

# Staff Report

for the Regular Meeting of the Board of Directors, June 26, 2019

**TO:** Honorable Board of Directors

**FROM:** Chip Close, Water Operations Manager  
Aurora Tipton, Customer Service Administrator  
Kaycee Strong, Water Efficiency Technician

**DATE:** June 7, 2019

**SUBJECT:** **Badger Meter Technology Presentation**

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## ***OPERATIONS***

### **RECOMMENDATION ACTION:**

Receive a presentation demonstrating the capability of the recently deployed Badger Meter System.

### **BACKGROUND:**

The District has begun the replacement of the previous generation Sensus radio-read water meters with Badger cellular communicating meters. The Sensus meters are beyond their 15-year service life and are in need of replacement to continue accurate reads.

The switch to cellular, otherwise known as advanced metering infrastructure (AMI), is providing the District real-time water use tracking that can be communicated to our customer base. District staff is also utilizing the technology for real-time leak detection to help the District meet its goals for water efficiency and to save our customers money through rapid leak detection response.

To date, roughly 6,400 of the District's 19,500 meters have been replaced with new AMI meters. The effort to replace all meters has been scaled back from its initial launch due to budget cuts, and meters are now replaced through attrition.

This item is in alignment with Goal numbers two and four of the District's Strategic Plan, as improved technology allows enhanced communication with and outreach to District customers in a more timely fashion.

### **BUDGETARY IMPACT:**

Informational item only

Attachments (1): PowerPoint presentation

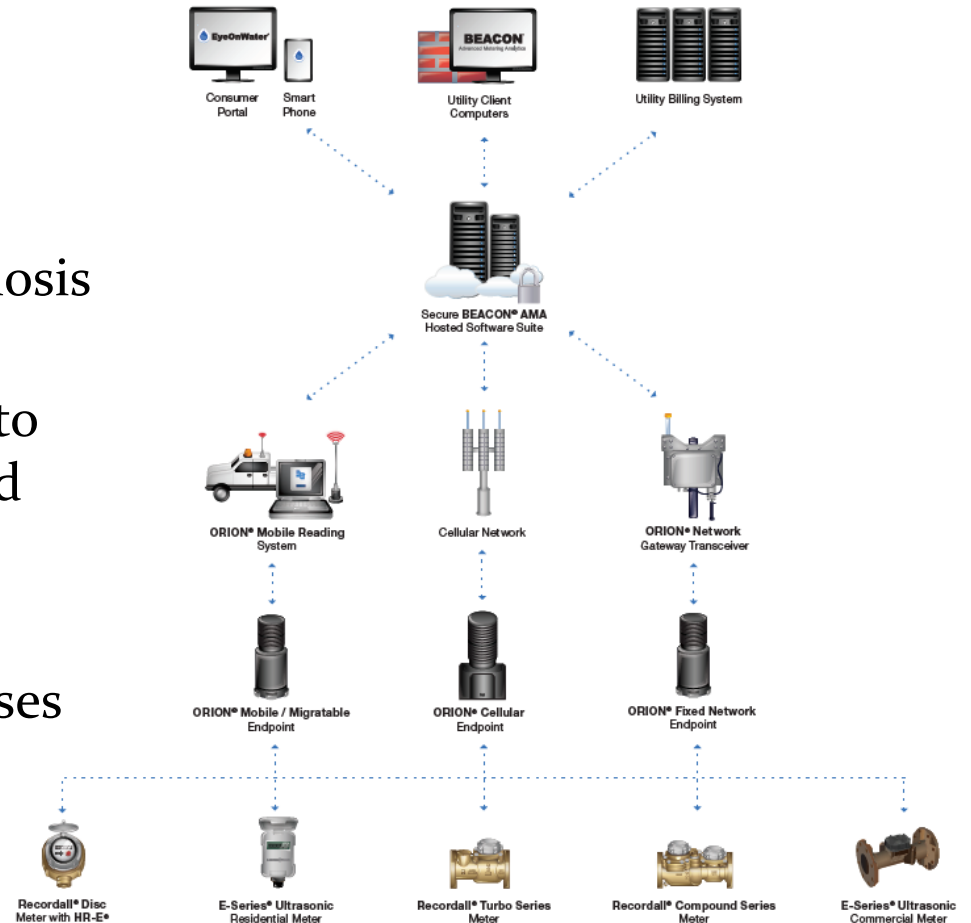
# NID Meter Replacement Program



**NID**

# Project Background and Purpose

- NID began testing new meter technology in 2015
- Automatic Meter Infrastructure (AMI) will allow for better diagnosis of water usage.
- Real-time access to water usage to help better track and understand usage
- Detect and resolve leaks
- Monitor meters and identify losses





