

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES
BENEFICIAL USE FIELD REPORT

A. GENERAL INFORMATION

Permit No. 63-12304

1. Owner: Middleton Irrigation Assn Inc/ Middleton Mill Ditch Co

Phone No: (208) 585-6676 / (208) 585-3207

Current Address: PO Box 214 / PO Box 848

City, State, Zip: Middleton, ID 83644-0214

2. Accompanied by: Archie Combs

Exam Date: 6/8/2010 & 7/15/2010

Address: Same as above

Phone No: (208) 921-2122 Cell

Relationship to Permit Holder: Ditch Rider

Tributary to: Boise River

3. Source: Willow Creek

B. OVERLAP REVIEW

1. Other water rights with the same place of use: 63-124N, 63-125G, 63-126E, 63-161X, 63-168B, 63-168D, 63-173, 63-198AC, 63-254, 63-255, 63-370, 63-32480, 63-32518, 63-32519, 63-32520, 63-32521, and 63-32522.

2. Other water rights with the same point of diversion: None

C. DIVERSION AND DELIVERY SYSTEM

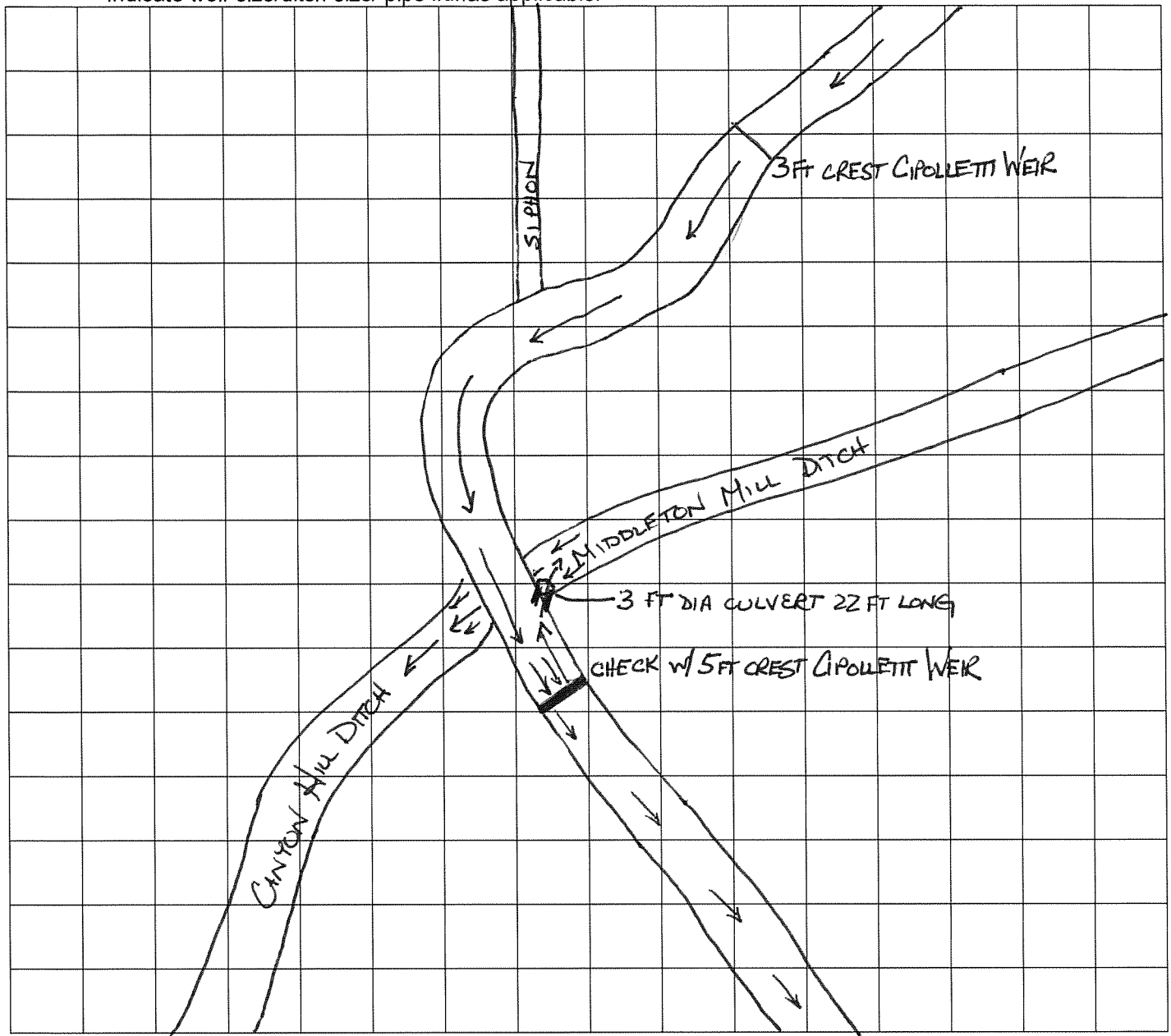
1. Point(s) of Diversion

[illegible]

2. Place(s) of Use LARGE POU - SEE ATTACHED MAP(S) FOR LEGAL DESCRIPTION

[illegible]

3. Delivery System Diagram. Indicate all major components and distances between components.
Indicate weir size/ditch size/ pipe i.d..as applicable.



