RESOLUTION NO. 23-02
OF THE BOARD OF DIRECTORS OF THE BORREGO SPRINGS WATERMASTER
ESTABLISHING A REVISED COMPREHENSIVE METERING PROGRAM

WHEREAS, a Stipulated Judgment (Judgment) was entered in the Superior Court of California on April 8, 2021 that determined and adjudicated all groundwater rights in the Borrego Springs Subbasin (Subbasin) and established the Borrego Springs Watermaster (Watermaster) to administer and enforce the provisions of the Judgment including its Physical Solution.

WHEREAS, the Judgment requires all pumpers with Baseline Pumping Allocations to install Watermaster approved meters for the purpose of tracking groundwater pumping volumes.

WHEREAS, the Judgment and Rules & Regulations require that upon installation, and annually thereafter, each pumper shall arrange for the manufacturer or qualified installer of such approved meters to provide written verification to the Watermaster of the ongoing accuracy of the meter readings and meter calibration; and the Watermaster or its designee shall provide forms to submit proof of meter installations.

WHEREAS, the Judgment requires that any Party holding BPA may elect to install and maintain, at its own expense, manual read meters approved by Watermaster on condition that: (i) the Watermaster physically read the meters on the schedule determined by the Watermaster and the Party pay all costs associated with the Watermaster's reading, accounting, and reporting related to such meters; and (ii) the Party has executed an Entry Agreement as specified in Exhibit "8" for the purpose of allowing Watermaster access to the Party's well.

WHEREAS, per section 4.2.4 of the Rules & Regulations, the Watermaster Technical Consultant shall propose, and the Watermaster Board shall adopt and maintain, rules and regulations regarding metering and data collection consistent with the provisions of the Judgment.

WHEREAS, prior to entry of the Judgment in April 2021, the Settlement Agreement and proposed Stipulated Judgment were the basis of formation of an Interim Borrego Springs Watermaster ("Interim Watermaster").

WHEREAS, the Interim Watermaster adopted three Resolutions governing the Watermaster meter reading program to comply with the proposed Stipulated Judgment, including: Resolution 20-02 Establishing Approved Meters; Resolution 20-03 Establishing Criteria for Verification of Meter Calibration, Installation, and Accuracy; and Resolution 20-05 Establishing Meter Read Protocols and Required Documentation.

WHEREAS, the Interim Watermaster established a monthly frequency for meter read reporting to effectively implement the Judgment per the recommendation of the Technical Advisory Committee; and developed protocols for collecting and reporting meter reads through a combination of official Watermaster meter reads and Pumper self-reporting.

Whereas, the Watermaster seeks to establish an updated, comprehensive metering program that supersedes the prior guidelines established by the Interim Watermaster.

NOW, THEREFORE, be it resolved by the Board of Directors of the Borrego Springs Watermaster, as follows:

1. Resolutions 20-02, 20-03, and 20-05 are hereby superseded by this Resolution 23-02 establishing a revised, comprehensive metering program, which is made up of the five attached exhibits.

2. The Board of Directors hereby approves the attached *Exhibit 1 - List of Approved Meters and Telemetric Systems*.

3. The Board of Directors hereby approves the attached *Exhibit 2 - Requisite Information to Demonstrate Proof of Meter Calibration and Proper Installation*.

4. The Board of Directors hereby approves the attached *Exhibit 3 - Requisite Information to Verify Accuracy of Meters*.

5. The Board of Directors hereby approves the attached *Exhibit 4 - Qualified Vendors for Annual Meter Accuracy Testing and Calibration, Verification of Proper Installation, and Telemetric System Installation and Maintenance*.

6. The Board of Directors hereby approves the *attached Exhibit 5 - Meter Read Program and Documentation Requirements*.

7. Exhibits 1 through 5 may need to be amended from time to time and amendments to any or all of the exhibits may be made with approval of the Board of Directors.

8. The Board of Directors hereby directs the Technical Consultant to maintain and publish to the Watermaster website this Resolution 23-02 together with the most up-to-date version of Exhibits 1 through 5, each of which will note the date of last revision and approval by the Board.