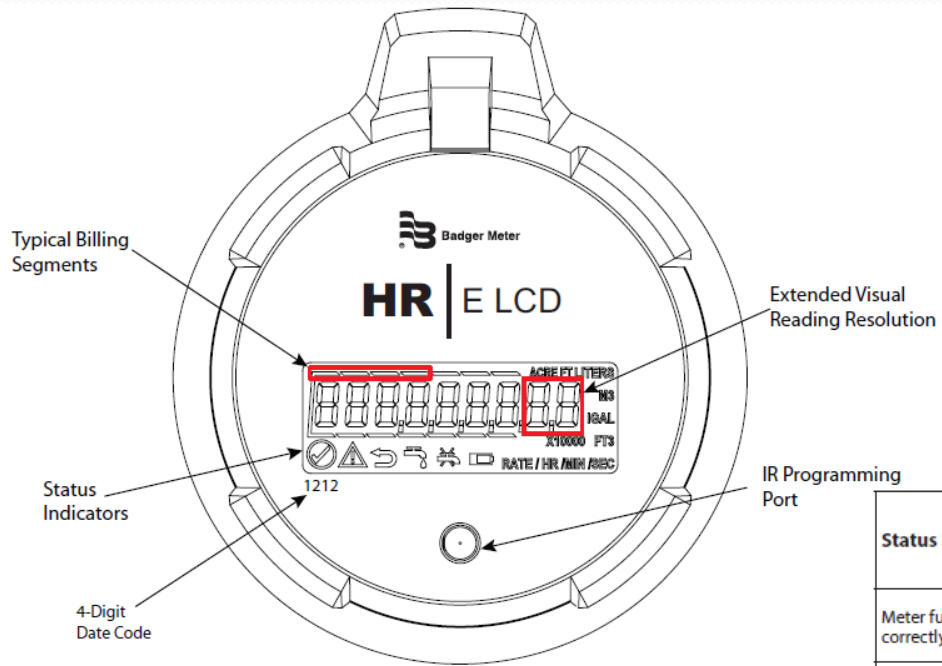
# Converting to Badger Meters

- Approximately 6,380 Badger meters installed as of June 18<sup>th</sup>, 2019



- Existing meters are replaced when components fail

# BADGER METER



**Model 25 Disc Series Meter Calibrated in Gallons**



Status Indicator	Icon	Status Description	HR-E LCD Display	HR-E LCD with ORION Cellular or Fixed Network* and Migratable* Endpoints <small>*Firmware version 1.8 or higher required</small>
Meter functioning correctly		Encoder operating correctly.	Continuous display on encoder as long as no other status indicators are triggered.	Indicator status not sent to the endpoint.
Encoder alarm		Several potential conditions may exist, including: Encoder removal Temperature limit exceeded (34...140° F) Magnetic tamper	Encoder alarm remains active for 35 days. The alarm automatically clears after 35 days if any of the 3 conditions has not recurred.	Encoder alarm sent to the endpoint.
Reverse flow		Encoder detects reverse flow.	Reverse flow alarm remains active for 35 days. The alarm automatically clears after 35 days if reverse flow condition has not recurred.	Encoder detects reverse flow and sends alarm message to the endpoint.
Suspected leak		Encoder detects 24 hours without one 15-minute interval of no flow.	The alarm clears automatically when a 15-minute no-flow interval occurs.	Encoder detects suspected leak and sends alarm message to the endpoint. If condition clears before message is sent to the endpoint, it is not reported.
30 day no usage		No measured flow in past 30 days.	The alarm is automatically cleared once flow occurs.	Encoder detects 30 days no usage and sends alarm to the endpoint.
End of life battery indicator		Indicated battery life based on pre-calculated consumption.	Alarm activated at 19 years and does not clear.	Encoder sends alarm to the endpoint.