Scale 1"= NOT TO SCALE

- ☒ Copy of USGS Quadrangle attached showing location(s) of diversion and place(s) of use (required).
- ☒ Aerial photo attached (required for irrigation of 10+ acres).
- ☒ Photo of diversion and system attached.

Well or Diversion Identification No.*	Motor Make	HP	Motor Serial Number	Pump Make	Pump Serial No. or Discharge Size
N/A					

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

D. FLOW MEASUREMENTS

Measurement Equipment	Type	Make	Model No.	Serial No.	Size	Calibration Date
Cipoletti Weir (Upstream of PD)					3 ft	
Cipoletti Weir (Downstream of PD @ check)					5 ft	

Measurements:

Water too high (above weir) during first site visit 6/8/2010 for measurements.

Measurements taken during second site visit on 7/15/2010.

Upstream weir: H(head) = 1.24 ft. Crest = 3 ft.

Downstream weir: H = 0.70 ft. Crest = 5 ft.

Theoretical measurement based on high water mark on check: H = 1.98 ft. Crest = 5 ft.

E. NARRATIVE/REMARKS/COMMENTS

System Design: Permit holder has constructed a check in the main channel of Willow Creek as the P/D. This check has a 5 ft weir to measure water spilled past/down Willow Creek. Boards are placed in the check, water backs up into a 3 ft diameter culvert approximately 22 ft long back into the Middleton Mill Ditch. The Middleton Mill Ditch is piped to flow underneath Willow Creek (at this diversion site) to the west into Canyon Hill Ditch, i.e. Middleton Mill Ditch becomes Canyon Hill Ditch west of Willow Creek. Water is then distributed within the western portion of the permit holder's Large POU to Canyon Hill Ditch users. Water diverted at this site can only reach the Canyon Hill Ditch users, thus only the western portion of the Large POU is recommended as the POU for this permit. Diversion under this permit supplements Boise River water rights delivered to the Canyon Hill Ditch users. The P/D location is recorded as the culvert location on Willow Creek. There is a 3 ft weir upstream of the diversion site on Willow Creek. The permit holder determines how much water is being diverted from Willow Creek under this permit by subtracting the amount of water flowing past the P/D through the downstream weir from the amount flowing through the upstream weir. There is a siphon, known as the "Newman Siphon", located between the upstream weir and the P/D. The property owner at this siphon can divert water from Willow Creek, but rarely does per the ditch rider.

Measurement: Measurement at the upstream weir in excess of 14 cfs. The theoretical measurement at the downstream weir/check point in excess of 46 cfs. It is reasonable to assume 10 cfs or more can be diverted at any one moment from this site when water is available and needed. Water was not being diverted at time of site visits, because it was not needed by the system users at that time. Weir measurements/set-ups are far from ideal for accurate measurements. The stream channels above both weirs contain a significant amount of vegetation along the banks. The approach velocities and drops between the upstream and downstream water surfaces at both sites are greater than the ideal conditions. Water also spills/leaks from the head wall/check in significant quantities from the downstream weir. The actual flow at the downstream check was likely significantly larger than 9.68 cfs measured at the time of the second site visit. Based on the upstream weir measurement of 14.04 cfs, the clearly under representative downstream weir measurement of 9.68 cfs, the theoretical measurement in excess of 46 cfs based on the high water mark on the check, and the diameter of the culvert water flows from the P/D into the ditch, it is reasonable to assume at least 10 cfs can be diverted at this site.

Acres Irrigated within Service Area: Per my request, the permit holder's representative submitted a list totaling 908.15 shares (1 share = 1 acre) delivered to shareholders of the Canyon Hill Ditch during the development period of this permit (See Jerry Kiser's letter of November 12, 2010). 908.15 acres has been rounded to 909 acres per Department standards (Beneficial Use Exam Rules) for purposes of licensing.

This permit is conditioned that the diversion works should be lockable to allow for watermaster control/shut off. This diversion system is not set up for a lockable device, but the watermaster can make sure water is not checked at the site, i.e. water is allowed to flow down Willow Creek and not diverted at the check into the ditch. Permit holder's representative submitted a written request to modify this condition to allow for the Director of the IDWR to require installation of a lockable controlling works, if necessary, in the future (See Jerry Kiser's letter of November 12, 2010).

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

F. FLOW CALCULATIONS

Measured Method:

☒ Additional Computation Sheets Attached

Upstream weir: $H = 1.24 \text{ ft} = 14.04 \text{ cfs}$ per Table 4 Water Measurement handbook (using Cone's formula).

Downstream weir: $H = 0.70 \text{ ft} = 9.68 \text{ cfs}$ per Table 4 Water Measurement handbook (using Cone's formula).

Theoretical measurement based on high water mark: $H = 1.98 \text{ ft} = 46.90 \text{ cfs}$ per LMNO Engineering online calculator tool based on Bureau of Reclamation Water Measurement Manual equation $Q = 3.367 Lh^{3/2}$ where Q is flow (cfs), L is the crest length (ft), and h is the head (ft). Both weir measurements subject to error based on weir construction and channel conditions, see narrative section for more details. Copy of Table 4 of Water Measurement handbook attached.