PASSED AND ADOPTED at a regular meeting of the Board of Directors of the Borrego Springs Watermaster held on the 9th day of March 2023 by the following vote:

AYES: Duncan, Smith, Bilyk, Jorgensen, Bennett

NOES: None

ABSENT: None

David Duncan, Chairperson
Board of Directors

Shannon Smith, Secretary of the Board
ATTEST

Exhibit 1

List of Approved Meters and Telemetric Systems

Updated: March 9, 2023

The following is the list of Watermaster approved meters and telemetric systems that have been previously reviewed by the Watermaster and found acceptable to meet the metering requirements of the Judgment. This list will be updated from time to time to include additional meters or telemetric systems that have been reviewed and deemed acceptable to the Watermaster Technical Consultant. The most updated list will be provided on Watermaster's Website: Pumper Resources – Borrego Springs Watermaster

To approve new meters to the list (whether manually or telemetrically read), Watermaster Technical staff will review the meter specifications and meter manuals to ensure that meters meet the American Water Works Association (AWWA) C708 standards. Other meters added to the list

MasterMeter
Octave Ultrasonic Meters and BLMJ Meter
Large Ultrasonic Water Meter for C&I Meter Applications - The Octave (mastermeter.com)
Bottom Load Multi-Jet (BLMJ) Meter - Master Meter

McCrometer
Manual-read flow meters for drinking water and irrigation wells
Flow Connect telemetric systems
Flow Meters for Agriculture and Irrigation | McCrometer
FlowConnect - Collect and Transmit Flow Data | McCrometer USA - Overview
Flow Meters for Drinking Water and Waste Water | McCrometer

Badger
5M2-030-P1 Badger Meter M2000 electromagnetic flow meters
ModMAG | M2000 Electromagnetic Flow Meter | Badger Meter

DLJ Meters
DLJ Multi-Jet Water Meter
dljwatermeters.com

JAIN USA
Jain Logic (SWIIM Product) for telemetric and Ag water management
Ag Water Management Services | Jain Irrigation USA (jainsusa.com)

Exhibit 2
Requisite Information to Demonstrate Proof of Meter Calibration and Proper Installation to the Borrego Springs Watermaster
Updated March 9, 2023

For all new meter installations, the following information must be submitted to the Watermaster as proof of meter calibration and proper installation for each well owned by pumpers with a Baseline Pumping Allocation. All information is required to be considered complete. In the event that a required item cannot be provided, please provide a detailed explanation. All personal information, including well locations, will be kept confidential. These guidelines may be updated by Watermaster technical staff from time to time. The most updated guidance will be provided on Watermaster's Website: Pumper Resources – Borrego Springs Watermaster

Pumper and Well Information:

- Pumper Name
- State Well ID
- Well Name
- GPS Coordinates of well location

Meter Information:

- Manufacturer
- Meter Type
- Meter Model
- Meter Size
- Serial Number
- Installation Date
- Certificate of factory calibration
  Attachment A1 contains examples of factory calibration forms.

Verification of Proper Installation

- Photographs of the well and meter that clearly show:
  - The meter make, model, and serial number
  - The meter read face
  - That there are no valves or other devices upstream of the meter that could significantly divert water before being read by meter (blow-off, air release valves are OK)

- A signed letter from the manufacturer or qualified vendor verifying that:
  - There are no valves or other devices upstream of the meter that could significantly divert water before being read by meter
  - The meter is accessible for meter reading
  - The meter has been installed according to good design practices for accurate meter reading

- An alternative option to providing the signed manufacturer letter is to perform a meter accuracy test, as described in Exhibit 3 of Resolution 23-02 (*Requisite Information to Verify Accuracy of Meters to the Borrego Springs Watermaster*)

Attachment B is an example of an appropriate photographic log of well and meter
Attachment C is an example of a 3rd Party Verification of Proper Meter Installation

Attachment A to Exhibit 2

Badger Meter

Order {[Order Number]}-{[Order Line Number]}

BMI Serial #:	51626244	BME Serial #:	1905-035
BMI Item #:	100-0072	BME Part #:	9010306
BMI Catalog String:	M2-030-P1-A-MWW-S-XXGF-STD		