# BEACON HOME SCREEN



**BEACON**  
Advanced Metering Analytics

Welcome Kaycee Strong | [Help](#) | [Sign Out](#)  
NEVADA IRRIGATION DISTRICT

At a Glance

Monitor

Analytics

Assets

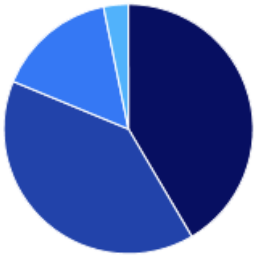
Users



Add / Remove

## Flow Health

All Meters



Breakdown of flow anomalies. Click on arrows for details.

712

No Recent Flow

681

Leak Detected

267

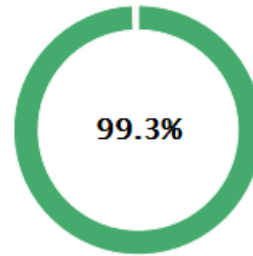
Backflow

55

Continuous Flow

## Device Health

All Meters



Percentage of devices with OK status

6,336

Status OK

44

Reporting Issues

34 Endpoint Tamper

7 Meter/Encoder Alarms

5 Encoder Communication Error

1 Endpoint Alarms

Continuous  
Flow  
Vs.  
Leak  
Detected

What's the  
Difference?

# BEACON HOME SCREEN

## System Water Usage

### Weekly Usage (CCF/Week)•

\* This metric is calculated from networked meters only.



▲ 15.40 %

This Week

**31,976** CCF

Last Week

**27,051** CCF

## Top Accounts By Usage (Weekly)

Rank ▲	Account	CCF	Δ Rank
1		598	— →
2		529	▲ 1 →
3		487	▲ 17 →
4		432	▼ 2 →
5		394	▼ 1 →
6		271	▲ 1 →

## Favorites

★ Location	Meter ID	CCF/wk
★	16389148	21 →
★	16176680	28 →



# Monitor Page



**BEACON**  
Advanced Metering Analytics

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NEVADA IRRIGATION DISTRICT

At a Glance | **Monitor** | Analytics | Assets | Users

6,415 meters Filters ▾ Actions ▾

**Tags** -

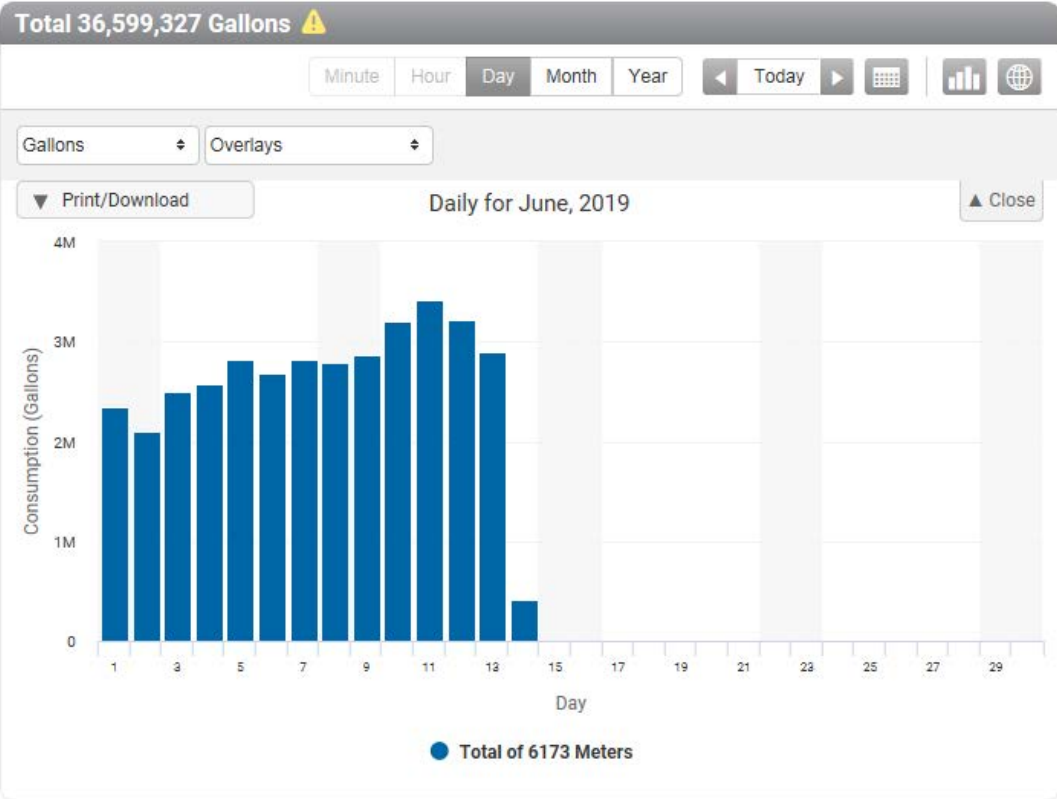
- ▶ Continuous Flow Expected
- ▶ Main Use
- ▶ Site

