



State of Idaho

DEPARTMENT OF WATER RESOURCES

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C.L. "BUTCH" OTTER
Governor

GARY SPACKMAN
Director

March 3, 2014

Re: Final Order Requiring Measuring Devices for Ground Water Diversions in Water District No. 73, The Pahsimeroi River and Tributaries.

Dear Water User,

The Idaho Department of Water Resources (Department or IDWR) has issued the enclosed order requiring installation of measuring devices for diversions of ground water rights within Water District No. 73, the Pahsimeroi River and Tributaries. Measuring devices on ground water diversions are necessary to ensure IDWR and the watermaster have the information needed to adequately deliver water and protect water rights in priority. The enclosed order is a Final Order pursuant to Section 67-5246, Idaho Code. Any party may file a petition for reconsideration of a final order as explained in the enclosed information sheet.

The order requires that measuring devices be installed on ground water diversions in Water District No. 73. The requirement excludes small diversions (less than 5 acres of irrigation) and those used solely to divert water for small domestic and/or stock water uses.

The order requires users to submit measurement plans to IDWR by March 31, 2014. To facilitate evaluation of measurement plans, requests for variance, and requests for exemption or extension of time, IDWR has included a response form that serves as a measurement plan, or a request for variance. Please fill out one form for each well listed on Attachment A that you divert water from and submit it to IDWR before the March 31, 2014 deadline. Be sure to fill out the WMIS Number for your well as described in Attachment A of the order. Water users may download additional copies of the form from the following IDWR web site address:

<http://www.idwr.idaho.gov/WaterManagement/WaterDistricts/UpperSalmon/UpperSalmon.htm>

Measuring devices for the affected diversions must be certified flow meters from the list of approved flow meters unless a variance has been provided by IDWR. IDWR may provide a variance to accept existing devices or alternative measurement methods based on a case-by-case evaluation by IDWR. Please refer to the enclosed document "*Minimum Acceptable Standards for Open Channel and Closed Conduit Measuring Devices*" for information on types of measuring devices acceptable to IDWR. This document and other information on the topic are available on IDWR's Internet site at the following address:

http://www.idwr.idaho.gov/WaterManagement/WaterMeasurement/water_measurement.htm

Final Order Requiring Measuring Devices
Water District No. 73 – Groundwater
March 3, 2014
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If you have questions concerning this order, please contact the Water Distribution Section at the IDWR State Office, 208-287-4958.

Respectfully,



Nick Miller
Water Distribution Section

Enclosures:

Final Order Requiring Measuring Devices in Water District 73 Dated February 27, 2014 (5 pages)

Explanatory Information to Accompany a Final Order (1 page)

IDWR Minimum Acceptable Standards for Open Channel and Closed Conduit Measuring Devices (4 pages)

Measurement and Control Requirement Response Form (1 page per well)

Cc: Ted O'Neal, Watermaster, Water District 73
IDWR Eastern Region

**BEFORE THE DEPARTMENT OF WATER RESOURCES
OF THE
STATE OF IDAHO**

**IN THE MATTER OF REQUIRING MEASURING)
DEVICES ON GROUND WATER DIVERSIONS) **FINAL ORDER**
IN WATER DISTRICT No. 73,)
THE PAHSIMEROI RIVER AND TRIBUTARIES)
_____)**

On December 18, 2012, the Department issued *Preliminary Order Revising Water District Nos. 170 and 73* to owners of all non de minimis water rights in Idaho Department of Water Resources (IDWR or Department) Administrative Basin 73. That order revised Water District No. 73 by incorporating ground water administration for all non de minimis ground water rights and by designating it a sub-district within Water District No. 170.

A primary purpose of a water district is the administration of water rights within the water district by a water master. A water master administers water rights by reading measuring devices and adjusting head gates or other controlling works to deliver the authorized flowrate to the water right holder. Measuring devices required under this order will assist the watermaster in administering water rights and reporting the amount of water withdrawn from each well.

