

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

A. GENERAL INFORMATION

Permit No: 95-16391
Exam Date: 07/09/2024

1. Current Owner:
ASIA WILLIAMS PO BOX 369 BLANCHARD ID 83804-0369 AND/OR
BRIAN WILLIAMS PO BOX 369 BLANCHARD ID 83804-0369
2. Accompanied by: Brian Williams
Phone No: 503-267-2674
Address: Same as above
Relationship to permit Holder: Permit Holder

3. SOURCE:
UNNAMED STREAM

Tributary
BLANCHARD CREEK

Method of Determination: ArcMap and DRG layer

B. OVERLAP REVIEW

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

Water Right No.	Source	Purpose of Use	Basis
95-18632	UNNAMED STREAM	STOCKWATER	PERMIT – in licensing approval process

Comments: Right 95-18632 has been split from parent Right 95-16391 (this Permit) during licensing review and accounts for only the in-stream stockwater beneficial use (BU) of the original permit approval. Stockwater BU remains on each respective Right, and I've recommended addition of condition X35 describing that: Rights 95-16391 and 95-18632 when combined shall not exceed a total diversion rate of 0.02 cfs for stockwater uses. X35 mitigates concerns for enlargement between all beneficial uses accounted for following the split procedure.

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

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

UNNAMED STREAM SE¼ SE¼, Sec. 25, Twp 54N, Rge 06W, B.M. BONNER County -117°1.612, 47°59.589 (upstream)
 UNNAMED STREAM SE¼ SE¼, Sec. 25, Twp 54N, Rge 06W, B.M. BONNER County -117°1.598, 47°59.611 (middle)
 UNNAMED STREAM SE¼ SE¼, Sec. 25, Twp 54N, Rge 06W, B.M. BONNER County -117°1.574, 47°59.622 (downstream)

Method of Determination: three 24-hr impoundment pools were GPS located during the field exam as illustrated above in underlined text.

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	
54N	06W	25																6.2	6.2

Total Acres: 6.2

PLACE OF USE: STOCKWATER

Twp	Rng	Sec	NE				NW				SW				SE				Totals
			NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
54N	06W	25																X	

Method of Determination: Beneficial use 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
UNNAMED STREAM (UPSTREAM POD)	DUROMAX	6.5	XP650WP	DUROMAX	3.0-INCH DISCHARGE REDUCED TO 1.5-INCH FLEXIBLE FIRE HOSE
UNNAMED STREAM (MID STREAM & DOWNSTREAM PODs)	NORTHSTAR		#0719 4829	GENERATOR MOUNTED NORTH STAR TRASH WATER PUMP	ITEM #1091631 2-INCH DISCHARGE

*** EACH GENERATOR FRAMED WATER PUMP IS PORTABLE AND TWO PUMPS ARE USED BETWEEN 3 TOTAL 24-HR IMPOUNDMENT POOLINGS, BUT ONLY 2 PUMPING STATIONS AT ONE TIME.

D. FLOW MEASUREMENTS

1.

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

2. Measurements: I was unable to perform flow measurements due to inadequate pipe requirements – flexible fire hoses used in each pump's diverting works. I attempted to perform a 5-gal bucket measurement from the Northstar Pump (largest performance capacity pump, but the bucket filled in less than 5-seconds making the measurements unusable by Beneficial use exam standards. I've recommended using manufacturer specifications and irrigation component configurations to evaluate recommended flow rates.

E. FLOW CALCULATIONS

☒ Additional Computation Sheets Attached

Measured Method: each pump's data plate or manufacturer specifications & big gun spray nozzle configuration specifications based on GPM.

- Permit authorized 0.40 cfs maximum diversion rate (20 acres irrigation associated with Permit approval).
- Field exam derived flow rates:
 - Duromax 6.5 hp generator framed water pump XP650WP max flow rate = 220 gpm, but the pump undergoes substantial reduction in flow as the 3-inch discharge is coupled down to 1.5-inch flexible hose routed upslope approximately 50 ft before being connected to a single impact sprinkler for irrigation use. I observed the full circle ½" fitting full circle brass impact sprinkler rainbird style) that is rated at 5.5 gpm with 5/32-inch head.
 - Northstar generator framed semi trash water pump connected to big gun Ambro 1.5-inch sprinkler with an 8mm nozzle has a 39-gpm flow rate.
 - Total flow rate observed = 45.5-gpm or 0.10 cfs.

- Recommended maximum diversion rate for licensing purposes = **0.14 cfs** based on **0.02 cfs** (stockwater use) + **0.12 cfs** (irrigation use for 6.2 ac active irrigation observed at time of exam).
 - I'm recommending 0.12 cfs for the irrigation BU although the sprinkler configuration observed during the exam equaled 0.10 cfs. The Northstar pump alone has a pump capacity which exceeds 0.12 cfs depending on what size nozzle is installed on the Ambro big gun sprinkler. Permit Holder's diverting works are capable of 0.12 cfs as recommended.
- Department standard diversion rate for irrigation = 0.02 cfs per ac x 6.2 ac = 0.12 cfs considering department rounding standards.

F. VOLUME CALCULATIONS

1. Volume Calculations for irrigation:

$$V_{I.R.} = (\text{Acres Irrigated}) \times (\text{Irrigation Requirement}) = 6.2 \text{ ac} \times 3.0 \text{ afa} = 18.6 \text{ af}$$

$$V_{D.R.} = [\text{Diversion Rate (cfs)}] \times (\text{Days in Irrigation season}) \times 1.9835 = 0.12 \text{ cfs} \times 214 \text{ days} \times 1.9835 = 50.9 \text{ af}$$

$$V = \text{Smaller of } V_{I.R.} \text{ and } V_{D.R.} = 18.6 \text{ af}$$

2. Volume Calculations for Other Uses: The irrigation beneficial use from the Unnamed Stream water source is exempt from the volume reporting requirements in accordance with IDAPA 37.03.02, Section 035.

