

# DRAFT

## Conceptual Framework

# Groundwater Extraction Metering Program

*For Discussion Only*



## San Antonio Basin Groundwater Sustainability Agency

Ad Hoc Committee Updates to GSA Board

October 17, 2023



# METERING PROGRAM COMPONENTS

## Who

- All wells in the GSA (excluding de minimis wells)
  - GSA is legally authorized to require flow meters. Landowner is responsible for all associated costs. (Water Code 10725.8)

## Flow Meter Specifications

- Flow meter with totalizer calibrated w/accuracy of +/- 5% by volume.

## Installation

- Must be installed to manufacturer specifications. Develop SABGSA Installation Form.

## Calibration

- Accuracy of +/-5%.
- If verification error exceeds 5%, then the meter must be recalibrated or replaced with a certifiable meter.
- **Ad Hoc Comm. to continue to discuss frequency of routine calibration and validation – per manufacturers specifications v. GSA master schedule (perhaps every 5 years).**

## Accuracy Level Required by other GSAs

- + / - 5%
  - Cuyama
  - Mid Kings River
  - Upper Ventura River
  - Fox Canyon
  - Borrego Springs
- + / - 2%
  - McMullin

# FLOW METER INSTALLATION FORM

## What Does SABGSA Request from Landowners for Each Well?

### SABGSA Flow Meter Installation Form Components

- Section 1: Landowner and Well Information
  - Landowner Name and Company/Organization Name
- Section 2: Meter/Well Location
  - Well Name/Number
  - Geographical Coordinates (Lat/Long)
- Section 3: Meter Information
  - Flow Meter Make/Manufacturer/Serial Number
- Section 4: Installation Information
  - Installer Name / Company / Contact Information
  - Installation Date
  - **Manufacturers Spec on Timing of Routine Calibration?**
- Section 5: Additional Documentation – Not a Legal Requirement
  - For new install – Manufacturer's calibration certificate?
  - For existing meters, identify acceptable date range for most recent calibration.

### Reporting Form Ad Hoc Comm. Discussion Items

- **Should pipe diameter and size of flow meter be included on the form?**
- **Should this be an attestation form certifying compliance or require documentation?**
- **Additional Documentation – Require certificate?**
- **Additional Documentation - Require a photograph of the flow meter at the time of installation?**
- **If multiple flowmeters on a parcel, SABGSA could require a map identifying the locations of the various flowmeters and lands serviced collectively by these flowmeters**



# FLOW METER REPORTING PROCESS

Semi-Annually by Landowners on May 1 and November 1

## Reporting Requirements / Process

- Monthly Readings: 1<sup>st</sup> day of each month
- Monthly flow meter readings must be reported twice a year to the GSA in Spring and Fall (Based on WY)
  - 60 Days to Submit Report
    1. April 1-September 1 readings – due Nov. 1
    2. October 1 – March 1 readings – due May 1
- Reporting must be completed using the process identified by the GSA.
  - Submit SABGSA Reporting Form
  - Submittal Options for SABGSA Reporting Form:
    1. Hardcopy via US Mail
    2. Electronic (fillable pdf) via Email
    3. **Would like to explore online form – may be a future option – build flexibility into Ordinance**

## SABGSA Reporting Form May Include

- Owner/Operator
- Local Well Name
- State Well Number (SWN)
- Flow meter serial number
- Flow meter reading for the volume (including units) for the reporting period with date and time of recording
- Total volume (including units) for the reporting period
- Photograph of the well flow meter at the time of reading showing the totalizer value



# FLOW METER REPORTING FORM

## What Does SABGSA Request from Landowners for Each Well?

### SABGSA Flow Meter Reporting Form Components

- Section 1: Landowner and Well Information
  - Landowner Name and Company/Organization Name
  - Well Name/Number
  - Flow Meter Make/Manufacturer
  - Flow Meter Serial Number
  - APN Served by Well
- Section 2: Flow Meter Measurement Data
  - Measurement Date
  - Totalizing Flow Measurement
  - **Flow Measurement Unit (acre-feet, gallons per min)**
  - Notes – If a meter goes down, this is where it is reported
- Section 3: Additional Documentation
  - **Require photograph?**

### Reporting Form Ad Hoc Comm. Discussion Items

- **Is SABGSA asking landowners to calculate total volume of extraction for the reporting period or simply provide the reading and flow measurement unit?**
- **Should SABGSA ask for a photograph of the flow meter at the time of reading showing the totalizer value and measurement unit? If yes, at what frequency – once per year?**
- **Consider developing excel spreadsheet for organizations installing multiple flow meters**



