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 • Website: www.idwr.idaho.gov

C.L. "BUTCH" OTTER
Governor

GARY SPACKMAN
Director

September 15, 2016

Re: Preliminary Order Requiring Measuring Devices for Ground Water Diversions in Water District No. 143, Raft River Basin

Dear Water User,

The Idaho Department of Water Resources ("IDWR") has issued the enclosed Preliminary Order ("Order") requiring installation of measuring devices for ground water rights and diversions within Water District 143, the Raft River Basin. The enclosed Order is a preliminary order pursuant to Section 67-5243, Idaho Code. Any party may file a petition for reconsideration of a preliminary order as explained in the enclosed information sheet.

Please note that flow meters must be installed on ground water irrigation diversions by the start of the 2018 irrigation season and on non-irrigation diversions by January 1, 2018. The Order excludes the following ground water uses and diversions unless further notified by IDWR:

a. Domestic and stockwater uses as defined by Section 42-111, Idaho Code;
b. Diversions for irrigation uses less than or equal to five (5) acres; and
c. Non-irrigation uses with a total rate of diversion less than or equal to 0.24 cubic feet per second (approximately 108 gallons per minute).

Please refer to the enclosed documents *"Minimum Acceptable Standards for Open Channel and Closed Conduit Measuring Devices"* and *"List of Approved Closed Conduit Measuring Devices"* for information on types of IDWR acceptable measuring devices. These documents and other information on the topic are available on IDWR's website: www.idwr.idaho.gov → Water Data → Water Measurement → Guidelines.

If you have questions concerning this Preliminary Order or IDWR's water measurement standards, please contact the IDWR State office (208-287-4800) or Southern Regional office (208-736-3033).

Respectfully,

Tim Luke
Water Compliance Bureau

Encl: *Final Order; Explanatory Information to Accompany a Preliminary Order; Minimum Acceptable Standards for Open Channel and Closed Conduit Measuring Devices*; *List of Approved Closed Conduit Measuring Devices*

C. Nathan Erickson, IDWR Southern Region & WD143 Watermaster

BEFORE THE DEPARTMENT OF WATER RESOURCES

OF THE STATE OF IDAHO

IN THE MATTER OF REQUIRING MEASURING DEVICES FOR GROUND WATER DIVERSIONS IN WATER DISTRICT No. 143 (RAFT RIVER BASIN)	))))	**PRELIMINARY ORDER**

On December 2, 2015, the Idaho Department of Water Resources ("Department") issued a *Preliminary Order Creating Water District No. 143* ("Preliminary Order") for the purpose of administering ground water rights in the Department's Administrative Basin No. 43. The Preliminary Order excluded ground water rights in Basin 43 used for domestic and stockwater purposes as defined by Idaho Code §§ 42-111 and 42-1401A (11), and ground water rights located within Water District No. 130 overlying the Eastern Snake Plain Aquifer ("ESPA").

A primary purpose of a water district is the administration of water rights and distribution of water within the water district by a watermaster. Idaho Code § 42-602. The watermaster delivers the flow rate and/or volume authorized by the water right to the water right holder by measuring diversions and adjusting controlling works. Idaho Code § 42-607. To ensure accuracy of the distribution of water, the Director of the Department can require installation of a measuring device by a water right holder to assist a watermaster in the administration and distribution of water in a water district. Idaho Code § 42-701.

To assist the watermaster of Water District No. 143 ("WD143") in the administration of ground water rights, ground water right holders must install measuring devices for ground water diversions within WD143.

FINDINGS OF FACT

1. On July 23, 1963, the Director ("Director") of the Department[1] issued an order designating the Raft River Critical Ground Water Area ("RRCGWA") pursuant to Idaho Code § 42-233a. *Designation of Raft River Critical Ground Water Area* (July 23, 1963). The designated area included ground water located within the entire Raft River drainage area in the Department's Administrative Basin No. 43, and the Marsh Creek drainage area (Albion Basin) within the Department's Administrative Basin No. 45. The order stated that, "withdrawals of underground water [are] approaching the estimated amount of water available and there are a number of valid permits outstanding which have not reported."

2. The boundary of the RRCGWA was modified four times since 1963 following completion of various studies of the Raft River basin. On August 2, 1965, an area on the extreme northern boundary was removed from the RRCGWA. On September 19, 1966, the Albion Basin on the west side of the Raft River Basin was removed. On November 16, 1970, the area north of Yale road was removed. On June 30, 1977, the Elba and Yost-Almo sub-basins were removed.

[1] At the time, the Department was known as the Idaho Department of Reclamation.

3. On December 2, 2015, the Department issued the Preliminary Order creating WD143, which includes ground water rights in the Department's Administrative Basin No. 43, except ground water rights located in Water District No. 130 overlying the Eastern Snake Plain Aquifer and ground water rights used for domestic and stock water purposes as defined by Idaho Code §§ 42-111 and 42-1401A (11).

4. Paragraph four of the Preliminary Order creating WD143 stated the following:

> The Department shall issue a separate order requiring the installation of measuring devices and controlling works for water right diversions within WD143.

5. The first annual meeting of the water users of WD143 was held on March 29, 2016. At the meeting, the water users elected a watermaster and selected an advisory committee in accordance with Idaho Code § 42-605.

