State of Idaho
DEPARTMENT OF WATER RESOURCES
322 East Front Street • P.O. Box 83720 • Boise, Idaho 83720-0098
Phone: (208) 287-4800 • Fax: (208) 287-6700 • Web Site: www.idwr.idaho.gov

C. L. "BUTCH" OTTER
Governor

DAVID R. TUTHILL, JR.
Interim Director

July 25, 2007

KATHRYN GOODWIN
1730 N WHITE OAK WY
MERIDIAN, ID 83642

RE: Measurement and Control for Goat Creek Diversions

Dear Mrs. Goodwin:

This letter is a follow-up to our conversation on July 13, 2007. I am glad we had the chance to meet and discuss possible means of measurement and control for the Goat Creek diversion GC7B. Following our meeting, I visited Mr. Browning and he asked that I copy him on this letter as well.

I have attached four documents that I believe will help you coordinate with the other users on Goat Creek and develop a plan for controlling measuring your diversion. The first document is a three-page summary listing each point of diversion on Goat Creek as well as the water rights that can currently legally divert from each point. Note that this list reflects the current legal configuration and may not reflect actual uses, proposed transfers, and other changes that may exist. The second document is a one-page summary listing the water right owners and their contact information. The third document is a map showing the locations of the points of diversion, place of use information for each water right, landowner information, and the approximate locations of many of the ditches and stream channels. The fourth document is a package of information on controlling works, measuring devices, manufacturers, suppliers, and IDWR standards.

During our meeting, we discussed a general concept for a controlling works and measuring device on the GC7B ditch. The next step is for the users holding rights from GC7B to develop and submit to IDWR, detailed plans for the proposed structures. Plans can include written descriptions, diagrams, approximate dimensions, proposed materials, and/or manufacturer name and model information. Dimensions may be approximate, but should be accurate for proposed measuring devices given that size, in many cases, dictates whether a measuring device is appropriate. IDWR will review the plans to ensure the proposed structures will meet IDWR requirements. In order to allow sufficient time for construction prior to the 2008 irrigation season, please submit the detailed plans as soon as possible.

As we discussed, I am offering to meet with the Goat Creek users and assist in developing the plans for the structures. If this is of interest to the users, please contact me when you have a meeting scheduled so I can plan to attend.

If you have any questions or if I can be of further assistance, please feel free to contact me at (208)-287-4956.

Sincerely,

Nick Miller, P.E.
Water Distribution Section

Enclosures:
- Water rights summary for Goat Creek – Two pages
- Goat Creek Water Right Owner Contact Information – One page
- Map of Goat Creek Water Rights and Diversions – One page @ 11" x 17"
- Information Package – 20 pages (10 double sided pages)

cc:
Roger A. Browning – 360 N Bedford DR # 204, Beverly Hills, CA 90210

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GOAT CREEK WATER RIGHTS AND OWNER INFORMATION
WD170

Div.Name	WR_num	Source	Priority Date	Twp	Range	Sec	QQQ	Rate(cfs)	Volume(af)	Acres	Acre Limit	Water Use(s)	Owner(s)
GC1	71-6	GOAT CREEK	5/1/1902	10N	13E	8	NWNWSE	6.4		831.9		IRRIGATION	PIVA, BRUNO (Current); PIVA, MARY C (Current); PIVA, PIERO (Current)
	71-7	GOAT CREEK	6/1/1902	10N	13E	8	SWNWSE	6.4		831.9		IRRIGATION	PIVA, BRUNO (Current); PIVA, MARY C (Current); PIVA, PIERO (Current)
	71-10190	GOAT CREEK	9/1/1902	10N	13E	8	NWNWSE	17.6		831.9		IRRIGATION	PIVA, BRUNO (Current); PIVA, MARY C (Current); PIVA, PIERO (Current)
GC2	71-6	GOAT CREEK	5/1/1902	10N	13E	17	NWNENW	6.4		831.9		IRRIGATION	PIVA, BRUNO (Current); PIVA, MARY C (Current); PIVA, PIERO (Current)
	71-7	GOAT CREEK	6/1/1902	10N	13E	8	SWSENE	6.4		831.9		IRRIGATION	PIVA, BRUNO (Current); PIVA, MARY C (Current); PIVA, PIERO (Current)
	71-10190	GOAT CREEK	9/1/1902	10N	13E	17	SENWNW	17.6		831.9		IRRIGATION	PIVA, BRUNO (Current); PIVA, MARY C (Current); PIVA, PIERO (Current)
GC2A	71-6	GOAT CREEK	5/1/1902	10N	13E	8	NWSWSE	6.4		831.9		IRRIGATION	PIVA, BRUNO (Current); PIVA, MARY C (Current); PIVA, PIERO (Current)
	71-7	GOAT CREEK	6/1/1902	10N	13E	17	SENWNW	6.4		831.9		IRRIGATION	PIVA, BRUNO (Current); PIVA, MARY C (Current); PIVA, PIERO (Current)
	71-10190	GOAT CREEK	9/1/1902	10N	13E	8	SWSENE	17.6		831.9		IRRIGATION	PIVA, BRUNO (Current); PIVA, MARY C (Current); PIVA, PIERO (Current)
GC3	71-6	GOAT CREEK	5/1/1902	10N	13E	8	SWNWSE	6.4		831.9		IRRIGATION	PIVA, BRUNO (Current); PIVA, MARY C (Current); PIVA, PIERO (Current)
	71-7	GOAT CREEK	6/1/1902	10N	13E	4	SESWSW	6.4		831.9		IRRIGATION	PIVA, BRUNO (Current); PIVA, MARY C (Current); PIVA, PIERO (Current)
	71-10190	GOAT CREEK	9/1/1902	10N	13E	8	NWSWSE	17.6		831.9		IRRIGATION	PIVA, BRUNO (Current); PIVA, MARY C (Current); PIVA, PIERO (Current)
GC3A	71-6	GOAT CREEK	5/1/1902	10N	13E	8	SWSENE	6.4		831.9		IRRIGATION	PIVA, BRUNO (Current); PIVA, MARY C (Current); PIVA, PIERO (Current)
	71-7	GOAT CREEK	6/1/1902	10N	13E	8	NWNESE	6.4		831.9		IRRIGATION	PIVA, BRUNO (Current); PIVA, MARY C (Current); PIVA, PIERO (Current)
	71-10190	GOAT CREEK	9/1/1902	10N	13E	17	NWNENW	17.6		831.9		IRRIGATION	PIVA, BRUNO (Current); PIVA, MARY C (Current); PIVA, PIERO (Current)
GC4	71-6	GOAT CREEK	5/1/1902	10N	13E	4	SESWSW	6.4		831.9		IRRIGATION	PIVA, BRUNO (Current); PIVA, MARY C (Current); PIVA, PIERO (Current)
	71-7	GOAT CREEK	6/1/1902	10N	13E	17	NWNENW	6.4		831.9		IRRIGATION	PIVA, BRUNO (Current); PIVA, MARY C (Current); PIVA, PIERO (Current)
	71-10190	GOAT CREEK	9/1/1902	10N	13E	8	SWSENE	17.6		831.9		IRRIGATION	PIVA, BRUNO (Current); PIVA, MARY C (Current); PIVA, PIERO (Current)
GC5	71-6	GOAT CREEK	5/1/1902	10N	13E	8	SWSENE	6.4		831.9		IRRIGATION	PIVA, BRUNO (Current); PIVA, MARY C (Current); PIVA, PIERO (Current)
	71-7	GOAT CREEK	6/1/1902	10N	13E	8	SWSENE	6.4		831.9		IRRIGATION	PIVA, BRUNO (Current); PIVA, MARY C (Current); PIVA, PIERO (Current)
	71-10190	GOAT CREEK	9/1/1902	10N	13E	4	SESWSW	17.6		831.9		IRRIGATION	PIVA, BRUNO (Current); PIVA, MARY C (Current); PIVA, PIERO (Current)
GC5A	71-10144	GOAT CREEK	1/17/1940	10N	13E	8	NWSWSE	0.15		2.4		IRRIGATION	PARKS, RICK C (Current)
GC6	71-4055B	GOAT CREEK	1/17/1940	10N	13E	8	SESESW	0.06		2.1		IRRIGATION	BROWNING, KATHERINE A (Current); BROWNING, ROGER A (Current)
	71-10854	GOAT CREEK	1/17/1940	10N	13E	8	SESESW	0.22		13	5	IRRIGATION, STOCKWATER	BROWNING, KATHERINE A (Current); ROGER A BROWNING TRUST (Current)
	71-10144	GOAT CREEK	1/17/1940	10N	13E	8	SESESW	0.15		2.4		IRRIGATION	PARKS, RICK C (Current)
GC7	71-22A	GOAT CREEK	5/1/1902	10N	13E	8	SWSESW	0.28		1.9		IRRIGATION, STOCKWATER	FREEMAN, CATHERINE SUE (Current); FREEMAN, DUANE LEE (Current)
GC7A	71-7063	GOAT CREEK	6/30/1980	10N	13E	17	NWNENW	3	4.8	1.5		DOMESTIC, IRRIGATION, POWER	SCHNEIDER, DORIS I (Current); SCHNEIDER, RICHARD L (Current)

