

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

A. GENERAL INFORMATION

Permit No: 91-7903
Exam Date: 10/02/2020

1. Current Owner:
KENNETH A MUELLER PO BOX 613 SAINT MARIES ID 83861-0613 AND/OR
CONNIE E MUELLER PO BOX 613 SAINT MARIES ID 83861-0613
2. Accompanied by: Kenneth Mueller
Phone No: 208-582-0318
Address: Same as above
Relationship to permit Holder: Permit holder

3. **SOURCE:**
ST JOE RIVER

Tributary
COEUR D ALENE LAKE

Method of Determination: Arcmap and DRG.

B. OVERLAP REVIEW

1. Other water rights with the same place of use: YES Overlap

Water Right No.	Source	Purpose of Use	Basis
91-7170	GROUNDWATER	MUNICIPAL	DECREED

Comments: Decreed right 91-7170 uses groundwater for municipal use by the Avery Water & Sewer District with service area that overlaps this rights POU. 91-7170 is not a concern for overlap with this surface water source and the respective beneficial uses.

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

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

ST JOE RIVER NE¼ NE¼, Sec. 15, Twp 45N, Rge 05E, B.M. SHOSHONE County

Method of Determination: GPS. POD is located at -115°48.197, 47°14.953.

PLACE OF USE: IRRIGATION

Twp	Rng	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
45N	05E	15	0.9 L1	0.1 L2															1.0

Total Acres: 1.0

PLACE OF USE: FIRE PROTECTION

Twp	Rng	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
45N	05E	15	X L1	X L2															

Method of Determination: Field examination and Arcmap aerial imagery.

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 ID No.*	Motor Make	Hp	Motor Serial No.	Pump Make	Pump Serial No. or Discharge Size
WATER TRANSFER PUMP	HONDA GX120	UNKOWN		HONDA WB20XT	2 INCH

D. FLOW MEASUREMENTS

1.

Measurement Equipment	Type	Make	Model No.	Serial No.	Size	Calib. Date
NONE						

2. Measurements: I was unable to perform a flow measurement due to the 2" main trunk line being flexible fire hose, and 5-gal bucket measurements from the fire hose connection filling in less than 5 seconds. Internet research of the applicant's tripod sprinklers with Orbit brass impact sprinkler heads with 1/8-inch nozzles was used to derive a theoretic flow rate equal to 6ea nozzles operating at 45 PSI x 3.2 gpm per head = 19.2 gpm or 0.04 cfs.

E. FLOW CALCULATIONS☒ Additional Computation Sheets Attached

Measured Method: 1/8-inch nozzle Orbitz tripod brass impact sprinklers using water transfer pump maximum operating pressure of 45 PSI results in 6 ea sprinklers x 3.2 gpm per head = 19.2 gpm or 0.04 cfs considering department rounding standards.

F. VOLUME CALCULATIONS

1. Volume Calculations for irrigation:

$$V_{I.R.} = (\text{Acres Irrigated}) \times (\text{Irrigation Requirement}) = 1 \text{ acre} \times 3.0 \text{ afa} = 3.0 \text{ af}$$

$$V_{D.R.} = [\text{Diversion Rate (cfs)}] \times (\text{Days in Irrigation season}) \times 1.9835 = 0.03 \text{ cfs} \times 214\text{-day} \times 1.9835 = 12.7 \text{ af}$$

$$V = \text{Smaller of } V_{I.R.} \text{ and } V_{D.R.} = 3.0 \text{ af}$$

2. Volume Calculations for Other Uses:

This right uses a surface water source and does not receive an annual volume nor maximum diversion volume.

G. NARRATIVE/REMARKS/COMMENTS

Field exam performed on 10/2/2020 with the applicant, Kenneth Mueller, showed water being diverted from the St. Joe River for irrigation and fire protection purposes. At the POD, the applicant's diverting works include a Honda WB20XT generator water transfer pump with screened intake flexible pipe located along the shore of his property. I was unable to perform a flow measurement due to the 2" main trunk line being flexible fire hose, and 5-gal bucket measurements from the fire hose connection filling in less than 5 seconds. Internet research of the applicant's tripod sprinklers with Orbit brass impact sprinkler heads (1/8-inch nozzle) was used to derive a theoretic flow rate equal to 6ea nozzles operating at 45 PSI x 3.2 gpm per head = 19.2 gpm or 0.04 cfs.

