



Redwood City, Sensus & AMI

Worldwide demand for energy and water is increasing while costs are rising



**By 2030, the world's population will increase by 1 billion,
consuming 40% more energy and 53% more water**



**The increased demand is
deteriorating our utility
infrastructures, requiring
\$35 trillion in upgrades by 2030**

An aerial night photograph of Dubai, United Arab Emirates. The image captures the city's iconic skyline, with the Burj Khalifa standing prominently in the upper center. The city is illuminated with warm yellow and orange lights, reflecting off the water in the canals. In the foreground, a large, curved canal is brightly lit with green lights, creating a vibrant contrast with the surrounding urban landscape. The architecture is a mix of modern skyscrapers and older, more traditional buildings, all densely packed together. The overall scene conveys a sense of a thriving, modern metropolis.

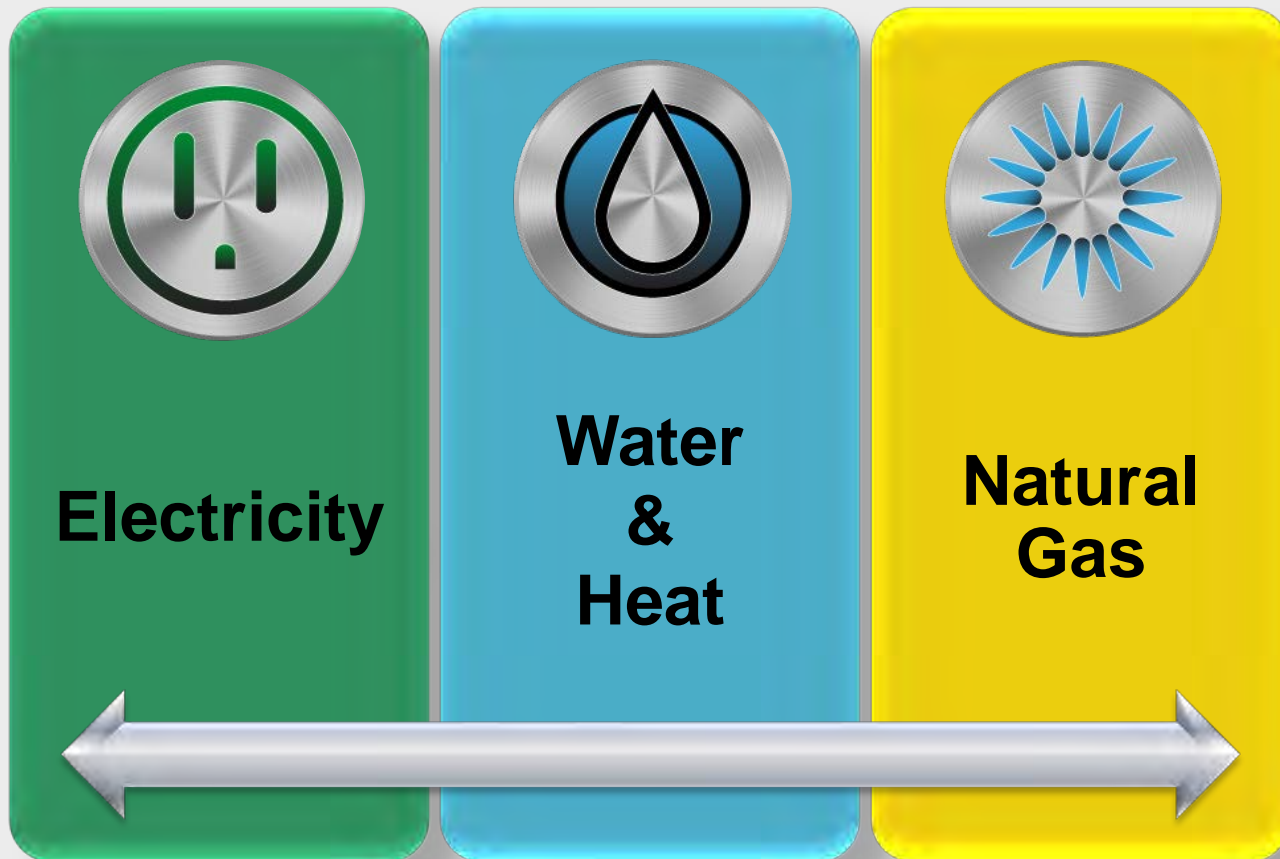
The Time To Act Is Now

COMPANY OVERVIEW



Proven Technology

For global electric, gas and water utility infrastructures that enable intelligent use, measurement and conservation of critical energy and water resources



Sensus by the Numbers

12M

SmartPoints™
deployed in NA

3,600

EMPLOYEES
on 5 continents

\$46M

R&D Investment

341

AMI Water
Systems

10,000

CUSTOMERS
on 5 continents

What We Offer

- Smart Grid Communications Networks
- Smart Meters
- Advanced Metrology
- Distribution Automation
- Demand Response
- Home Area Networks
- Smart Lighting
- Managed Services
- Software

Sensus Technology Offerings

Water and Heat Meters

Residential and commercial meters to measure, and monitor water, air conditioning and radiated heat. Includes sub-metering for multi-unit housing and commercial buildings.



