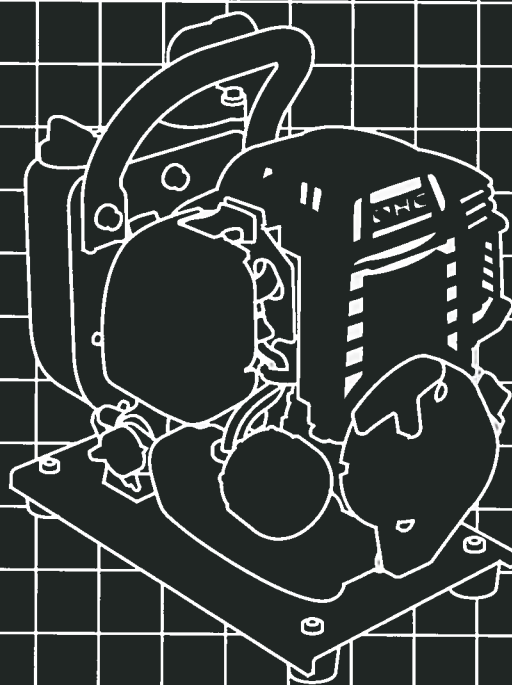
Equipment

Owner's Manual

WATER PUMP

WX10

Click here to save this
manual to your computer.



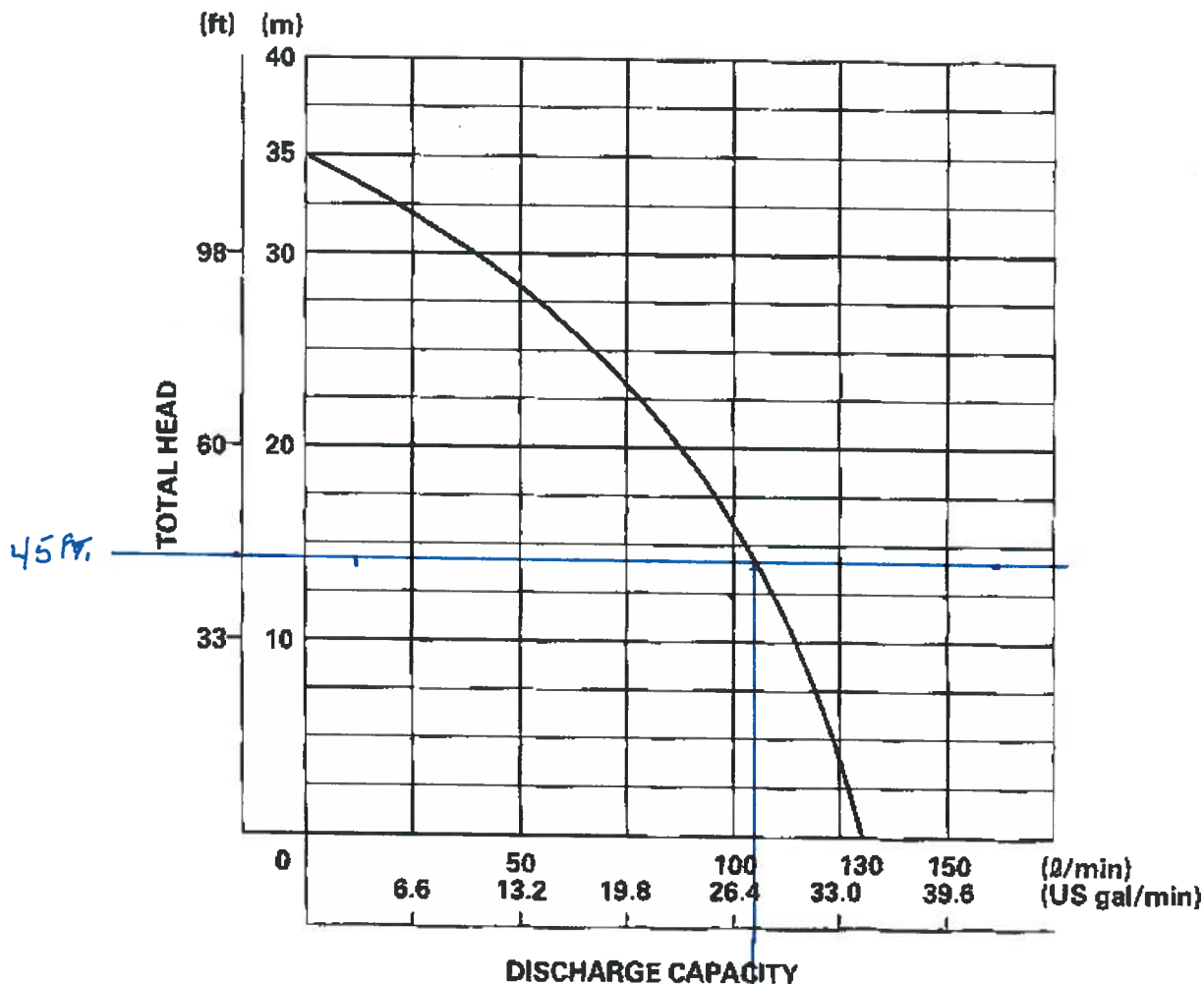
TECHNICAL & CONSUMER INFORMATION

Pump

Suction port diameter	1.0 in (25 mm)
Discharge port diameter	1.0 in (25 mm)
Total head (maximum)	115 ft (35 m)
Suction head (maximum)	23 ft (7 m)
Discharge capacity (maximum)	34.3 US gal (130 l , 28.6 Imp gal) per minute
Self-priming time	120 seconds at 16.4 ft (5 m)
Pressure (maximum)	43 psi (299 kPa , 3.05 kgf/cm ²)
Continuous running time	Approximately 65 min (actual time varies with pump load)