Detector Type 2

Nominal Size:	3 Inches or 80 DN	Pressure Rating:	150 ASA
Connection:	Type 2	Material:	C-Steel
Liner:	PTFE	Max Temperature:	212 °F or 100 °C
Electrode:	Hastelloy C22	Protection Class:	IP 67
Detector Housing:	C-Steel painted	Detector Offset:	-0.0046 m/s
Detector Constant:	1858.7		

Amplifier: M2000

Mounting:	Detector mounted	Protection Class:	IP 67
Amplifier Housing:	Cast aluminium	Cable Length:	N/A
Flow Range:	2.4 to 956 GPM	Flow Direction:	Bi-directional
Full Scale Flow (Qn):	200 GPM	Power Supply:	85-265 VAC
Min/Max Alarm:	Min = 0% Max = 100%	Low Flow Cut Off:	0.2%
Empty Pipe Detection Active:	Yes	Pulse Rate:	1 pulse / Gallon
Analog Output:	4...20 mA	Pulse Width:	1:1
Pulse Output:	Active (Open Collector)	Full Scale Flow:	200 GPM
Software	1.19 ES		

	Flow Rate (% of Qn)	% Deviation
Measure Point 1:	25	0.08
Measure Point 2:	50	-0.02
Measure Point 3:	75	-0.08

The calibration of the Badger Meter ModMag M1000, M2000, M3000, M4000, M5000 and 7600P meters, sizes ¼ inch through 20 inches, are traceable to the International Systems of units using the services of the Czech Metrology Institute (CMI). The National Institute of Standards and Technology (NIST) recognizes the validity of CMI's calibration and measurement certificates.

Attachment A to Exhibit 2

Propeller Meter

CERTIFIED TEST REPORT

CUSTOMER: FAIN DRILLING

MODEL NO: MW503

METER SERIAL NO: 20-00488

CONFIGURATION

METER INSIDE DIAMETER: 2.988

METER OUTSIDE DIAMETER:

TEST DATE: 1/17/2020

TEST FACILITY: Volumetric

IDEAL TEST CONSTANT: 6000

CALIBRATION DATA

	Tested TC	GPM	Accuracy
1	6008	261	100.1

CERTIFIED BY: Robert Galusha **ID#:** 176785 **DATE:** 1/17/2020

This calibration was performed on a gravimetric or volumetric test facility, traceable to the National Institute of Standards and Technology, USA. The estimated flow measurement uncertainty of the calibration facilities are:
Gravimetric +/- 0.15% Volumetric +/- 0.5%

McCROMETER
3255 WEST STETSON AVENUE
HEMET, CA 92545 USA
PHONE (951) 652-6811 / FAX (951) 652-3078
WEB SITE: http://www.mccrometer.com E-MAIL: customerservice@mccrometer.com

Attachment B to Exhibit 2

Photographs 1 to 4: Flow meter installation

Photograph 1

Photograph 2

Photograph 3

Photograph 4

Attachment C to Exhibit 2

Return to: Borrego Springs Watermaster

c/o West Yost • 23692 Birtcher Drive • Lake Forest, CA 92630

3rd Party Verification of Proper Meter Installation

Meter information:

- Meter Serial Number: _____
- Last Factory Calibration: _____
- Meter Make and Model: _____
- Needed pipe straight run based on model: Up: Down: _____

Site information:

- What is upstream of the meter location? _____
- What is the distance from the meter site to the upstream disturber? _____
- What is downstream of the meter location? _____
- What is the distance from the meter to the downstream disturber? _____
- Is the proposed meter site on a horizontal or vertical segment of pipe? _____
- If vertical, is the meter calibrated for vertical? _____

Notes: _____

_____

By signing this document, I certify that:

- I am a representative from the meter manufacturer or a qualified vendor.
- The above information is correct.
- The meter has been installed according to good design practices.

_____ _____

Signature Date

_____ _____

Print Name, Title Company/Affiliation

Exhibit 3
Requisite Information to Verify Accuracy of Meters to the Borrego Springs Watermaster
Updated March 9, 2023

The accuracy of the pumping meters installed at each well owned by pumpers with a Baseline Pumping Allocation, whether existing or new, must be verified annually by the Watermaster. These guidelines may be updated by Watermaster technical staff from time to time. The most updated guidance will be provided on Watermaster's Website: Pumper Resources – Borrego Springs Watermaster

The following information must be submitted to the Watermaster to verify the meter accuracy. All information is required to be considered complete. In the event that a required item cannot be provided, please provide a detailed explanation. All personal information, including well locations, will be kept confidential.