G. VOLUME CALCULATIONS

1. Volume Calculations for Irrigation:

$$VI.R. = (\text{Acres Irrigated}) \times (\text{Irrigation Requirement}) = 909 \times 4.5 = 4090.5$$

$$VD.R. = [\text{Diversion Rate (cfs)}] \times (\text{Days in Irrigation Season}) \times 1.9835 = 10.0 \times 260 \times 1.9835 = 5157.1$$

$$V = \text{Smaller of VI.R. and VD.R.} = 4090.5$$

2. Volume Calculations for Other Uses:

H. RECOMMENDATIONS

1. Recommended Amount

BENEFICIAL USE	PERIOD OF USE		RATE OF DIVERSION ANNUAL	
	From	To	Q(cfs)	V(afa)
Irrigation	3/1	11/15	10.0	4090.5
TOTALS			10.0	4090.5

2. Recommended Amendments

- ☐ Change P.D. as reflected above
☐ Change P.U. as reflected above

- ☐ Add P.D. as reflected above
☐ Add P.U. as reflected above

- ☒ None
☐ Other

I. AUTHENTICATION

Field Examiner's Name

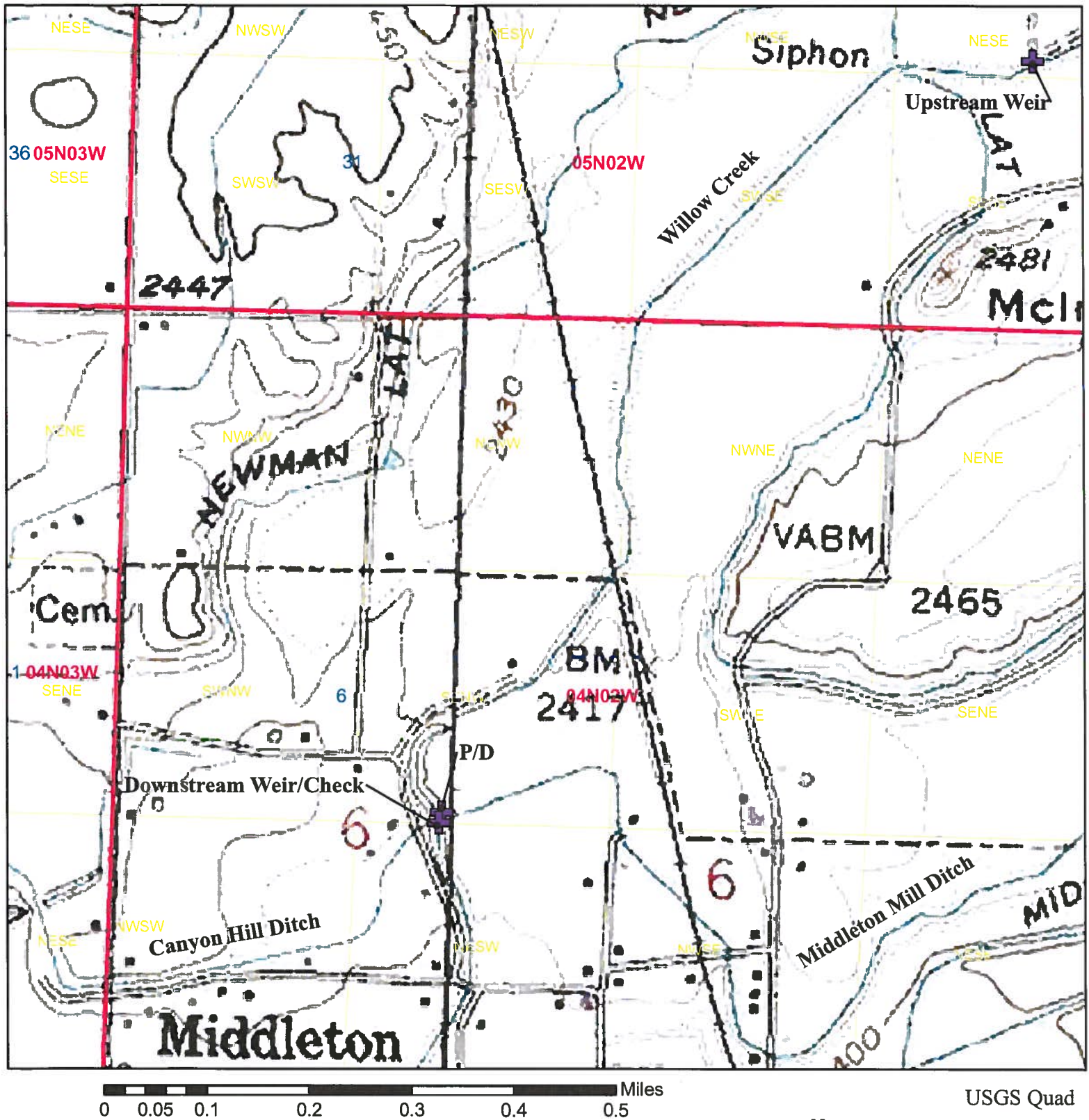


Reviewer

Date 11/16/2010

Date

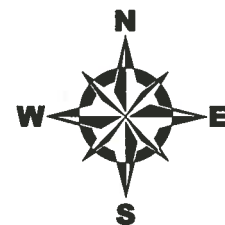
63-12304 License Exam



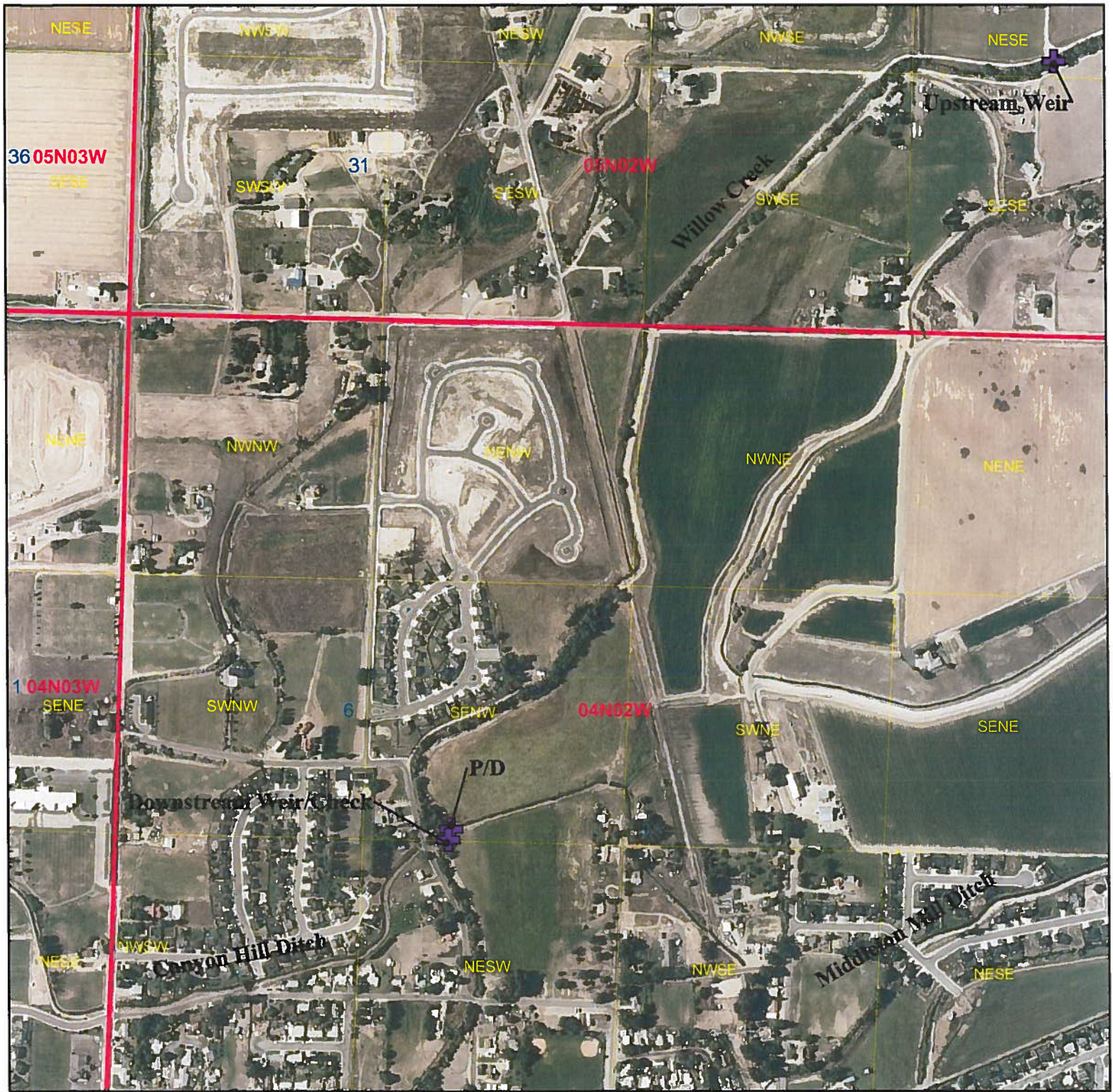