6. The advisory committee of WD143 met on June 21, 2016. Department representatives and the watermaster were present during the meeting and discussed with the advisory committee the issuance and implementation of a measuring device order for diversions in the water district. The advisory committee recommended a phased approach to compliance with Department measurement orders. Based on discussion with Department representatives, the committee recommended that measuring devices be installed over an approximate two year period so that meters be installed on irrigation wells by the start of the 2018 irrigation season. The committee further recommended exempting measuring device requirements to wells used for irrigation of 5 acres or less, and wells used for non-irrigation purposes where the well diversion rate is less than or equal to 0.24 cubic feet per second ("cfs").

7. The Department's *Minimum Acceptable Standards for Open Channel and Closed Conduit Measuring Devices* ("Minimum Measurement Standards") require installation of a certified flow meter on closed conduit or pipe line diversions. *Minimum Measurement Standards* at p. 2. Many ground water delivery systems pressurize closed conduits to convey and apply the water. The minimum measurement standards allow alternative meters or methods to be employed if such meters or methods "will produce similarly accurate results." *Id.* at p. 2. The power consumption coefficient ("PCC") measurement method is an alternative method that the Department may consider and approve for "qualifying irrigation diversions only." *Id.* at p. 2. The PCC is a ratio of power usage to water withdrawal.

CONCLUSIONS OF LAW

1. Idaho Code § 42-233a, provides in pertinent part:

> 42-233a. "CRITICAL GROUND WATER AREA" DEFINED – PUBLIC HEARINGS – PUBLICATION OF NOTICE – GRANTING OR DENIAL OF APPLICATION – APPEAL.
>
> The director may require all water right holders within a critical ground water area to report withdrawals of ground water and other necessary information for the purpose of assisting him in determining available ground water supplies and their usage.

2. Idaho Code § 42-701 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.

3. Measurement of diversions is necessary in WD143 for the proper distribution of water and administration of water rights. Measurement of diversions has the following administrative benefits:

i. Collective quantification of ground water withdrawals assists the director of the Department, the water district and local ground water right holders in determining the available ground water supplies and usage;

ii. Quantification of individual ground water withdrawals creates the necessary evidence to ensure ground water rights are used within their authorized diversion limits and that withdrawals can be regulated to the authorized diversion limits of the water rights when such limits are exceeded; and

iii. Collective and individual quantification of ground water withdrawals establishes an equitable, defensible and legal basis for determining water user assessments since Idaho law requires that expenses of the water district be based on water delivery.

4. The Director should require the installation of measuring devices for diversions of ground water within WD143.

ORDER

IT IS HEREBY ORDERED that:

1. The holders of water rights in WD143, except those ground water rights, uses and diversions identified below, shall install and maintain on each point of diversion or well, a measuring device of a type acceptable to the Department. **Owners of irrigation wells or diversions that are required to be measured shall install acceptable measuring devices by the start of the 2018 irrigation season. Owners of non-irrigation diversions that are required to be measured shall install acceptable measuring devices by January 1, 2018.**

2. The measuring and reporting required by this order is waived until further notification by the Department for the following ground water uses and diversions:

a. Domestic and stockwater uses as defined by Idaho Code §§ 42-111 and 42-1401A(11);

b. Diversions of ground water or water systems with multiple diversions irrigating less than or equal to five (5) acres;

c. Diversions of ground water or water systems with multiple diversions delivering ground water for any purpose other than irrigation that divert less than or equal to 0.24 cubic feet per second (approximately 108 gallons per minute); and

d. Ground water rights located within Water District 130 overlying the ESPA.

3. Measuring devices acceptable to the Department for wells required to be measured shall be flow meters identified in the Department's *List of Approved Closed Conduit Flow Meters* (Version 2.9 updated 8-22-2016) (copy attached). These specifications apply to both irrigation and non-irrigation water uses.

4. The Department will consider a request for variance of the Department-approved flow meter requirement upon submittal of a written plan to the Department. Acceptable variances may include the following methods or devices:

- Development of a PCC, which is a ratio of power usage to water withdrawal. Acceptance of the PCC method may be provided *only for irrigation diversions that consist of one (1) well and one irrigation discharge point or one distinct flow and demand condition, and water levels do not change significantly during the irrigation season (example: a well diverting water to one center pivot only with no end gun, a well diverting water to one wheel line, or multiple wheel lines as long as the same multiple wheel lines are always on at the same time)*;

- Timing diversion with an hour meter (time clock) *for one well that discharges to an open ditch or pond where a) discharge is constant and not controlled by valves, b) ground water levels do not change significantly during the annual season of use, and c) the rate of flow is measured annually by a ground water district hydrographer*;

- Measurement with a properly functioning flow meter that was installed *prior to the date of this order, and determined as acceptable by the Department* (meters installed prior to the date of this order and included in the Department's *List of Approved Closed Conduit Flow Meters version 2.9* are deemed acceptable); and

- Measurement with a standard open channel measuring device installed in an open channel or ditch for measuring multiple wells in a well field and the measuring device is read daily, or daily flows are recorded by use of a continuous recorder or data logger.