Electricity Smart Meters

iCON® A residential and iCON APX commercial meters used with FlexNet™ two-way smart grid communications network.



Gas Meters

Mechanical meters (Cubix, R275) and advanced ultrasonic (Sonix) meters. Can include smart points for two-way communication and remote shut off.



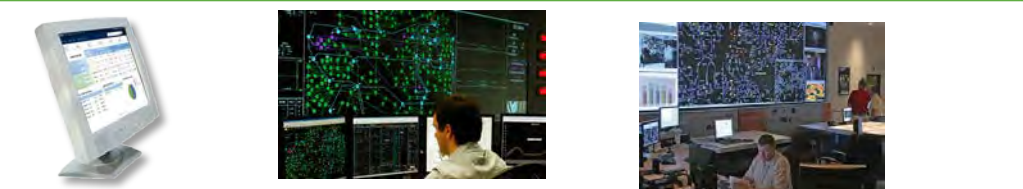
Distribution Automation

Devices and software applications that provide communications and control of utility distribution operations and equipment.

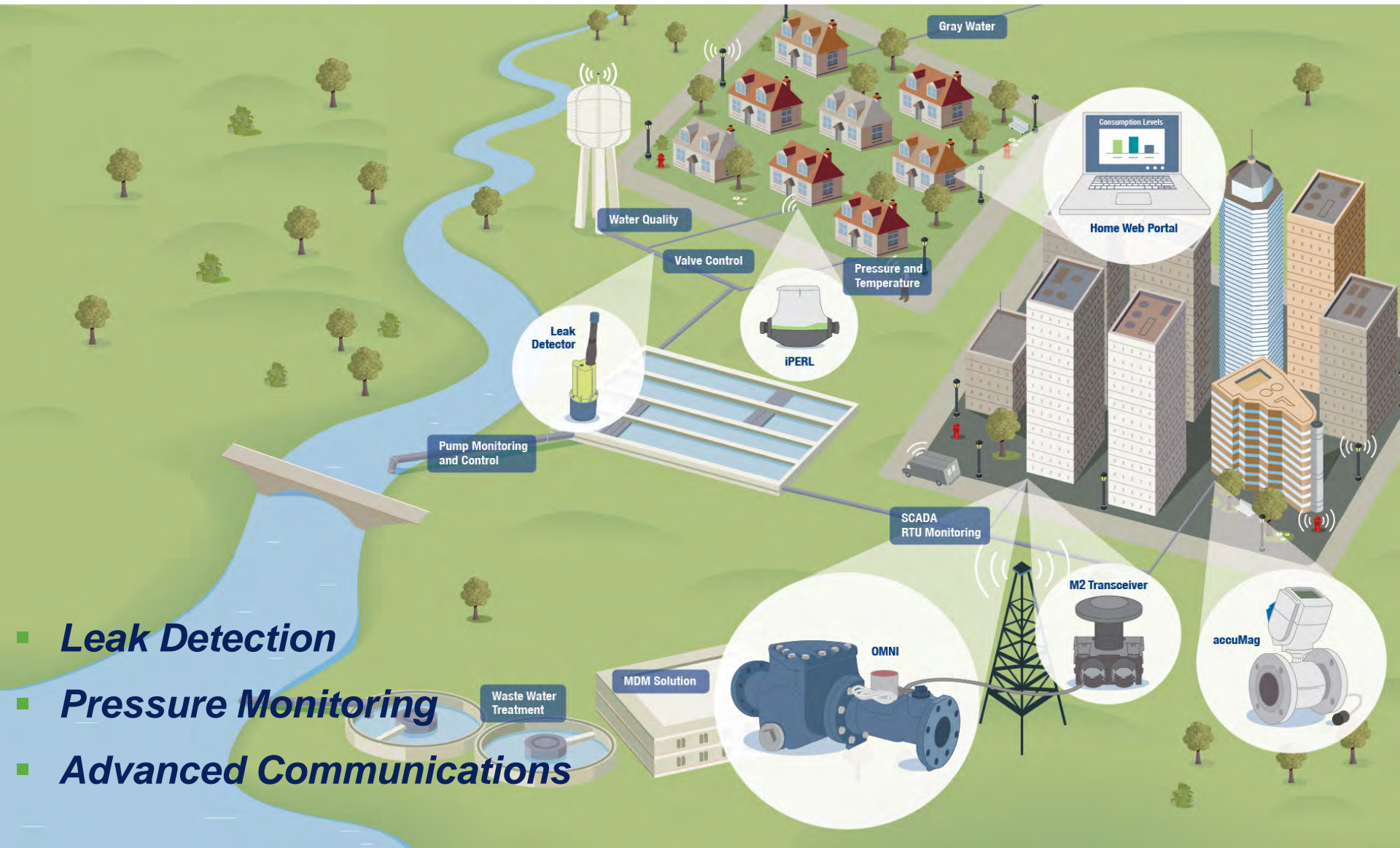


Software & Services

Managed services and application software to increase network productivity, lower operating costs and reduce risk