**Account** -

- ▶ Billing City
- ▶ Billing State
- ▶ Billing Zip
- ▶ Class Code
- ▶ EyeOnWater

**Location** -

- ▶ City
- ▶ Cycle
- ▶ Route
- ▶ State
- ▶ Zip





# Customer Cards

★

Add Note
Tags
Set Alert
More ▾
⊞

Mar 9-15

**13**

*Cubic Feet*

Mar 16-22

**70**

*Cubic Feet*

**Account ID**  
42238-01

**Account Name**  
SOLD

**Class Code**  
SINGLE

**Service Address**  
RYANS LANE, 226  
GRASS VALLEY, CA 95945

**Meter ID**  
17722988

**Cycle**  
4

**Route**  
469

📍 Location
⌚ Meter
📊 Reads
📶 Endpoint

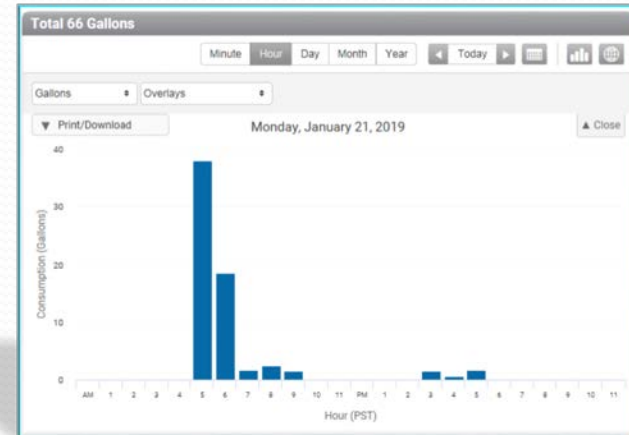
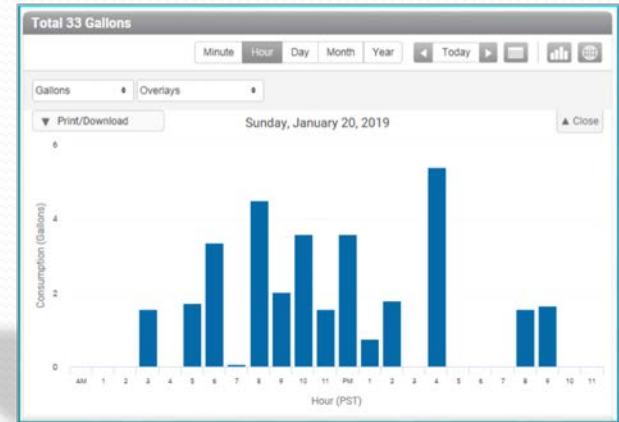
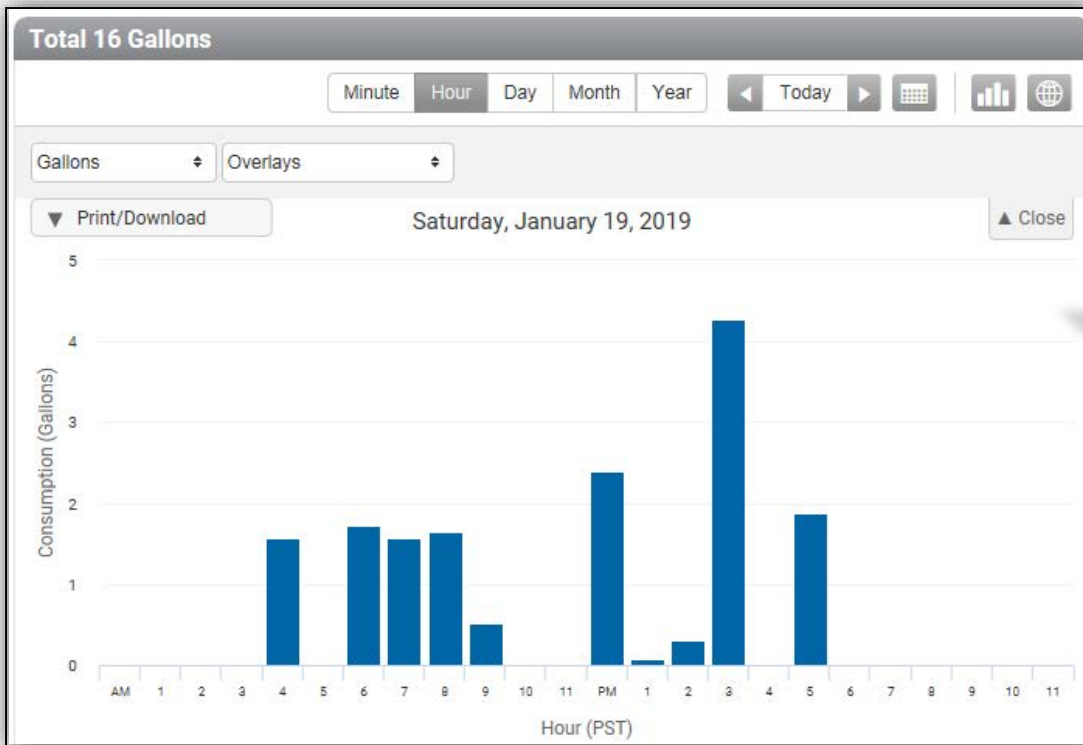
<b>Meter ID</b> 17722988	<b>Model</b> 25	<b>Meter Install Date</b> Sep 29, 2017 23:59 PDT	<b>Latitude</b> 39.22956
<b>Meter S/N</b> 17722988	<b>Make</b> BADGER	<b>Timezone</b> US/Pacific	<b>Longitude</b> -121.06918
	<b>Size</b> 5/8"		<b>Geocode Status</b> SERVICE POINT