5. Requests for variance must be submitted to the Department and will be considered by the Water District watermaster and the Department on a case-by-case basis. Variances proposing measurement with an existing flow meter or measuring device must satisfy Department criteria and accuracy tests. Existing meters or measuring devices that do not satisfy standards, or that fail, will be required to be replaced with an approved flow meter unless another variance is obtained. Requests for variance must be made using the Department's form *"Request for Variance of IDWR Approved Flow Meter Requirement"* available on the Department's website or upon request.

6. If a user cannot comply with the deadlines in item 1 above, the Department may grant an extension of time. The Department will consider requests for extensions on a case-by-case basis. Requests for extension must be made to the Department in writing. A water right holder may request an extension because of non-use. Non-use may be required by a federal land set aside program, or the water user may be temporarily not diverting as authorized by the water right. In some situations, the Department may exempt a diversion from the measurement requirements of this order. Conditions that may result in an exemption include, but may not be limited to, the following:

- Abandonment, non-use, or consolidation of diversions that results in a diversion being unused; or

- A reduction or change to the water right that results in an authorized diversion rate less than or equal to 0.24 cubic feet per second (cfs) and/or reduces the authorized irrigation use to five acres or less.

7. The requirements of this Order apply to new ground water diversions authorized after the date of this Order, except those ground water uses or diversions identified in items 1 a. through 1d. of this section. This Order does not require the installation of lockable controlling works, although nothing in this Order shall preclude the Director and/or the watermaster 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 shut off and refuse to deliver water to any ground water user who does not have, or who fails to maintain, an adequate measuring device on a diversion after the start of the 2018 irrigation season (irrigation diversions) or after January 1, 2018 (non-irrigation diversions), unless an extension or exemption has been provided by the Department.

9. The watermaster shall be responsible for the collection and annual reporting of all measurement data for the diversions within water district boundaries subject to this order. All diversions shall be reported to the Department using the Department's WMIS online database application.

Dated this 14 day of September 2016

MAT WEAVER
Deputy Director

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that on this 15th day of September 2016, the above and foregoing document was served on each individual or entity on the service list for this matter on file at the Idaho Department of Water Resources, 322 East Front Street, Boise, Idaho and www.idwr.idaho.gov. Each individual or entity on the service list was served by placing a copy of the above and foregoing document in the United States mail, postage prepaid and properly addressed.

Documents served: **Preliminary Order in the Matter of Requiring Measuring Devices for Ground Water Diversions in Water District No. 143 (Raft River Basin)**

Sarah Shaul

Sarah Shaul
Technical Records Specialist
Idaho Department of Water Resources

EXPLANATORY INFORMATION TO ACCOMPANY A PRELIMINARY ORDER

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

(Required by Rule of Procedure 730.02)

The accompanying order or approved document is a "**Preliminary Order**" issued by the department pursuant to section 67-5243, Idaho Code. **It can and will become a final order without further action of the Department of Water Resources ("department") unless a party petitions for reconsideration, files an exception and brief, or requests a hearing as further described below:**

PETITION FOR RECONSIDERATION

Any party may file a petition for reconsideration of a preliminary order with the department within fourteen (14) days of the service date of this order. **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 67-5243(3) Idaho Code.

EXCEPTIONS AND BRIEFS

Within fourteen (14) days after: (a) the service date of a preliminary order, (b) the service date of a denial of a petition for reconsideration from this preliminary order, or (c) the failure within twenty-one (21) days to grant or deny a petition for reconsideration from this preliminary order, any party may in writing support or take exceptions to any part of a preliminary order and may file briefs in support of the party's position on any issue in the proceeding with the Director. Otherwise, this preliminary order will become a final order of the agency.

REQUEST FOR HEARING

Unless a right to a hearing before the Department or the Water Resource Board is otherwise provided by statute, any person aggrieved by any final decision, determination, order or action of the Director of the Department and who has not previously been afforded an opportunity for a hearing on the matter may request a hearing pursuant to section 42-1701A(3), Idaho Code. A written petition contesting the action of the Director and requesting a hearing shall be filed within fifteen (15) days after receipt of the denial or conditional approval.

ORAL ARGUMENT

If the Director grants a petition to review the preliminary order, the Director shall allow all parties an opportunity to file briefs in support of or taking exceptions to the preliminary order and may schedule oral argument in the matter before issuing a final order. If oral arguments are to be heard, the Director will within a reasonable time period notify each party of the place, date and hour for the argument of the case. Unless the Director orders otherwise, all oral arguments will be heard in Boise, Idaho.

CERTIFICATE OF SERVICE

All exceptions, briefs, requests for oral argument and any other matters filed with the Director in connection with the preliminary order shall be served on all other parties to the proceedings in accordance with IDAPA Rules 37.01.01302 and 37.01.01303 (Rules of Procedure 302 and 303).

FINAL ORDER

The Director will issue a final order within fifty-six (56) days of receipt of the written briefs, oral argument or response to briefs, whichever is later, unless waived by the parties or for good cause shown. The Director may remand the matter for further evidentiary hearings if further factual development of the record is necessary before issuing a final order. The department will serve a copy of the final order on all parties of record.