Sensus Smart Water Technology



- **Leak Detection**

- **Pressure Monitoring**

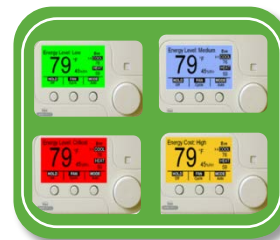
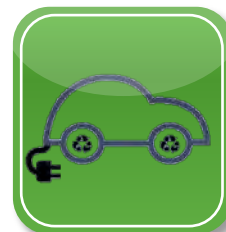
- **Advanced Communications**

Smart Grid Communications Network

FlexNet



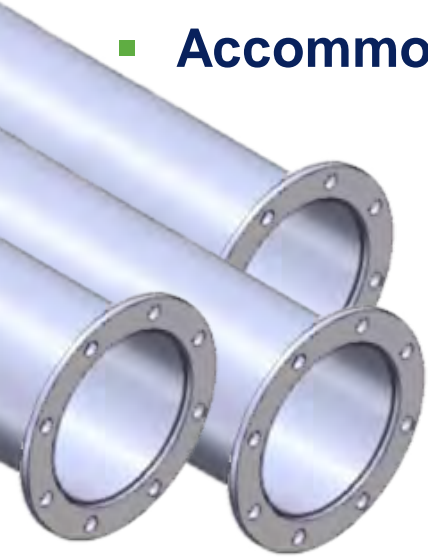
- Tower or pole-based utility communication system
- Licensed, primary-use radio spectrum
- Electric, water and gas utilities
- Enables multiple “smart grid” applications
 - Distribution Automation
 - Smart Metering & Data Acquisition
 - Demand Response
 - Home Area Networks
 - Lighting Control
 - Pre-Pay
 - Leak Detection
 - Each over a separate, dedicated channel



FlexNet Communications - Transceiver

Field Demonstrated

- Add/Change Spectrum on Same Infrastructure
- Dedicate Spectrum to Applications
- Dedicate Sub-Channels to Applications
- Upgrade Collector Rack Mount Hardware
- Accommodate Future Apps and Protocols



FlexNet 520M2 Transmitter



- 20 Year Battery Warranty
- True Two-Way Communications
- Top of Hour Readings
- Transmits at Two Watts of Power
- Primary Use Licensed Band
- User Configurable Alarms
- Hourly Readings 6 times per day
- Change Endpoint Settings Remotely
- Update Firmware Remotely
- Dual Port Unit Available

Integrated Alarms

- Leak Detection
- Reverse Flow Detection
- Broken Pipe Detection



RNI - Meter Data Management

SENSUS
The Measure of the Future

Reports Diagnostics Tools MDM Administration

MDM > Billing Routes > List > **Town Gas Only > Meters**

Route Type: Reader Read/Locations: 0/317 Status: Device Loaded
Error: <none>

Meters

Filter: All Search: <none> Find 317 Total Record(s) Options: <none>

Records to Return 20 (R) << first (H) < prev 12345678910 next > H last >> H

Import Sequence	Account ID	Service Address	Meter ID	SmartPoint ID
1	543	160 W 200 S	LEV00329	1229089
2	544	400 E 200 S	LEV00330	1229053
3	551	212 S 200 E	LEV00294	517589
4	556	214 So 400 E #8	LEV00333	1306646
5	287	214 So 400 E #3	LEV00091	511105
6	557	275 E 300 S	LEV00208	516844
7	503	175 E Center	LEV00309	517626
8	101	151 S Main (corral)	LEV00324	1229055
9	260	253 S 200 W	LEV00095	510474
10	530	189 E 300 N	LEV00322	1229069
11	534	70 W 350 S	LEV00323	1229120
12	11	444 E 300 S	LEV00117	516981
13	341	465 East 300 South	LEV00119	516964
14	296	479 E 300 S	LEV00118	517078
15	205	495 E 300 S	LEV00106	517047
16	297	494 E 300 S	LEV00108	517098
17	349	484 E 300 So	LEV00120	517068
18	202	630 E 300 S	LEV00111	517093
19	298	310 S 550 E	LEV00112	517087
20	167	330 S 550 E	LEV00109	517055