The applicant is limited by the department standard diversion rate for 1 acre of land, which equals **0.03 cfs** and is being recommended to license the irrigation beneficial use of this water right. In the event a water master district is activated for this region, the applicant may be required to reduce the diversion rate by the minor overage (0.01 cfs) identified during the field exam. As the diversion rate was derived using theoretic component specification data for sprinkler heads, it is possible there is a deviation factor, and the applicant does not over divert at all. It is difficult to delineate due to the large pump capacity of the water transfer pump that is covered under the fire protection component of this water right. Additionally, based on topography this segment of the St. Joe River is a gaining reach, and any over irrigation presumably sub-irrigates back to the river based on the proximity of the irrigation POU to shoreline and elevation rise on the applicant's property.

The Fire protection diversion rate recommended to license this right is the permit approved value equal to **0.20 cfs**. The Honda water transfer pump with GX120 motor has a manufacturer's specification maximum pump capacity of 164 gpm or 0.37 cfs with 45 PSI maximum operating pressure. There is no concern for diversion rate enlargement due to the fire protection systems used to fight active fires being an exempt use. The larger pump capacity is greatly restricted prior to being used for irrigation purposes mitigating concerns for enlargement of the irrigation component diversion rate.

The fire protection POU and irrigation POU are the same acreage on the applicant's property and consist of 1 acre of waterfront lawn space which was sketched out on field maps during the exam. For fire protection, the water system routes a 50 ft flexible fire hose perpendicular away from the river to a "tee" splitter with manual shutoff valves installed on each side of the split. Attached to the splitter are additional approximately 250 feet of 2-inch flexible fire hose routed each direction with irrigation riser valves with manual shutoff valves set at intervals to hose bib connections. Mr. Mueller stated he developed the water system this way so he wouldn't have to unroll and connect a fire hose in the event of a fire, rather just isolate the respective length of fire hose from the irrigation system prior to use. The irrigation portion of the water system uses six each hose to tripod sprinklers to water approximately half the 1-acre POU at a time, then alternate to the opposite side of the system.

During licensing review Arcmap aerial imagery was used to trace out the fire protection and irrigation POU. The annual volume requirement for the irrigation beneficial use equals 1.0 ac x 3.0 afa = 3.0 af, but as this right uses a surface water source there is no annual nor maximum diversion volume applied to the face of the license. Volume limitations are covered using conditions of approval for the irrigation use.

Government Lot 1 assigned to the POD on the permit was removed during licensing review; Arcmap aerial imagery and GPS show the POD is in the same NE¼NE¼ of Section 15, but not in the portion designated with the government lot. Condition WB9 was replaced by 227 to accurately describe the minimum stream flow for right 91-7122 and designate a gauging station the applicant may reference to monitor St. Joe River daily flows. All other condition son the permit shall be carried to licensing.

Decreed right 91-7170 uses groundwater for municipal use by the Avery Water & Sewer District with a service area that overlaps this rights POU. 91-7170 is not a concern for overlap with this right's surface water source and respective beneficial uses. There are no additional concerns for overlap with this right.

Have conditions of permit approval been met? ☒ Yes ☐ No

H. RECOMMENDATIONS

1. Recommended Amounts

<u>Beneficial Use</u>	<u>Period of Use</u>	<u>Rate of Diversion</u>
IRRIGATION	04/01 to 10/31	0.03 CFS
FIRE PROTECTION	01/01 to 12/31	0.20 CFS

