



State of Idaho

DEPARTMENT OF WATER RESOURCES

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C. L. "BUTCH" OTTER
Governor

DAVID R. TUTHILL, JR.
Director

JULY 10, 2008

JACK BROWN
BOX 61
SUN VALLEY, ID 83353

RE: MEASUREMENT AND CONTROL OF 71-7178 AND 71-7179

Dear Jack:

This letter is a follow-up to our visit on June 27th at your property on Lost Creek. We discussed measurement and control of the diversions associated with permits 71-7178 and 71-7179. As we discussed, the groundwater well can be measured using the power consumption coefficient method or by using an hour meter. The inflow to the reservoirs can be suitably measured with small v-notch weirs. The outflow from the reservoirs is reported to be entirely through seepage to the subsurface, so measurement of the outflow is not necessary.

I will contact you in the coming weeks to schedule a time to measure the outflow of the well and record the power consumption. Also, I have attached a rating table and some guidelines for construction and installation of v-notch weirs that you might find helpful.

If I can be of further assistance, please feel free to contact me at (208)-287-4956. Otherwise, I look forward to speaking with you in the coming weeks.

Sincerely,

A handwritten signature in black ink, appearing to read 'Nick Miller', written over a white background.

Nick Miller, P.E.
Water Distribution Section

Enclosures:

Weir installation and use information – 2 pages

Requirements for all Sharp-Crested Weirs:

- (a) The upstream face of the weir plates and bulkhead should be plumb, smooth, and normal to the axis of the channel.
- (b) The entire crest should be level for rectangular and trapezoidal shapes, and the bisector of V-notch angles should be plumb.
- (c) The edges of the weir opening should be located in one plane, and the corners should have proper specified angles.
- (d) The top thickness of the crest and side plates should be between 0.03 and 0.08 inch (in).
- (e) All weir plates should have the same thickness for the entire boundary of the overflow crest. If the plates are thicker than specified in condition (d), the plate edges shall be reduced to the required thickness by chamfering the downstream edge of the crest and sides to an angle of at least 45 degrees; 60 degrees is highly recommended for a V-notch to help prevent water from clinging to the downstream face of the weir.
- (f) The upstream edges of the weir opening plates must be straight and sharp. Edges of plates require machining or filing perpendicular to the upstream face to remove burrs or scratches and should not be smoothed off with abrasive cloth or paper. Avoid knife-edges because they are a safety hazard and damage easily.
- (g) The bottom edge plates and fastener projection upstream should be located a distance of at least two measuring heads from the crest. If not, the plates must be inset flush with the upstream face of the supporting bulkhead, and the fasteners must be countersunk on the upstream poolside. Upstream faces of the plates must be free of grease and oil.
- (h) The overflow sheet or nappe should touch only the upstream faces of the crest and side plates.
- (i) Maximum downstream water surface level should be at least 0.2 foot (ft) below crest elevation. However, when measuring close to the crest, frequent observations are necessary to verify that the nappe is continually ventilated without waves periodically filling the under nappe cavity.
- (j) To prevent the nappe from clinging to the downstream face of the weir, the head measurement should be greater than 0.2 ft. Conditions (d), (e), and (f) also help to prevent clinging. If measurements must be made at heads approaching this value for substantial periods, operators must ensure the head measuring system has commensurate precision with respect to needed accuracy and must continually check for clinging.
- (k) The measurement of head on the weir is the difference in elevation between the crest and the water surface at a point located upstream from the weir a distance of at least four times the maximum head on the crest.
- (l) The length of rectangular and trapezoidal weir crests should be at least three times the usual head.

$$Q = 2.49H^{2.48}$$

This table is a rating table for a 90-degree v-notch weir. H is the height of water above the notch of the V.

H(ft)	Discharge(cfs)	H(ft)	Discharge(cfs)	H(ft)	Discharge(cfs)
0.20	0.046	0.55	0.57	0.90	1.92
0.21	0.052	0.56	0.59	0.91	1.97
0.22	0.058	0.57	0.62	0.92	2.02
0.23	0.065	0.58	0.64	0.93	2.08
0.24	0.072	0.59	0.67	0.94	2.14
0.25	0.080	0.60	0.70	0.95	2.19
0.26	0.088	0.61	0.73	0.96	2.25
0.27	0.097	0.62	0.76	0.97	2.31
0.28	0.11	0.63	0.79	0.98	2.37
0.29	0.12	0.64	0.82	0.99	2.43
0.30	0.13	0.65	0.86	1.00	2.49
0.31	0.14	0.66	0.89	1.01	2.55
0.32	0.15	0.67	0.92	1.02	2.62
0.33	0.16	0.68	0.96	1.03	2.68
0.34	0.17	0.69	0.99	1.04	2.74
0.35	0.18	0.70	1.03	1.05	2.81
0.36	0.20	0.71	1.06	1.06	2.88
0.37	0.21	0.72	1.10	1.07	2.94
0.38	0.23	0.73	1.14	1.08	3.01
0.39	0.24	0.74	1.18	1.09	3.08
0.40	0.26	0.75	1.22	1.10	3.15
0.41	0.27	0.76	1.26	1.11	3.23
0.42	0.29	0.77	1.30	1.12	3.30
0.43	0.31	0.78	1.34	1.13	3.37
0.44	0.33	0.79	1.39	1.14	3.45
0.45	0.34	0.80	1.43	1.15	3.52
0.46	0.36	0.81	1.48	1.16	3.60
0.47	0.38	0.82	1.52	1.17	3.68
0.48	0.40	0.83	1.57	1.18	3.75
0.49	0.42	0.84	1.62	1.19	3.83
0.50	0.45	0.85	1.66	1.20	3.91
0.51	0.47	0.86	1.71	1.21	3.99
0.52	0.49	0.87	1.76	1.22	4.08
0.53	0.52	0.88	1.81	1.23	4.16
0.54	0.54	0.89	1.87	1.24	4.25
				1.25	4.33