Pumper and Well Information:

- Pumper Name
- Well ID
- Well Name

Verification of Meter Accuracy

- A form prepared by a qualified vendor documenting the results of the meter accuracy test. The form must include and demonstrate:
    - The meter test date
    - The meter information (make, model, size, serial number, units of reporting)
    - The test information, for a least two tests on the same day:
        - test method
        - meter reads before and after test
        - metered flow and actual flow
        - accuracy of meter read, expressed as percent accuracy.
    - Clear documentation if meter calibration or repair is needed. Meter calibration or maintenance is needed if the accuracy is less than 95% or greater than 105%
- If a calibration is performed, submit forms documenting the calibration results and additional information from the vendor certifying the post-calibration accuracy (Such as additional accuracy tests). Calibration must be completed within 30 days of a finding that the meter does not meet the accuracy standards.

Attachment A contains two examples of meter accuracy tests performed by qualified vendors.

Attachment A to Exhibit 3

PUMP CHECK

Pumping Systems Analysts

Hydraulic Test Report

Since 1958

(951) 684-9801 • Lic. 799498 • Fax (951) 684-2988

CERTIFICATE OF ACCURACY

Customer: [redacted]
Location: [redacted]
Identification: [redacted]
System: [redacted]

Test Date: 09/17/2018

Meter Size: 6" Make: Water Specialties
Meter No: 973969-06 Register: CuFt x 100

General Data

Meter read before test: 401457 Meter read after test: 401473

Pipe ID: 8.0625 (Inch) Pipe area: 51.054 (sq.in.) Pressure: 5.0 (Lbs/sq.in.)

Test Data **Test Before Inspection**

Test Equipment			Totalizer		Volume				
Test No.	Mano Read	Actual GPM	Second Read	First Read	Diff.	Convert to Gallons	Time in Seconds	Metered GPM	Percent of Flow
1	11.20	572	401461	401457	4	2,992	316.70	567	99.1%
2	11.15	569	401466	401461	5	3,740	397.50	565	99.2%
3	11.10	567	401472	401466	6	4,488	478.85	562	99.2%
Avg.		569.3					Avg.	564.6	**99.2%**

Remarks

34.07.466n117.43.232w
PC 3122/SCE 41078

Approved Rhonda Steward

Rhonda Steward
cn=Rhonda Steward, o=Pump Check, ou, email=rhonda@pumpcheck.com, c=US
2018.09.25 09:08:20 -07'00'

Attachment A to Exhibit 3

McCall's Meters Inc.

1498 Mesa View Street
Hemet, CA 92543
Tel: 951-654-3799 Fax: 951-654-3991

Field Test Report

Utility: XXXXX
XXXXX
XXXXX

Account Number: XXXX
Meter Location:

Date: 11-26-18
Tech: TD & ND

Size: 8"
Manuf: Water Specialties
Type: Prop w/ transmitter
Ser No: 20070812-06

Test Point: Remove 1" sampler before meter and outside shed

Pipe I.D. 6.000 inches
Pipe Area: 28.27 sq. inches
Pressure: NA psi

Meter Readings:
Meterhead: 718122 Units: Gals x 1000
Remote: Units:

	Meter	Trans
Drive Gear	NA	
Driven Gear	NA	

TEST BEFORE REPAIR

Test No.	Pitot Data: Mano. Diff.	Pitot Data: Pitometer Flow GPM	Subject Meter Data: Totalizer Units Gals x 1000 Stop Read	Subject Meter Data: Totalizer Units Gals x 1000 Start Read	Subject Meter Data: Test Run Volume Gallons	Subject Meter Data: Test Run Time Min.	Subject Meter Data: Test Run Time Sec.	Subject Meter Data: Meter Flow GPM	Subject Meter Data: Indicated Meter Accuracy
1	5.9	166.8	614316	614315	1000.0	5	47.6	172.6	**103.5 %**
2									
3									
4									
5									