Section 67-5246(5), Idaho Code, provides as follows:

> Unless a different date is stated in a final order, the order is effective fourteen (14) days after its service date if a party has not filed a petition for reconsideration. If a party has filed a petition for reconsideration with the agency head, the final order becomes effective when:
>
> (a) The petition for reconsideration is disposed of; or
> (b) The petition is deemed denied because the agency head did not dispose of the petition within twenty-one (21) days.

APPEAL OF FINAL ORDER TO DISTRICT COURT

Pursuant to sections 67-5270 and 67-5272, Idaho Code, if this preliminary order becomes final, any party aggrieved by the final order or orders previously issued in this case may appeal the final order and all previously issued orders in this case 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 this preliminary order becoming final. See section 67-5273, Idaho Code. The filing of an appeal to district court does not 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 closed conduits which convey water from the well to system discharge points such as irrigation sprinkler systems. Ground water may also discharge from a well and short section of pipe to open channels or ditches.

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 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 Reclamation[1]

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.

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[1] The Bureau of Reclamation measurement guidelines can be found at:
https://idwr.idaho.gov/files/water-measurement/2001-Bureau-of-Reclamation-Water-Measurement-Manual.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

Standard closed conduit measuring devices are flow meters that have been "certified" or approved for use by IDWR based on independent third party testing. IDWR has published a list of meters that have passed testing and are certified for use[2]. Tests were conducted for both accuracy and repeatability on all submitted models, and a pass/fail rating awarded. The *IDWR List of Approved Closed Conduit Flow Meters* ("Approved Flow Meters List") may be found at:

https://idwr.idaho.gov/files/water-measurement/approved-flow-meter-list.pdf

Certified meters must be installed with minimum straight pipe length requirements as specified in the Approved Flow Meters List. Owners or operators who install a certified meter without the minimum straight length 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 may 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*;

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 ±10% of the rate of flow and volume as measured with a portable standard flow meter. 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, an applicable IDWR water measurement order, and criteria found in the document entitled *IDWR ESPA Water Measurement and Reporting Guidelines*[3].

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[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:
https://idwr.idaho.gov/files/water-measurement/IDWR-Water-Measurement-Reporting-Guidelines.pdf

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

The tables below list flow meters that have been independently tested and subsequently approved by the Idaho Department of Water Resources (IDWR) for use in closed conduit measurement applications. The approved flow meters were tested by the Utah Water Research Laboratory at Utah State University using NIST[1] traceable instrumentation and subject to IDWR testing standards. Meters on this list performed at or above the IDWR minimum acceptable standards for accuracy when installed in long-run and short-coupled pipe configurations specified by IDWR. Please note that the approved meter list is ***model*** specific, not manufacturer specific. Prior to selecting and purchasing a meter, consult the manufacturer's installation requirements to ensure that all installation specifications for the specific model can be achieved. The list below is subject to change as additional meters are added or removed. This is the most current list and can be found on the IDWR website at the following URL:
http://idwr.idaho.gov/files/water-measurement/approved-flow-meter-list.pdf

Straight Pipe Length - The minimum length of unobstructed pipe free of flow disturbers, immediately above and below the meter sensors, spool, or flow tube.
Flow Disturber - Any fitting or irregularity in the piping above or below the measuring device sensor location that affects flow patterns through the device or sensor location. Disturbers may include but are not limited to: pump discharges, elbows, check or chemigation valves, butterfly or gate valves, pipe reducers.

IDWR Installation Requirements:
Approved full profile magnetic flow meters and spooled ultrasonic flow meters must be installed with a minimum straight pipe length equivalent of three (3) pipe diameters upstream and two (2) pipe diameters downstream from the center of the meter spool. Approved clamp-on and wetted ultrasonic flow meter transducers must be located with a minimum straight pipe equivalent of ten (10) pipe diameters upstream and five (5) pipe diameters downstream of the nearest transducer. Manufacturer specifications for upstream and downstream straight pipe requirements may be greater or less than the IDWR requirements. All other manufacturer installation specifications must be met.

[1] NIST - National Institute of Standards and Technology.

Approved Full Profile Magnetic Flow Meters*

Manufacturer	Model/Specifications	Power Supply	IDWR-accepted Pipe Applications (Nominal Pipe Size)
Endress+Hauser	ProMag L400 (L sensor with 400 transmitter)	AC	1" - 90"
Endress+Hauser	ProMag W400 (W sensor with 400 transmitter)	AC	2" - 78"
Siemens	SITRANS FM MAGFLO MAG 5100W w/ 5000 converter	AC	1" to 78"
Siemens	SITRANS FM, MAGFLO 8000, model 7ME6880	DC	1" to 48"
McCrometer	Ultra Mag w/ M-Series Converter	AC	2" to 48"
Badger	M2000 Amplifier w/ M2000 Detector	AC	1/4" to 54"
Khrone	Enviromag 2000 w/ Optiflux 2000 F/G	AC	3/8" to 80"
Khrone	Waterflux 3100C/F	AC	1" to 24"
Rosemount	8705 w/ 8732E transmitter	AC	1/2" to 36"
Burkert	8054/8055 w/ Magflow transmitter	AC	1" to 80"
Seametrics†	AG 2000†	DC†	4" to 10"
Seametrics†	AG 3000†	DC†	4" to 12"
Seametrics†	iMag 4700†	DC†	4" to 12"
Sparling	Tiger Mag W/FM6561051110 Converter	AC	3/8" to 48"
Sensus	IPerl	DC	5/8"-1"
Growsmart by Lindsay	IM3000	DC	2"-12"
ABB	WaterMaster	AC	3/8" to 96"
ABB	AquaMaster 3 with FER series transmitter	DC	½" to 24"

