

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

A. GENERAL INFORMATION

Permit No: 67-14517

Exam Date: 7/11/2012

1. Current Owner: CHESTER R MATEER
11989 LOWER BENCH RD
EMMETT ID 83617
(208)365-4830
2. Accompanied by: Randy Williams
Phone No: 208-405-1475
Address: 11600 N. River Rd, Payette, ID 83661
Relationship to Permit Holder: New owner of property

3. SOURCE TRIBUTARY
GROUND WATER

B. OVERLAP REVIEW

1. Other water rights with the same place of use: 3-10257
2. Other water rights with the same point of diversion: none

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

GROUND WATER L2 SW1/4NW1/4 Sec. 11, Twp 09N, Rge 05W, B.M. PAYETTE County

Method of Determination: GPS and visual inspection

2.

PLACE OF USE: IRRIGATION

Twp Rge Sec	NE				NW				SW				SE				Totals
	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	NE	NW	SW	SE	
09N 05W 11							1.4										1.4
							L 2										

Total Acres: 1.4

Method of Determination: GIS and visual inspection

3. YES Delivery System Diagram Attached (required). Indicate all major components and distances between components. Indicate weir size/pipe as applicable.
YES Aerial Photo Attached (required for irrigation of 10+ acres).
YES 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
Site Tag # D0047895	Franklin Electric	5	2821139310	Franklin Electric	2 inch discharge

*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
Pressure gauge with Pitot tube						

2. Measurements: A measurement of 78 psi was made using a Pitot tube and pressure gauge at the sprinkler nozzle. The corresponding discharge for a 1/2" nozzle was then interpolated from a Rainbird pressure/discharge table and also calculated using Bernoulli's equation. The theoretical discharge was also calculated from the pump horsepower (see attached calculations).

E. FLOW CALCULATIONS x Additional Computation Sheets Attached

Measured Method:

Rainbird chart = 0.14 cfs
Bernoulli calculations = 0.15 cfs
Theoretical = 0.16 cfs

Permit allows 0.22 cfs for the permitted 11 acre area.
Since the actual irrigated acreage is less than 5 acres, we can allow up to 0.03 cfs/acre:
1.4 acres irrigated x 0.03 cfs/acre = 0.04 cfs

I recommend 0.04 cfs be licensed under this permit.**F. VOLUME CALCULATIONS**

1. Volume Calculations for Irrigation:

$$V_{I.R.} = (\text{Acres Irrigated}) \times (\text{Irrigation Requirement}) = 1.4 \times 4.5 = 6.3$$

$$V_{D.R.} = [\text{Diversion Rate (cfs)}] \times (\text{Days in Irrigation season}) \times 1.9835 = 0.04 \times 259 \times 1.9835 = 20.54$$

$$V = \text{Smaller of } V_{I.R.} \text{ and } V_{D.R.} = 6.3 \text{ AF}$$

2. Volume Calculations for Other Uses:

None

G. NARRATIVE/REMARKS/COMMENTS

The system in place under this permit consists of a well and pump, connected to a fire-hose mainline that carries water to a single, portable, high-output, impact sprinkler. Mr. Williams indicated that he intends to dig a mainline from this well to irrigate the large field on his property to the east of his home (in accordance with the originally permitted 11 acres). At the time of the field exam, this work had not been completed. Mr. Williams was not familiar with the water right licensing process and it appears as though he submitted his Proof of Beneficial use under the assumption that it represented his plans for beneficial use as opposed to the actual beneficial use at the time the document was submitted. It is therefore recommended that only the 1.3 acre area that is currently being irrigated by the portable sprinkler/fire hose system, be licensed under this water right.

Based on this recommendation, Mr. Williams inquired about the steps he should take to acquire the necessary permits to complete the development of his irrigation system. We informed Mr. Williams that he has the option to file for a new permit or try to resume use of his surface water right (which hasn't been used since the mid-1990s). The diversion for the surface water right is located on the other side of the mobile home park and Mr. Williams indicated that the pump for this diversion is non-functional and the condition of the pipeline running under the mobile home community is questionable.