USGS Quad

Legend

- P/D & Weirs
- Township/Range
- Sections
- QQ



63-12304 License Exam

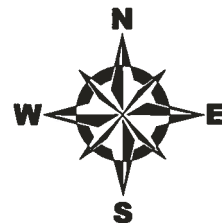


0 0.05 0.1 0.2 0.3 0.4 0.5 Miles

2009 Aerial Photo

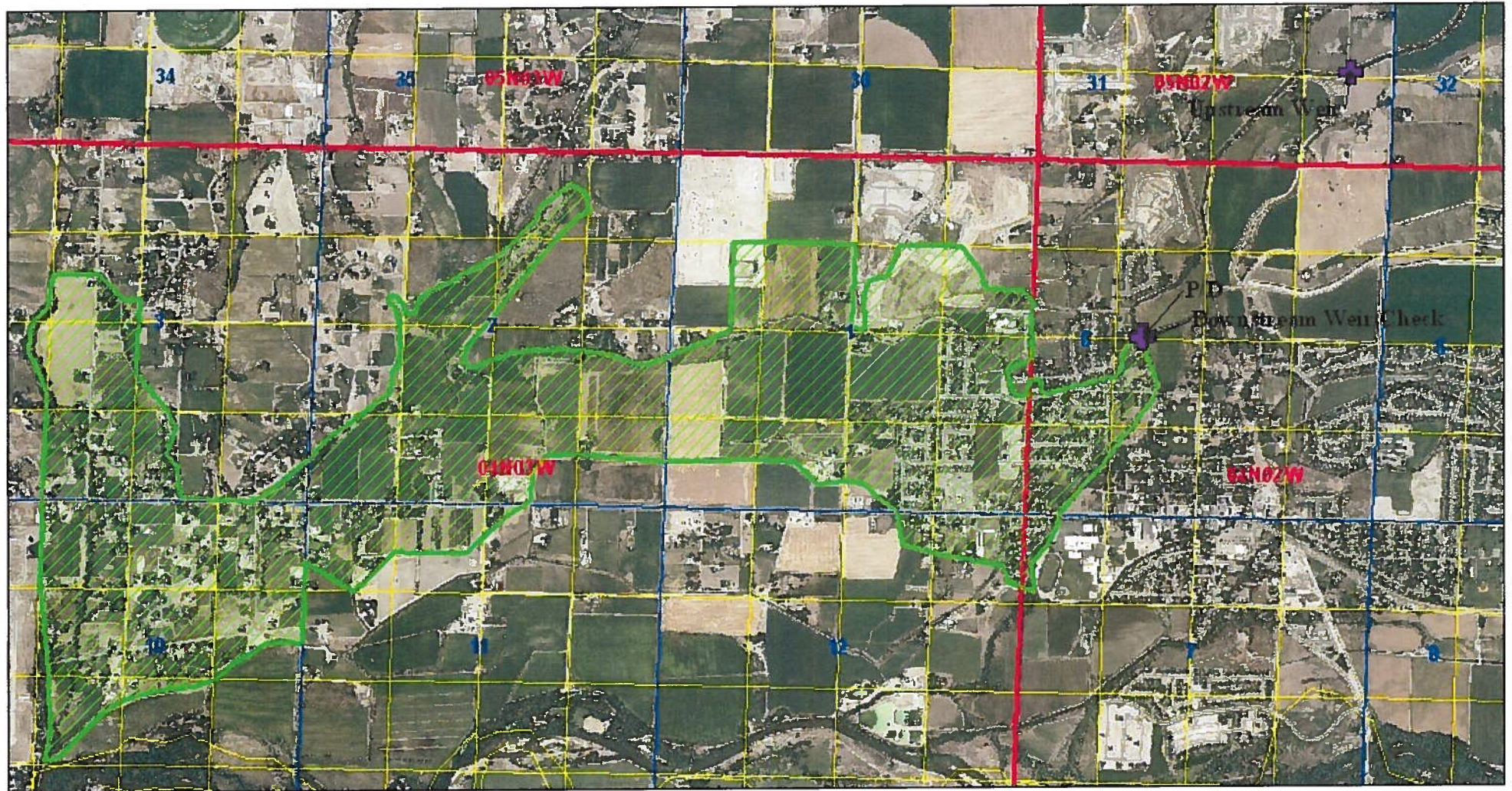
Legend

- P/D & Weirs
- Township/Range
- Sections
- QQ



Angie Grimm IDWR 9/1/2010

63-12304 License Exam



2009 Aerial Photo

Legend

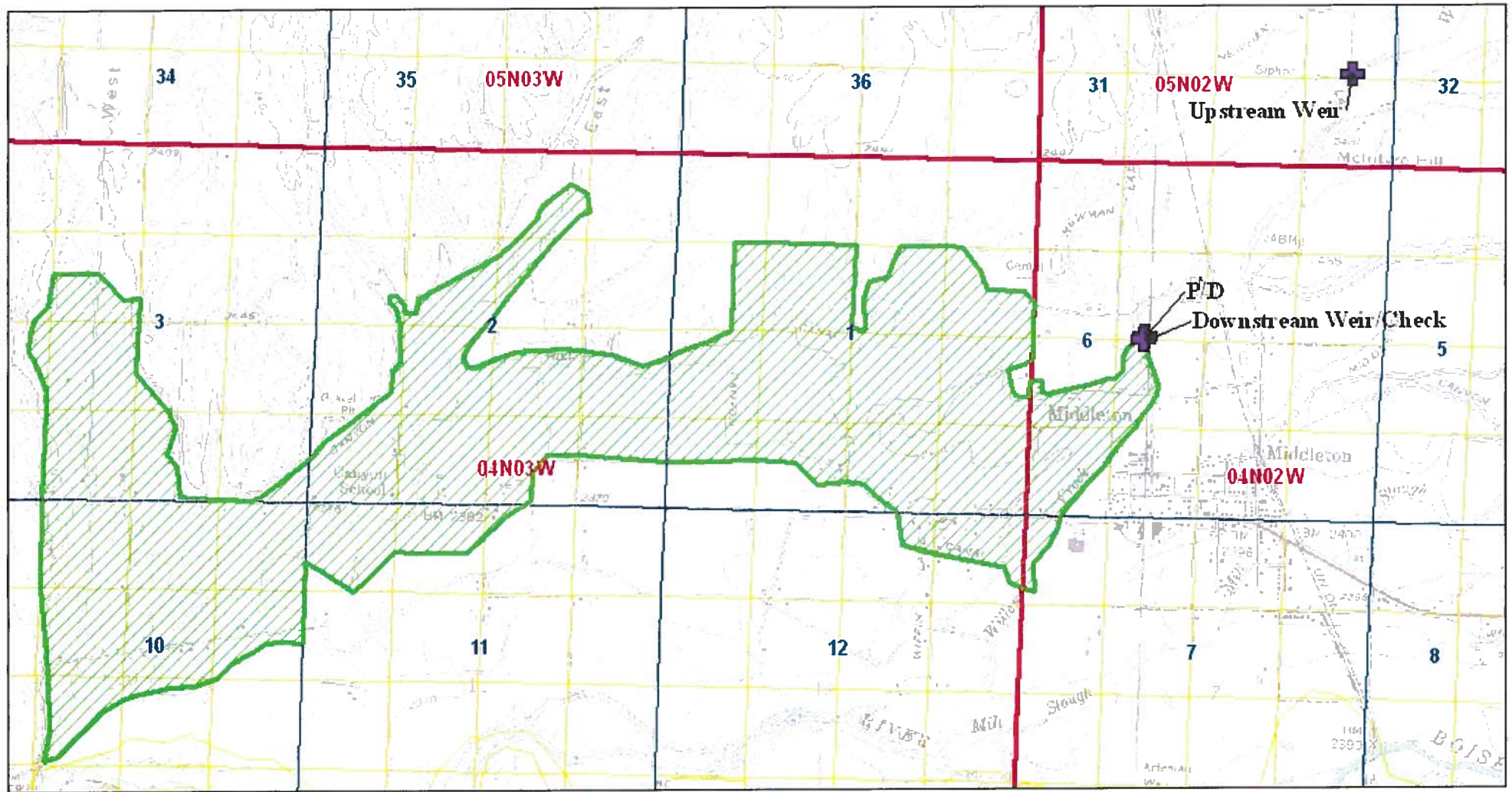
-  P/D & Weirs
-  POU
-  Township/Range
-  Sections
-  QQ