***Installations of all approved full profile magnetic flow meters require a *minimum* straight pipe length of 3 pipe diameters upstream and 2 pipe diameters downstream from the center of the meter spool. † Seametrics AG2000, AG3000 and iMag must be installed with AC power supply and a working battery must remain in the unit**

Approved Spooled Ultrasonic Flow Meters*			
Manufacturer	**Model/Specifications**	**Power Supply**	**IDWR-accepted Pipe Applications (Nominal Pipe Size)**
Master Meter	Octave	DC	2"-10"
Badger	E-Series	DC	3/4"-2"
Netafim	Octave	DC	2"-12"

***Installation of approved spooled ultrasonic flow meters require a *minimum* straight pipe length of 3 pipe diameters upstream and 2 pipe diameters downstream from the center of the meter spool.**

Approved Clamp-on and Wetted Transducer Ultrasonic Flow Meters*			
Manufacturer	**Model/Specifications**	**Power Supply**	**IDWR-accepted Pipe Applications (Nominal Pipe Size)**
Siemens	CLAMP-ON ULTRASONIC -SITRANS FUS 1010 w/ HIGH PRECISION TRANSDUCERS	AC	14"+
Fuji	Time Delta C w/ 1MHz transducers	AC	14"+
GE Panametrics	AT868 w/ 1MHz transducers	AC	14"+

*** Ultrasonic flow meter transducers must be located with a minimum straight pipe equivalent of ten (10) pipe diameters upstream and five (5) pipe diameters downstream of the nearest transducer.**
****The meters on the table above may not be used on pipe smaller than 14 inches unless a variance is approved by IDWR.**

7 SPRINGS RANCH LLC
2038 S HWY 81
MALTA ID 83342

AGUA CALIENTE LLC
ATTN COMPTROLLER
730 17TH ST STE 820
DENVER CO 80202

CARLYLE H AND VERLE N ANDERSON
1944 S 1125 E
MALTA ID 83342-8661

KATHRYN H AND RUEL BARKER
1621 W 950 N
PROVO UT 84604

MARY LUANA BARRETT
1731 S HWY 81
MALTA ID 83342-8744

JAMES L AND JEANETTE B BENNETT
PO BOX 657
MALTA ID 83342

LUANN S AND NOLAN K BRANCH
BRANCH FARMS LLC
2304 E 1850 S
MALTA ID 83342

NOLAN K BRANCH
2304 PIERCE LN
MALTA ID 83342

BRIGHAM YOUNG UNIVERSITY
C/O DAVID ANDREASON
887 E 500 S
DECLO ID 83323

C BAR CATTLE CO
C/O CHRISTOPHER F ROBINSON
PO BOX 540478
NORTH SALT LAKE UT 84054

ADT FARMS LLC, ADTD FARMS LLC, IDA GOLD FARMS GENERAL PARTNERSHIP, MIDWAY DAIRY LLC AND RELAR FARMS LLC
246 E 300 S
BURLEY ID 83318

ALMO COMMUNITY PARK
C/O LARRY EDWARDS
PO BOX 126
ALMO ID 83312

DIANE AND MARK BAKER
2050 E 1000 S
DECLO ID 83323-6000

DEBRA BARNES
390 E 300 S
BURLEY ID 83318

JOSEPH W BARRETT
HC 72 BOX 2024
MALTA ID 83342

JAY L BLACK
PO BOX 103
ALMO ID 83312

LUANN S AND NOLAN K BRANCH
1823 S 2330 E
MALTA ID 83342

JAMIE AND RANDY BRIGGS
PO BOX 132
MALTA ID 83342

BRIGHAM YOUNG UNIVERSITY
C/O OFFICE OF GENERAL COUNSEL
A-357 ASB
PO BOX 21333
PROVO UT 84602-1333

TODD CARPENTER
2023 E 1700 S
MALTA ID 83342

ALVIN E CARPENTER
2079 E 1700 S
MALTA ID 83342

CASSIA JOINT SCHOOL DISTRICT #151
237 E 19TH ST
BURLEY ID 83318

BERTHA L AND STANLEY B COLLINS
PO BOX 96
MALTA ID 83342

BARBARA JEAN AND LARRY COOPER
227 W 20 S KNOX DR
BURLEY ID 83318

ALBERT JAY AND JULENE COTTLE
1750 S 1900 E
MALTA ID 83342

CROSS E LAND LLC
358 S 2750 E
DECLO ID 83323

D L EVANS BANK
PO BOX 87
TWIN FALLS ID 83303

DELTA FARMS LLC
1627 S 2350 E
PO BOX 631
MALTA ID 83342

JANIS C AND KENT DURFEE
PO BOX 175
ALMO ID 83312

DUSTY FARMS LLC
301 SCOTT AVE STE 2
RUPERT ID 83350

DESIREE C AND NATHANIEL S CARSON AND
GWEN SQUIRES
1174 S HWY 81
DECLO ID 83323

TANA AND TODD CHRISTIANSEN
1697 S HWY 81
MALTA ID 83342

DEAN COMPTON
260 W 6 N
BRIGHAM CITY UT 84302

CORP OF THE PRESIDING BISHOP
CHURCH OF JESUS CHRIST OF LATTER DAY SAINTS
REAL ESTATE SERVICES DIV
50 E NORTH TEMPLE ST
SALT LAKE CITY UT 84150-6320