Totals: 0.20 CFS

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

I. AUTHENTICATION

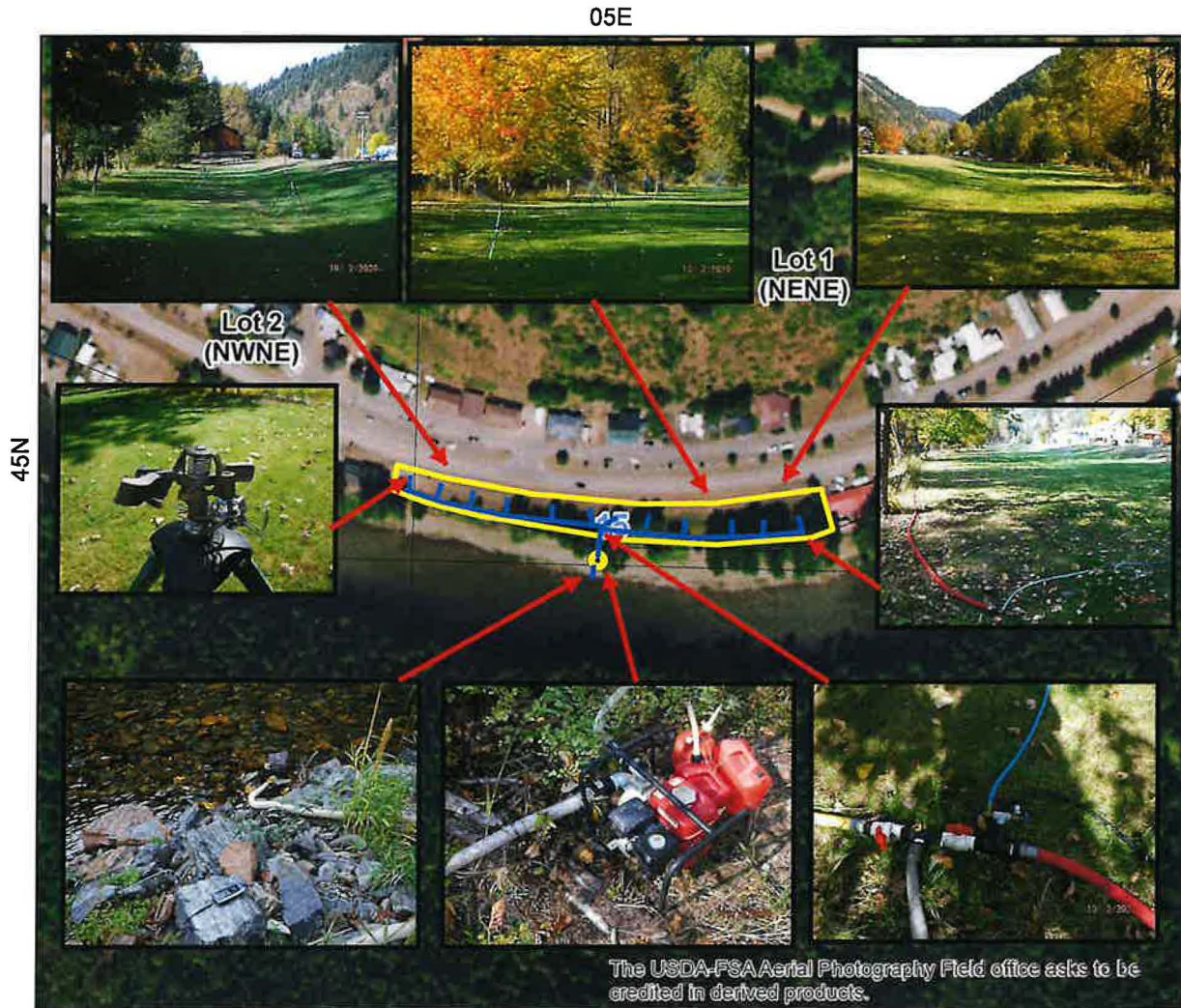
Luke Bates -

Field Examiner's Name *LB Bates* Date *11/18/2021*

Reviewer *Ad F...* Date *11/18/2021*

State of Idaho
Department of Water Resources
Attachment to Field Exam
91-7903

IRRIGATION system diagram. FIRE PROTECTION system diagram consists of all
2 INCH fire hose which create the main irrigation trunk lines.