BY IDWR 7/23/2007

GOAT CREEK WATER RIGHTS AND OWNER INFORMATION
WD170

Div.Name	WR_num	Source	Priority Date	Twp	Range	Sec	QQQ	Rate(cfs)	Volume(af)	Acres	Acre Limit	Water Use(s)	Owner(s)
GC7B	71-16	GOAT CREEK	5/1/1902	10N	13E	17	SENWNW	0.8		142.6		IRRIGATION	FUREY, JACK B (Current); RECINE JR, LOUIS F (Current)
	71-19A	GOAT CREEK	5/1/1902	10N	13E	17	SENWNW	0.88		142.6		IRRIGATION	FUREY, JACK B (Current); RECINE JR, LOUIS F (Current)
	71-22B	GOAT CREEK	5/1/1902	10N	13E	17	NWNENW	0.2		8.8		IRRIGATION	GOODWIN, DAVID C (Current); GOODWIN, DIANA K (Current); HARRIS, DEBORAH (Current)
	71-19B	GOAT CREEK	5/1/1902	10N	13E	17	SWNENW	0.02		4.3		IRRIGATION	PERIN, SUSAN P (Current)
	71-6	GOAT CREEK	5/1/1902	10N	13E	8	NWNESE	6.4		831.9		IRRIGATION	PIVA, BRUNO (Current); PIVA, MARY C (Current); PIVA, PIERO (Current)
	71-20A	GOAT CREEK	6/1/1902	10N	13E	17	SENWNW	1.46		142.6		IRRIGATION	FUREY, JACK B (Current); RECINE JR, LOUIS F (Current)
	71-20B	GOAT CREEK	6/1/1902	10N	13E	17	SENWNW	0.04		4.3		IRRIGATION	PERIN, SUSAN P (Current)
	71-7	GOAT CREEK	6/1/1902	10N	13E	8	NWSWSE	6.4		831.9		IRRIGATION	PIVA, BRUNO (Current); PIVA, MARY C (Current); PIVA, PIERO (Current)
	71-21A	GOAT CREEK	8/1/1902	10N	13E	17	SENWNW	2.34		142.6		IRRIGATION	FUREY, JACK B (Current); RECINE JR, LOUIS F (Current)
	71-21B	GOAT CREEK	8/1/1902	10N	13E	17	SENWNW	0.08		4.3		IRRIGATION	PERIN, SUSAN P (Current)
	71-10190	GOAT CREEK	9/1/1902	10N	13E	8	SWNWSE	17.6		831.9		IRRIGATION	PIVA, BRUNO (Current); PIVA, MARY C (Current); PIVA, PIERO (Current)
	71-10853	GOAT CREEK	5/15/1921	10N	13E	17	NWNENW	0.3		13	8	IRRIGATION	BROWNING, KATHERINE A (Current); ROGER A BROWNING TRUST (Current)
	71-4022	GOAT CREEK	1/17/1940	10N	13E	17	NWNENW	0.2		8.8		IRRIGATION	GOODWIN, DAVID C (Current); GOODWIN, DEBBIE E (Current); GOODWIN, DIANA K (Current)
	71-4053	GOAT CREEK	1/17/1940	10N	13E	17	SENWNW	0.46		4.3		DOMESTIC, IRRIGATION, STOCKWATER	PERIN, SUSAN P (Current)
	71-10644	GOAT CREEK	4/1/1942	10N	13E	17	NENW	0.06				DOMESTIC	CAMPILIO, JOHN J (Current)
	71-7084	GOAT CREEK	9/3/1982	10N	13E	17	NWNENW	0.1	15	5		IRRIGATION	JOSLYN, GRACE A (Current); JOSLYN, SPENCER A (Current); MENDIOLA, CAROL (Current); SINCLAIR, CHARLOTTE J (Current)
GC7C	71-10110B	GOAT CREEK	1/17/1940	10N	13E	17	NWNENW	0.05		1.9		IRRIGATION	SCHNEIDER, DORIS I (Current); SCHNEIDER, RICHARD L (Current)
	71-7063	GOAT CREEK	6/30/1980	10N	13E	17	SENWNW	3	4.8	1.5		DOMESTIC, IRRIGATION, POWER	SCHNEIDER, DORIS I (Current); SCHNEIDER, RICHARD L (Current)
GC8	71-16	GOAT CREEK	5/1/1902	10N	13E	17	SENWNW	0.8		142.6		IRRIGATION	FUREY, JACK B (Current); RECINE JR, LOUIS F (Current)
	71-19A	GOAT CREEK	5/1/1902	10N	13E	17	SENWNW	0.88		142.6		IRRIGATION	FUREY, JACK B (Current); RECINE JR, LOUIS F (Current)
	71-19B	GOAT CREEK	5/1/1902	10N	13E	17	SENWNW	0.02		4.3		IRRIGATION	PERIN, SUSAN P (Current)
	71-6	GOAT CREEK	5/1/1902	10N	13E	17	SENWNW	6.4		831.9		IRRIGATION	PIVA, BRUNO (Current); PIVA, MARY C (Current); PIVA, PIERO (Current)
	71-20A	GOAT CREEK	6/1/1902	10N	13E	17	SENWNW	1.46		142.6		IRRIGATION	FUREY, JACK B (Current); RECINE JR, LOUIS F (Current)
	71-20B	GOAT CREEK	6/1/1902	10N	13E	17	SWNENW	0.04		4.3		IRRIGATION	PERIN, SUSAN P (Current)
	71-7	GOAT CREEK	6/1/1902	10N	13E	17	SENWNW	6.4		831.9		IRRIGATION	PIVA, BRUNO (Current); PIVA, MARY C (Current); PIVA, PIERO (Current)
	71-21A	GOAT CREEK	8/1/1902	10N	13E	17	SENWNW	2.34		142.6		IRRIGATION	FUREY, JACK B (Current); RECINE JR, LOUIS F (Current)
	71-21B	GOAT CREEK	8/1/1902	10N	13E	17	SWNENW	0.08		4.3		IRRIGATION	PERIN, SUSAN P (Current)
	71-10190	GOAT CREEK	9/1/1902	10N	13E	17	SENWNW	17.6		831.9		IRRIGATION	PIVA, BRUNO (Current); PIVA, MARY C (Current); PIVA, PIERO (Current)
	71-4053	GOAT CREEK	1/17/1940	10N	13E	17	SWNENW	0.46		4.3		DOMESTIC, IRRIGATION, STOCKWATER	PERIN, SUSAN P (Current)
GC9	71-16	GOAT CREEK	5/1/1902	10N	13E	17	NWNENW	0.8		142.6		IRRIGATION	FUREY, JACK B (Current); RECINE JR, LOUIS F (Current)
	71-19A	GOAT CREEK	5/1/1902	10N	13E	17	NWNENW	0.88		142.6		IRRIGATION	FUREY, JACK B (Current); RECINE JR, LOUIS F (Current)
	71-6	GOAT CREEK	5/1/1902	10N	13E	17	SENWNW	6.4		831.9		IRRIGATION	PIVA, BRUNO (Current); PIVA, MARY C (Current); PIVA, PIERO (Current)
	71-20A	GOAT CREEK	6/1/1902	10N	13E	17	NWNENW	1.46		142.6		IRRIGATION	FUREY, JACK B (Current); RECINE JR, LOUIS F (Current)
	71-7	GOAT CREEK	6/1/1902	10N	13E	8	NWNWSE	6.4		831.9		IRRIGATION	PIVA, BRUNO (Current); PIVA, MARY C (Current); PIVA, PIERO (Current)
	71-21A	GOAT CREEK	8/1/1902	10N	13E	17	NWNENW	2.34		142.6		IRRIGATION	FUREY, JACK B (Current); RECINE JR, LOUIS F (Current)
	71-10190	GOAT CREEK	9/1/1902	10N	13E	8	NWNESE	17.6		831.9		IRRIGATION	PIVA, BRUNO (Current); PIVA, MARY C (Current); PIVA, PIERO (Current)
Unk	71-4055A	GOAT CREEK	5/15/1921	10N	13E	8	SESE	0.04				DOMESTIC, STOCKWATER	COVINGTON, FEN H (Current); COVINGTON, NOLA C (Current)
GC10	71-7063	GOAT CREEK	6/30/1980	10N	13E	17	NWNENW	3	4.8	1.5		DOMESTIC, IRRIGATION, POWER	SCHNEIDER, DORIS I (Current); SCHNEIDER, RICHARD L (Current)
	71-7064	GOAT CREEK	8/26/1980	10N	13E	17	NWNW	0.04	0.1			DOMESTIC	STARK, JAMES C (Current)