- Stockwater annual volume = (5 goats x 2 gal per head) = 10 gal per day + 5 gal per day for 10 chickens = 15 gal per day x 365 days = 5,475 gal annually; this value is below the threshold to round up to 0.1 af, but beneficial use of stockwater has been developed and the smallest volumetric value I can recommend equals **0.1 af**.

G. NARRATIVE/REMARKS/COMMENTS

I conducted the beneficial use field exam on 7/9/2024 with the Permit Holder, Brian Williams, which showed water being diverted from an Unnamed Stream for irrigation and stockwater beneficial uses (BUs). The Permit authorized development of both in-stream stockwater BU and stockwater use associated with diversion from the stream via pumping diversion works. Based on this information, I have recommended Permit 95-16391 be Split at time of licensing into two Rights as follows:

- Parent Right 95-16391 maintains 3ea PODs following an amendment of permit (for licensing purposes) related to pump diverting works and 24-hr impoundment pools, which are used for irrigation and stockwater diverting systems.
- Child Right 95-18632 carves off 2ea PODs, 1 Beginning Reach POD on the southern extent of the Permit Holder's parcel boundary and the Ending Reach POD on the Northern extent of the parcel. Both PODs are related to in-stream stockwater, and a separate BU report has been developed for the child Right.

During the exam I found the Permit Holders had developed 3ea 24-hr impoundment pools which are incorporated in portable pumping station PODs. The Permit authorized 2ea PODs for pump related diverting works; based on development IDWR required an Application for Amendment of Permit to add a 3rd POD at time of licensing. I mailed the amendment packet to the Permit Holder's address on file on 12/3/2024 and the Northern Regional Office received the signed forms with \$100.00 fee requirement on 12/30/2024.

Three (3) 24-hr impoundment pools are described below:

- The upstream pool is a small swale constructed parallel to a reach of stream (southernmost POD on stream), which has a screened 4-inch PVC pipe gravity flowing into the small pool. The applicant uses a portable generator pump with intake pipe to divert from the impoundment pool. An overflow discharge 4-inch PVC pipe feeds directly back to the creek so that once the pool is full all inflow from the stream discharges directly back to the stream in reach of approximately 15-ft from inflow-to-outflow.

- The midstream pool was developed with the same characteristics as the upstream pool described above.
- The downstream pool was excavated as an in-stream pool with a concrete headgate that incorporates wooden 2x planks as risers to control the depth of the pool.
 - With wooden risers installed to the top of the headgate the pool holds more water than authorized in a 24-hr impoundment vessel, but the configuration was set 1.5 feet below the headgate allowing a maximum depth of 6 feet to be stored in the pool. Using a pond analysis worksheet the 0.03 ac surface area sized pool has a maximum depth of 6-ft under normal operations, average depth of 4-ft (steep banked pool), and capacity of 0.1 af (rounded up based on Department rounding standards). 0.1 af is equivalent to 32,585 gallons; when compared to the 24-hr volume authorized for impoundment for 6.2 acres irrigation derived during the field exam, I've determined the Permit Holder is authorized to impound the following volume: $6.2 \text{ ac} \times 3.0 \text{ af} = 18.6 \text{ af} \times 325,850 \text{ gal per af} = 6,060,810 \text{ gal per season of use} / 214 \text{ day season of use} = 28,321 \text{ gal per day on average}$.
 - The difference between 32,585 gal at 6 ft max depth and 28,321 gal of authorized 24-hr impoundment = 4,264 gallons. This variation may be considered the deviation of rounding conventions found on the pond analysis worksheet rounding up to 0.1 af (an average depth of 2.5 ft – 4.0 ft results in the same 0.1 af volume for pool). I'm not concerned with the small difference in volume from the calculations above. **I recommend the Permit Holders seek additional water rights if they seek to pursue using the largest 24-hr impoundment pool as a storage pond.**
- It is noteworthy to state that 95-16391 doesn't authorize storage related BUs. **The Permit Holder is not authorized to store water in any of the 3-ea 24-hr impoundment pools outside the irrigation season of use = 4/1 to 10/31 annually.** Two 4-inch PVC intakes are required to be capped to prevent inflow to both small impoundment pools and all the 2x wooden planking should be removed from the concrete headgate associated with the in-stream pool when outside the authorized appropriation season of use.

At the 3-ea impoundment pools the Permit Holder uses two portable generator framed water transfer pumps which can be moved to each of 3 PODs dependent on rotational forest tree irrigation throughout the season of use. Both the Duromax pump and Northstar pump have maximum pump capacities that exceed the recommended **0.12 cfs** for the irrigation BU usage, but the diverting works are oversized to overcome total head once flexible fire hoses are routed 200 ft up slope to portable sprinklers. In both cases the transfer pumps are coupled down in orifice size restricting flow and increasing pressure. I GPS located each impoundment pool, which constitutes the location of each portable diverting works.