Section 42-701, Idaho Code, provides in pertinent part:

**42-701. INSTALLATION AND MAINTENANCE OF CONTROLLING
WORKS AND MEASURING DEVICES BY WATER APPROPRIATORS –
PROCEDURE UPON FAILURE TO INSTALL AND MAINTAIN – MEASURING AND
REPORTING OF DIVERSIONS – PENALTY FOR FAILURE TO COMPLY – REPORT
FILING FEE.**

1. The appropriators or users of any public waters of the state of Idaho shall maintain to the satisfaction of the director of the department of water resources suitable headgates and controlling works at the point where the water is diverted. Each device shall be of such construction that it can be locked and kept closed by the watermaster or other officer in charge, and shall also be of such construction as to regulate the flow of water at the diversion point. Each such appropriator shall construct and maintain, when required by the director of the department of water resources, a rating flume or other measuring device at such point as is most practical in such canal, ditch, wellhead or pipeline for the purpose of assisting the

watermaster or department in determining the amount of water that may be diverted into said canal, ditch, wellhead or pipeline from the stream, well or other source of public water. Plans for such headgates, rating flumes or other measuring devices shall be approved by the department of water resources.

2. If an appropriator determines that installation and maintenance of a measuring device required by the director would be burdensome for his diversion, the appropriator may, upon approval of the director, execute an agreement with the director and submit to the director such information and technical data concerning the diversion and pumping facilities as the director determines necessary to establish the relationship of power usage to water withdrawal by any pump used to divert public water.

3. Any appropriator or user of the public waters of the state of Idaho that neglects or refuses to construct or maintain such headgates, controlling works, or measuring devices..., upon receiving ten (10) days' notice from the director of the department of water resources within which to begin and diligently pursue to completion the construction or installation of the required device or devices or to begin and diligently pursue to completion a remedy to such defects as exist in accordance with said notice, then the director of the department of water resources may order the duly qualified and acting watermaster of the water district to shut off and refuse to deliver at the point of diversion, the water owned by such appropriator or user until the user does construct and maintain such headgates, controlling works or measuring devices or remedy the defects which exist or the director may take action pursuant to section 42-1701B, Idaho Code, to enforce the requirement to construct, install or maintain such devices.

4. The appropriators or users of the public waters of the state of Idaho shall be given a reasonable time within which to complete construction of such headgates, controlling works or measuring devices, depending upon the size and extent thereof, when due diligence has been used in the prosecution of such work.

ORDER

IT IS HEREBY ORDERED AS FOLLOWS:

1. Holders of water rights in IDWR Administrative Basin 73 that divert from points of diversion identified in Attachment A of this order shall install on each point of diversion listed on Attachment A, a measuring device of a type acceptable to the Department. Unless the Department has granted an extension, deferral, or exemption, as described in 3 and 4 below, the measuring devices and controlling works must be installed and functional prior to diverting water during the 2014 irrigation season.

2. Points of diversion listed on Attachment A represent locations where the cumulative rate of diversion of the water rights exceeds 0.24 cfs, and/or the total number of acres irrigated exceeds five acres. Owners of water rights diverting from locations listed on Attachment A must submit plans to IDWR for measuring devices for each point of diversion no later than March 31, 2014. Plans shall be reviewed by IDWR to determine whether proposed measuring devices are of a type acceptable to the Department. If measuring devices are already in place, a written description and diagram of the works shall be submitted to IDWR by March 31, 2014.

3. If a user cannot comply with the deadline in item (1) above, the Department may grant an extension of time for the diversion to be brought into compliance. Requests for extensions must be received by the Department before March 31, 2014. Requests for extensions will be considered by the Department on a case-by-case basis.

4. In some situations, the Department may exempt points of diversion on Attachment A from the requirements of item (1) above, or may allow deferred compliance for points of diversion on Attachment A. The Department will consider each request for exemption or deferral on a case-by-case basis. Conditions that may result in an exemption include, but are not limited to, abandonment, non-use, or consolidation of diversions that results in a diversion on Attachment A being unused.

5. Measuring devices that are acceptable to the Department for wells that are required to be measured shall be certified flow meters or another device pursuant to a variance as described in the Department's Minimum Acceptable Standards for Open Channel and Closed Conduit Measuring Devices (copy attached).

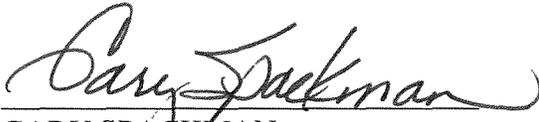
6. The watermaster shall shut off and refuse to deliver water to any diversion for water rights on Attachment A that does not have an adequate measuring device and/or lockable controlling works at any and all times following the start of the 2014 irrigation season, unless an extension, exemption, or deferral has been granted by IDWR.