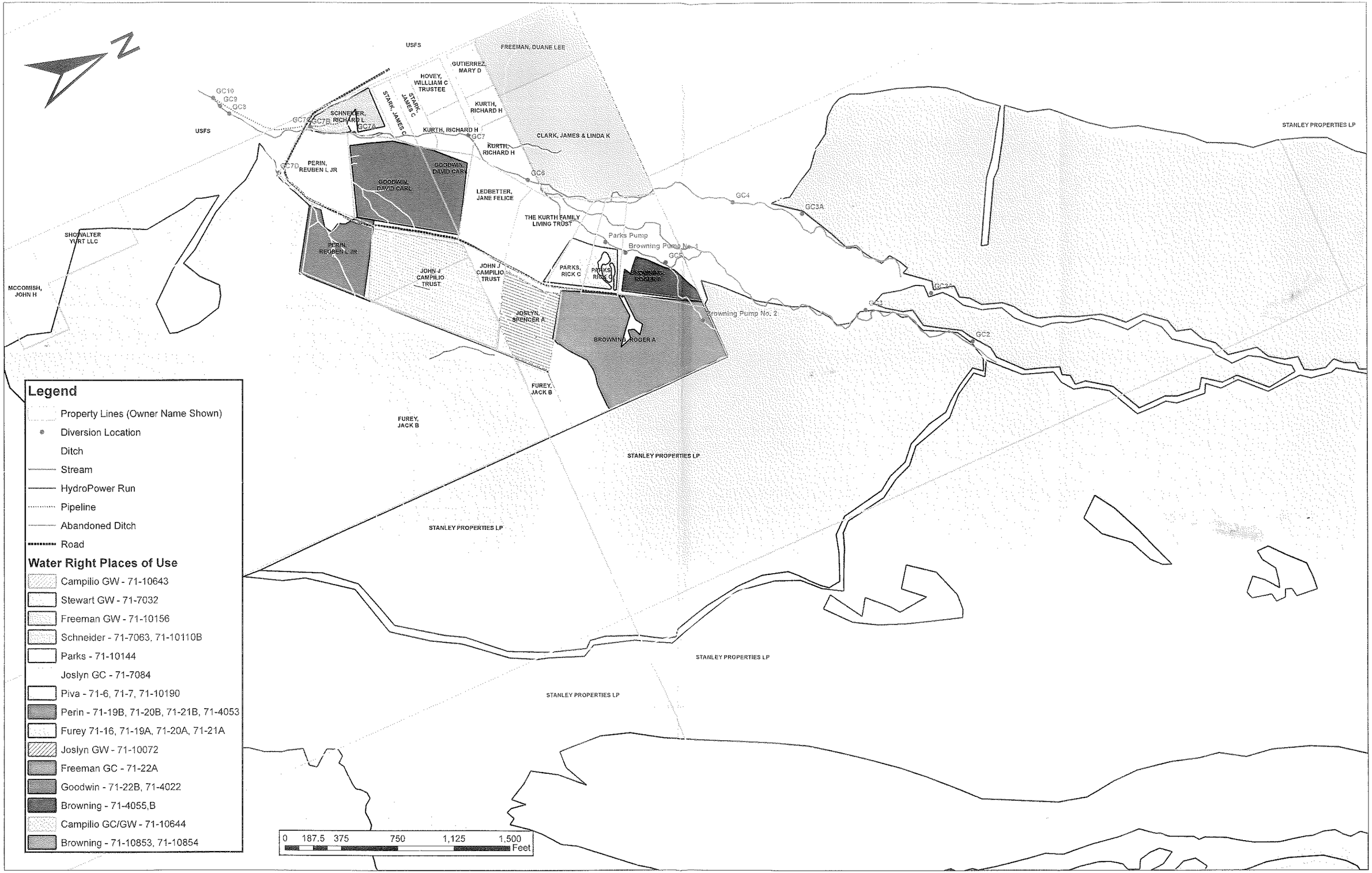
BY IDWR 7/23/2007

WATER RIGHT OWNERS AND CONTACT INFORMATION

FOR

GOAT CREEK - WD170

WR_num	OwnerType	Owner Name	StreetAddress	City	StateCode	PostalCode	Country	Phone	Phone2
71-10110B, 71-7063	Current Owner	DORIS I SCHNEIDER	PO BOX 103	STANLEY	ID	83278	USA	(208)774-3489	
71-10110B, 71-7063	Current Owner	RICHARD L SCHNEIDER	PO BOX 103	STANLEY	ID	83278	USA	(208)774-3489	
71-10144	Current Owner	RICK C PARKS	PO BOX 801	TWIN FALLS	ID	83303-0801	USA	(208)733-4441	(208)731-7165
71-10644	Current Owner	JOHN J CAMPILIO	327 W CARRILLO ST	SANTA BARBARA	CA	93101-3710	USA	(805)568-3758	
71-10853, 71-10854	Current Owner	ROGER A BROWNING TRUST	ROGER A BROWNING 360 N BEDFORD DR # 204	BEVERLY HILLS	CA	90210	USA	(310)278-5100	
71-10853, 71-10854, 71-4055B	Current Owner	KATHERINE A BROWNING	360 N BEDFORD DR #204	BEVERLY HILLS	CA	90210	USA	(310)278-5100	
71-16, 71-19A, 71-20A, 71-21A	Current Owner	JACK B FUREY	PO BOX 280	CHALLIS	ID	83226	USA	(208)876-4491	
71-16, 71-19A, 71-20A, 71-21A	Current Owner	LOUIS F RECINE JR	PO BOX 1391	POCATELLO	ID	83204	USA	(208)232-6101	
71-22A	Current Owner	CATHERINE SUE FREEMAN	BOX 212	STANLEY	ID	83278	USA		
71-22A	Current Owner	CATHERINE SUE FREEMAN	12148 BAKMAN CT	LAKESIDE	CA	92040	USA	(208)774-3648	(619)443-5774
71-22A	Current Owner	DUANE LEE FREEMAN	BOX 212	STANLEY	ID	83278	USA		
71-22A	Current Owner	DUANE LEE FREEMAN	12148 BAKMAN CT	LAKESIDE	CA	92040	USA	(619)443-5774	(208)467-5047
71-22B	Current Owner	DEBORAH HARRIS	1730 N WHITE OAK WAY	MERIDIAN	ID	83642	USA	(208)888-3809	(208)939-1392
71-22B, 71-4022	Current Owner	DAVID C GOODWIN	1730 N WHITE OAK WAY	MERIDIAN	ID	83642	USA	(208)888-3809	(208)939-1392
71-22B, 71-4022	Current Owner	DIANA K GOODWIN	1730 N WHITE OAK WAY	MERIDIAN	ID	83642	USA	(208)888-3809	(208)939-1392
71-4022	Current Owner	DEBBIE E GOODWIN	1730 N WHITE OAK WAY	MERIDIAN	ID	83642	USA	(208)888-3809	(208)939-1392
71-4053, 71-19B, 71-20B, 71-21B	Current Owner	SUSAN P PERIN	PO BOX 480	SUN VALLEY	ID	83353-2338	USA	(208) 622-8488	
71-4055A	Attorney	F BRUCE COVINGTON	PO BOX 1906	TWIN FALLS	ID	83303-1906	USA		
71-4055A	Current Owner	FEN H COVINGTON	1863 ALTURAS DR	TWIN FALLS	ID	83301	USA	(208)733-1793	
71-4055A	Current Owner	NOLA C COVINGTON	1863 ALTURAS DR	TWIN FALLS	ID	83301	USA	(208)733-1793	
71-4055B	Current Owner	ROGER A BROWNING	360 N BEDFORD DR	BEVERLY HILLS	CA	90210-5157	USA	(310)278-5100	
71-6, 71-7, 71-10190	Current Owner	BRUNO PIVA	PO BOX 176	CHALLIS	ID	83226	USA	(208)879-2351	
71-6, 71-7, 71-10190	Current Owner	MARY C PIVA	PO BOX 176	CHALLIS	ID	83226	USA	(208)879-2351	
71-6, 71-7, 71-10190	Current Owner	PIERO PIVA	PO BOX 176	CHALLIS	ID	83226	USA	(208)879-2351	
71-7064	Current Owner	JAMES C STARK	5145 BURLINGTON DR	BOISE	ID	83704	USA	(208)376-6931	