During the exam I observed the larger Northstar pump connected by flexible hose reduced to a 1.5-inch riser pipe with Ambo 1.5-inch "big gun" sprinkler. Mr. Williams removed the sprinkler, and I attempted to take a 5-gal bucket flow measurement, but the time required to fill was less than 5 seconds making the measurement unacceptable for licensing purposes. The big gun was fitted with an 8-mm nozzle, which manufacturer specifications identify as having a 39-gpm flow rate with 140-ft diameter spray arc. Mr. Williams asserts he uses flexible fire hose runs routed up-hill on either side of the POD, and can create two spray arcs per side of the watershed at the POU. I observed an old logging skid trail on each side of the small drainage, which serves as the level platform where the big gun is set to irrigate. Mr. Williams irrigates approximately 75 feet from each POD using the big gun, creating a corridor of irrigation 150-ft wide on each side of the stream, or 300-feet wide in total related to the Northstar pump and big gun configuration.

Mr. Williams uses the Duromax pump with smaller flexible fire hose to route further up-slop and irrigates using a portable sprinkler with 25-ft radius or 50-ft diameter watering arc. This enables an additional 50-ft per side of the stream; adding this reach of irrigation make a combined 300-ft (big gun) + 100-ft (brass impact sprinkler) = 400-ft corridor of irrigation from the PODs. During licensing review, I used ArcMap aerial imagery and the Measure tool to create a corridor extending roughly 200-ft from each POD to create the irrigation POU, which is based on pumping configurations demonstrated by the Permit Holder. The result is an area equal to **6.2 acres** in size which I've recommended as the Irrigation POU for licensing purposes. There is no annual volume designated on the license approval, but the Right Holder is bound by the Department standard authorization of 3.0 af per acre annually as detailed by conditions of approval.

The Stockwater POU is a small area around the primary residence where diverted stream water is used for small-scale stock watering. At time of exam there weren't any stock on the premise, but the Permit Holder had 5 goats and 10 chickens during the Permit's development period (4/9/2012 – 3/4/2022). Based on the historic use occurring within the development period I recommend licensing for the small scale stockwater use, which rounds up to **0.1 af** considering department rounding standards. I used ArcMap aerial imagery to assign the POU, and the Permit Holder is being recommended for in-stream stockwater use via Split Right 95-18632. The diversion rate for stockwater use equals **0.02cfs**, and the maximum diversion rate for licensing purposes = 0.12 cfs (Irrigation BU) + 0.02 cfs (Stockwater BU) = **0.14 cfs**.

I removed condition X02 and 26A from the Permit during licensing review. I removed condition 111, as the instream stockwater use is accounted for on child Right 95-18632. I've added condition X35 which designates that Rights 95-16391 and 95-18632 when combined shall not exceed a total diversion rate of 0.02 cfs for stockwater uses. X35 mitigates overlap concerns related to stacking water rights and the diversion rate between split Rights. All other conditions of approval are being carried forward to licensing. Aside from parent/child water right overlaps, there are no additional overlapping water right concerns toward licensing 95-16391.

Have conditions of permit approval been met? X Yes No

H. RECOMMENDATIONS

1. Recommended Amounts

<u>Beneficial Use</u>	<u>Period of Use</u>	<u>Rate of Diversion</u>	<u>Annual Volume</u>
IRRIGATION	04/01 to 10/31	0.12 CFS	
STOCKWATER	01/01 to 12/31	0.02 CFS	0.1 AF

Totals: 0.14 CFS

2. Recommended Amendments

 Change P.D. as reflected above X Add P.D. as reflected above None

 Change P.U. as reflected above Add P.U. as reflected above X None

I. AUTHENTICATION

Luke Bates – Sr Water Resource Agent

Field Examiner's Name

[Signature]
[Signature]