# PROGRAM COMPLIANCE & VERIFICATION

## Reporting Forms for Compliance

- Ad Hoc Committee to develop reporting form templates for:
  - Groundwater Extraction/Flow Meter Reporting Form
  - Installation/Calibration Compliance Form
  - **Routine Calibration Compliance Form**

## Enforcement for Non-Compliance

- SABGSA should consider future enforcement mechanisms (policies and penalties) for non-compliance.
- Legal counsel will develop recommendations for:
  - Well Registration Non-Compliance
  - Flow Meter Install Non-Compliance
  - Flow Meter Reporting Non-Compliance
  - Flow Meter Routine Calibration Non-Compliance

## SABGSA Well Registration Program Stats

- **Registered Wells: 268**
  - **Accounts for 12,370.83 irrigated acres – roughly 95.7% of total irrigated acres within the Basin**
  - **Outstanding Well Registrations account for 555.07 irrigated acres - roughly 4.3% of total irrigated acres within the Basin**
- **Metered Wells: 94 of 268 – 35%**
  - **Electromagnetic: 17**
  - **Propeller: 73**
  - **Ultrasonic: 2**
  - **Unknown: 2**
- **Unmetered Wells: 174 of 268 – 65%**



# ROUTINE CALIBRATION COMPLIANCE FORM

## What Does SABGSA Request from Landowners for Each Well?

### SABGSA Routine Calibration Reporting Form Components

- Section 1: Landowner Contact Information and Well Info
  - Landowner Name and Company/Organization Name
  - Well Name/Number
- Section 2: Meter Information
  - Flow Meter Make/Manufacturer/Serial Number
  - Flow Meter Size
  - Flow Measurement Unit
  - Flow Meter Multiplier (on face), Style, Use
  - New from Manufacturer – Yes or No
  - Discharge Pipe Size, Pump Motor/Engine (Horsepower)
- Section 3: Test Results for In-Place Flow Meter Testing
  - Meter start and end reading
  - Volume pumped
  - Run Time
  - Flow Rate
  - Accuracy % - Pass or Fail

### Routine Calibration Compliance Form Ad Hoc Comm. Discussion Items

- Include date and time test
- Name of calibration contractor/vendor
- Notes from contractor/vendor

# LEGAL AUTHORITY

## Water Code 10725.8 - SGMA

(a) **WATER MEASURING DEVICE:** A groundwater sustainability agency may require through its GSP that the use of **every groundwater extraction facility** within the management area of the GSA be **measured by a water-measuring device** satisfactory to the GSA.

(b) **COSTS, INSTALL, CALIBRATION:** **All costs associated** with the purchase and installation of the water-measuring device shall be **borne by the owner** or operator of each groundwater extraction facility. The water-measuring devices shall be **installed by** the GSA or, at the groundwater sustainability agency's option, by **the owner or operator** of the groundwater extraction facility. Water-measuring devices shall be **calibrated on a reasonable schedule as may be determined by the GSA.**

(c) **REPORTING:** **A GSA may require,** through its GSP, that the owner or operator of a groundwater extraction facility within the GSA file **an annual statement** with the GSA **setting forth the total extraction in acre-feet** of groundwater from the facility during the previous water year.

(d) In addition to the measurement of groundwater extractions pursuant to subdivision (a), a GSA may use any other reasonable method to determine groundwater extraction.

(e) **DE MINIMIS EXTRACTORS EXEMPT:** This section does not apply to de minimis extractors.



# CUYAMA BASIN GSA INTERVIEW

## Flow Meter Specifications

- Flow meter with totalizer calibrated w/accuracy of +/- 5% by volume.

## Installation/Initial Calibration

- Landowners can install. CBGSA recommended assistance in flowmeter selection and installation from the flow meter supplier. CBGSA provided Meter Selection/Install Guidance Doc.
- For new and existing meters, CBGSA requires calibration compliance form, certificate of calibration, and photo documentation.

## Routine Calibration – Every 5 Years, Electromagnetic Every 20 Years

- Has a preferred vendor list from the County
- No process in place for tracking, but will develop

## Reporting

- Monthly readings – no specific date of the month.
- Annual report by Jan 31<sup>st</sup> of each year – currently on CY cycle.
- Requires CBGSA Reporting Form and photo of meter for the December reading. Requests monthly photos.