0 0.2 0.4 0.8 1.2 1.6 2 Miles



Angie Grimm IDWR 9/23/2010

63-12304 License Exam



A horizontal number line is shown with tick marks at 0, 0.2, 0.4, 0.8, 1.2, 1.6, and 2. The word "Miles" is written at the right end of the line. A shaded region is indicated between the tick marks for 0.4 and 1.6.

USGS Quad

Legend

-  P/D & Weirs
 POU
 Township/Range
 Sections
 QQ



Angie Grimm IDWR 9/23/2010



63-12304 License Exam 6/8/2010: Siphon where water is backed up into Middleton Mill Ditch Co and piped under Willow Creek into Canyon Hill Ditch facing west. Culvert that water backs up into Middleton Mill Ditch (P/D) located where Alan Funkhauser (Drainage Dist #2) is standing.



63-12304 License Exam 6/8/2010: Downstream weir/check on Willow Creek facing southwest (downstream).



63-12304 License Exam 6/8/2010: Downstream weir/check on Willow Creek facing northwest (upstream). Note large drop on weir between upstream and downstream surfaces.



63-12304 License Exam 6/8/2010: Downstream weir/check on Willow Creek facing northeast (upstream).



63-12304 License Exam 6/8/2010: Upstream weir on Willow Creek facing southeast. Note vegetation on sides of creek upstream of weir.



63-12304 License Exam 7/15/2010: Upstream weir on Willow Creek facing south/southeast.



63-12304 License Exam 7/15/2010: Downstream weir/check on Willow Creek facing southeast (downstream).



63-12304 License Exam 7/15/2010: Looking down from on top of downstream weir/check at leakage on west side of check. Far right side of weir crest extreme left in this photo.