- Point of Diversion
- Place Of Use Boundary
- Townships
- PLS Sections
- Quarter Quarters

0 0.035 0.07 0.14 Miles



Home > Sprinklers > Brass Sprinklers > 1/2" Brass Part Circle Impact Sprinkler w/ Deflector 25° - 1/8"



1/2" Brass Part Circle Impact Sprinkler w/ Deflector 25° - 1/8"

★★★★☆ 11 Reviews [Ask a question](#)

1/2" Brass Part Circle Impact Sprinkler w/ Deflector 25° - 1/8"

~~\$31.42~~ **\$14.73**

Availability: In stock

SKU#: **RK-25D**

1

Add to Cart



[Details](#) [More information](#)

1/2" Brass Part Circle Impact Sprinkler w/ Deflector 25° - 1/8"

RK-25



Nozzle Inches (mm)	Pressure		Radius Feet	Flow GPM
	kg/cm ²	PSI		
1/8" (3.18)	2.0	28.4	34.8	2.5
	2.5	35.6	36.7	2.9
	3.0	42.7	37.7	3.1
	3.5	49.8	39.0	3.4

Nozzle: 1/8"
Pressure: 43 PSI

Spacing	Application Rate
Feet	Inches/Hour
20' x 20'	0.85

- APPLICANT'S IRRIGATION SYSTEM SET UP TO RUN 6EA TRIPOD SPRINKLERS AT ONE TIME.
 - o 6 EA X 3.2 GPM (@45 PSI) = **19.2 GPM OR 0.04 CFS**



Hover to zoom



Honda WB20XT4A - 164 GPM (2") Water Pump

Model: WB20XT4A

HONDA



(65) Write a Review

Q&A (5)

\$499.00

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Size

2"