Pump performance curve

As total head increases, discharge capacity decreases. The following graph shows the relationship between pump discharge capacity and total head, while pumping clear water at sea level.



$$27.6 \text{ gpm} / 448.8 = 0.06 \text{ CFS}$$

Specifications

Dimensions and weight

Length	13.4 in (340 mm)
Width	8.7 in (220 mm)
Height	11.6 in (295 mm)
Dry mass [weight]	13.4 lbs (6.1 kg)

Engine design and performance

Model	GX25T
Engine type	4-stroke, overhead camshaft, single cylinder
Displacement [bore × stroke]	1.53 cu-in (25.0 cm ³) [1.38 × 1.02 in (35.0 × 26.0 mm)]
Engine oil capacity	2 oz (0.08 L)
Fuel tank capacity	0.140 US gal (0.53 L)
Cooling system	Forced air
Ignition system	Transistor magneto
PTO shaft rotation	Counterclockwise

Tune up

Spark plug gap	0.024–0.028 in (0.6–0.7 mm)	Refer to page 38.
Idle speed	3,100 ± 200 rpm	
Valve clearance (cold)	Intake: 0.08 ± 0.02 mm Exhaust: 0.11 ± 0.02 mm	See your authorized Honda dealer.
Other specifications	No other adjustments needed.	

Pump

Suction port diameter	1.0 in (25 mm)
Discharge port diameter	1.0 in (25 mm)
Total head (maximum)	121 ft (37 m)
Suction head (maximum)	26 ft (8 m)
Discharge capacity (maximum)	32 US gal (120 L) per minute
Self-priming time	80 seconds at 16.4 ft (5 m)

Specifications are subject to change without notice.

Manning's Equation Calculator for Flow Rate in a Circular Conduit Flowing Full

S = 0.0444 ft/ft
n = 0.009 manning's coefficient
d = 1.5 pipe diameter (inches)
D = 0.13 pipe diameter (feet)
r = 0.06 pipe radius (feet)
A = 0.01 area (ft²)
WP = 0.39 wetted perimeter (ft)
R = 0.03 hydraulic radius (ft)

Q = 0.04 flow rate (CFS)

Channel Slope

Slope Options

☐ Manual Entry
☒ Slope Calculator

Slope Calculator

Rise = 20 feet

Run = 450 feet

Slope, S = 0.0444 ft/ft

Pipe Material, (n): plastic (pvc, abs)

Pipe Diameter (inches)
1.5 inches

READ ME

Manning's Equation (1), is an empirical formula that solves for velocity (v) in a open channel under uniform flow. The continuity equation (2) when combined with equation (1) allows for the computation of the flow rate (Q) in an open channel under uniform flow.

In equations (1) and (3), n refers to Manning's Coefficient of Roughness and can be found in tabulated form for many open channel types. R is the hydraulic radius of the open channel and is equal to the area of the open channel divided by the wetted perimeter, R = A/P. S is the slope of the energy grade line which is often assumed to be equal to the slope of the channel.

Because Manning's Equation is empirical the units are not arbitrary. To obtain a velocity in ft/s and a flow rate in ft³/s, area must be reported in ft², hydraulic radius must be reported in ft, and S must be reported in ft/ft. Manning's Coefficient of Roughness is a unitless constant.

$$(1) \quad v = 1.49 \left(\frac{1}{n} \right) \left(R^{\frac{2}{3}} \right) \sqrt{S}$$

$$(2) \quad Q = vA$$

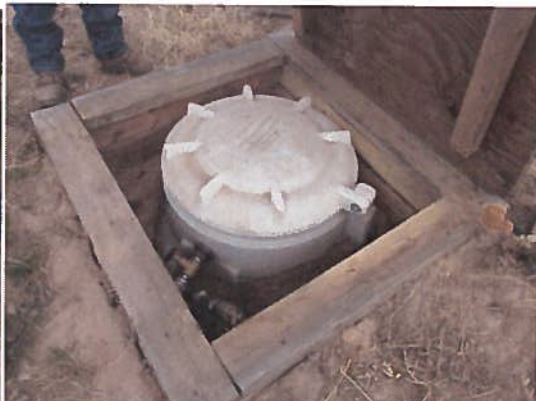
$$(3) \quad Q = 1.49 \left(\frac{1}{n} \right) (A) \left(R^{\frac{2}{3}} \right) \sqrt{S}$$

PHOTOGRAPHER AND DATE OF PHOTOS Daniel A. Nelson 10/4/2016

FILE NUMBER 63-34128



The photo on the left is the spring area. There is a buried french type drain in this area. You can see the disturbed ground. The picture on the right is the stockwater trough that is gravity fed from the spring.



The photo on the left above is the location where they hook in the portable pump. The spring feeds this line and the pump hooks up to the berry hydrant and up to the black hose that delivers water up hill to the 300 gallon storage tank shown in the picture on the left. Water from the storage tank is transported to the 5th wheel trailer.



The photos above are of the portable 25 cc pump motor that is used to pump the water up to the storage tank.