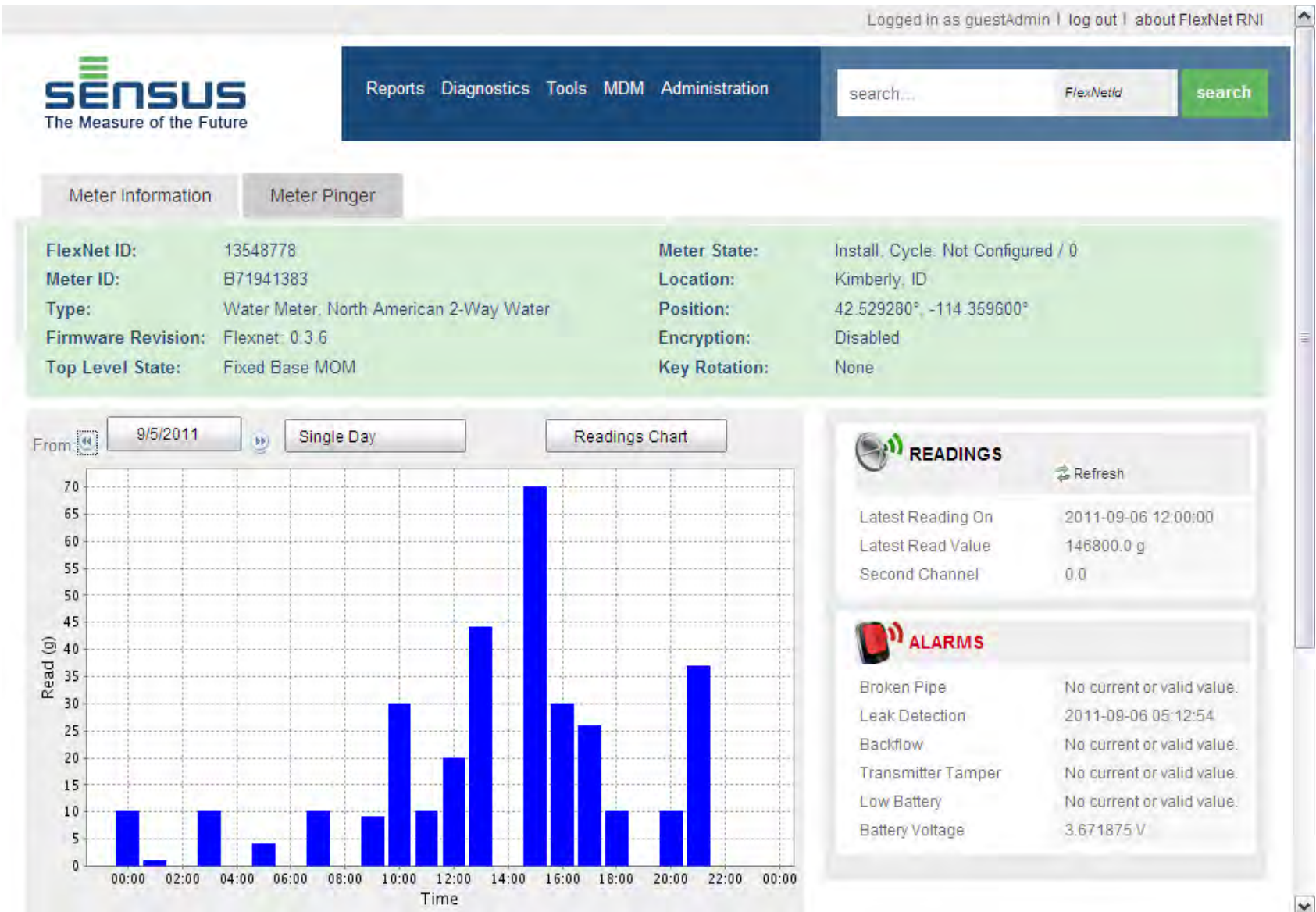
Records to Return 20 (R) << first (H) < prev 12345678910 next > H last >> H

The interface to utility operations

- Generates reports
- Interfaces with utility billing system
- Customize information for maximum efficiency



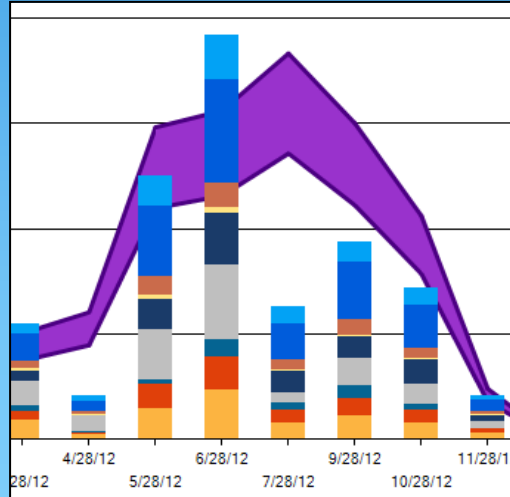
Individual Meter Information



Data Management Partnership

- **Our utility customer owns the data at all times**
 - This includes when we or our partners provide Software as a Service
- **We assess and validate our partners through a structured process**
 - Requirements driven
 - Secure
 - Scalable
 - Stable
- **Open standards driven integration**
 - RNI – MultiSpeak for transactions (on demand reads)
 - RNI - CMEP files (California Meter Exchange format) – flat file exchanges of data
 - RNI – Database Views