7. This Order shall be effective immediately on any new ground water diversions authorized after the date of this Order where the cumulative rate of diversion of the water rights exceeds 0.24 cfs, and/or the total number of acres irrigated exceeds five acres. This Order shall be effective after specific notification of the watermaster for any ground water diversion not otherwise listed on Attachment A. This Order does not require the installation of lockable controlling works, although nothing in this Order shall preclude the watermaster or Department

from mandating the installation of lockable controlling works on any diversion if such works are determined to be necessary for adequate administration and control of the diversion.

8. The watermaster shall be responsible for collection of all measurement data and annual reporting of such data to the Department.

Dated this 3rd day of March, 2014.


GARY SPACKMAN
DIRECTOR

Attachment A

Groundwater Diversions in Basin 73 for Which Measurement and Control are Required Under This Order

Current Owner	WMIS Number	PLS	Water Right Number	Priority Date	Diverston Rate (CFS)	Water Use List	Total Acres	Acre Limit	Volume (AF)
B P BAR RANCH INC	1001509	T15N R21E S16 NENENW	73-7121	7/4/1993	1.88	IRRIGATION	412.7	102.0	357.0
BAR G FARMS ENTERPRISES	1001514	T15N R21E S35 SESW	73-11993	4/1/1950	1.50	IRRIGATION	298.0	170.0	
BIG CREEK RANCH LLC	1001491	T14N R21E S13 SWSESE	73-2141	1/21/1952	2.00	IRRIGATION	100.0		350.0
	1001492	T14N R21E S24 SENWNE	73-2164	10/6/1966	5.00	IRRIGATION	598.0	366.0	1,281.0
			73-7000	10/26/1967	3.00	IRRIGATION	598.0	232.0	696.0
	1001493	T14N R22E S18 NENWSE	73-2142	4/24/1952	1.35	IRRIGATION	120.0		420.0
			73-7124	6/10/1994	2.00	IRRIGATION	175.0	104.1	
	1001518	T14N R22E S17 NWSW	73-12233	4/24/1952	1.05	IRRIGATION	951.2	94.1	329.4
			73-7022	2/28/1973	2.76	IRRIGATION	951.2	182.2	637.7
CIRCLE PI LLC	1001495	T14N R22E S17 SWSW	73-7038	1/18/1978	0.55	IRRIGATION	32.0		112.0
	1001517	T14N R22E S21 NESW	73-12179	8/1/1955	5.60	IRRIGATION	951.2	372.5	1,304.0
			73-12233	4/24/1952	1.05	IRRIGATION	951.2	94.1	329.4
	1001488	T14N R21E S12 NWNW	73-12220	3/20/2013	3.05	IRRIGATION	258.4		
			73-7025	12/7/1973	2.12	IRRIGATION	258.4	106.0	318.0
	1001485	T14N R21E S12 NENW	73-12219	3/20/2013	0.10	DOMESTIC, IRRIGATION, STOCKWATER	5.1		
DODD, BILL; DODD, NANCY	1001487	T15N R22E S30 SESW	73-7027	4/17/1975	0.18	IRRIGATION	9.0		27.0
FLYING JOSEPH RANCH LLC	1001498	T13N R22E S1 SESW	73-7102	9/17/1992	1.65	IRRIGATION	240.0		598.9
	1001499	T13N R22E S12 SENESE	73-10020A	6/9/1969	4.34	IRRIGATION	217.0		651.0
	1001500	T13N R22E S13 NENW	73-2165	9/23/1966	2.05	IRRIGATION	294.0		874.2
	1001520	T13N R22E S13 NESE	73-10020B	6/9/1969	3.09	IRRIGATION	251.0	155.0	463.0
			73-11840	6/6/1969	1.92	IRRIGATION	251.0	96.0	288.0
	1001519	T13N R23E S18 SESW	73-10020B	6/9/1969	3.09	IRRIGATION	251.0	155.0	463.0
			73-11840	6/6/1969	1.92	IRRIGATION	251.0	96.0	288.0
	1001502	T13N R23E S20 SWNE	73-12172	5/3/1990	5.27	IRRIGATION	425.5		
	1001503	T13N R23E S29 NENE	73-12172	5/3/1990	5.27	IRRIGATION	425.5		
		73-2162	8/31/1966	2.49	IRRIGATION	277.5		832.5	
	1001504	T13N R23E S29 SENE	73-12171	5/3/1990	3.50	IRRIGATION	425.5		
		73-2159	8/8/1966	3.29	IRRIGATION	402.0		1,206.0	
FRIEHE, BEREND; FRIEHE, CARLA	1001505	T12N R23E S3 SENENE LI	73-2160	8/24/1966	2.62	IRRIGATION	205.0		717.5
	1001506	T13N R23E S35 NWSWSW	73-2160	8/24/1966	2.62	IRRIGATION	205.0		717.5
HATCH LIVESTOCK	1001501	T15N R21E S9 SENWSE	73-7129	10/16/1997	1.64	IRRIGATION	99.0		
HATCH, RALPH; HATCH, RUTH	1001494	T15N R21E S9 NWSE	73-7040	9/23/1978	2.01	IRRIGATION	140.0		490.0
HATCH, WILLIAM L	1001496	T14N R22E S22 NWNE	73-7112	11/14/1989	0.79	DOMESTIC, IRRIGATION	38.5		135.4
HAYES, SCOTT M	1001513	T15N R21E S34 SWNENW	73-10028	2/7/1973	2.65	IRRIGATION	217.0		
IDAHO POWER CO	1001510	T15N R21E S21 NWNENW	73-11961	3/18/2002	13.53	FISH PROPAGATION	0.0		6,669.0
	1001511	T15N R21E S21 NWNENW	73-11961	3/18/2002	13.53	FISH PROPAGATION	0.0		6,669.0
	1001512	T15N R21E S21 NWNENW	73-11961	3/18/2002	13.53	FISH PROPAGATION	0.0		6,669.0
KERCHINSKI, JOSEPH; KERCHINSKI, LYNNDA	1001490	T14N R22E S6 SESESE	73-7037	11/23/1977	2.22	IRRIGATION	111.0		333.0
MARTINY, JIM			73-12067	7/15/1966	0.33	IRRIGATION	39.4		137.9
MARTINY, LINDA R	1001489	T14N R22E S6 NWSE	73-12068	7/15/1966	0.21	IRRIGATION	24.3		85.0
MARTINY, VIRGINIA K			73-12069	7/15/1966	0.67	IRRIGATION	79.3		277.6
MICKELSEN, CATHERINE; MICKELSEN, DON	1001507	T13N R23E S36 SWNW	73-7026	2/19/1975	4.66	IRRIGATION	369.0		1,291.5
	1001508	T13N R23E S36 SWNE	73-7026	2/19/1975	4.66	IRRIGATION	369.0		1,291.5
PARKINSON, DOUG J; PARKINSON, JANIEL S	1001486	T15N R22E S30 NENW	73-7031	12/11/1975	2.92	IRRIGATION	312.0		936.0
ROBINS, DOUGLAS; ROBINS, PAMELA L	1001497	T14N R22E S27 SENW	73-7041	4/17/1979	1.64	IRRIGATION	160.0		480.0
UNITED STATES OF AMERICA ACTING THROUGH	1001517	T14N R22E S21 NESW	73-12180	8/1/1955	0.28	IRRIGATION	18.4		64.6
			73-12218	8/1/1955	0.52	IRRIGATION	951.2	34.6	121.4
WHITWORTH RANCHES INC	1001515	T15N R22E S19 NWSW	73-2166	10/6/1966	1.00	IRRIGATION	100.0		348.0
WHITWORTH, SCOTT L	1001516	T15N R21E S25 NENESE	73-2161	8/31/1966	1.60	IRRIGATION	75.0		227.5