71-7084	Current Owner	GRACE A JOSLYN	1130 N ALLUMBAUGH APT 223	BOISE	ID	83704	USA	(208)327-1223	
71-7084	Current Owner	SPENCER A JOSLYN	3213 N 39TH ST	BOISE	ID	83703	USA		
71-7084	Current Owner	CAROL MENDIOLA	1050 PARK HILL	BOISE	ID	83702	USA		
71-7084	Current Owner	CHARLOTTE J SINCLAIR	2503 COSTERO MAGESTUOSO	SAN CLEMENTE	CA	92673	USA		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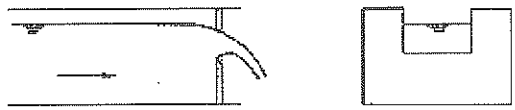
USFS
FREEMAN, DUANE LEE
GUTIERREZ, MARY D
HOVEY, WILLIAM C TRUSTEE
STARK, JAMES C
KURTH, RICHARD H
SCHNEIDER, RICHARD L
CLARK, JAMES & LINDA K
PERIN, REUBEN L JR
GOODWIN, DAVID CARL
LEDBETTER, JANE FELICE
THE KURTH FAMILY LIVING TRUST
STANLEY PROPERTIES LP
SHOWALTER YURT LLC
MCCOMISH, JOHN H
JOHN J CAMPILIO TRUST
JOSLYN, SPENCER A
PARKS, RICK C
BROWNING, ROGER A
FUREY, JACK B
Parks Pump
Browning Pump No. 1
Browning Pump No. 2
GC10
GC9
GC8
GC7
GC7B
GC7A
GC6
GC5
GC4
GC3A
GC3
GC2
Legend
Property Lines (Owner Name Shown)
Diversion Location
Ditch
Stream
HydroPower Run
Pipeline
Abandoned Ditch
Road
Water Right Places of Use
Campilio GW - 71-10643
Stewart GW - 71-7032
Freeman GW - 71-10156
Schneider - 71-7063, 71-10110B
Parks - 71-10144
Joslyn GC - 71-7084
Piva - 71-6, 71-7, 71-10190
Perin - 71-19B, 71-20B, 71-21B, 71-4053
Furey 71-16, 71-19A, 71-20A, 71-21A
Joslyn GW - 71-10072
Freeman GC - 71-22A
Goodwin - 71-22B, 71-4022
Browning - 71-4055,B
Campilio GC/GW - 71-10644
Browning - 71-10853, 71-10854
0 187.5 375 750 1,125 1,500
Feet

MEASUREMENT DEVICE SELECTION CONSIDERATIONS:

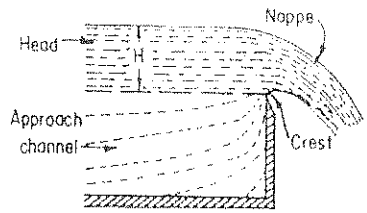
- Accuracy requirements
- Cost
- Legal constraints
- Range of flow rates
- Head loss
- Adaptability to site conditions
- Adaptability to variable operating conditions
- Type of measurements and records needed
- Operating requirements
- Ability to pass sediment and debris
- Longevity of device for given environment
- Maintenance requirements
- Construction and installation requirements
- Device standardization and calibration
- Field verification, troubleshooting, and repair
- User acceptance of new methods
- Vandalism potential
- Impact on environment

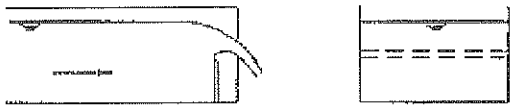
STANDARD WEIRS:

Sharp-Crested Weirs:

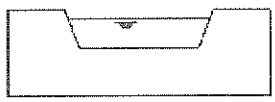


Contracted Rectangular





Suppressed Rectangular



Cipolletti Contracted

Contracted Triangular or V–Notch

Rectangular Weirs:
- Simple to construct
- Fairly accurate

Trapezoidal Weirs:
- More accurate than rectangular
- 1:4 side slopes are standard

V-Notch Weirs:
- Best choice for small flows (<1 cfs)
- Comparable accuracy from 1 to 10 cfs
- Requires the most head drop

Table 6.—Capacities of standard weirs in second-feet. (See sec. 13.)