Redwood City Automated Meter Infrastructure

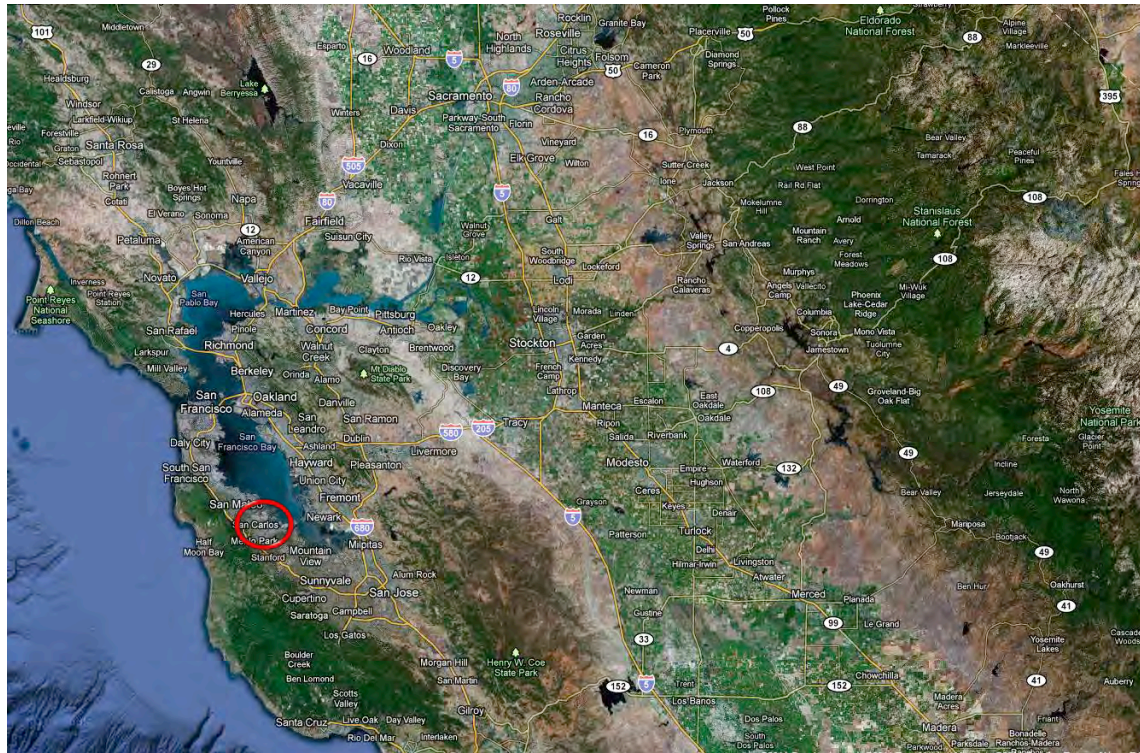


My WATER



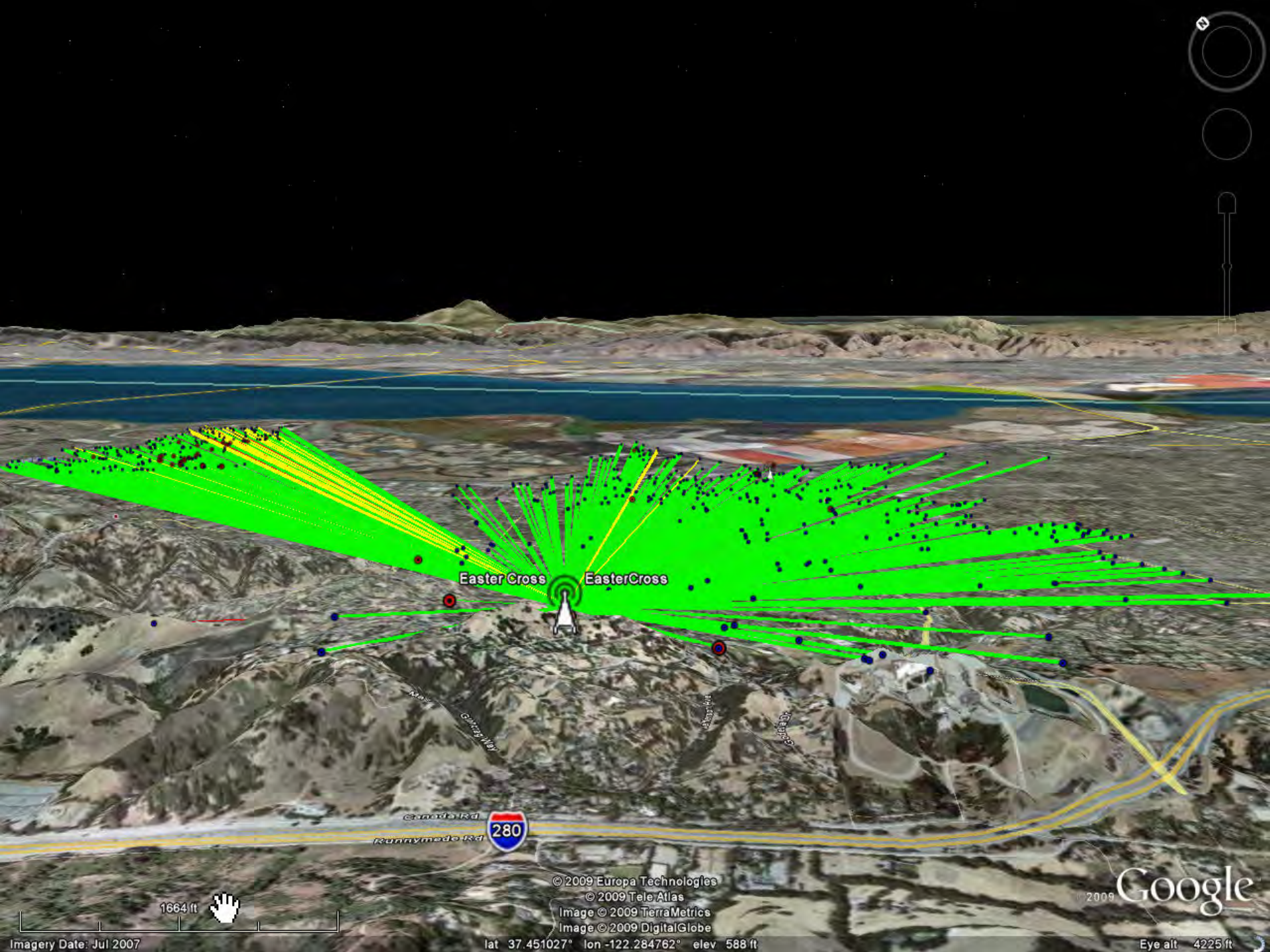
Redwood City

- Service Area Population 86,000
- 24,000 water service connections



AMI in Redwood City

- Started 2008 in preparation for budget based rates
- 650 dedicated irrigation accounts fully implemented
- 168 Recycled Water accounts
- AMI for all new and replaced meters
- 5000 residential, commercial, and other
- 18,000 manual meters not yet converted
- 3 – TGBs (data collectors)



Easter Cross

EasterCross



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Image © 2009 DigitalGlobe

2009 Google

lat 37.451027° lon -122.284762° elev 588 ft

Eye alt 4225 ft

1664 ft



Imagery Date: Jul 2007



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Data SIO, NOAA, U.S. Navy, NGA, GEBCO