MARCIA L AND ROGER L CRANE
2046 E 600 S
DECLO ID 83323

D L EVANS BANK
212 S MAIN
PO BOX 517
ALBION ID 83311

GEORGE K DARRINGTON
1990 S 2350 E
MALTA ID 83342

LORIN AND TERESA L DURFEE
776 E 2975 S
ALMO ID 83312

E BRUCE AND KAY H DURFEE
PO BOX 187
ALMO ID 83312

EAGLE CREEK NORTHWEST LLC
C/O UBS AGRIVEST LLC
PO BOX 53
NAMPA ID 83653

EAST VALLEY CATTLE LLC
471 N 300 W
JEROME ID 83338

IRMA FAY EDWARDS
PO BOX 494
ELBA ID 83342

BRIAN EVANS
ASB B-340
PROVO UT 84602

FARM CREDIT WEST FLCA
PO BOX 1640
SANTA MARIA CA 93456

GRANT A FEHLMAN
PO BOX 101
MALTA ID 83342

GARY AND KAREN FOWLES
2203 S 2350 E
MALTA ID 83342-8612

BARBARA E AND GOLDEN F GARDINER
1750 S HWY 81
MALTA ID 83342

MICHAEL D AND TONI L GARNER
113 S 2550 E
DECLO ID 83323

DOUGLAS GLASPEY
U S GEOTHERMAL INC
1509 TYRELL LN STE B
BOISE ID 83706

PETER J AND SYLVIA T GRUSH
RED ROCK FARMS LLC
2038 S HWY 81
MALTA ID 83342

DORIS B AND LARRY K EDWARDS
PO BOX 126
ALMO ID 83312

ERO RESOURCES CORP
C/O STEVE HANNULA
4001 E MAIN ST
EMMETT ID 83617

NATURE FARM LLC
872 E PEBBLE DR
BURLEY ID 83318

FEDERAL LAND BANK ASSN OF UTAH FLCA
406 W SOUTH JORDAN PKWY STE 500
SOUTH JORDAN UT 84095

FIVE RIVERS RANCH CATTLE FEEDING LLC
5408 IDYLWILD TRAIL
BOULDER CO 80301

S CHAD FRIDAL
2970 E 1400 S
MALTA ID 83342

MARIE JEANNE AND MATTHEW C GARDINER
234 S 100 W
ST GEORGE UT 84770

GARNER LAND LLC, GW FINANCE CO LLC AND
WEBB BROTHERS LAND & LIVESTOCK LLC
22 N YALE RD
DECLO ID 83323

EDWARD AND PATSY ANN GOODRICH
1709 S HWY 77
MALTA ID 83342-8738

D JAY AND JEANETTE W HARPER
1926 S 2350 E
MALTA ID 83342

ALAN J AND BEVERLY K HARPER
2436 E 1850 S
MALTA ID 83342

HARRIS AG LLC
2655 E 1440 S
PO BOX 1024
MALTA ID 83342

DORRIS M AND ROGER W HICKEN
1346 S 2300 E
MALTA ID 83342

HANK T AND LACEY G HIGLEY
PO BOX 652
MALTA ID 83342

HOLMGREN LAND & LIVESTOCK
785 N 350 E
TREMONTON UT 84337

JOYCE HUTCHISON
HC 72 BOX 2184
MALTA ID 83342

IRELAND BANK
ATTN LDC
486 YELLOWSTONE AVE
POCATELLO ID 83201

J R SIMPLOT CO
C/O DAVID SPURLING
999 MAIN ST STE 1300
BOISE ID 83707

JCK FARMS LLC
695 S 320 W
PROVO UT 84601

LORIN G JONES
2355 E 2425 S
PO BOX 2221
MALTA ID 83342

HARPER VALLEY LAND LLC
2045 E 850 S
DECLO ID 83323

RYAN HAWKER
PO BOX 433
ELBA ID 83342

HEATH AND DAWN HIGLEY
1971 S 2350 E
MALTA ID 83342

BRENT AND TERRY HOBSON
2595 E STREVELL RD
MALTA ID 83342

BROOK E AND STACY M HOLTMAN
PO BOX 74
MALTA ID 83342

IDAHO AG CREDIT FLCA
PO BOX 300
AMERICAN FALLS ID 83211

J E TRACY INC
PO BOX 138
ALMO ID 83312

J7 LLC
C/O JEFFREY C JOHNSON
PO BOX 147
MALTA ID 83342-0147

GLENN L AND HAZEL R JONES
2425 S 2385 E
B0X 2220
MALTA ID 83342

DIANE D AND J MAX JONES
2060 E 1000 S
DECLO ID 83323

BRENT AND GLEN W JONES
PO BOX 151
ALMO ID 83312

BETH R AND HAROLD A JONES
SUBLETT RT
MALTA ID 83342

PAT AND SCOTT KNUDSEN
1424 S 2350 E
MALTA ID 83342-8629

LAKESHORE FARMS 2 LLC
C/O FARMLAND MANGEMENT SERVICES
301 E MAIN ST