	Meter	Trans
Drive Gear		
Driven Gear		

TEST AFTER REPAIR

Test No.	Pitot Data: Mano. Diff.	Pitot Data: Pitometer Flow GPM	Subject Meter Data: Totalizer Units Gals x 1000 Stop Read	Subject Meter Data: Totalizer Units Gals x 1000 Start Read	Subject Meter Data: Test Run Volume Gallons	Subject Meter Data: Test Run Time Min.	Subject Meter Data: Test Run Time Sec.	Subject Meter Data: Meter Flow GPM	Subject Meter Data: Indicated Meter Accuracy
1									
2									
3									
4									
5									

Remarks: The test results indicate proper meter accuracy.

Exhibit 4

Qualified Vendors for Annual Meter Accuracy Testing and Calibration, Verification of Proper Installation, and Telemetric System Installation and Maintenance

Updated March 9, 2023

The following is the list of qualified vendors that Watermaster has identified and found reputable to provide metering services that will comply with the Judgment. This list will be updated from time to time to include additional vendors that have been identified by the Watermaster Executive Director or Technical Consultant. The most updated list will be provided on Watermaster's Website: Pumper Resources – Borrego Springs Watermaster.

1. McCall's Meter Sales and Service, Inc.
   1498 Mesa View Street, Hemet, CA 92543
   Office: (951) 654-3799
   Fax: (951) 654-3991
   http://mccallsmeters.com/

2. McKeever Water Well & Pump Service, Inc.
   82-550 Avenue 60, Thermal CA 92274
   Office: (760) 399-4237
   Fax: (760) 399-4239

3. Pump Check
   P.O. Box 5646, Riverside, CA 92517
   Office: (951) 684-9801
   Fax: (951) 653-1950
   info@pumpcheck.com
   http://pumpcheck.com/

4. McCrometer, Inc.
   Pamela Fuller, Regional Sales Manager
   (951) 757-6416
   PamF@mccrometer.com
   https://www.mccrometer.com/

5. Jain USA (SWIIM platform for telemetry and water management)
   Kirk Lyster, Sales and Customer Service Manager
   (760) 427-5382
   klyster@jainusa.com
   www.JAINUSA.com

Exhibit 5
Meter Read Program and Documentation Requirements
Updated March 9, 2023

The purpose of reading meters is to collect and document the information needed to calculate total groundwater pumping for the water year (or any other time period of interest) at each active pumping well of the BPA Parties. It is critical that the meters are read accurately and that the meter read is properly documented.

How meter read data is reported to the Watermaster is dependent on the type of meter installed. Data from meters with telemetry systems (smart meters) can be transmitted electronically to the Watermaster. Manual-read meters must be visited in-person and the meter read documented manually via photograph and field notes. The cost of all activities to read and collect manual-meter read data is paid for only by the Pumpers with manual-read meters. The following describes (1) the meter read program, which establishes the meter reading frequency and QA/QC protocols for all wells and (2) the documentation required for official Watermaster meter reads of manual-read meters.

The Watermaster meter program will be periodically evaluated and Exhibit 5 updated to reflect changes. by the Watermaster. The most updated program will be available on Watermaster's Website: Pumper Resources – Borrego Springs Watermaster.

Watermaster will keep all personal information, including well locations confidential.

Meter Read Program

Watermaster has established a monthly frequency for meter read reporting to support the effective implementation of the Judgment based on the Water Year[1] (WY).

The following describes how monthly meter read data will be collected from wells with smart meters and manual-read meters.

- For wells with Smart Meters
    - Watermaster will download meter read data from the telemetry portal provided by the pumper on a monthly schedule.
    - Parties must perform an annual field verification (manual reads) of each smart meter to compare to the telemetry reported reads. The manual read should include taking a clear, readable photograph of the well meter face as evidence of its readout value. Watermaster staff will send an email to the Parties, or their designated representative, to request the annual meter QA/QC check.
    - Should a Pumper's telemetry system fail to read out data, Watermaster staff will immediately notify the Pumper, or their designated representative, to resolve the problem and request self-reporting of meter reads until the system is fixed.
        - The manual read should include taking a clear, readable photograph of the well meter face as evidence of its readout value. And, a clear photograph showing the meter serial number. One photograph with both items of information is acceptable.