Date

1/27/2025

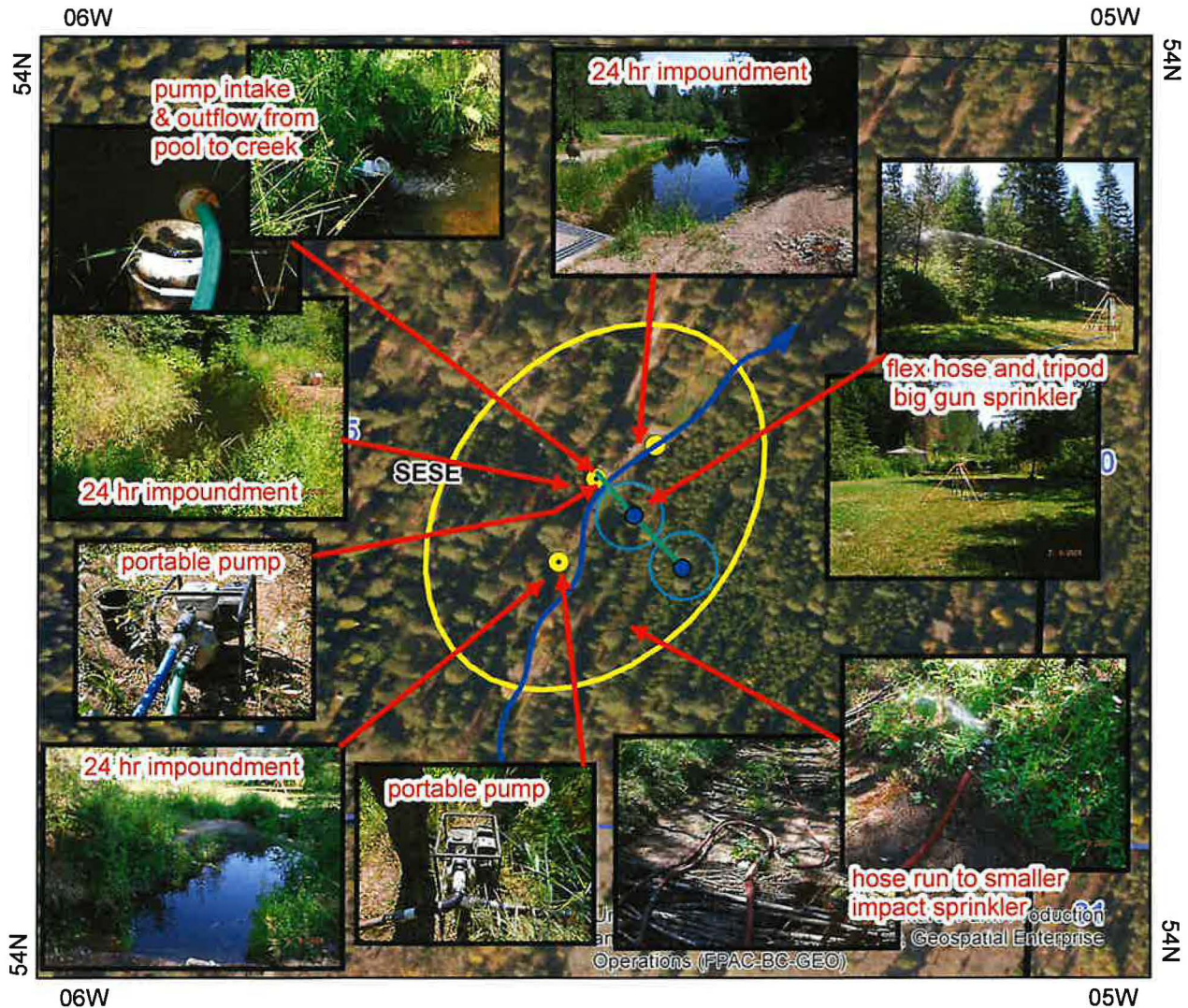
Reviewer

Date

3/27/2025

State of Idaho
Department of Water Resources
Attachment to Field Exam
95-16391

This map depicts the IRRIGATION System diagram.



Example: Sprinkler and Sprinkler Arc Pattern

Place Of Use Boundary

Point of Diversion

Townships

PLS Sections

Quarter Quarters

State of Idaho
Department of Water Resources
Attachment to Field Exam
95-16391

This map depicts the STOCKWATER system diagram.



0 0.035 0.07 0.14 Miles

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



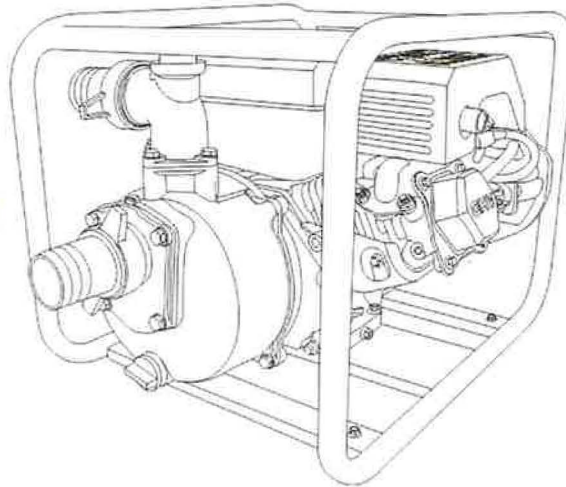


Gasoline Water Pump Owner's Manual

XP652WP ☐

XP650WP ☒

XP904WP ☐

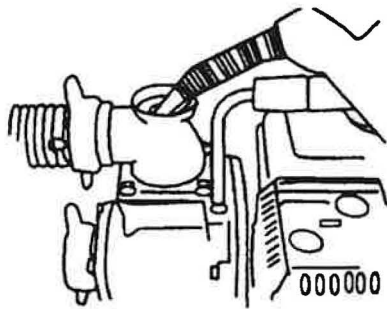


DuroMax Customer Service

info@duromaxpower.com or call 1-844-DUROMAX
Monday - Friday 7am to 5pm. PST

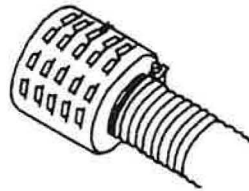
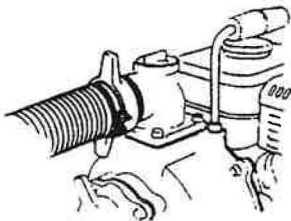
Product Support (Product: information, application & warranty questions)

support@duromaxpower.com or call 1-844-DUROMAX
Monday - Friday 7am to 5pm. PST



The pump unable to such up water:

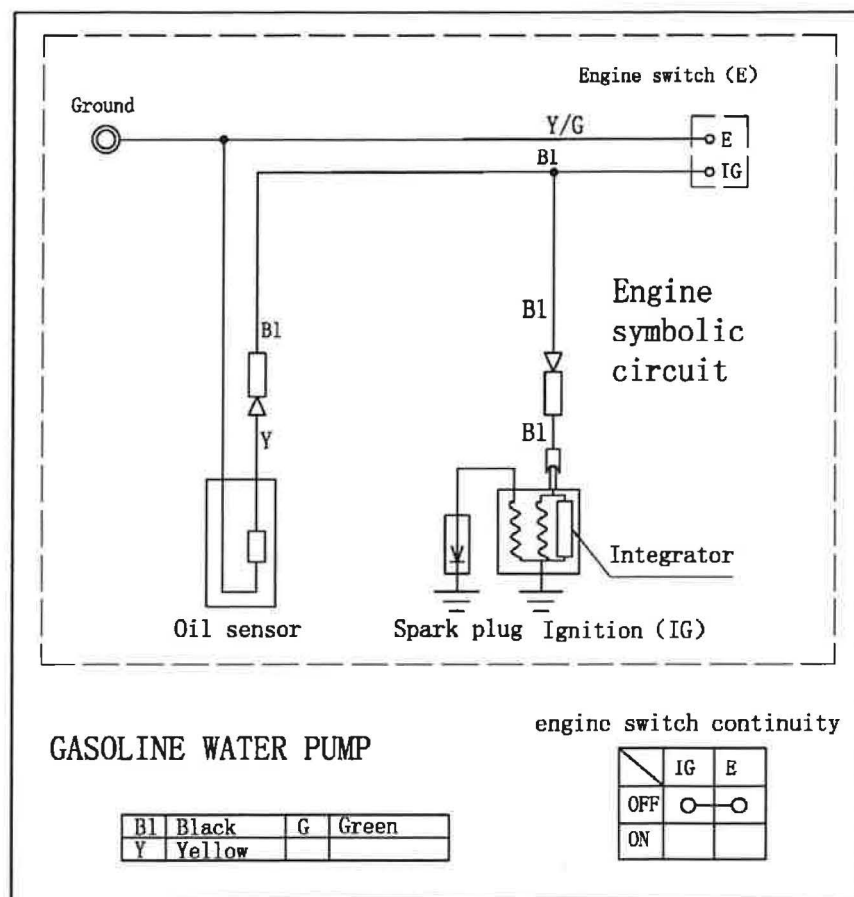
- 1) Is it filled with enough amount of water?
- 2) Is the filter clogged?
- 3) Is the hose fastener clip tightened?
- 4) Is the hose damaged?
- 5) Is the suction head too high?
- 6) If the pump still fails to work, send it to any of the authorized dealers.



XI. Specifications

Type	XP652WP	XP650WP	XP904WP
Engine type	XP6.5HP	XP6.5HP	XP9.0HP
Max. Power	4.7kw(7HP)	4.7kw(7HP)	6.5kw(9.0HP)
Displacement	208cc	208cc	270cc
Fuel tank capacity	1.0 Gallons	1.0 Gallons	1.7 Gallons
Oil capacity	0.63 US. Qt.	0.63 US. Qt.	1.16 US. Qt.

Water intake pipe dia.	2"	3"	4"
Water output pipe dia.	2"	3"	4"
Revolution	3600rpm	3600rpm	3600rpm
Max. overhead lift	92ft	98ft	98ft
Max. suction lift	26ft	26ft	26ft
Max. flow rate	158 GPM	220 GPM	427 GPM
Size	18.7×15.6× 15.4(in.)	21.3×17.5× 19.3(in.)	25.2×20.7× 22.3(in.)





PERFORMANCE DATA

20JH

20JH

1/2" Full Circle, Brass Impact Sprinkler

Bearing: 1/2" Male NPT, Brass

Trajectory Angle: 23°

Operating Range: 35-80 psi

Flow Rate: 2.0-5.47 GPM

Radius: 35-44 ft.

FEATURES

- Durable brass die-cast arm
- Stainless steel springs and fulcrum pin
- Chemically resistant Teflon™ washers
- Two-year warranty

BENEFITS

- Spoon drive arm runs on larger nozzles and higher pressures
- Corrosion and grit resistant
- Built to last

Straight Bore Nozzle (SBN-1)

(Stream Height: 6 ft.)

PSI @ Nozzle	NOZZLE SIZE							
	7/64"		1/8"		9/64"		5/32"	
	Rad.	GPM	Rad.	GPM	Rad.	GPM	Rad.	GPM
35	38	2.05	38	2.68	39	3.39	39	4.19
40	38	2.19	39	2.86	40	3.62	39	4.47
45	39	2.32	39	3.03	40	3.84	40	4.73
50	39	2.45	39	3.20	40	4.05	40	5.00
55	39	2.57	40	3.35	40	4.24	40	5.23
60	39	2.68	40	3.50	41	4.43	41	5.47

Straight Bore Nozzle with Vane (SBN-1V)

(Stream Height: 7 ft.)

PSI @ Nozzle	NOZZLE SIZE							
	7/64"		1/8"		9/64"		5/32"	
	Rad.	GPM	Rad.	GPM	Rad.	GPM	Rad.	GPM
35	38	2.05	39	2.68	41	3.39	42	4.19
40	39	2.19	40	2.86	41	3.62	42	4.47
45	39	2.32	40	3.03	42	3.84	42	4.73
50	40	2.45	41	3.20	42	4.05	43	5.00
55	40	2.57	41	3.35	43	4.24	43	5.23
60	40	2.68	41	3.50	43	4.43	44	5.47

Rain Flow Nozzle (RFN-1)

BASE PRESSURE PSI	RADIUS	
	2.0 GPM	2.5 GPM
30	35	37
40	36	38
50	-	38
60	-	38
70	-	39
80	-	39

PART NUMBERS AND ORDERING INFORMATION

Ordering Example

To order a 20JH sprinkler with a 7/64" Straight Bore Nozzle the part number would be:

MAKE YOUR SPRINKLER CHOICE FROM CHART 1

A05841- +

CHOOSE NOZZLE SIZE(S) FROM CHART 2

07 =

ADD THEM TOGETHER TO CREATE THE PART NUMBER

A05841-07

Chart 1	PART NUMBER: FIRST HALF
SPRINKLER ONLY	
Sprinkler without Nozzle	A05840
SPRINKLER WITH SINGLE NOZZLE INSTALLED	
Sprinkler with SBN-1	A05841-
Sprinkler with LPN-1	A05842-
Sprinkler with RFN-1	A05843-
Sprinkler with SBN-1V	A05846-

Chart 2	PART NUMBER: SECOND HALF			
NOZZLE	7/64"	1/8"	9/64"	5/32"
Brass Straight Bore Nozzle (105780-) SBN-1	07	08	09	10
Brass Low Pressure Nozzle (104571-) LPN-1	07	08	09	-
Brass SBN-1 with Straightening Vane (106160-) SBN-1V	07	08	09	10
RAIN FLOW NOZZLE	2.0 GPM		2.5 GPM	
Brass Rain Flow Nozzle (111088-) RFN-1	02-00		02-50	

Bold nozzle size numbers denote the most common nozzle choices.