Data U.S. Navy

lat 37.527479° lon -122.264259° elev 6 ft

© 2009 Google

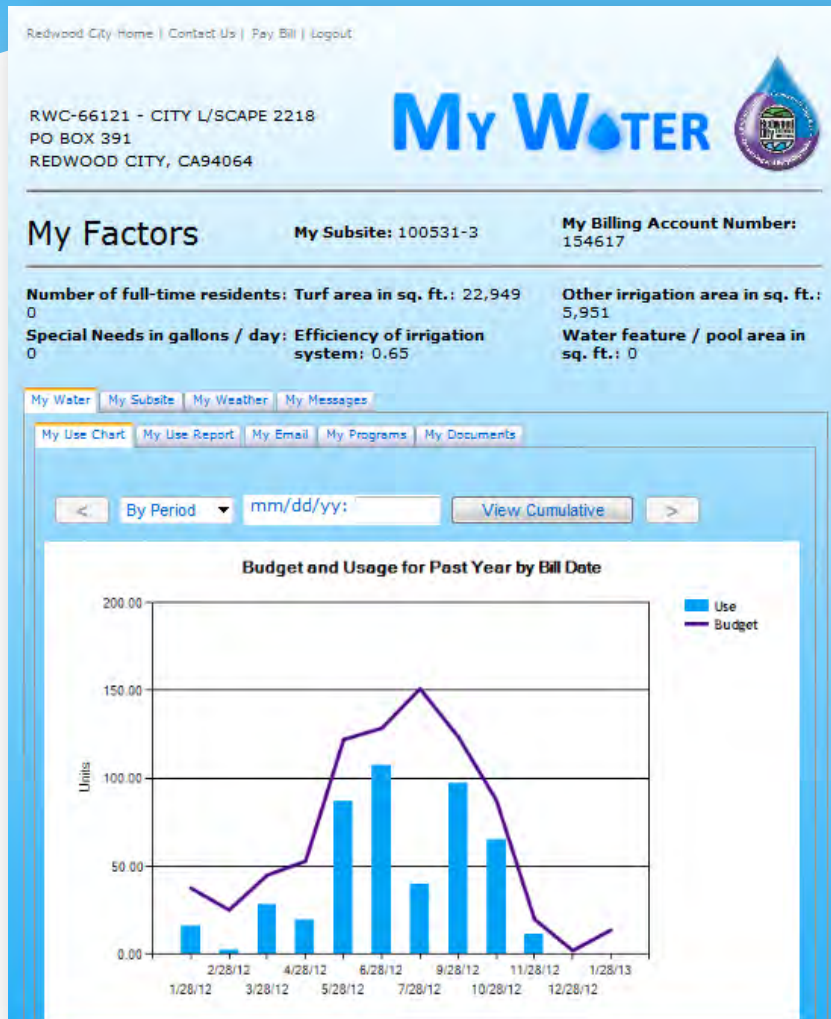
Farallon Dr

Eye alt 1077 ft

Imagery Dates: Jun 2007 - Jul 2007



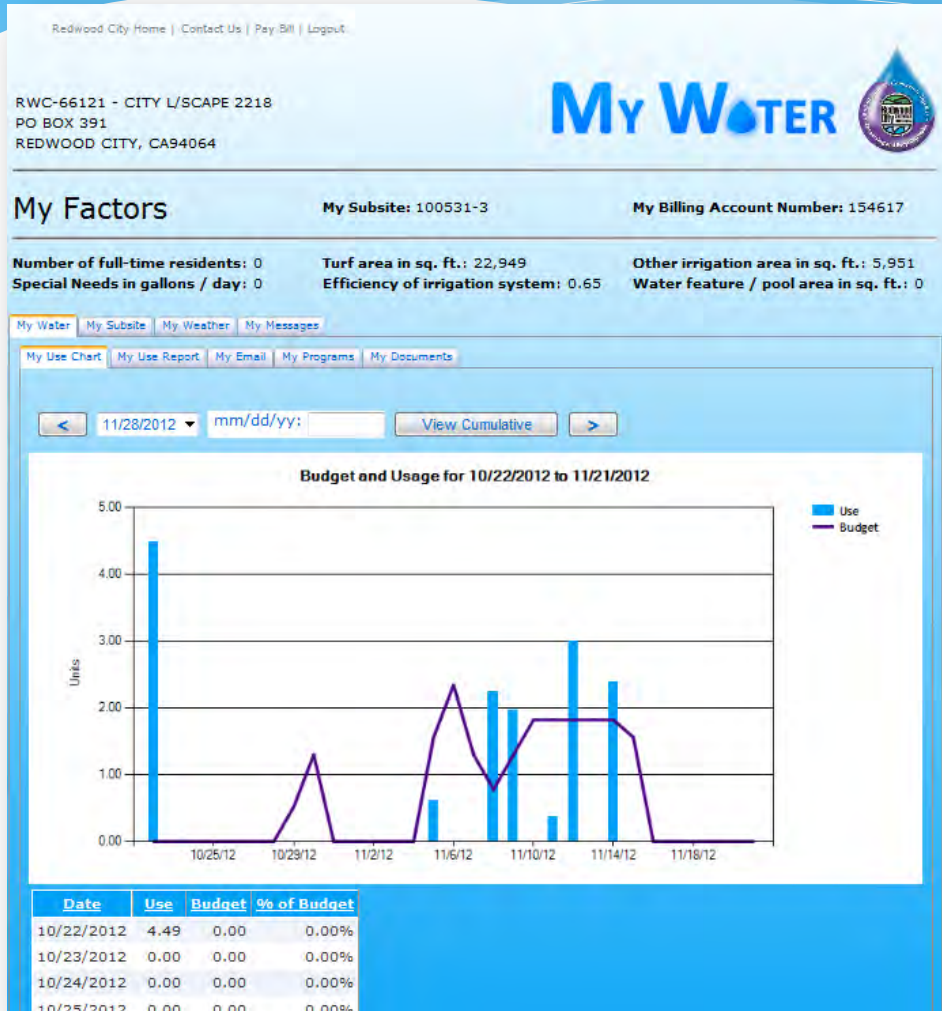
Customer Portal



- Quick view of Past Year
 - Water consumption
 - Water budget
 - Percentage of over/under use
- Automated Email Notices
 - Leak Alerts
 - Over Budget notices
 - Water Use Report