Length in feet	Contracted rectangular		Suppressed rectangular		Cipolletti	
	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum
1.0	0.590	0.286	0.631	0.298	0.638	0.301
1.5	1.65	.435	1.77	.447	1.79	.452
2.0	3.34	.584	3.66	.596	3.69	.602
2.5	5.87	.732	6.30	.744	6.37	.753
3.0	9.32	.881	10.0	.893	10.1	.903
3.5	13.8	1.03	14.8	1.04	15.0	1.05
4.0	19.1	1.18	20.4	1.19	20.6	1.20
4.5	25.7	1.33	27.5	1.34	27.8	1.35
5.0	33.5	1.48	36.0	1.49	36.4	1.51
5.5	42.3	1.63	45.3	1.64	45.8	1.66
6.0	52.7	1.78	56.6	1.79	57.2	1.81
7.0	77.4	2.07	82.9	2.08	83.8	2.11
8.0	108.5	2.37	116.2	2.38	117.5	2.41
9.0	145.3	2.67	155.9	2.68	157.6	2.71
10.0	188.8	2.97	202.4	2.98	204.6	3.01
12.0	298.4	3.56	320.0	3.57	323.6	3.61
14.0	439.1	4.16	470.4	4.17	475.6	4.21
16.0	612.0	4.75	656.5	4.76	663.8	4.82
18.0	822.4	5.35	882.0	5.36	891.8	5.42

NOTE.—Limits follow the prescribed practice of $h > 0.2$ foot and $h < \frac{1}{3}L$.

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.

FLUMES:

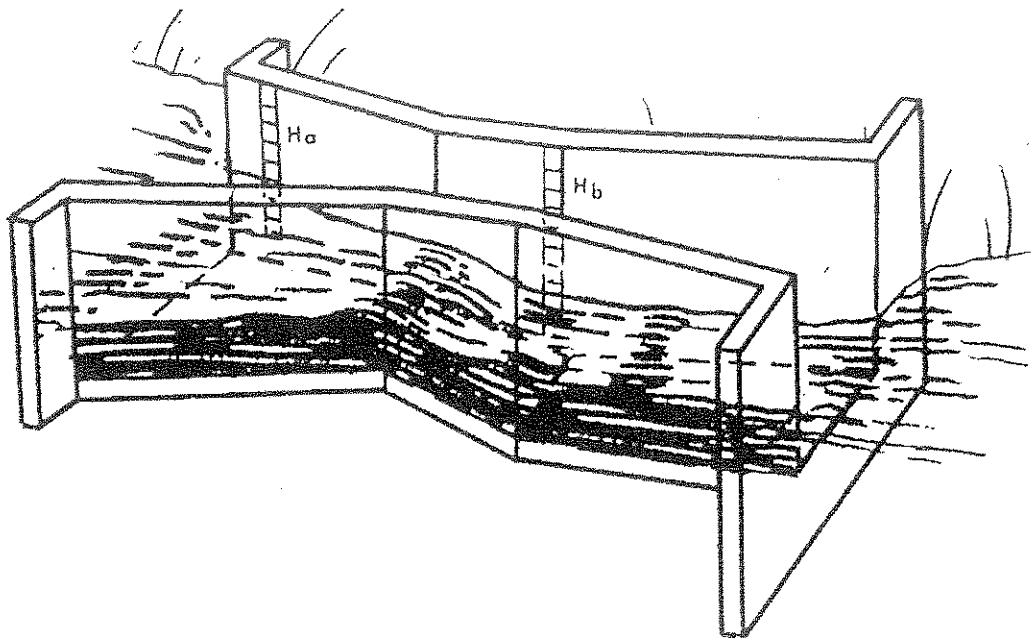
Parshall Flume is most common –

Advantages include:

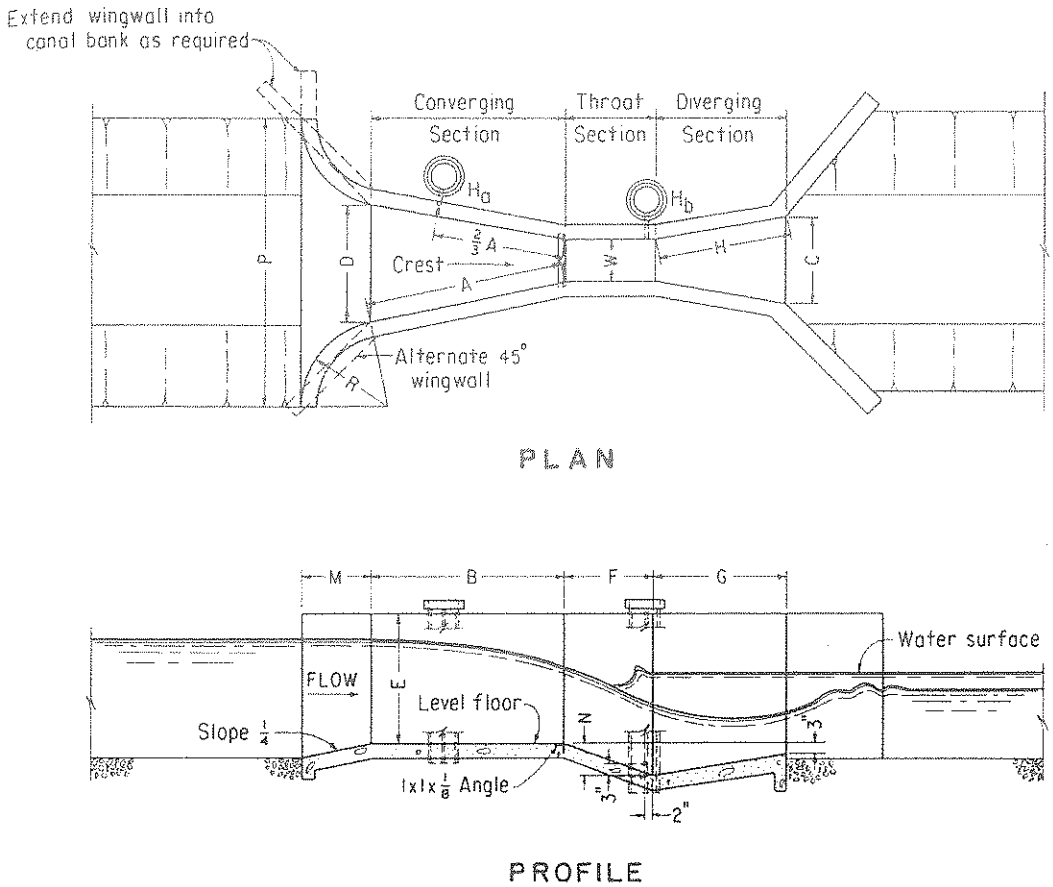
- Very low head loss
- Insensitive to velocity of approach
- Self cleaning
- Can measure a wide range of flows
- Can tolerate significant submergence

Requirements:

- Must be set level and plumb
- A section of straight flow above and below the flume
- Staff gage must be accurately placed



Parshall Flume



Schematic showing profile and plan views of Parshall Flume.