95-16391

LICENSING REVIEW – IRRIGATION COMPONENTS – PREPARED BY LUKE BATES

Ambo 1.5" Sprinkler



8 MM NOZZLE INSTALLED AT TIME OF FIELD EXAM

Specifications

Flow Range: 20-107 gal/min.

Coverage: Up to 190' Diameter

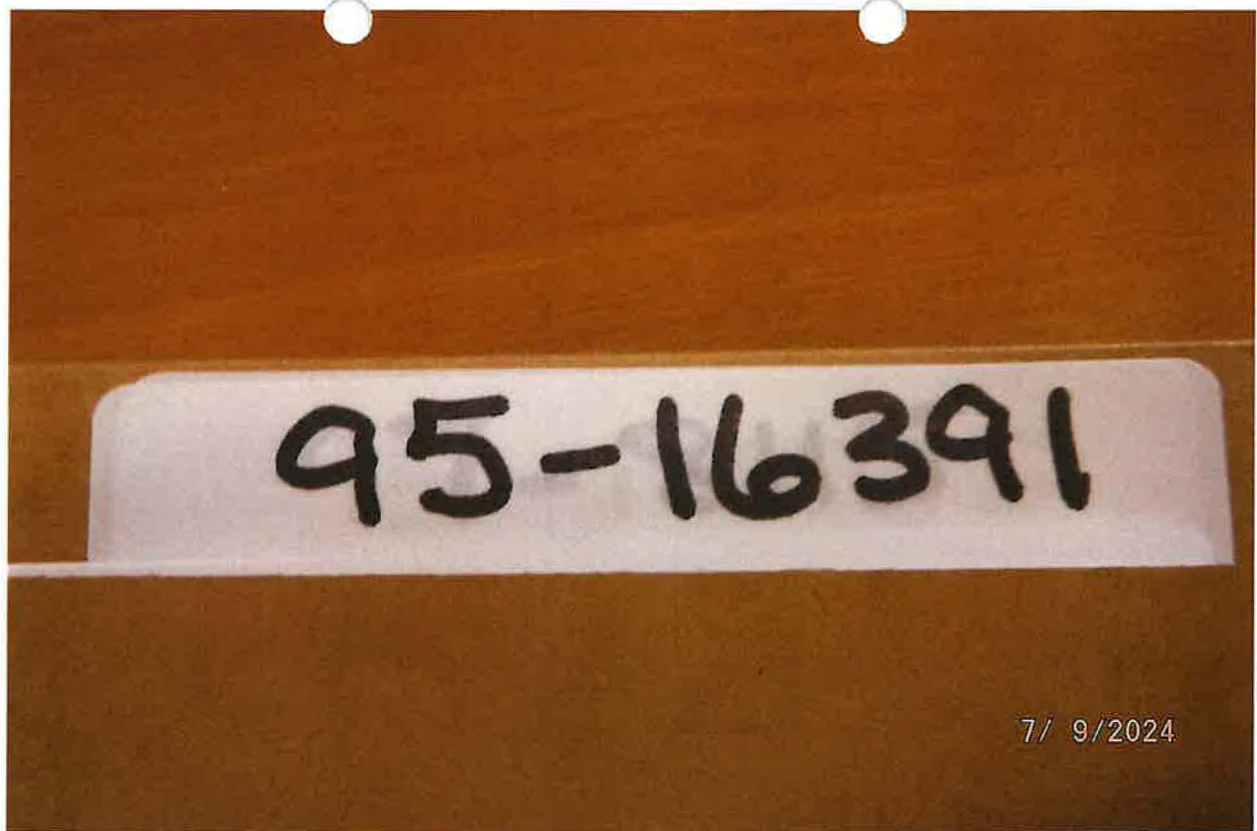
Construction: Aluminum w/ Brass Lower Turning Union.