EXPLANATORY INFORMATION TO ACCOMPANY A FINAL ORDER

(To be used in connection with actions when a hearing was **not** held)

(Required by Rule of Procedure 740.02)

The accompanying order is a "Final Order" issued by the department pursuant to section 67-5246, Idaho Code.

PETITION FOR RECONSIDERATION

Any party may file a petition for reconsideration of a final order within fourteen (14) days of the service date of this order as shown on the certificate of service. **Note: The petition must be received by the Department within this fourteen (14) day period.** The department will act on a petition for reconsideration within twenty-one (21) days of its receipt, or the petition will be considered denied by operation of law. See section 67-5246(4), Idaho Code.

REQUEST FOR HEARING

Unless the right to a hearing before the director or the water resource board is otherwise provided by statute, any person who is aggrieved by the action of the director, and who has not previously been afforded an opportunity for a hearing on the matter shall be entitled to a hearing before the director to contest the action. The person shall file with the director, within fifteen (15) days after receipt of written notice of the action issued by the director, or receipt of actual notice, a written petition stating the grounds for contesting the action by the director and requesting a hearing. See section 42-1701A(3), Idaho Code. **Note: The request must be received by the Department within this fifteen (15) day period.**

APPEAL OF FINAL ORDER TO DISTRICT COURT

Pursuant to sections 67-5270 and 67-5272, Idaho Code, any party aggrieved by a final order or orders previously issued in a matter before the department may appeal the final order and all previously issued orders in the matter to district court by filing a petition in the district court of the county in which:

- i. A hearing was held,
- ii. The final agency action was taken,
- iii. The party seeking review of the order resides, or
- iv. The real property or personal property that was the subject of the agency action is located.