<b>Register Size</b> 5/8"	<b>Unit</b> Cubic Feet	<b>Resolution</b> 0.001	<b>Number of Dials</b> 9
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<b>Billing Read &amp; Method</b> 3.3945 CCF Network	<b>Read Date</b> Mar 22, 2018 20:29 PDT 14 hours ago
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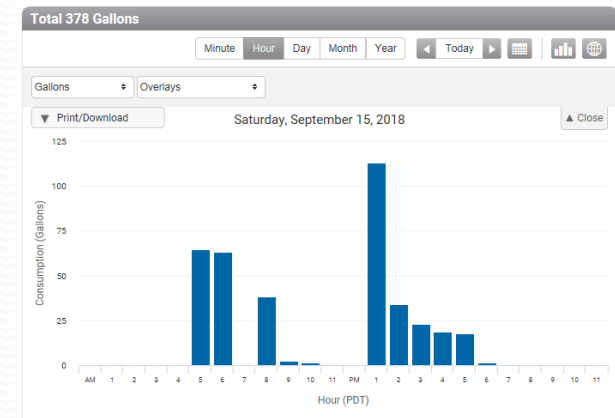
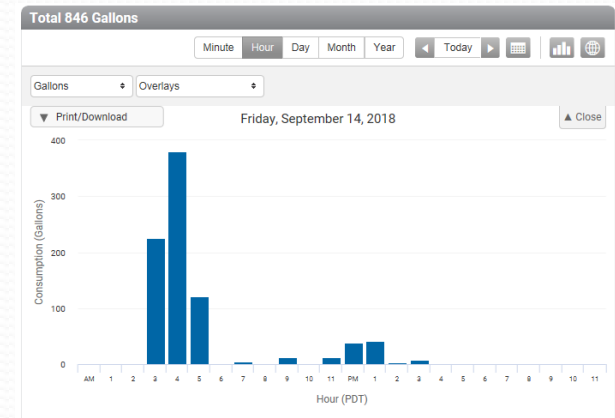
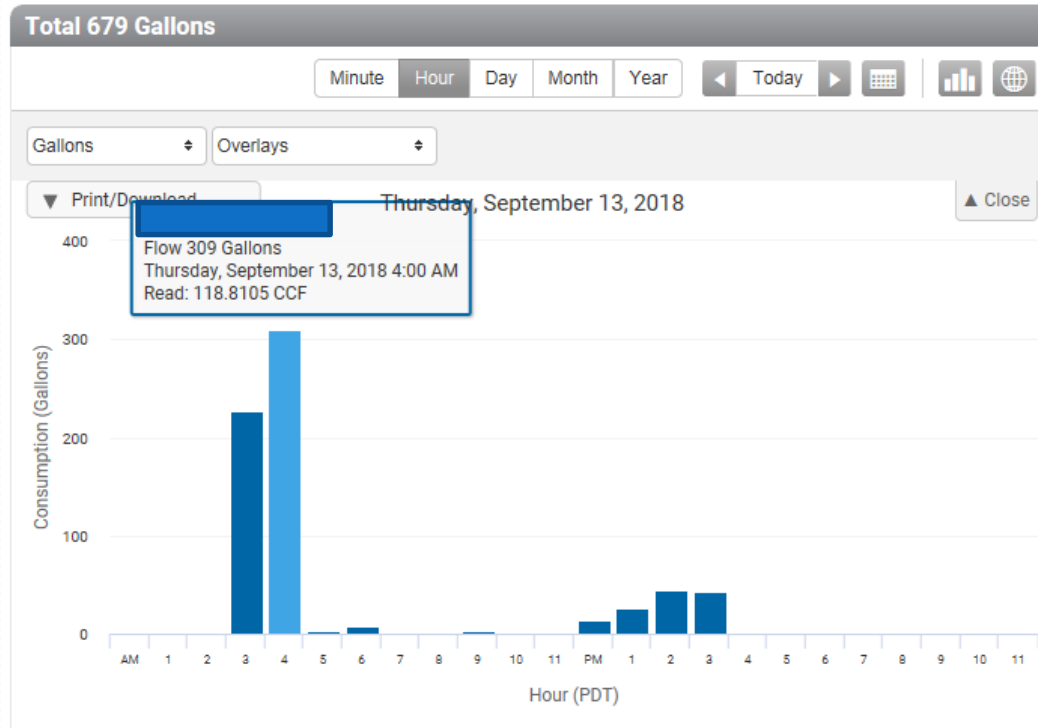
<b>Previous Comm.</b> Mar 22, 2018 20:35 PDT	<b>Endpoint S/N</b> 110031947	<b>Status</b> Active	<b>Firmware Version</b> 1.8.621
<b>Next Comm.</b> Mar 23, 2018 20:35 PDT	<b>Endpoint Install Date</b> Feb 28, 2018 23:59 PST	<b>Signal Strength</b> ( ( ( ✓ ) ) ) Good	<b>Battery</b> ( ✓ ) Good
<b>Register Interface</b> Encoder			