Trajectory: 30°

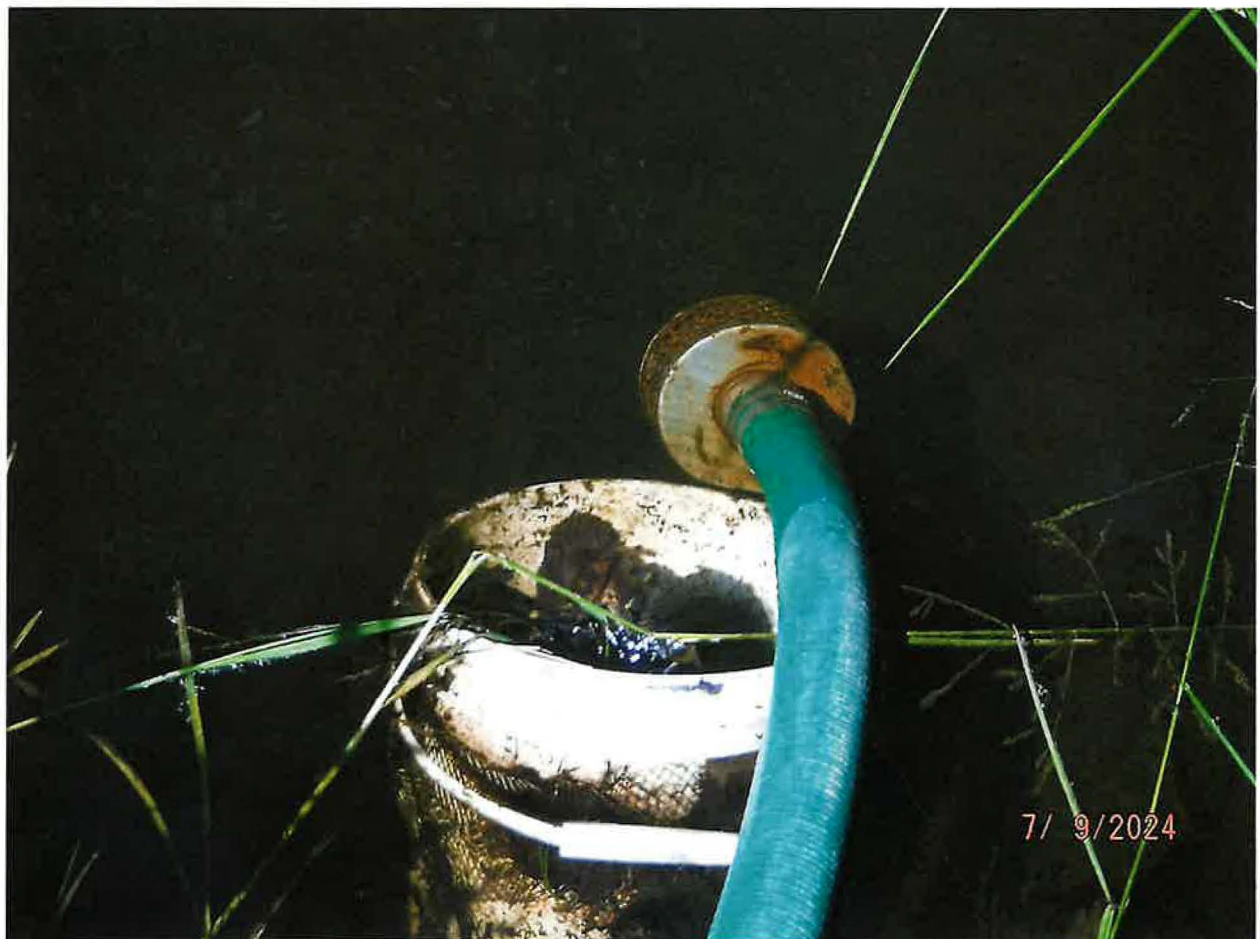
Inlet Size: 1.5" Standard Pipe Thread, Jet Stream Breaker

AMBO w/ 7mm (.28") Diffuser Nozzle (30° Trajectory) 1.5" FNPT Connection										
	Nozzle 8mm (.31")		Nozzle 10mm (.39")		Nozzle 12mm (.47")		Nozzle 14mm (.55")		Nozzle 16mm (.63")	
PSI	GPM	Diameter	GPM	Diameter	GPM	Diameter	GPM	Diameter	GPM	Diameter
35	29	120	39	126	50	134	64	142	79	146
40	31	124	41	132	54	140	68	148	85	152
50	35	132	48	144	60	152	78	162	95	164
60	39	140	51	152	66	166	83	172	104	176
70	-	-	55	158	71	178	90	184	112	188

Impact Drive Ambo Sprinkler is constructed with a heavy cast aluminum body, brass drive arm, and brass lower turning union. Features include adjustable stops for full or part circle coverage, an adjustable jet breaker for changes stream pattern, and a quick change nozzle setup; all supported by a 1 1/2" female standard pipe thread connection. A very popular sprinkler, the Ambo is a dual port sprinkler with a secondary stream nozzle located just above the main barrel to cover close and intermediate ranges. The Ambo is unique to most other impacts as the drive arm operates off of the secondary nozzle instead of the main barrel. This unique design allows the main barrel to project water and gain ultimate distance without any interruptions from a drive arm. The Impact Drive Ambo Sprinkler also has a slightly slower reversing motion than most traditional impact sprinklers. Moreover, the Ambo includes a set of nozzles to accommodate 20 to 107 gallons per minute and coverages up to 190 feet in diameter!



BENEFICIAL USE FIELD EXAM DATE 7/9/2024



POD – LOWER 24-HR IMPOUNDMENT POOL USING SCREENED INTAKE TO GENERATOR FRAMED WATER TRANSFER PUMP; BUCKET IN PHOTO IS A FLOWTHROUGH PASSAGE BACK TO STREAM VIA 4" PVC PIPE



POD – LOWER 24-HR IMPOUNDMENT POOL; GENERATOR FRAME WATER TRANSFER PUMP

NORTH STAR PUMP: ITEM No. 1091631 S/N 0719 4829





LOWER 24-HR IMPOUNDMENT POOL DEVELOPED OFF-STREAM; 4" PVC PIPE INFLOWS TO POOL FROM CREEK AND 4" PVC PIPE OUTFLOWS BACK TO PIPE. ONCE FULL INFLOW = OUTFLOW.