TURLOCK CA 95380

ARLO P LLOYD
2227 ELBA ALMO RD
ELBA ID 83326

BONITA T LLOYD
HC 61 BOX 1508
ELBA ID 83326

JANET AND KENNETH A MC FARLAND
1049 S HWY 81
DECLO ID 83323

BRIDGIT AND G LUKE MONTGOMERY
1968 S 2450 E
MALTA ID 83342

ALBERTA AND AMPELIO MONTOYA
PO BOX 87
MALTA ID 83342

LONNA AND MARK T NEWCOMB
251 E 200 S
RUPERT ID 83350

WILLIAM D JONES
PO BOX 152
ALMO ID 83318

JONES & WIDERBURG FARMS
82 S 150 E
BURLEY ID 83318

L HANGIN C LAND LLC
2299 S HWY 81
MALTA ID 83342

LEON R WALKER FAMILY TRUST
C/O ZEONA M WALKER TRUSTEE
87 S 800 E
LINDON UT 84042

F STANLEY AND JEANETTE LLOYD
2270 S ELBA ALMO RD
ELBA ID 83342

M & H FARMS
561 TERRACE DR
BURLEY ID 83318

METROPOLITAN LIFE INSURANCE CO
10801 MASTIN BLVD STE 930
OVERLAND PARK KS 66210

GUY YALE MONTGOMERY
PO BOX 37
MALTA ID 83342

ALVIN NEDDO
2252 E 1500 S
MALTA ID 83342-8628

JOSEPH J AND URSULA J NEWMAN
PO BOX 338
DECLO ID 83323

NORTHWEST FARM CREDIT SERVICES FLCA
1408 POMERELLE AVE STE B
BURLEY ID 83318

OK RENTALS IDAHO LLC
6616 W 10760 N
HIGHLAND UT 84003

GUS AND RANAE OMAN
PO BOX 117
MALTA ID 83342

PETER J GRUSH
P BAR S CO LLC AND P BAR S DAIRY
2025 S HWY 81
MALTA ID 83342

KARLA AND ROBERT PARKE
2025 S 2350 E
MALTA ID 83342-8612

GLENN R PARKE
2201 E 1625 S
MALTA ID 83342-8600

ADA PARKE
2280 E 1625 S
MALTA ID 83342

DALE O AND JEAN PIERCE
2269 E PIERCE LN
PO BOX 2058
MALTA ID 83342

PINNACLE GREAT PLAINS OPERATING CO LLC
10333 N MERIDIAN ST STE 425
INDIANAPOLIS IN 46290

PKD PROPERTIES LLC
1404 E 500 N
JACKSON WY 83350

R O JONES & SONS INC
PO BOX 137
ALMO ID 83312

RABO AGRIFINANCE INC
12443 OLIVE BLVD STE 50
ST LOUIS MO 63141

RAFT RIVER LAND & LIVESTOCK LLC
PO BOX 584
RUPERT ID 83350

RAFT RIVER RURAL ELECTRIC COOP INC
PO BOX 617
MALTA ID 83342

RAFT RIVER VALLEY FARMS LLC
390 N 925 E
DECLO ID 83323

RALPH PEAK FAMILY TRUST
20122 18TH AVE NW
SHORELINE WA 98177-2210

ROUND MOUNTAIN RANCH
3475 S ROUND MOUNTAIN LN
MALTA ID 83342-8626

SCHORZMAN RANCH INC
3298 E 1400 S
MALTA ID 83342

D LANE SCHUMANN
2547 S 2400 E
MALTA ID 83342

JADE O AND MALIESA B SEARS
PO BOX 222
MALTA ID 83342

CORDELL AND PATRICIA SHERIDAN
PO BOX 184
ALMO ID 83312

SHERRY SOUTHERN
3437 E 1547 S
MALTA ID 83342

SPENCER BROTHERS
26505 N 63310 W
MALTA ID 83342

STATE OF IDAHO
DEPT OF TRANSPORTATION
216 S DATE ST
SHOSHONE ID 83352

STATE OF IDAHO
DEPT OF PARKS & RECREATION
PO BOX 83720
BOISE ID 83720-0065

CONNIE AND MARK STREETER AND JOHN H AND TONYA ZOLLINGER
1529 S 3350 E
MALTA ID 83342

ROBERT E AND WALLACE C TAYLOR
C/O CAROLE TAYLOR
2714 WAKONDA DR
FORT COLLINS CO 80521-1244

CLAIR TEETER
1355 E. 1750 S.
MALTA ID 83342

JAY R AND RONDA KIM THORNTON
PO BOX 635
MALTA ID 83342

SHARYL L AND VERNON L (BUD) TRACY
149 W 1ST N
MALTA ID 83342

SMITH BROTHERS JERSEYS LLC
2534 S 2400 E
MALTA ID 83342

DALLAN AND JENNIFER SPENCER
PO BOX 112
MALTA ID 83342

CATHY AND JOHN B SPRATLING
550 TERRACE DR
BURLEY ID 83318

STATE OF IDAHO