The appeal must be filed within twenty-eight (28) days of: a) the service date of the final order, b) the service date of an order denying petition for reconsideration, or c) the failure within twenty-one (21) days to grant or deny a petition for reconsideration, whichever is later. See section 67-5273, Idaho Code. The filing of an appeal to district court does not in itself stay the effectiveness or enforcement of the order under appeal.

**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 affects the selection of a measuring device. 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 when required by IDWR are to be installed at or near the point of diversion from the public water source.

I. MEASUREMENTS IN OPEN CHANNELS

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 IDWR.

A. Standard Open Channel Measuring Devices

All open channel surface water diversions should be measured using one of the following standard open channel flow measuring devices commonly used in Idaho:

- **Weirs:** contracted or suppressed rectangular weirs, Cipolletti weir, 90 degree V-notch weir
- **Flumes:** Parshall flume, trapezoidal flume, ramped flume (ramped, broad-crested weir)
- **Submerged Orifices:** submerged rectangular orifice, constant head orifice
- **Acoustic:** acoustic Doppler flow meter (ADFM), acoustic Doppler current profiler

The installed flow rate accuracy of open channel measurement devices must be +/- 10.0% as compared to an acceptable open channel current meter or other standard portable measuring devices such as an acoustic Doppler flow meter or acoustic Doppler current profiler.

Construction, installation and operation of these devices should follow published guidelines, such as those published by the United States Bureau of Reclamation¹

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

Any weir, flume, or other measuring device that has not been constructed, installed, or maintained correctly and therefore does not measure flow in the standard manner consistent with standard rating tables or curves is considered to be a non-standard device. 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 standard portable open channel measuring device. Examples of standard portable open channel measuring devices include the acoustic Doppler flow meter, the acoustic Doppler current profiler, or a portable flume. These devices are acceptable provided they are installed and operated according to all relevant manufacturer recommendations.

Further information and requirements are available from IDWR upon request.

¹ The Bureau of Reclamation measurement guidelines can be found at:
http://www.idwr.idaho.gov/WaterManagement/WaterMeasurement/PDFs/BoR_WMM_%202001revision.pdf

II. CLOSED CONDUIT MEASURING DEVICES

The following discussion is applicable to measurement of diversions from any water source that diverts via a full-flowing, closed conduit.

A. Standard Closed Conduit Measuring Devices

A certified meter is required on new installations of measuring devices for closed conduit or pipe line diversions. A certified meter is a model of flow meter that has participated in independent third party testing and has been approved by IDWR for use. IDWR has published a list of meters that have participated in independent third party testing² and have been certified for use where the installation configuration and application meet manufacturer's requirements. Tests were conducted for both accuracy and repeatability on all submitted models, and a pass/fail rating awarded. A list of these meters may be found at:

http://www.idwr.idaho.gov/WaterManagement/WaterMeasurement/PDFs/Approved_flow_meter_list.pdf.

Owners or operators who install a certified meter without the minimum manufacturer spacing requirements, or otherwise inconsistent with manufacturer's specifications, may need to provide an adequate testing section of straight pipe located somewhere on the diversion system either upstream or downstream of the installed flow meter. This testing section can be excavated pipeline as long as the section of pipe carries all water being measured through the installed flow meter. Water users choosing to expose pipe will be required to excavate the pipe at their expense at the request of the district hydrographer, watermaster and/or IDWR staff.

B. Non-standard Closed Conduit Measuring Devices: Requests for Variance

In some cases, site conditions preclude use of a certified meter, and another meter or method of measurement will produce similarly accurate results. In cases where the user can show that a proposed alternative meter or method would be as accurate as, or otherwise is better suited to an application than any of the meters on the approved list, a user can propose using an alternative meter or method by submitting a Request for Variance Form, available from IDWR. If a request is submitted and granted, the water user bears the risk that the alternative meter or method will perform as expected.