2-INCH OVERFLOW DISCHARGE PORT NECKED DOWN TO FLEXIBLE 1 ½ INCH BLUE FIRE HOSE (100 FT X 2 HOSES) CONNECTED TO BIG GUN SPRINKLER FOR IRRIGATION



BIG GUN SPRINKLER PAIRED WITH NORTHSTAR WATER TRANSFER PUMP & FIRE HOSE(S)



BIG GUN WITH 8MM NOZZLE WITH 1-1/2 INCH STANDARD PIPE THREAD



ACTIVE IRRIGATION USING NORTHSTAR WATER TRANSFER PUMP FROM LOWER 24-HR IMPOUNDMENT
AND 100-FT FIRE HOSE CONVEYANCE SYSTEM



5-GAL BUCKET MEASUREMENT ATTEMPTED FROM 1-1/2 INCH IRRIGATION RISER PIPE AT SPRINKLER
ATTACHMENT – UNABLE TO USE MEASUREMENT DUE TO FILE TIME REQUIREMENTS (< 5 SECONDS)



POD – UPPER 24-HR IMPOUNDMENT POOL SCREENED INTAKE TO WATER TRANSFER PUMP



UPPER 24-HR OFF-STREAM IMPOUNDMENT POOL; 4-INCH INFLOW PIPE FROM STREAM AND 4-INCH OUTFLOW ENSURES WATER BEYOND 24-HR IMPOUNDMENT RETURNS FLOW DIRECTLY TO STREAM



POD – UPPER 24-HR IMPOUNDMENT POOL; POWER MAX XP650WP, GENERATOR FRAME 6.5 HP PUMP





1-1/2 INCH FIRE HOSE COVENYANCE TO SPRINKLER SYSTEM, WHICH IS REDUCED DOWN TO A 3/4-INCH BRASS IMPACT SPRINKLER



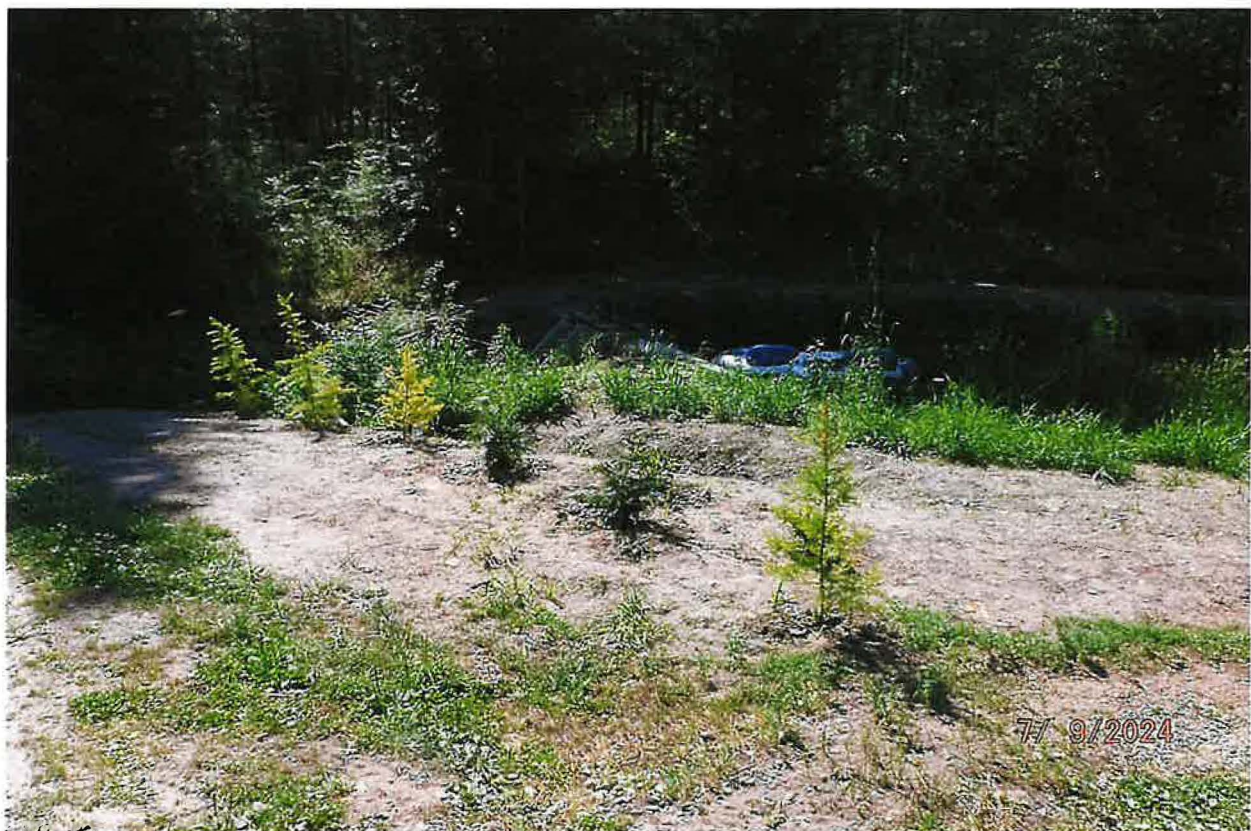


IRRIGATION POU – TREE PLOTS LOCATED ON SLOPED TOPOGRAPHY EITHER SIDE OF UNNAMED STREAM





IRRIGATION POU – LEVEL GRASS AREAS ALONG STREAM LOCATED WITHIN THE POU



TREE & SHRUB PLANTINGS IRRIGATION



IRRIGATION POU – TREE STAND IRRIGATION USING PORTABLE SPRINKLERS FROM 2EA WATER TRANSFER PUMPS



IRRIGATION POU – STREAM SIDE LOWLAND IRRIGATED WITH PORTABLE SPRINKLER SYSTEM



24-HR IMPOUNDMENT POND – CONSTRUCTED IN-STREAM WITH CONCRETE HEADGATE USING
WOODEN PLANK INSERTS





24-HR IMPOUNDMENT POND – INSTREAM WITH HEADGATE CONSTRUCTION