## Context

- **GSA Board: 5 GSA Reps, 5 County Reps, 1 CSD Rep**
- **Approx. 25,000 acres irrigated Ag**
- **Groundwater Extraction Fee in Place**
- **25 AFY or More – Reporting Form. Less than 25 AFY Gross Conversion Factors**
- **Landowners Had 1 Year to Install**
- **How GSA Uses Metering Data**
  - **Admin Staff**
    - **Compliance and Enters Annual Extraction for Billing – uses photograph to QC forms**
  - **Hydrogeologists**
    - **Enter Monthly Data into Model – uses ET and photographs to QC**

# UPPER RIVER VENTURA GSA INTERVIEW

## Flow Meter Specifications

- Flow meter with totalizer calibrated w/accuracy of +/- 5% by volume.

## Installation/Initial Calibration

- Installed per manufacturer's specifications.
- For new and existing meters, URVGSA requires certificate of calibration from Approved Flow Meter Testing Company and photo documentation – well discharge and piping and meter face with totalizer digits and flowmeter units – date and time stamped.

## Routine Calibration – Based on Extraction Volume

- 3 Years – 100+ AFY; 5 Years – Less Than 100 AFY
- Written certification of accuracy by qualified flowmeter testing company – Approved Flowmeter Testers List – plus photo.

## Reporting – Agency Sends Forms Each Quarter

- Monthly readings – no specific date of the month. Reported in AFY.
- Reported quarterly – currently on CY cycle. 45 days to submit.
- Requires URVGSA Reporting Form and photo of meter each quarter with date stamp

## Context

- **Approx. 5% of Basin is irrigated Ag – primarily Municipal**
- **Groundwater Extraction Fee in Place**
- **ED is a Hydrogeologist**
- **Landowners Had 1 Year to Install**
- **How GSA Uses Metering Data**
  - **Admin Staff**
    - **Compliance**
    - **Enters Annual Extraction for Billing**  
– uses photograph to QC forms
  - **Hydrogeologists**
    - **Enter Data into Model – uses ET and photographs to QC when needed**

# PROPOSED NEXT STEPS

Subject to Change Based on RFP Responses....



## AD HOC COMM. DELIVERABLES

Nov 28<sup>th</sup> GSA Board Meeting

- Reporting Form
- Installation Compliance Form
- Routine Calibration Compliance Form

## LEGAL COUNSEL DELIVERABLES

Jan. 16<sup>th</sup> or Feb. 20<sup>th</sup> GSA Board Meeting

- Legal counsel presents first draft of Ordinance for discussion including enforcement mechanisms (policies and penalties) for non-compliance.

## AD HOC COMMITTEE DELIVERABLES

Jan. 16<sup>th</sup> or Feb. 20<sup>th</sup> GSA Board Meeting

- Recommendations for data entry/management – may consider RFP



# DISCUSSION ITEMS/QUESTIONS

- General comments on draft framework
- What else should the Ad Hoc Committee explore?

# FLOW RATE TO ENERGY USAGE METHOD

Preliminary Analysis – Requires Discussion with Ad Hoc Comm.

## INDIRECT FLOW MEASUREMENT:

The types of meters SABGSA has considered (propeller, ultrasonic, and electromagnetic) are all direct measurements of flow. **The flow rate to energy usage method can be considered an indirect measurement of flow.** It can be **fairly accurate if the well pumps consistently at a fairly consistent water level.** That breaks down over time as water levels drop so knowing the relationship between water levels and the pump discharge at that level is important to correct the Kwh to the right flow.

## CALIBRATION:

This method would **likely require calibration at least once a year, if not twice**, to determine the kWh multiplier during seasonal high water levels and during seasonal low water levels and would still require a big assumption that operating conditions remain similar throughout the intervening periods.

## FACTORS THAT IMPACT ENERGY USE VS. FLOW:

Dynamic changes in pump condition, dynamic changes in back pressure on any system irrigation lines the pump might be feeding into, pumps outfitted with VFDs (variable frequency drive), drawdown from adjacent wells, fluctuating water levels throughout the year, etc. **Essentially, any dynamics in the system that result in changing resistance to the operation of the pump motor can throw this method into question.**

## EXAMPLE PROVIDED TO SABGSA FOR CONSIDERATION:

The provided kWh conversion calculated during the Gato Cyn Ranch Pump Test suggests a linear relationship between flow and energy use. This relationship is more likely a curve, hence the need for a monitoring program like PumpMonitor.