Table 4. Flow over Cipolletti weirs in cubic feet per second.*

Head in ft. "H"	Head in inches, approx.	Crest length (L)					For each additional foot of crest in excess of 4 ft. (approx.)
		1.0 foot	1.5 feet	2.0 feet	3.0 feet	4.0 feet	
		Flow in cubic feet per second					
0.10	1-3/16	0.107	0.160	0.214	0.321	0.429	0.108
0.11	1-5/16	0.123	0.185	0.246	0.370	0.494	0.124
0.12	1-7/16	0.140	0.210	0.280	0.421	0.562	0.141
0.13	1-9/16	0.158	0.237	0.316	0.474	0.632	0.159
0.14	1-11/16	0.177	0.264	0.352	0.528	0.706	0.177
0.15	1-13/16	0.195	0.293	0.390	0.586	0.782	0.196
0.16	1-15/16	0.216	0.322	0.430	0.644	0.860	0.216
0.17	2-1/16	0.237	0.353	0.470	0.705	0.941	0.236
0.18	2-3/16	0.258	0.384	0.512	0.768	1.024	0.257
0.19	2-1/4	0.280	0.417	0.555	0.832	1.110	0.278
0.20	2-3/8	0.302	0.450	0.599	0.898	1.20	0.302
0.21	2-1/2	0.324	0.484	0.644	0.966	1.29	0.324
0.22	2-5/8	0.349	0.519	0.691	1.04	1.38	0.35
0.23	2-3/4	0.374	0.555	0.739	1.11	1.47	0.37
0.24	2-7/8	0.397	0.591	0.786	1.18	1.57	0.39
0.25	3	0.423	0.628	0.836	1.25	1.67	0.42
0.26	3-1/8	0.449	0.667	0.886	1.33	1.77	0.44
0.27	3-1/4	0.475	0.705	0.937	1.40	1.87	0.47
0.28	3-3/8	0.502	0.745	0.990	1.48	1.97	0.49
0.29	3-1/2	0.529	0.785	1.04	1.56	2.08	0.52
0.30	3-5/8	0.557	0.827	1.10	1.64	2.19	0.55
0.31	3-3/4	0.586	0.869	1.15	1.73	2.30	0.57
0.32	3-13/16	0.615	0.911	1.21	1.81	2.41	0.60
0.33	3-15/16	0.644	0.954	1.27	1.89	2.52	0.62
0.34	4-1/16	0.675	1.00	1.32	1.98	2.64	0.66
0.35	4-3/16	0.705	1.04	1.38	2.07	2.75	0.69
0.36	4-5/16	0.735	1.09	1.44	2.16	2.87	0.71
0.37	4-7/16	0.767	1.13	1.50	2.25	2.99	0.74
0.38	4-9/16	0.799	1.18	1.57	2.34	3.11	0.78
0.39	4-11/16	0.832	1.23	1.63	2.43	3.24	0.81
0.40	4-13/16	0.866	1.28	1.69	2.53	3.36	0.84
0.41	4-15/16	0.899	1.32	1.76	2.62	3.49	0.87
0.42	5-1/16	0.932	1.37	1.82	2.72	3.61	0.89
0.43	5-3/16	0.967	1.42	1.89	2.81	3.74	0.93
0.44	5-1/4	1.00	1.47	1.95	2.91	3.87	0.97
0.45	5-3/8	1.04	1.53	2.02	3.01	4.01	1.00
0.46	5-1/2	1.07	1.58	2.09	3.11	4.14	1.02
0.47	5-5/8	1.11	1.63	2.16	3.21	4.28	1.06
0.48	5-3/4	1.15	1.68	2.23	3.32	4.41	1.10
0.49	5-7/8	1.18	1.74	2.30	3.42	4.55	1.13
0.50	6	1.22	1.79	2.37	3.53	4.69	1.16
0.51	6-1/8	1.26	1.85	2.44	3.64	4.83	1.20
0.52	6-1/4	1.30	1.90	2.51	3.74	4.97	1.24
0.53	6-3/8	1.34	1.96	2.59	3.85	5.12	1.26
0.54	6-1/2	1.38	2.02	2.66	3.96	5.26	1.30
0.55	6-5/8	1.42	2.07	2.74	4.07	5.41	1.33
0.56	6-3/4	1.46	2.13	2.81	4.18	5.56	1.38
0.57	6-13/16	1.50	2.19	2.89	4.30	5.71	1.41
0.58	6-15/16	1.54	2.25	2.97	4.41	5.86	1.44
0.59	7-1/16	1.58	2.31	3.05	4.53	6.01	1.49

*Computed from Cone's formula: $Q = 3.247 L H^{1.48} \frac{0.566 L^{1.48}}{1.2 L^{1.48}} H^{1.48} + 0.609 H^{2.48}$

Table 4 (Continued). Flow over Cipolletti weirs.