Submerged Orifices

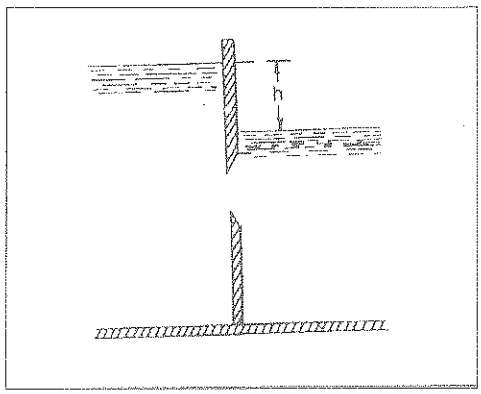
Typically not encouraged due to silting and clogging problems.

Appropriate where:

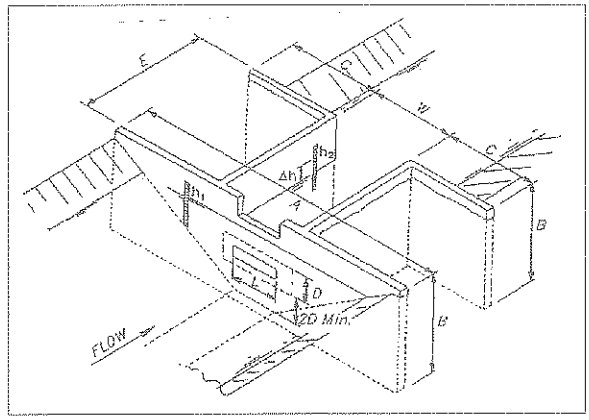
- Low available head
- Economics or other site conditions preclude the use of a Parshall flume

Disadvantages include:

- Two measurements are required (upstream head and downstream head)
- Subject to clogging or accumulation of debris



Cross-section view.



Angled view of installation.

Installation Requirements:

(a) The upstream edges of the orifice should be straight, sharp, and smooth.
(b) The upstream face of the orifice wall should be vertical.
(c) The top and bottom edges of the orifice opening should be level.
(d) The sides of the opening should be truly vertical.
(e) The inset orifice plates must be flush, and the upstream face of the supporting bulkhead with the fasteners must be countersunk on the upstream side.
(f) The distance from the opening edges to the boundary and the water surface, both on the upstream and downstream sides, should be greater than twice the least dimension of the orifice opening.
(g) The face of the plates must be free of grease and oil.
(h) Avoid orifice plate knife-edges because they are a safety hazard and can damage easily; orifice opening plate perimeter should be between 0.03 and 0.08 inch (in) thick.
(i) If the plates are thicker than condition (h), the plate edges should be reduced to the required thickness by chamfering the downstream edge of the orifice plates to an angle of at least 45 degrees.
(j) Flow 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.
(k) The edges of the supporting bulkhead wall cutout to receive the orifice opening plate should be located at least one wall thickness from the orifice opening edges.
(l) For submerged flow, the effective head on the orifice is the actual difference in elevation between the water surfaces upstream and downstream from the orifice wall. The differential head should be at least 0.2 foot (ft).
(m) For free flow, the effective head on the orifice is the difference in elevation between the upstream water surface and the center of the orifice opening.

(n) The cross-sectional area of the water prism 20 to 30 ft upstream from the orifice should be at least eight times the cross-sectional area of the orifice.
(o) The selected type of head measuring device must be compatible with required project accuracy and the amount of head loss that is acceptable.

Information Sheet

This information sheet is intended to provide additional information for users affected by this order.

Diversions on Federal Lands:

Diversions on United States Forest Service (USFS) Lands.
Installation of headgates and flow measuring devices on USFS lands may require a special use permit or other authorization. Please contact the appropriate USFS office for further information prior to initiating any ground disturbing activity on USFS land. If your diversion is within the Sawtooth National Forest, please contact the Sawtooth National Recreation Area office at the number below.

Diversions in the Sawtooth National Recreation Area (SNRA).
This includes all diversions within the SNRA, including those on private and those on public lands. All structures associated with diversions within the Sawtooth National Recreation Area must meet scenic easement requirements on lands on which the United States owns an easement. Private lands within the Sawtooth National Recreation Area that are not encumbered by a scenic easement must be in conformance with the Private Lands Regulations (36 CFR Part 292). Diversions within the SNRA on United States Forest Service lands must also comply with permitting requirements of the United States Forest Service. Prior to constructing or developing plans for headgates and measuring devices, users should contact the SNRA office and identify any special considerations or requirements of the SNRA.

Diversions on Bureau of Land Management (BLM) Lands.
Water right owners with points of diversion on BLM lands should contact the agency and identify any special requirements prior to developing plans for headgates and measuring devices.

SNRA Office
HC 64, Box 8291
5 North Fork Canyon Rd
Ketchum, ID 83340
208-727-5000

Salmon-Challis Nat. Forest
Forest Supervisor's Office
1206 So. Challis Street
Salmon, ID 83467
(208) 756-5100

BLM Challis Field Office
Tim Vanek
801 Blue Mountain Road
Challis, Idaho 83226
(208) 879-6200

Other Considerations:

Ownership Change and Water Right Updates.

IDWR recognizes that changes in water right ownership and points of diversion have occurred and are not always reflected in the IDWR records. Some of the diversion locations listed in this order may no longer be in use, or may have been moved or consolidated with other diversions. Water right ownership may not be up to date, and the points of diversion listed in this order may include unused diversions. If the water right ownership and/or point of diversion information listed in the order do not appear to be correct, please contact IDWR to correct the information.

IDWR Workshop.

IDWR plans to hold a one-day workshop during the week of March 12, 2007. The workshop will focus on design and construction of control works and measuring devices. The workshop will also discuss other opportunities available to users to improve their water distribution systems and spread the cost of construction. These opportunities include: consolidating diversions, revising distribution systems, and participating in existing state and federal programs that may provide some funding to the user. IDWR will send notice of the workshop to water users when the time and location have been scheduled.

Fish Screens.

Some of the diversions listed in this order may be scheduled to have a fish screen installed by the Idaho Department of Fish and Game (IDFG). Users should contact IDFG at the address below to ensure the plans for fish screens will not conflict with the user's plans for measuring devices and headgates. In some cases, up to 75% of the cost for installation of controlling works is provided with the installation of the fish screen. Additionally, users who are not already scheduled to have a fish screen installed should contact IDFG to determine if a fish screen might be required in the future.

IDFG Screen Shop
97 HWY 93 North.
P.O. Box 1336
Salmon, ID 83467
(208) 756-6022

STATE OF IDAHO
DEPARTMENT OF WATER RESOURCES (IDWR)

MINIMUM ACCEPTABLE STANDARDS FOR OPEN CHANNEL AND CLOSED CONDUIT MEASURING DEVICES

The source and means of diversion of water, whether surface or ground water, generally determines the measurement and reporting process. Surface water sources such as streams, springs and waste channels are normally diverted into open channels (ditches or canals), but closed conduits (pipes or culverts) are also used. Ground water is usually diverted into pipes (which may also discharge into open channels).

Measuring devices are required at or near the point of diversion from the public water source.

OPEN CHANNEL

SURFACE WATER DIVERSIONS

I. Flow Measurement

The following discussion is applicable only to diversions from surface water sources. Measurement of a ground water diversion with an open channel measuring device must be pre-approved by the Department.

A. Standard Open Channel Measuring Devices

Standard weirs, flumes and submerged orifices are pre-calibrated devices commonly used for measuring water in open channels. The installation of one of these devices provides a fixed relationship between the stage and flow.