A more financially feasible approach for Mr. Williams may be to transfer his surface water POD to the slough or river adjacent to his property and pump water from this new location. According to Jan Shurte, since his surface water right was decreed in 2007, he is still within the 5-year period where he is not subject to forfeiture due to lack of beneficial use. She indicated that she would call Mr. Williams and inform him that, at this point in time, he still has the option to file for a transfer without risk of forfeiture. Dan Nelson pointed out that he also has the option to file for an extension of time. If he files for a transfer, he will have until the end of the 2012 irrigation season to complete his irrigation system and resume irrigation under his surface water right. After that point, he is likely to be subject to forfeiture of the right due to lack of beneficial use over the 5-year grace period.

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	0.040 CFS	6.30 AF
<u>Totals:</u>		0.040 CFS	6.30 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 Jennifer Cuhacyan (Technical Hydrologist)

Field Examiner's Name

Jennifer Cuhacyan

Date

7/31/12

Reviewer

Date

Attachments:

A - system photos

B - Reference Map

C - System Diagram

D - Rainbird chart

E - Bernoulli calcs.

F - Groundwater theoretical

PHOTOGRAPHER AND DATE OF PHOTOS: JENNIFER CUHACIYAN 7/11/2012

FILE NUMBER: 67-14517

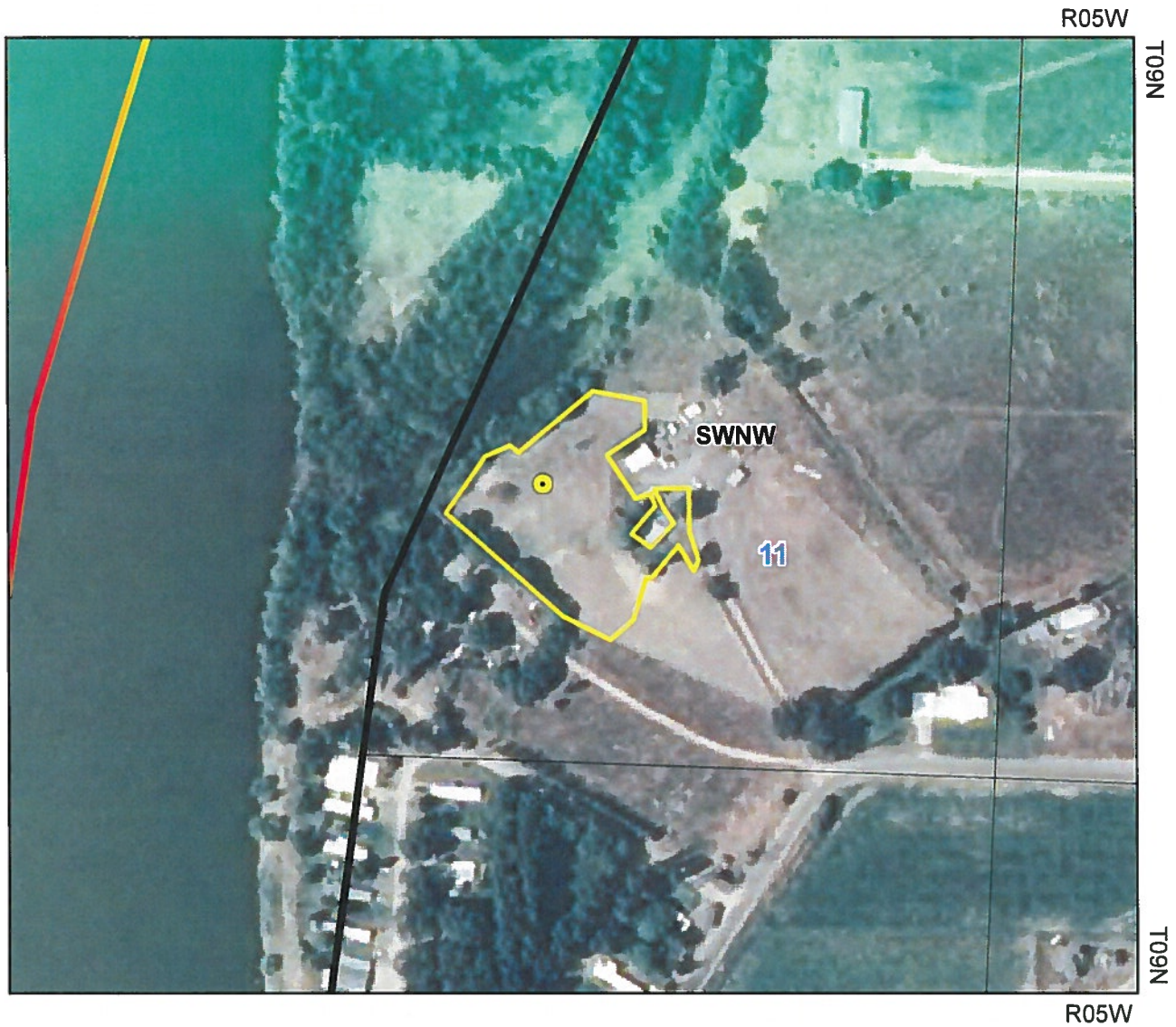


Attachment A

State of Idaho
Department of Water Resources

~~Attachment To~~ Water Right License
Reference Map 67-14517

This map depicts the IRRIGATION place of use boundary for this water right at the time of this approval and is attached to the approval document solely for illustrative purposes.



0 0.03 0.06 0.12 Miles

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

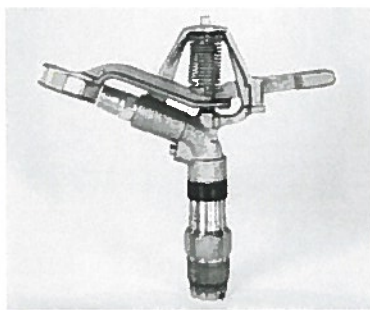


Attachment B

Attachment C: System Diagram



Full Circle Impact Sprinklers
1 1/4" (32 mm) Sprinklers



80EHD

1 1/4" 32 mm Full Circle, Brass Impact Sprinkler

Bearing: 1 1/4" Male NPT, Brass

Trajectory Angle: 27°

Operating Range: 25-100 psi 1.7-6.9 bars

Flow Rate: 17.1-127.7 GPM 2.88-2.9 m³/h

Radius: 61-116 ft. 18.6-35.4 meters

Features

- Heavy duty brass construction
- Internal plastic straightening vane
- Stainless steel springs and fulcrum pin
- Plastic bearing hood
- Chemically resistant washers
- Dual nozzle ports
- Two-year warranty

Benefits

- Internal straightening vane increases distance of throw
- Plastic bearing hood protects spring and bearing sleeve from damage
- Corrosion and grit resistant
- Built to last

U.S. STANDARD DATA

PERFORMANCE DATA

80EHD

STRAIGHT BORE NOZZLE (SBN-5) WITH PLUG* (Stream Height: 14 ft.)

