



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

December 19, 2013

KING HILL IRRIGATION DISTRICT
C/O GARDNER "GIB" BROWN MGR
PO BOX 428
KING HILL, ID 83633

Re: Final Order Requiring Measuring Devices for King Hill Irrigation District Surface Water Diversions in Water District No. 2.

Dear Water User:

The Idaho Department of Water Resources (IDWR or Department) has issued the enclosed order requiring installation of measuring devices for diversions of surface water rights within Water District No. 2 owned and operated by King Hill Irrigation District (KHID). The enclosed order is a final order issued by the Department 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 all diversions operated by KHID from the Snake River within the State Water District No. 2. Devices must be installed prior to the 2015 irrigation season. Measuring devices for closed conduit systems can be selected from the attached list of IDWR-approved flow meters. IDWR will consider alternative measurement methods and flow meters upon submittal of requests and plans by water users and upon approval by the watermaster or 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. That document and other information on the topic are available on IDWR's website at the following address:

<http://www.idwr.idaho.gov/WaterManagement/WaterMeasurement/PDFs/MinAccepStand.pdf>

Please note that KHID water rights are diverted within Water District 130 and are administered by the watermaster within that district. However, as further explained in the attached order, the Water District No. 2 watermaster will measure and report water diversion from the KHID rediversions from the Snake River.

While KHID bears the responsibility for installing and operating measuring devices pursuant to this order, IDWR and the Idaho Water Resource Board (IWRB) may be able to help offset the cost to KHID for the purchase and installation. In December 2012, IDWR and IWRB staff worked with Water District No. 2 water users on a United States Bureau of Reclamation (BOR) WaterSmart grant. In May 2013, the BOR awarded IWRB a grant to help offset costs associated with installing measuring devices on 22 diversions within the district in 2014. Representatives from IDWR and the IWRB continue to work on a second grant application process under the BOR WaterSmart program. The application, due January 27, 2014, will be for the 2015 and 2016 irrigation seasons to cost share

King Hill Irrigation District
December 19, 2013
Page 2 of 2

the installation of measuring devices on remaining diversions not included in the first grant awarded to the IWRB in 2013, potentially including those of KHID required by this order.

If you have questions concerning this order, or if KHID is interested in pursuing funding through the 2014 WaterSmart program, please contact the Watermaster for Water District No. 2, Corbin Knowles at the IDWR State Office in Boise at 208-287-4842, or contact the IDWR Water Distribution Section at 208-287-4958.

Respectfully,



Tim Luke
Chief, Water Compliance Bureau

Enclosures:

Final Order Requiring Measuring Devices, King Hill Irrigation District, December 19, 2013
Explanatory Information to Accompany a Final Order
IDWR Minimum Acceptable Standards for Open Channel and Closed Conduit Measuring Devices
Idaho Department of Water Resources List of Approved Closed Conduit Flow Meters, Version 2.4

Cc: Corbin Knowles, Watermaster Water District No. 2
IDWR Western Region

King Hill Irrigation District operates a number of diversions on the Snake River that divert rights not administered by Water District No. 2, but are necessary to quantify for purposes of administering rights within Water District No. 2. This order requires measurement and control of the King Hill Irrigation District diversions within the area administered by Water District No. 2.

FINDINGS OF FACT AND CONCLUSIONS OF LAW

1. King Hill Irrigation District (KHID) holds water rights 37-4112 and 37-21595. These rights authorize KHID to inject water from the Malad River into the Snake River and redivert that water from up to six locations on the Snake River below its confluence with the Malad River.
2. The source and point of diversion for water rights 37-4112 and 37-21595 are within state Water District No. 130 and within the administrative jurisdiction of that watermaster.
3. Measurement of the Malad River rediversions from the Snake River has not historically been necessary to administer rights from the Malad River by the Water District No. 130 Watermaster.
4. The points of rediversion for water rights 37-4112 and 37-21595 are within the reach of the Snake River administered by Water District No. 2.
5. Water District No. 2 was created to administer water rights diverting from the Snake River.
6. The August 26, 2013 order requiring measurement in Water District No. 2 was limited to diversions for water rights from the Snake River and administered by the Water District No. 2 Watermaster and did not affect water right 37-4112 or 37-21595.
7. Finding of Fact 10 in the May 1, 2012 *Preliminary Order Creating Water District No. 2* states one of the reasons for creating Water District No. 2 is, in part, to:

Measure both diversions and reservoir flows to account for fluctuations resulting from reservoir hydropower facilities and determine actual flow conditions and minimum flows at Murphy Gage. Without diversion and reservoir flow measurements, gage fluctuations resulting from hydropower reservoir facilities could be overstated and actual flow conditions may be erroneous. Inaccurate determinations of minimum stream flows could result in unnecessary curtailment of certain water rights within the proposed water district as well as other water districts or areas that are tributary to the Snake River between Milner Dam and the Murphy Gage.

8. Water rights 37-4112 and 37-21595 divert from a source not under the control of the Water District No. 2 Watermaster, but measurement of the injection to and redirection from the Snake River under those rights is necessary to adequately quantify and protect water rights administered by Water District No. 2.
9. 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 use 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. Prior to diverting water during the 2015 irrigation season, King Hill Irrigation District shall install on each point of diversion authorized by water rights 37-4112 and 37-21595, a measuring device of a type acceptable to the Department.

2. Measuring devices that are acceptable to IDWR are as described in IDWR's *Minimum Acceptable Standards for Open Channel and Closed Conduit Measuring Devices* (copy attached).

3. In some situations, IDWR may exempt a diversion from the requirements of this order or may allow deferred compliance for a diversion. IDWR will consider each request for exemption or deferral on a case-by-case basis. Conditions that may result in exemption or deferral include, but are not limited to, the following:

- Abandonment, non-use, or consolidation of diversions that results in a diversion being unused, or reduces the use under the right to five acres or less.
- Delays caused by requirements of other government entities.

4. This Order does not require the installation of lockable controlling works, although nothing in this Order shall preclude 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.

5. The Water District No. 2 Watermaster shall shut off and refuse to deliver water under water rights 37-4112 and 37-21595 to any diversion that does not have an adequate measuring device at any and all times following the start of the 2015 irrigation season.

Dated this 23 day of DECEMBER, 2013


MAT WEAVER
DEPUTY DIRECTOR

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_ReportingGuidlines.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"