Various size weirs, flumes and submerged orifices are available and each type and size has a separate rating, or relationship between head and flow. Standard designs and information about installation and use of different measuring devices, including rating tables, can be provided by the department. All open channel flow diversions should be measured using one of the following standard open channel flow measuring devices commonly used in Idaho:

- contracted rectangular weir
- suppressed rectangular weir
- Cipolletti weir
- 90 degree V-notch weir
- Parshall flume
- trapezoidal flume
- submerged rectangular orifice
- constant head orifice
- ramped broad crested weir (or ramped flume)

Construction and installation of these devices should follow published guidelines. Additional information is available on the IDWR Internet site at the addresses below. Additional references are available upon request.

http://www.idwr.idaho.gov/water/districts/water_measurement.htm

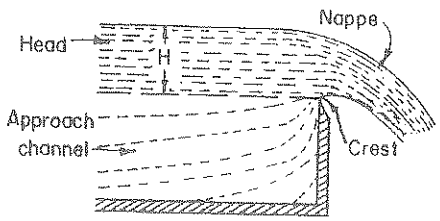


Figure 1. Generalized profile of a standard sharp-crested weir.

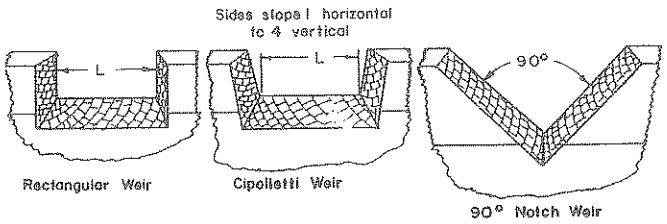


Figure 2. Examples of common weir types.

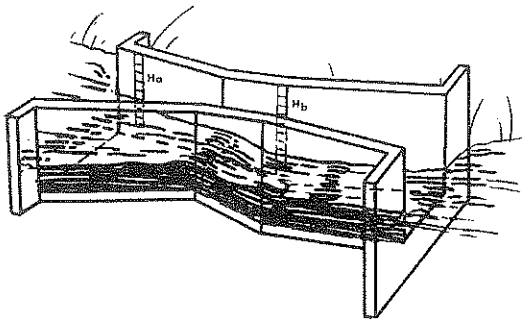


Figure 3. Parshall Flume.

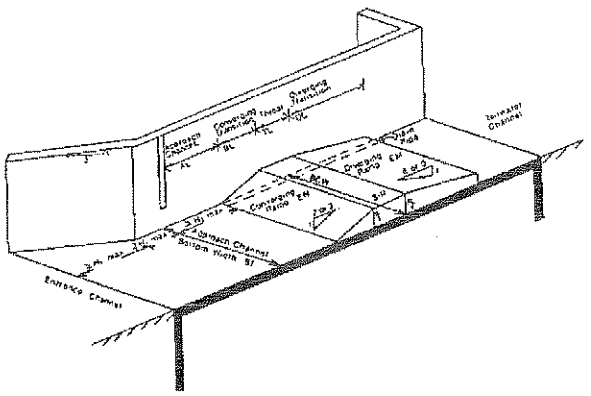


Figure 4. Ramped Flume.

B. Non-standard open channel devices: Rated Structures or Rated Sections

IDWR may authorize the use of non-standard devices and rated sections provided the device or section is rated or calibrated against a set of flow measurements using an acceptable open channel current meter or a standard portable measuring device. Further restrictions and requirements are available from the Department upon request.

C. Closed Conduit Measuring Devices

Refer to the Ground Water measuring section for installation, accuracy, and calibration standards of closed conduit measuring devices.

GROUND WATER DIVERSIONS

Ground water diverters have the option of installing a flowmeter, or using power records to estimate water withdrawals. Information regarding the use of power records will follow this discussion of flowmeters.

I. Flow Measurement

There are many flowmeters on the market, with costs ranging from several hundred dollars to several thousand dollars. In general, the higher priced meters are more accurate and require less maintenance. Most meters on the market have an acceptable accuracy rating for IDWR's guidelines. However, some types and designs are much more prone to maintenance problems. Moving parts tend to wear when sand or silt is present, and moss often plugs small orifices and slows moving parts. No single flowmeter is best for every situation. We recommend that you visit with qualified dealers and discuss your needs with them.

A. Minimum Standards

The following are minimum standards for closed conduit flowmeters:

- Minimum manufacturers' design accuracy of +/- 2 percent of reading
- Installed accuracy of at least +/- 10 percent of reading
- Meter must be calibrated with an independent, secondary measuring device when installed, and at least once every four years thereafter. In many cases, IDWR or the water district will perform this calibration.
- Must read instantaneous flow or be capable of flow rate calculation
- Must record total volume
- Non-volatile memory (power outage does not zero volume reading)
- Sufficient digits to assure "roll-over" to zero does not occur within 2 years
- Volume reading cannot be "reset" to zero
- Installed to manufacturers' specifications

Meter manufacturers typically specify that a meter must be located in a section of straight pipe at least 10 pipe diameters downstream and 5 pipe diameters upstream of any valves, bends, contractions, or other interferences which will distort the flow pattern. However, some types of meters will produce acceptable results when installed in shorter sections of

straight pipe. For example, at least one electro-magnetic flowmeter provides excellent measurement accuracy with only 5 lengths of straight pipe upstream from the meter.

Each manufacturer should provide the installation specifications for its meters. These **specifications must be adhered to** in order to achieve the accuracy required for the water measurement program. Again, we stress the importance of visiting with a qualified dealer and discussing your specific needs with them.

B. Types of Measuring Devices for Closed Conduits

Types	Pipe Sizes	Maintenance Required	Relative Purchase Price
Differential Head • Orifice • Venturi • Annubar	small to large	Low to high. Sand wears on sharp edges, and particles can plug small orifices and tubes.	low to medium
Force Velocity • Turbine • Propeller • Impeller	small to large	Typically moderate to high. Often problematic when exposed to sand or moss. Some cannot measure low velocities	low to medium
Ultrasonic	small to large	Low. Typically non-invasive with no moving parts to wear	high
Vortex	small to medium (about 12 to 14 inch maximum pipe diameter	Low. Few or no moving parts to wear.	high
Electro-Magnetic	small to medium (about 12 to 14 inch maximum pipe diameter	Low. No moving parts. Can provide good results with shorter lengths of straight pipe.	high

Power Records

An alternative to installing flowmeters is the use of power records and other information to estimate the annual diversion from a pump. This method, which we call the Power Consumption Coefficient (PCC) method, utilizes information obtained from the pumping plant while running at or near full capacity. Two parameters are measured while the pump is operating: flow rate and input power. With this information, one can calculate the number of kilowatt-hours required to pump one acre-foot of water. This number is unique to each well and pumping plant due to the physical attributes of the system.

To determine the rate of flow, a portable measuring device, such as an ultrasonic non-invasive meter or a differential head device, can be used. Simultaneous with the flow measurement, power is measured using the utility's kilowatt-hour meter. A qualified individual with the necessary equipment will be required to perform these measurements.

With the power consumption coefficient, an annual volume of water pumped can be calculated from the total annual kilowatt-hours of energy consumed by the pumping plant. The total power usage for each pumping plant will be supplied to the Department by electric utilities.

Some complex systems cannot use this method due to the potential for large errors. See the discussion on page 5 to see if this method can be used.

Because systems wear and water levels change, it is necessary to occasionally verify the flow to power ratio. Therefore, the power consumption coefficient must be re-calibrated at least once every four years.

Can power records be used to estimate my diversion?

Only irrigation water users may use power records to estimate their diversion because the utilities will only provide consumption information for irrigation uses. If you are not an irrigation user, but want to use power records, you must propose a method of reporting your power consumption data.