PSI @ Nozzle	NOZZLE SIZE US STANDARD									
	11/32"		3/8"		13/32"		7/16"		15/32"	
	Rad.	GPM	Rad.	GPM	Rad.	GPM	Rad.	GPM	Rad.	GPM
25	61	17.10	62	20.30	64	23.40	66	26.70	66	30.30
30	64	18.80	65	22.30	68	25.70	69	29.30	72	33.20
35	67	20.30	68	24.10	72	27.80	74	31.70	77	35.90
40	69	21.80	71	25.80	75	29.70	77	33.90	80	38.50
45	71	23.10	73	27.40	77	31.60	79	36.00	82	40.80
50	73	24.40	75	28.90	79	33.30	81	38.00	84	43.10
55	75	25.50	77	30.30	81	34.90	83	39.70	86	45.30
60	77	25.80	79	30.80	83	35.90	86	41.60	88	47.40
65	79	26.90	81	32.00	84	37.40	87	43.30	90	49.90
70	81	28.10	83	33.30	86	38.90	89	45.10	91	51.40
75	82	29.20	84	34.50	87	40.30	90	46.80	93	53.30
80	83	30.40	86	35.70	89	41.80	92	48.40	94	55.10
85	85	31.50	87	37.00	90	43.20	93	50.00	96	56.90
90	86	32.70	89	38.30	92	44.60	95	51.50	97	58.50
95	87	33.90	90	39.50	93	46.00	96	53.00	98	60.00
100	88	34.00	91	40.70	94	47.40	97	54.50	99	61.50

* Nozzle and plugs must be purchased separately.

STRAIGHT BORE NOZZLE (SBN-5) AND SPREADER (LAN-1-20)* (Stream Height: 14 ft.)

PSI @ Nozzle	NOZZLE SIZE US STANDARD									
	11/32"		3/8"		13/32"		7/16"		15/32"	
	Rad.	GPM	Rad.	GPM	Rad.	GPM	Rad.	GPM	Rad.	GPM
25	61	23.30	62	26.50	64	29.60	66	32.90	66	36.40
30	64	25.60	65	29.10	68	32.40	69	36.10	72	40.00
35	67	27.70	68	31.40	72	35.10	74	39.00	77	43.30
40	69	29.60	71	33.60	75	37.60	77	41.80	80	46.30
45	71	31.50	73	35.70	77	39.90	79	44.40	82	49.20
50	73	33.20	75	37.70	79	42.10	81	46.80	84	51.90
55	75	34.90	77	39.70	81	44.30	83	49.10	86	54.70
60	77	36.50	79	41.40	83	46.60	86	51.50	88	57.20
65	79	38.00	81	43.20	84	48.60	87	53.80	90	59.80
70	81	40.10	83	44.90	86	50.40	89	55.90	91	62.10
75	82	41.00	84	46.70	87	52.40	90	57.90	93	64.30
80	83	42.60	86	48.30	89	54.30	92	60.00	94	66.70
85	85	43.80	87	49.80	90	56.00	93	62.00	96	68.80
90	86	45.70	89	51.40	92	57.90	95	63.90	97	70.70
95	87	46.60	90	53.00	93	59.60	96	65.80	98	72.80
100	88	47.90	91	54.50	94	61.20	97	67.50	99	74.80

Part Numbers and Ordering Information

Sprinkler Only	
U.S. Standard	
Sprinkler without Nozzle	A23802

Nozzle Only		XX = Nozzle Size										
		U.S. Standard	7/32"	11/32"	3/8"	13/32"	7/16"	15/32"	1/2"	17/32"	9/16"	5/8"
Brass Straight Bore Nozzle	SBN-5	103043-XX	—	22	24	26	28	30	32	34	36	40
Brass Low Pressure Nozzle	SPB-1	108149-XX	—	22	24	26	28	30	32	—	—	40
Brass 20° Low Angle Spreader Nozzle	LPN-1-20	100226-XX	14	—	—	—	—	—	—	—	—	—
Plug for 1/8" Spreader Port		100417	Bold nozzle size numbers denote the most common nozzle choices.									

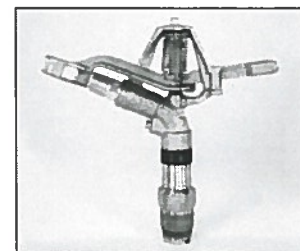
METRIC DATA

PERFORMANCE DATA

80EHD

STRAIGHT BORE NOZZLE (SBN-5V) WITH PLUG* (Stream Height: 4.3m)