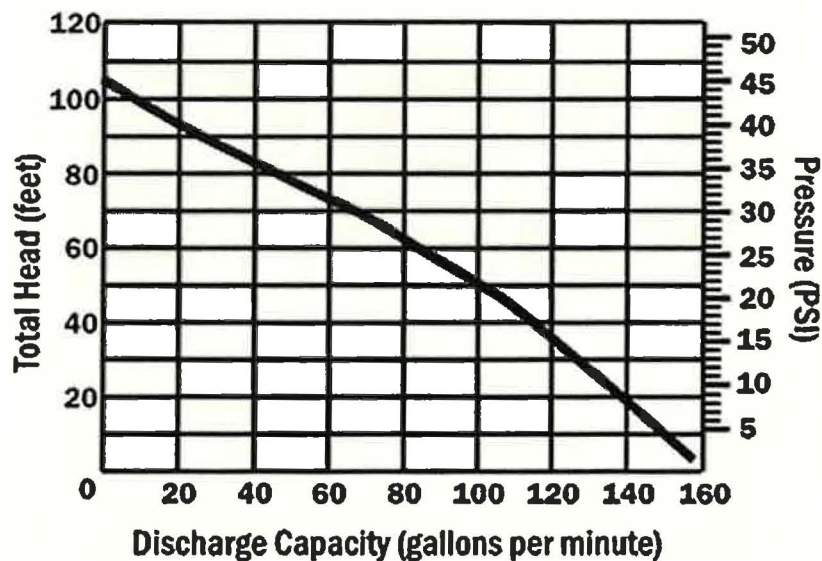
Qty 1

Add To Cart

Media Gallery

Honda WB20XT4A - 164 GPM (2") Water Pump

WB20XT3 TOTAL HEAD VS PUMP OUTPUT



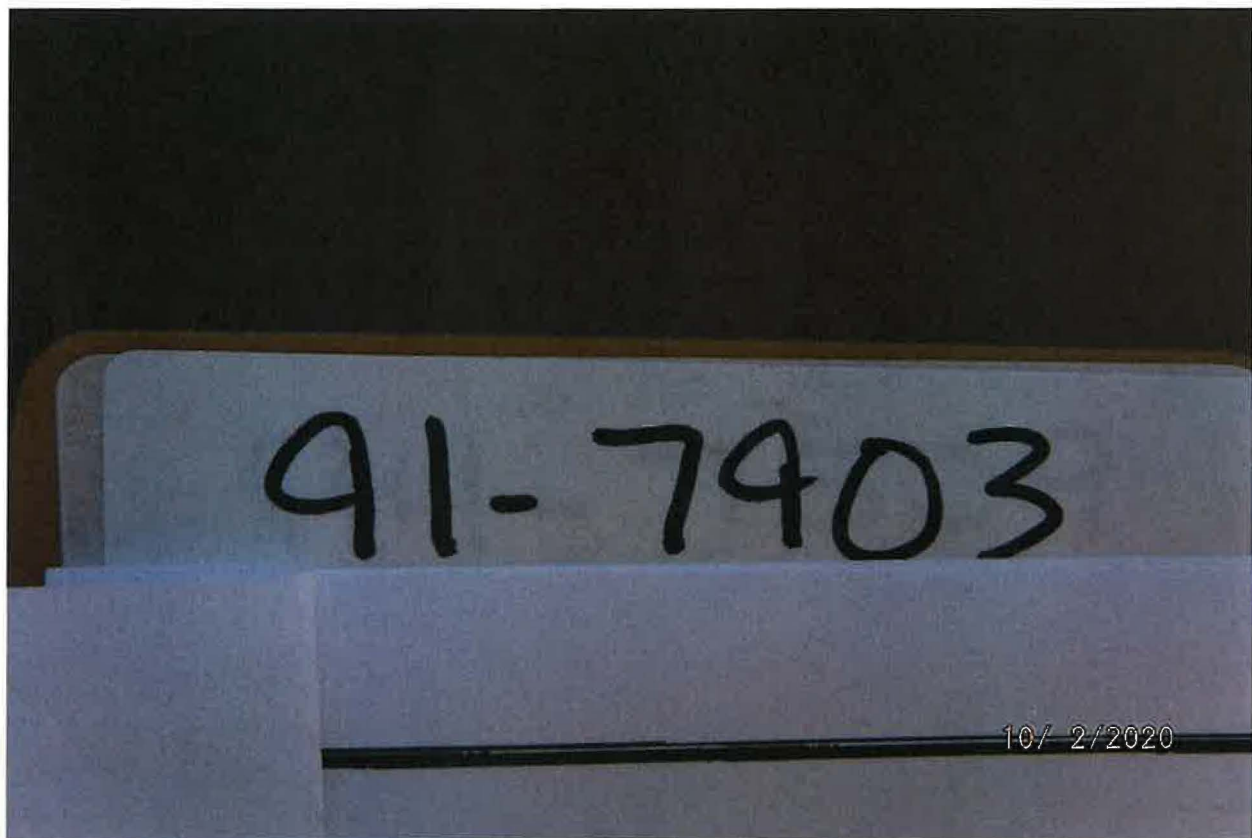
Specifications

WB20XT4A



Pump

Gallons Per Minute	164 Gallons
Inlet Diameter	2"
Outlet Diameter	2"
Self Priming	Yes
Pump Head Material	Aluminum
Pump Housing Drain	Yes
Quick Clean Out	No
Mechanical Seal Material	Silicon Carbide
Impeller Material	Cast Iron
Solids Handling Size	3 inch
Suction Head	25 Feet
Maximum PSI	45
Total Head Lift	105 Feet
Submersible	No



FIELD EXAM DATE 10/2/2020



POD – HONDA WB20XT WITH GX120 MOTOR WATER TRANSFER PUMP 2" PORT



AT POD – SCREENED INTAKE SUCTION PIPE IN RIVER





FIRE PROTECTION & IRRIGATION POU – WATER SYSTEM DELIVERY LINE MAIN TEE JUNCTION



FIRE PROTECTION & IRRIGATION POU – LOOKING EAST FROM TEE IN WATER LINE



FIRE PROTECTION & IRRIGATION POU – LOOKING WEST FROM TEE IN WATER LINE



IRRIGATION RISER CONNECTIONS TO HOSE AND TRIPOD SPRINKLER AT INTERVAL ON MAIN TRUNK LINE



ORBIT BRASS IMPACT SPRINKLER 6EA OPERATES AT ONE TIME, ALTERNATES IRRIGATION SCHEDULE



FIRE PROTECTION & IRRIGATION POU