View by Period

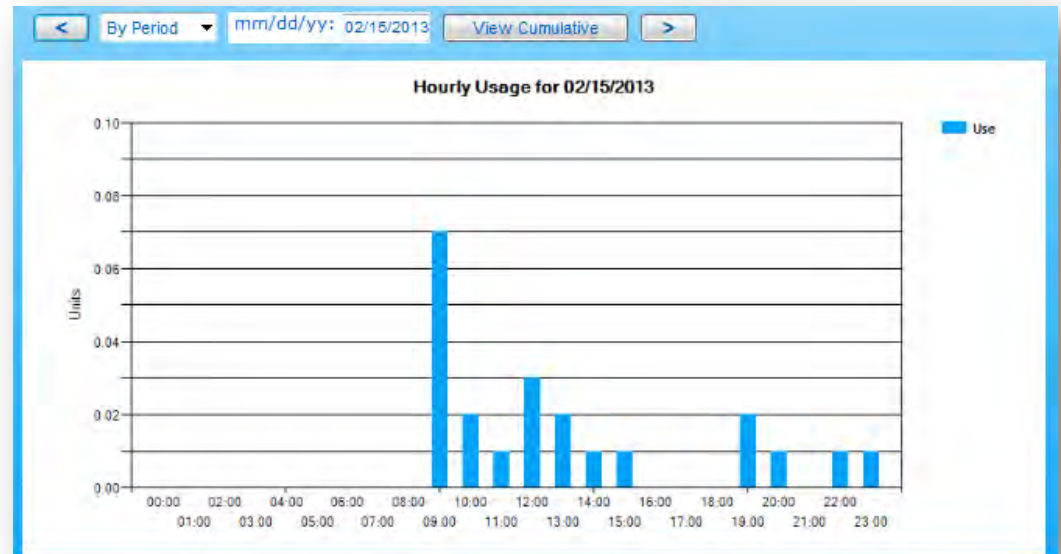


- Consumption & Budget totals by day for billing period.
- Cumulative or Daily Totals

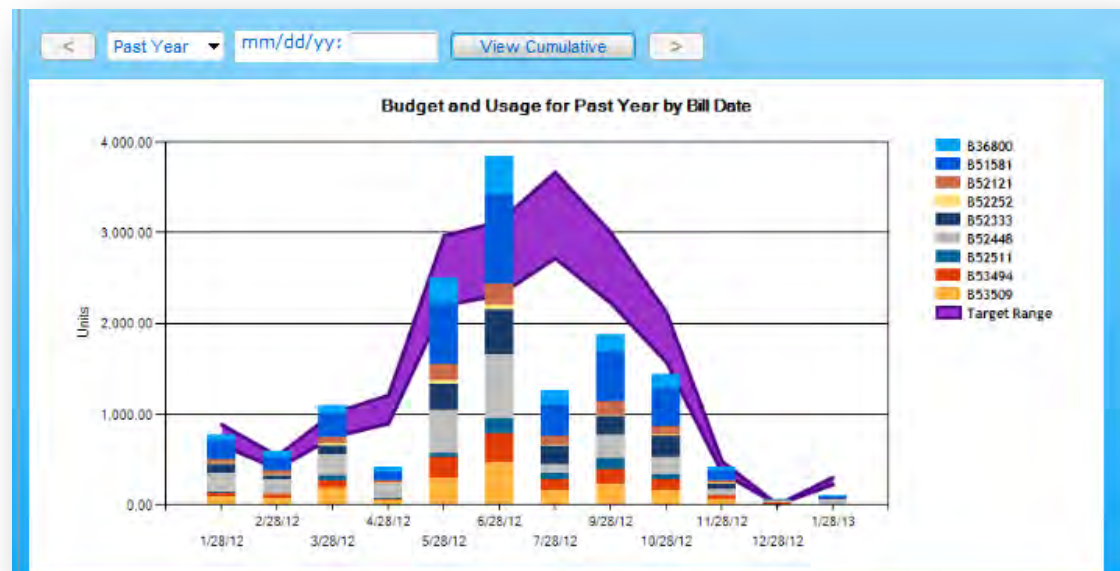


View by Hour

- * Irrigation schedules
- * Time of use
 - * Restrictions
 - * Troubleshooting
- * Constant use (leak)
- * Broken Pipe



- * Target Range 100% to 125%
 - * encourage adequate irrigation for poor soil conditions to leach salts
- * Flat rate for all use



Notifications to Staff

- * Alerts Currently in Use

- * Leak Alert Summary
- * Closed Accounts with Consumption
- * Accounts with Negative Consumption

- * Planned Alerts

- * Broken Pipe Detection
- * Meter Tamper Alarms
- * Battery Alarms

Notifications to Customers

- * Notifications Currently in Use
 - * Leak Alert (daily while leak persists)
 - * Usage Alert (daily if over budget)
 - * Usage Report (every two weeks)
 - * Administrator Notifications (as needed)
- * Future Notifications
 - * Broken Pipe
 - * User configurable usage/budget alert

Questions/Contact

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