BARS @ Nozzle	NOZZLE SIZE METRIC														
	8.7 mm (11/32")			9.5 mm (3/8")			10.3 mm (13/32")			11.1 mm (7/16")			11.9 mm (15/32")		
	Rad.	Flow	Flow	Rad.	Flow	Flow	Rad.	Flow	Flow	Rad.	Flow	Flow	Rad.	Flow	Flow
	(m)	(lps)	(m ³ /h)	(m)	(lps)	(m ³ /h)	(m)	(lps)	(m ³ /h)	(m)	(lps)	(m ³ /h)	(m)	(lps)	(m ³ /h)
1.7	18.6	1.08	3.88	18.9	1.28	4.61	19.5	1.48	5.31	20.1	1.68	6.06	20.1	1.91	6.88
2.0	19.3	1.16	4.19	19.6	1.38	4.97	20.5	1.59	5.73	20.8	1.82	6.53	21.6	2.06	7.41
2.5	20.6	1.30	4.69	21.0	1.55	5.57	22.2	1.78	6.42	22.8	2.03	7.32	23.7	2.31	8.30
3.0	21.5	1.43	5.16	22.1	1.70	6.11	23.3	1.96	7.05	23.9	2.23	8.03	24.8	2.53	9.11
3.5	22.3	1.55	5.58	22.9	1.84	6.61	24.2	2.12	7.62	24.8	2.41	8.69	25.7	2.74	9.86
4.0	23.2	1.62	5.83	23.8	1.93	6.95	25.1	2.24	8.06	25.8	2.58	9.27	26.6	2.94	10.57
4.5	24.1	1.70	6.12	24.7	2.02	7.28	25.6	2.36	8.51	26.5	2.74	9.85	27.4	3.15	11.35
5.0	24.8	1.81	6.51	25.4	2.14	7.70	26.4	2.50	8.99	27.3	2.90	10.43	28.0	3.30	11.89
5.5	25.3	1.91	6.89	26.2	2.25	8.09	27.1	2.63	9.47	28.0	3.05	10.97	28.6	3.47	12.49
6.0	26.0	2.02	7.26	26.8	2.37	8.52	27.7	2.76	9.94	28.6	3.19	11.49	29.4	3.63	13.07
6.5	26.5	2.13	7.66	27.4	2.48	8.93	28.3	2.89	10.40	29.2	3.33	11.98	29.8	3.77	13.57
6.9	26.8	2.15	7.72	27.7	2.57	9.24	28.7	2.99	10.77	29.6	3.44	12.38	30.2	3.88	13.97



80EHD

BARS @ Nozzle	NOZZLE SIZE METRIC														
	12.7 mm (1/2")			13.5 mm (17/32")			14.3 mm (9/16")			15.9 mm (5/8")			17.5 mm (11/16")		
	Rad.	Flow	Flow	Rad.	Flow	Flow	Rad.	Flow	Flow	Rad.	Flow	Flow	Rad.	Flow	Flow
	(m)	(lps)	(m ³ /h)	(m)	(lps)	(m ³ /h)	(m)	(lps)	(m ³ /h)	(m)	(lps)	(m ³ /h)	(m)	(lps)	(m ³ /h)
1.7	20.1	2.13	7.68	20.1	2.34	8.43	20.1	2.67	9.61	20.1	3.25	11.70	20.1	3.91	14.06
2.0	21.8	2.30	8.27	21.8	2.53	9.10	21.8	2.87	10.35	21.8	3.50	12.60	21.8	4.22	15.18
2.5	24.4	2.57	9.26	24.4	2.83	10.19	24.6	3.22	11.60	24.6	3.92	14.12	24.6	4.74	17.06
3.0	25.7	2.83	10.17	26.4	3.11	11.18	27.1	3.54	12.73	27.5	4.31	15.50	27.5	5.22	18.78
3.5	26.6	3.05	11.00	27.5	3.36	12.10	28.7	3.83	13.77	29.1	4.66	16.78	29.7	5.65	20.34
4.0	27.5	3.27	11.79	28.4	3.63	13.06	29.4	4.07	14.66	30.5	4.98	17.93	31.2	6.06	21.82
4.5	28.4	3.49	12.58	29.3	3.87	13.92	30.2	4.39	15.79	31.1	5.33	19.20	32.3	6.45	23.21
5.0	29.0	3.69	13.29	30.0	4.08	14.68	30.9	4.64	16.70	31.8	5.64	20.30	33.1	6.81	24.51
5.5	29.5	3.88	13.96	30.7	4.29	15.44	31.7	4.88	17.57	32.6	5.93	21.33	33.5	7.16	25.77
6.0	30.3	4.05	14.58	31.3	4.49	16.15	32.1	5.10	18.37	33.2	6.20	22.30	34.3	7.49	26.96
6.5	30.7	4.22	15.17	32.0	4.67	16.83	32.8	5.30	19.07	33.8	6.45	23.21	35.0	7.81	28.11
6.9	31.1	4.35	15.65	32.3	4.82	17.35	33.2	5.50	19.81	34.1	6.64	23.89	35.4	8.06	29.00