DEPT OF PARKS & RECREATION
PO BOX 169
ALMO ID 83312

LYNN AND SUSAN STEADMAN
345 N YALE RD
AMERICAN FALLS ID 83211-5569

SUN VALLEY AGRIBUSINESS PARTNERS LLC
PO BOX 2169
SUN VALLEY ID 83353

CEDRIC TAYLOR
PO BOX 637
MALTA ID 83342

JED AND JENNIFER THORNTON
2118 S 1125 E
MALTA ID 83342

TLD PROPERTIES
1404 E 500 N
JACKSON WY 83350

KEVIN W AND TRUDY TRACY
2262 E 1500 S
MALTA ID 83342-8628

TRAVELERS INSURANCE CO
C/O CITIGROUP INVESTMENTS
242 TRUMBULL ST - 7TS
HARTFORD CT 06115

KRISTINE AND LANCE UDY
1529 E HWY 77
MALTA ID 83342

UNITED STATES OF AMERICA ACTING THROUGH
USDI BUREAU OF LAND MANAGEMENT
IDAHO STATE OFFICE
1387 S VINNELL WAY
BOISE ID 83709-1657

VALLEY VU CEMETERY
PO BOX 65
MALTA ID 83342-8612

RALPH WALLIN
279 E 800 N
GENOLA UT 84655

EUGENE WARD
295 E 2ND N
PO BOX 36
MALTA ID 83342

SARA JANE, CLARK AND VAUDIS J WARD
2749 S NARROWS RD
MALTA ID 83342

THOMAS C WARD
450 W HWY 30
BURLEY ID 83318

DOUGLAS WARD
PO BOX 102
ALMO ID 83312

RONALD C AND VENNA C WARD
PO BOX 109
ALMO ID 83312

U S GEOTHERMAL INC
390 E PARK CENTER BLVD STE 250
BOISE ID 83706

UNITED STATES OF AMERICA ACTING THROUGH
USDA FARM SERVICE AGENCY
9173 W BARNES STE B
BOISE ID 83709-1555

US DEPT OF INTERIOR
BUREAU OF LAND MANAGEMENT
200 S OAKLEY HWY
BURLEY ID 83318

LINDA L WALLIN
2739 MCFALL CT
LAS VEGAS NV 89121

GLEN WARD
WARD LAND & LIVESTOCK LLC
227 E 400S
BURLEY ID 83318

WALLACE P WARD
123 E 100 S
BURLEY ID 83318

ROBERT W WARD
2950 S NARROWS RD
MALTA ID 83342

NANCY WARD
BOX 1580
ELBA ID 83326

ROSCOE B AND JOYCE WARD
PO BOX 108
ALMO ID 83312

JANIS AND OLENE K WARR
2231 S 2350 E
MALTA ID 83342

WEBB BASIN DAIRY AND WEBB BASIN REAL ESTATE LLC
406 N HISAW LN
AMERICAN FALLS ID 83211

WESTERN AG CREDIT FLCA
10980 S JORDAN GATEWAY
PO BOX 95850
SOUTH JORDAN UT 84095-0850

CLETA AND DENTON WHITAKER
2145 S 2350 E
MALTA ID 83342

ANDREW W AND TIA K WHITAKER
PO BOX 131
MALTA ID 83342-0131

ARDEN EUGENE AND WYNELL F WICKEL
2337 E 1500 S
MALTA ID 83342

WILLIAM D JONES & SONS
C/O WILIAM D JONES
PO BOX 152
ALMO ID 83312

CAROL J AND LYLE D WOODBURY
152 N YALE RD
DECLO ID 83323

CINDA S, DELMAR L, KENNETH AND KENNETH D WOODWORTH
CLEFT OF THE ROCK FARMS
51 N 3350 E
AMERICAN FALLS ID 83211

JANET AND KIRTLAND YATES
1941 S 2450 E
MALTA ID 83342

ZIONS FIRST NATIONAL BANK
COMMERCIAL BANKING CENTER
1235 SOUTH UTAH AVE
IDAHO FALLS ID 83402

WELLS FARGO BANK NA
BOISE BBG LOAN OPERATIONS CTR
PO BOX 8203
BOISE ID 83707-2203

DIANA M AND MICHAEL P WHEELER
2155 E 100 S
DECLO ID 83323

JENNIFER L AND TRAVIS L WHITAKER
2165 S 2350 E
MALTA ID 83342

DOROTHY J AND WILLIAM K WICKEL
1726 SOUTH ELBA ALMO RD
ELBA ID 83342

JOHN H WIGHT
PO BOX 621
MALTA ID 83342

WILLOW CREEK ENTERPRISES LLC
C/O REED GIBBY
872 E PEBBLE DR
BURLEY ID 83318

LYLE D WOODBURY
STAR RT BOX 54
DECLO ID 83323

WYNN DEWSNUP FAMILY REVOCABLE TRUST
PO BOX 767
RUPERT ID 83350

ZIONS BANK
102 W MAIN ST
BURLEY ID 83318