[1] Water Year – October 1st to September 30th.

  - If a telemetric system is not fixed within three months of going offline, the Pumper must execute an Entry Permit to enable Watermaster to perform official Watermaster reads.
  - Failure to enable entry by Watermaster after three notifications of the telemetry system failure will result in the Pumper being subject to an issuance of an inspection warrant under the powers afforded by SGMA and being designated as not in good standing with Watermaster. In this case, the Pumper may be reported to the Board, and potentially the Court, for non-compliance. Watermaster staff will make best efforts to work with the Pumper to achieve compliance prior to reporting to the Court.
- The costs associated with collecting telemetric data are included as part of the annual Pumping assessment.
- The costs associated with collecting manual-reads, if triggered, will be borne by the Pumper.

- For wells with manual-read meters:
  - Watermaster will perform official meter read events on a quarterly schedule at or near the end of the following months: September, December, March, and June. Official meter reads will be performed by Watermaster staff or its contractor. Watermaster's current contractor is Borrego Water District. The documentation of official reads is discussed later in this Exhibit.
  - Parties will perform self-reporting in the months between official Watermaster meter read events (8 times per year at or near the end of October, November, January, February, April, May, July, and August).
    - Parties with manual-read meters are to provide Watermaster staff with an email (borregospringswm@westyost.com) or text message (949.600.7527) of the reporting period meter read, including the date and time of the read and a photograph of the meter face as evidence of its readout value. And, a clear photograph showing the meter serial number. One photograph with both items of information is acceptable.
    - Failure to self-report meter reads for three consecutive self-reporting events will result in the Pumper being subject to an issuance of an inspection warrant under the powers afforded by SGMA and being designated as not in good standing with Watermaster. In this case, the Pumper may be reported to the Board, being designated as not in good standing with Watermaster and the Pumper may be reported to the Board, and potentially the Court, for non-compliance. Watermaster staff will make best efforts to work with the Pumper to achieve compliance prior to reporting to the Court.
  - The Pumper's with manual-read meters will pay all costs associated with reading and collecting manual-meter read data. Invoices for these services will be pre-paid and invoiced annually by the Watermaster. Failure to pay meter-read invoices will result in the Pumper being designated as not in good standing with Watermaster and the Pumper

may be reported to the Board, and potentially the Court, for non-compliance. . Watermaster staff will make best efforts to work with the Pumper to achieve compliance prior to reporting to the Court.

Meter Read Documentation for Official Watermaster Reads

To ensure accuracy of each meter read, the following protocol must be followed by the Watermaster Official Meter Reader at each well.

- Make a handwritten note, or key punch into excel file using a tablet or device, of:
  - BPA Party name
  - Well name or address
  - The last four digits of the meter serial number (SN)
  - Date and time of meter read
  - The meter read
  - The meter read units
  - Any challenges with reading the meter (e.g. face broken/cracked, no access, etc.)
- Take photograph(s) of:
  - The meter make, model, and serial number
  - The well meter face that clearly shows the meter read and units of measure
  - One photograph with both items of information is acceptable.

At the completion of the meter reading event:

- Name each photograph with the following file name:
  - Last 4 digits of SN_Date_MeterInfo (e.g. *9999_20200930_MeterInfo)*
  - Last 4 digits of SN_Date_MeterRead (e.g. *9999_20200930_MeterRead)*

- Scan and save any handwritten notes with the following file name:
  - Date_MeterReadNotes (e.g., *20200930_MeterReadNotes)*
- Send photographs and scan of hand written notes (or excel file of notes) to Watermaster Staff at borregospringswm@westyost.com.

Attachment A is the form that should be used for the handwritten or electronic field notes. It will be provided to the meter reader by Watermaster as an Excel file and a PDF file. After the first meter reading event, the form can be updated to pre-populate the well owner and serial number information.

Attachment A to Exhibit 5

Borrego Springs Watermaster
Meter Read Field Data Form

Well #	BPA Party Name	Well Name or Address	Meter SN - Last 4 Digits	Read Date (M/D/Y)	Read Time (AM/PM)	Meter Read	Meter Read Units	Challenges With Reading Meter?
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								