Head in ft. "H"	Head in inches, approx.	Crest length (L)					For each additional foot of crest in excess of 4 ft. (approx.)
		1.0 foot	1.5 feet	2.0 feet	3.0 feet	4.0 feet	
		Flow in cubic feet per second					
0.60	7-3/16	1.62	2.37	3.13	4.64	6.17	1.53
0.61	7-5/16	1.67	2.43	3.20	4.76	6.32	1.55
0.62	7-7/16	1.71	2.49	3.28	4.88	6.47	1.60
0.63	7-9/16	1.75	2.55	3.37	5.00	6.63	1.63
0.64	7-11/16	1.80	2.62	3.45	5.12	6.79	1.67
0.65	7-13/16	1.84	2.68	3.53	5.24	6.95	1.72
0.66	7-15/16	1.89	2.75	3.61	5.36	7.11	1.75
0.67	8-1/16	1.93	2.81	3.70	5.48	7.28	1.79
0.68	8-3/16	1.98	2.87	3.79	5.61	7.44	1.83
0.69	8-1/4	2.02	2.94	3.87	5.73	7.61	1.87
0.70	8-3/8	2.07	3.01	3.95	5.86	7.77	1.91
0.71	8-1/2	2.12	3.07	4.04	5.99	7.94	1.95
0.72	8-5/8	2.16	3.14	4.13	6.12	8.11	1.99
0.73	8-3/4	2.21	3.21	4.22	6.24	8.28	2.03
0.74	8-7/8	2.26	3.28	4.31	6.38	8.45	2.08
0.75	9	2.31	3.35	4.40	6.51	8.62	2.12
0.76	9-1/8	2.36	3.42	4.49	6.64	8.80	2.16
0.77	9-1/4	2.41	3.49	4.58	6.77	8.97	2.21
0.78	9-3/8	2.46	3.56	4.67	6.90	9.15	2.24
0.79	9-1/2	2.51	3.63	4.76	7.04	9.33	2.29
0.80	9-5/8	2.56	3.70	4.85	7.18	9.51	2.33
0.81	9-3/4	2.61	3.77	4.95	7.31	9.69	2.38
0.82	9-13/16	2.66	3.84	5.04	7.45	9.87	2.42
0.83	9-15/16	2.71	3.92	5.14	7.59	10.05	2.46
0.84	10-1/16	2.77	3.99	5.23	7.73	10.23	2.51
0.85	10-3/16	2.82	4.07	5.33	7.87	10.42	2.55
0.86	10-5/16	2.87	4.14	5.43	8.01	10.60	2.60
0.87	10-7/16	2.93	4.22	5.52	8.15	10.79	2.64
0.88	10-9/16	2.98	4.29	5.62	8.30	10.98	2.69
0.89	10-11/16	3.04	4.37	5.72	8.44	11.17	2.72
0.90	10-13/16	3.09	4.45	5.82	8.59	11.36	2.77
0.91	10-15/16	3.15	4.53	5.92	8.73	11.55	2.82
0.92	11-1/16	3.20	4.60	6.02	8.88	11.74	2.87
0.93	11-3/16	3.26	4.68	6.13	9.03	11.94	2.91
0.94	11-1/4	3.32	4.76	6.23	9.17	12.13	2.96
0.95	11-3/8	3.37	4.84	6.33	9.32	12.33	3.00
0.96	11-1/2	3.43	4.92	6.44	9.48	12.53	3.05
0.97	11-5/8	3.49	5.00	6.55	9.62	12.72	3.10
0.98	11-3/4	3.55	5.09	6.64	9.78	12.92	3.14
0.99	11-7/8	3.61	5.17	6.75	9.93	13.12	3.19
1.00	12	3.67	5.25	6.86	10.08	13.32	3.24
1.01	12-1/8		5.33	6.96	10.24	13.53	3.29
1.02	12-1/4		5.42	7.07	10.40	13.73	3.34
1.03	12-3/8		5.50	7.18	10.55	13.94	3.38
1.04	12-1/2		5.59	7.29	10.71	14.15	3.43
1.05	12-5/8		5.67	7.40	10.87	14.35	3.48
1.06	12-3/4		5.76	7.51	11.03	14.56	3.53
1.07	12-13/16		5.84	7.62	11.18	14.76	3.58
1.08	12-15/16		5.93	7.73	11.35	14.98	3.63
1.09	13-1/16		6.02	7.84	11.51	15.19	3.68

Table 4 (Concluded). Flow over Cipolletti weirs.

Head in ft. "H"	Head in inches, approx.	Crest length (L)					For each additional foot of crest in excess of 4 ft. (approx.)
		1.0 foot	1.5 feet	2.0 feet	3.0 feet	4.0 feet	
		Flow in cubic feet per second					
1.10	13-3/16	6.11	7.96	11.68	15.41	3.74	
1.11	13-5/16	6.20	8.07	11.84	15.62	3.79	
1.12	13-7/16	6.29	8.18	12.00	15.84	3.84	
1.13	13-9/16	6.37	8.29	12.16	16.04	3.88	
1.14	13-11/16	6.46	8.41	12.33	16.26	3.94	
1.15	13-13/16	6.56	8.53	12.50	16.48	3.98	
1.16	13-15/16	6.65	8.65	12.67	16.70	4.03	
1.17	14-1/16	6.74	8.76	12.84	16.93	4.08	
1.18	14-3/16	6.83	8.88	13.01	17.15	4.14	
1.19	14-1/4	6.93	9.00	13.18	17.37	4.19	
1.20	14-3/8	7.02	9.12	13.35	17.59	4.24	
1.21	14-1/2	7.11	9.24	13.52	17.81	4.29	
1.22	14-5/8	7.20	9.36	13.69	18.03	4.34	
1.23	14-3/4	7.30	9.48	13.87	18.27	4.40	
1.24	14-7/8	7.40	9.60	14.04	18.49	4.46	
1.25	15	7.49	9.72	14.21	18.71	4.51	
1.26	15-1/8			14.39	18.95	4.57	
1.27	15-1/4			14.56	19.17	4.62	
1.28	15-3/8			14.74	19.41	4.67	
1.29	15-1/2			14.92	19.65	4.73	
1.30	15-5/8			15.11	19.88	4.78	
1.31	15-3/4			15.29	20.12	4.82	
1.32	15-13/16			15.46	20.34	4.88	
1.33	15-15/16			15.64	20.58	4.94	
1.34	16-1/16			15.82	20.82	4.99	
1.35	16-3/16			16.01	21.06	5.05	
1.36	16-5/16			16.19	21.29	5.10	
1.37	16-7/16			16.37	21.53	5.16	
1.38	16-9/16			16.57	21.78	5.22	
1.39	16-11/16			16.75	22.02	5.28	
1.40	16-13/16			16.94	22.27	5.33	
1.41	16-15/16			17.13	22.51	5.39	
1.42	17-1/16			17.31	22.75	5.44	
1.43	17-3/16			17.51	23.01	5.50	
1.44	17-1/4			17.70	23.26	5.55	
1.45	17-3/8			17.89	23.50	5.62	
1.46	17-1/2			18.08	23.75	5.67	
1.47	17-5/8			18.28	24.01	5.73	
1.48	17-3/4			18.47	24.26	5.79	
1.49	17-7/8			18.66	24.50	5.84	
1.50	18			18.85	24.75	5.91	