STRAIGHT BORE NOZZLE (SBN-5) AND SPREADER (LAN-1-20)* (Stream Height: 4.3m)

BARS @ Nozzle	NOZZLE SIZE METRIC														
	8.7 mm x 5.56 mm (11/32" x 7/32") 20°			9.5 mm x 5.56 mm (3/8" x 7/32") 20°			10.3 mm x 5.56 mm (13/32" x 7/32") 20°			11.1 mm x 5.56 mm (7/16" x 7/32") 20°			11.9 mm x 5.56 mm (15/32" x 7/32") 20°		
	Rad.	Flow	Flow	Rad.	Flow	Flow	Rad.	Flow	Flow	Rad.	Flow	Flow	Rad.	Flow	Flow
	(m)	(lps)	(m ³ /h)	(m)	(lps)	(m ³ /h)	(m)	(lps)	(m ³ /h)	(m)	(lps)	(m ³ /h)	(m)	(lps)	(m ³ /h)
1.7	18.6	1.47	5.29	18.9	1.67	6.02	19.5	1.87	6.72	20.1	2.08	7.47	20.1	2.30	8.27
2.0	19.3	1.59	5.71	19.6	1.80	6.49	20.5	2.01	7.23	20.8	2.24	8.05	21.6	2.48	8.92
2.5	20.6	1.78	6.40	21.0	2.02	7.25	22.2	2.25	8.11	22.8	2.50	9.01	23.7	2.78	10.00
3.0	21.5	1.95	7.02	22.1	2.21	7.96	23.3	2.47	8.90	23.9	2.75	9.90	24.8	3.05	10.97
3.5	22.3	2.11	7.60	22.9	2.40	8.63	24.2	2.68	9.63	24.8	2.97	10.71	25.7	3.30	11.88
4.0	23.2	2.26	8.14	23.8	2.57	9.25	25.1	2.88	10.37	25.8	3.19	11.48	26.6	3.54	12.76
4.5	24.1	2.40	8.65	24.7	2.73	9.83	25.6	3.07	11.06	26.5	3.40	12.24	27.4	3.78	13.60
5.0	24.8	2.56	9.21	25.4	2.89	10.40	25.5	3.24	11.67	27.3	3.59	12.92	28.0	3.99	14.35
5.5	25.3	2.68	9.65	26.2	3.04	10.95	27.0	3.42	12.31	28.0	3.78	13.60	28.6	4.20	15.12
6.0	26.0	2.81	10.12	26.8	3.18	11.45	27.7	3.58	12.89	28.6	3.96	14.25	29.4	4.39	15.79
6.5	26.5	2.93	10.55	27.4	3.33	11.98	28.3	3.74	13.48	29.2	4.13	14.88	29.8	4.57	16.46
6.9	26.8	3.02	10.88	27.7	3.44	12.38	28.7	3.86	13.90	29.6	4.26	15.33	30.2	4.72	16.99

* Nozzles must be purchased separately.
See Chart below.