Owners of **surface water diversions** must have a flow-measuring device in most cases. The alternate method of estimating water withdrawals with power records cannot be used unless you pump from a public water source and can show the Department that it will yield reliable results (case by case determination).

Owners of **ground water diversions** can either install a totalizing flowmeter or ask the Department to use power records to estimate withdrawals. If the pump discharges to an open channel, an open channel measuring device can be employed to measure the water diverted if the device and a method of tracking hours of operation are pre-approved by the Department. Flow meters which register only instantaneous flow rate are not acceptable unless the water user can demonstrate a reliable method of tracking the number of hours the pump operates

through the season (the flow measuring device must then be read and flow rate recorded at least once per week).

Estimating total water diversion from power records requires the derivation of a relationship between power demand and flow. Flow rate and power demand must be measured simultaneously to determine the number of kilowatt hours needed to pump an acre-foot of water. This relationship, called a power consumption coefficient, is applied to the year-end power records to determine the total acre-feet diverted.

The total water diverted can be accurately estimated if the system configuration or operation is not complex. Unfortunately, power records will not always yield acceptable results, and it will be necessary to install a flowmeter. **Flowmeters must be installed** if any of the following conditions exist:

- The well flows (artesian) so that water can be diverted when the pump is off.
- The energy consumption meter that records power used by the pump also records power used by other devices not integral to the irrigation system. For example, if the meter also records power used by a home, shop, cellar, etc., a flowmeter must be installed because power used by the pump cannot be isolated from the other devices. However, if the meter also records power used by center pivots, booster pumps, or other devices which operate when the main pump operates, the alternate method may be acceptable.
- The energy consumption meter records the power used by more than one well pump. If a deep well pump which discharges to an open pond or ditch and a relift pump are both connected to the same electrical meter, the discharge from the well pump can be measured, and a time clock can be installed to record the total number of hours of pump operation which can be multiplied by the flow rate to determine the total volume of water diverted.
- The energy supplied to the pump cannot be accurately and reliably measured. For example, most diesel and propane driven pumps do not have provisions to measure the fuel used by the engine. These will be reviewed on a case-by-case basis.
- The flow rate from the pump varies significantly due to changes in demand or operation. For example, pumps that discharge into a pressurized system some times and then open discharge at other times, or pumps that supply multiple pivots, would likely have flow rates that change drastically. These changes would alter the flow to power ratio, causing inaccurate estimates of diversions. The alternate method of estimating water withdrawals with power records may only be used if the water user can propose an acceptable method of tracking these changes in operation.
- Changing water levels cause the flow or operating pressures to vary significantly over the irrigation season.

Manufacturers/Distributors of Headgates:

GNI Waterman LLC,
25500 Road 204
Exeter, California 93221
PO Box 458
Phone: 559-562-4000
Toll Free: 800-331-0808
Fax: (559) 562-2277
Email: sales@watermanusa.com
www.watermanusa.com

A•M VALVE COMPANY LLC
7425 W Sunnyview Ave
Visalia, CA 93291
Phone: 559-651-2066
Toll Free: 866-462-8700
Fax: 559-651-2065
Email: sales@amvalve.com
Email: support@amvalve.com
Email: info@amvalve
www.amvalve.com

Fresno Valves & Castings, Inc.
7736 East Springfield Avenue
P.O. Box 40
Selma, CA 93662
Phone: 800-333-1658
Fax: 559-834-2017
e-mail: info@fresnovalves.com
www.fresnovalves.com

Local Warehouse:
211 Bridon Way
Jerome, ID 83338-6143
Phone: 208-324-2963

Manufacturers/Distributors of Headgates (cont'd):

Contech Construction Products – Steel fabrication
1510 W Sunnyside Rd
Idaho Falls, ID 83402-4357
Phone: 208-522-1713

Irrigation Centers - They can fabricate steel gates, weirs, and flumes.
410 S Front St
Arco, ID 83213
Phone: 208-527-3075

Amcor – Concrete applications
2240 S Yellowstone
Idaho Falls, ID 83402-4323
Phone: 208-522-6150

Manufacturers of Flumes and Weirs:

Irrigation Centers - Fabrication and sales of steel gates, weirs, and flumes.
410 S Front St
Arco, ID 83213
Phone: 208-527-3075

Intermountain Environmental Inc.
601 West 1700 South, Suite B
Logan, UT 84321
Phone: 435-755-0774
Toll Free: 800-948-6236
Fax: 435-755-0794
Email: info@inmtn.com
www.inmtn.com

Plasti-Fab, Inc. – Plastic flumes

PO Box 100
Tualatin, Oregon
97062-0100
Phone: 503-692-5460
Fax: 503-692-1145
Email: sales@plasti-fab.com
http://www.plasti-fab.com/flumes/flumes.html

Manufacturers of Flumes and Weirs (Cont'd):

Honkers Supreme – Goose Decoys, but can manufacture fiberglass flumes
317 Addison Ave W
Twin Falls, ID 83301-5003
Phone: 208-734-2060

Distributors of Inline Flow meters:

Rust Automation & Controls
8070 South 1300 West
PO Box 367
West Jordan, UT 84084
Phone: 801-566-7878
Fax: 801-566-9260

Irrigation Components Northwest
5902 Oakesdale Road
Oakesdale, WA 99158
Phone 1: 509-991-2365
Phone 2: 509-285-5403
Fax: 509-285-5403
Email: kenhanson@palousenet.com

Western Engineering
4306 South Main St.
Salt Lake City, UT 84107-2600
Phone: 801-268-3333
Fax: 801-268-3358
Email: office@WEngineering.com
www.WEngineering.com

Controls Warehouse
356 Cypress Road
Ocala, FL 34472
Phone: 352-687-0351
Toll Free: 800-321-6056
Fax: 352-687-8925
Email: sales@controlswarehouse.com
www.controlswarehouse.com/waste.htm

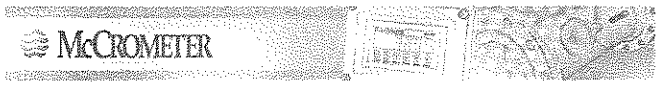
Distributors of Inline Flow meters (Cont'd):

Daniel L. Jerman Co.
275 Railroad Place
Hackensack, NJ 07601
Phone: 800-654-3733
Fax: 201-487-3953
Email: sales@watermeters.com
www.watermeters.com

Mountain States Instruments
3620 West 2100 South
Salt Lake City, UT 84044
Phone: 801-521-8045
Fax: 801-521-8043
E-mail: kima@iwestco.com
www.msinst.com

Branom Instrument Co
4090 W State St SUITE Unit 28
Boise, ID 83703-4445
Phone: 208-336-5444

Manufacturers of Inline Flow meters:



McCrometer, Inc.

3255 W. Stetson Ave.
Hemet, California 92545
Phone: 951-652-6811
Toll Free: 800-220-2279
Fax: 951-652-3078
www.mccrometer.com

ABB Automation
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http://www.dynasonics.com

Manufacturers of Inline Flow meters (Cont'd):

Badger Meter, Inc.
(Distributed by Rust Automation & Controls – See above)
P.O. Box 245036
Milwaukee, WI 53224-9536
Phone: 877-243-1010
Email: flow@badgermeter.com

SIEMENS Siemens
(Distributed by Branom Instrument Co – See above)
www.siemens.com

Seametrics, Inc
(Distributed by Irrigation Components Northwest – See above)
(Distributed by Western Engineering – See above)
19026 72nd Ave South
Kent, WA 98032
Phone: 253-872-0284
Toll Free: 800-975-8153
Fax: 253-872-0285
Email: info@seametrics.com