The following alternate measurement methods may be considered:

- Development of a Power Consumption Coefficient (PCC), which is a ratio of power usage to water withdrawal. Acceptance of the PCC method may be provided *for qualifying irrigation diversions only*;
- Use of an hour meter (time clock) *for qualifying diversions only*;
- Use of an acceptable flow meter that was installed *prior to the date of the measurement order*;
- *For irrigation diversions only*, use of an acceptable non-certified flow meter where it can be shown that installation of a certified flow meter would be burdensome or ineffective.

If a meter is already installed, that meter may be used if the meter is field-tested by IDWR staff, the water district watermaster, or a district hydrographer using a portable standard flow meter and upon a determination that the meter is installed properly and accurate to within $\pm 10\%$ of actual rate of flow and volume. If a non-certified meter is approved and installed but does not pass a field check, IDWR may require the water user to replace the meter with a certified meter at the water user's expense.

If an alternative method is approved and that method is later found to be insufficient, the variance will be withdrawn and a certified meter will be required to be installed. The suitability of any pumping station for an hour meter or the PCC method of measurement will be based on criteria found in this document and in the document entitled *IDWR ESPA Water Measurement and Reporting Guidelines*³.

² Testing was conducted at the Utah Water Research Laboratory (UWRL), a National Institute of Standards and Technology (NIST) traceable lab in Logan, Utah.

³ This document can be found at:

http://www.idwr.idaho.gov/WaterManagement/WaterMeasurement/PDFs/IDWRESPA_WaterMeasurement_ReportingGuidelines.pdf

Idaho Department of Water Resources List of Approved Closed Conduit Flow meters

The table below lists flow meters **that have been tested and approved by IDWR for use in closed conduit measurement applications where the installation configuration and application meet manufacturer's requirements for the selected model.** These approved flow meters were subject to testing requirements outlined by IDWR and conducted by staff from Utah State's NIST¹ traceable lab in Logan Utah and performed at or above IDWR minimum acceptable standards for accuracy when installed in piping distances that met or exceeded minimum straight run piping requirements specified by IDWR. The approved list is current as of this printing, but may change as additional models and manufacturers undergo testing and approval. The current version of these standards, including this list, is posted on the IDWR Internet site at the following URL:

http://www.idwr.idaho.gov/WaterManagement/WaterMeasurement/PDFs/Approved_flow_meter_list.pdf

Note that not all models are appropriate for every application. Pipe size, available straight pipe lengths, water chemistry, pressure, velocity, environmental exposure, and power requirements are among the factors affecting whether a given meter will perform for a given application. Prior to selecting a meter, consult the manufacturer's installation requirements to assure they can be met.

Manufacturer	Model/Specifications	Type	IDWR-accepted Pipe Applications (Nominal Pipe Size)
Siemens	CLAMP-ON ULTRASONIC -SITRANS FUS 1010 w/ HIGH PRECISION TRANSDUCERS	Clamp-On Ultrasonic	>12"
Siemens	SITRANS F M MAGFLO MAG 5100W w/ 5000 converter	Full profile Electro-Magnetic	1" to 78"
Siemens	SITRANS FM, MAGFLO 8000, model 7ME6880	Full profile Electro-Magnetic	1" to 48"
Fuji	Time Delta C w/ 1MHz transducers	Clamp-On Ultrasonic	>12"
Seametrics	AG 2000	Full profile Electro-Magnetic	4" to 10"
GE Panametrics	AT868 w/ 1MHz transducers	Clamp-On Ultrasonic or Wetted Transducer	>12"
McCrometer	Ultra Mag w/ M-Series Converter	Full profile Electro-Magnetic	2" to 48"

¹ NIST - National Institute of Standards and Technology.

Manufacturer	Model/Specifications	Type	IDWR-accepted Pipe Applications (Nominal Pipe Size)
Badger	M2000 Amplifier w/ M2000 Detector	Full profile Electro-Magnetic	1/4" to 54"
Khrone	Enviromag 2000 w/ Optiflux 2000 F/G	Full profile Electro-Magnetic	3/8" to 80"
Rosemount	8705 w/ 8732E transmitter	Full profile Electro-Magnetic	1/2" to 36"
Burkert	8054/8055 w/ Magflow transmitter	Full profile Electro-Magnetic	1" to 80"
Sparling	Tiger Mag W/FM6561051110 Converter	Full profile Electro-Magnetic	3/8" to 48"
Sensus	IPerl	Full profile Electro-Magnetic	5/8"-1"
Master Meter	Octave	Full Profile Ultrasonic	2"-10"
Badger	E-Series	Full Profile Ultrasonic	3/4"-2"