Part Numbers and Ordering Information

Sprinkler Only		Nozzle Only		XX = Nozzle Size											
Metric		Metric 5.56mm 8.7 mm 9.5mm 10.3mm 11.1mm 11.9mm 12.7mm 13.5mm 14.3mm 15.9mm 17.5mm													
Sprinkler without Nozzle	A23802	Brass Straight Bore Nozzle	SBN-5	103043-XX	—	22	24	26	28	30	32	34	36	40	44
		Brass Low Pressure Nozzle	SPB-1	108149-XX	—	22	24	26	28	30	32	—	—	40	—
		Brass 20° Low Angle Spreader Nozzle	LAN-1-20	100226-XX	14	—	—	—	—	—	—	—	—	—	—
		Plug for 1/8" Spreader Port		100417	Bold nozzle size numbers denote the most common nozzle choices										

- Computations for sprinkler discharge

EQUATIONS:

$$A = \pi r^2$$

$$Q = AV$$

$$\frac{P}{\gamma} = \frac{v^2}{2g}$$

GIVEN:

$$P = 78 \text{ psi}$$

$$d = 0.5" \leftarrow \text{nozzle diameter}$$

$$= 0.0416 \text{ ft}$$

CONSTANTS:

$$\gamma = 62.4 \text{ lb/ft}^3$$

$$g = 32.2 \text{ ft/s}^2$$

CALCS:

$$r = \frac{0.0416}{2} = 0.0208 \text{ ft}$$

$$A = \pi (0.0208)^2 = 0.001364 \text{ ft}^2$$

$$P = \frac{78 \text{ lbs}}{\text{in}^2} \times \frac{144 \text{ in}^2}{\text{ft}^2} = 11,232 \text{ lbs/ft}^2$$

$$\frac{P}{\gamma} = \frac{v^2}{2g} \Rightarrow \sqrt{\frac{P 2g}{\gamma}} = v$$

$$v = \sqrt{\frac{(11,232)(2)(32.2)}{62.4}} = 107.67 \text{ ft/s}$$

$$Q = 107.67 \text{ ft/s} \times 0.001364 \text{ ft}^2 = \boxed{0.147 \text{ ft}^3/\text{s}}$$

$$= \boxed{65.856 \text{ gpm}} \leftarrow$$

Attachment F

GROUNDWATER THEORETICAL ANALYSIS

FILE: 67-14517

DATE: 7/11/2012

BY: Jennifer Cuhacivan

THEORETICAL RATE OF FLOW: $Q = \frac{(8.8 \times (\text{HP}) \times (\text{EFF.}))}{\text{TDH}}$

Q = CFS

HP = Total Brake Horsepower of pumping plant (including booster)

Eff. = Pumping plant efficiency (assume 70% or 0.70)

TDH = Total dynamic head = [(LIFT) + (PSI X 2.31)]

LIFT = Depth to water in FEET from land surface to pumping water level

PSI = Pumping pressure measured in PSI near pump (if open discharge assume [0])

$$Q = \frac{(8.8) \times (5 \text{ HP}) \times (0.70)}{[(8 \text{ ft}) + (78 \text{ psi} \times 2.31)]} = 0.1641 \text{ cfs} = 73.4 \text{ gpm}$$

LIFT FROM:

Measurement ()

Owner ()

Area estimate ()

Well Logs (X)

Booster (Y) (N)

PSI FROM:

Measurement (X)

Owner ()

Estimate ()

Owner Gage ()

NOTES ON PUMP:

Motor Make, Serial or ID

Franklin Electric, 2821139310

Pump Make, Serial or ID, rating

" "

REMARKS:

Look up from rainbird straight bore nozzle table:
1/2" nozzle @ 78 psi = 100.8 gpm (= 0.135 cfs)

Calculated from: $A = \pi r^2$, $Q = AV$, $P = \frac{V^2}{8 \text{ } 2g} \Rightarrow Q = 105.86 \text{ gpm}$