# Hour by Hour Water Use



An 1835 sq. ft. single family residence water use for  
January 19-21, 2019  
Average = 38 gallons per day

# I Used How Much Water?




The same single family residence water use for  
September 13-15, 2018  
Average = 634 gallons per day

# Identifying Customers with Leaks

**Leak Detected: 1.6 Gallons/hour (0.21 Cubic Feet/hour) beginning May 31, 2019 4:00 PDT**

★ Add Note Tags Set Alert More ▾ ⊖

	May 30-Jun 5 <b>13</b> CCF	Jun 6-12 <b>14</b> CCF	<b>Account ID</b> 11099-04	<b>Class Code</b> SINGLE	<b>Meter ID</b> 16998215
			<b>Account Name</b> <b>SOLD</b>	<b>Service Address</b> ORO VALLEY ROAD, 24950 AUBURN CA 95602	<b>Cycle</b> 3
			<b>Service Agreement</b> Start: Apr 25, 2019	<b>Route</b> 328	

📍 Location ⌚ Meter 📊 Reads 📡 Endpoint

<b>Billing Read &amp; Method</b> 677.6496 CCF Network	<b>Read Date</b> Jun 14, 2019 5:59 PDT 8 hours ago
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- 673 leaks detected on 06/18/2019
- Leaks ranged from 1 gallon per hour to 464 gallons per hour
- Leak report checked daily
  - Large leaks are dispatched immediately
  - Customers with smaller leaks receive a letter

# Notifying Customers of a Leak



## NEVADA IRRIGATION DISTRICT

1036 W. Main Street, Grass Valley, CA 95945-5424  
(530) 273-6185 ~ Fax: (530) 477-2646 ~ www.nidwater.com

June 11, 2019

Nevada Irrigation District  
1036 West Main Street  
Grass Valley, Ca 95945

Account: 36184-0  
Service Address: West Main Street, 1036

Dear Customer:

A recent report has been taken of our water meter, and we find that the meter has detected a continuous flow of water for more than a 24-hour period. This continuous flow may cause an increase in your monthly water consumption.

You may already be aware of the continuous flow, however, we are taking this means of notifying you in advance of the regular billing, so that you may determine any source through which water may be leaking and wasted, and thereby eliminate any additional loss.

Continuous Flow Rate: 5.09 gallons/hour  
Read Date: 6/11/2019 1:44:00 AM  
Current Read: 56.0453CCF

Enclosed you will find information about reading your water meter and how to determine if there is a leak at the property. If you have completed the steps and still have questions, please contact Customer Service at 530-273-6185.

Sincerely,

Nevada Irrigation District

SERVING PORTIONS OF NEVADA, PLACER & YUBA COUNTIES



## How to Detect a Water Leak

### • Check meter for running water

**Sensus Meters:** Look for red dial spinning– indicating water flowing through meter

**Badger Meters:** Numbers on the right hand side will be moving– indicating water flowing through meter

### • Verify leak with a timed meter test

**Step 1:** Locate meter and write down all numbers showing

**Step 2:** Don't use water for 30-60 minutes

*(Including swimming pools, ice-cube maker, landscape irrigation, etc.)*

**Step 3:** Verify the numbers on the meter are the same

**\*\*If the numbers are different, water ran through the meter during that time and you likely have a leak.**

### • Isolating leak

**Step 1:** Locate the shut off valve at the home and turn it off.

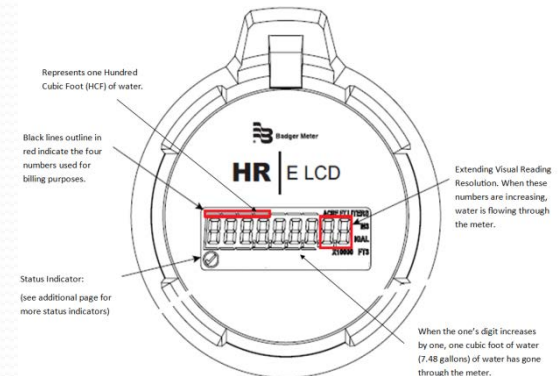
**Step 2:** Look at meter. If water is still flowing through the meter, the leak is located in the pipes between the meter and the shut off valve to the home.

**\*\*If the meter is not moving the leak is beyond that shut off valve.**

**Questions? Call NID**

**530-273-6185**

**nidwater.com**



### Status Indicators:

Status Indicator	Icon	Status Description	HR-E LCD Display
Meter functioning Correctly		Register/encoder is operating correctly.	Continuous display on register/encoder as long as no other status indicators are triggered
Suspected Leak		Register/encoder detects 24 hours without one 15-minute interval of no flow.	The alarm clears automatically when a 15-minute no-flow interval occurs.

### Rate of Flow:

The rate of flow screen is in Gallons per minute. The displayed rate will be based on the average flow rate for the prior minute (since the last time the flow rate was displayed). This screen displays for 5 seconds.

If, there are numbers showing on this screen, and you were NOT running water. Water flowed through the meter when you were not using it.





# Summary of Fees and Charges

- Endpoints communicate via the cellular network. This data exchange requires that the District purchase service units.
- Each endpoint uses 1 service unit per month.
- The average cost per service units is \$0.86.
- Once the District has converted all meters, the annual cost for data exchange is estimated to be \$205,000.



# Thank You

