

# **Surfside Water Use Efficiency Goals 2008 – 2014**

## **2014 Progress Report**

**Goal #1:** Reduce water usage on an ERU basis by an average of one percent per year over the long-term 20-year planning horizon.

ERU is an acronym for “Equivalent Residential Units”. An ERU is a unit of measure used to equate non-residential or multi-family residential water usage to a specific number of single-family residences.

For example, if a system has sufficient physical capacity to serve 100 ERU’s, then that system would have sufficient capability to meet the projected needs of 100 full-time single-family residences. That same system would also be able to serve any combination of commercial, industrial, and residential customers provided the quantity of water used is equivalent to the projected needs of 100 full-time single-family homes (100 ERU’s).

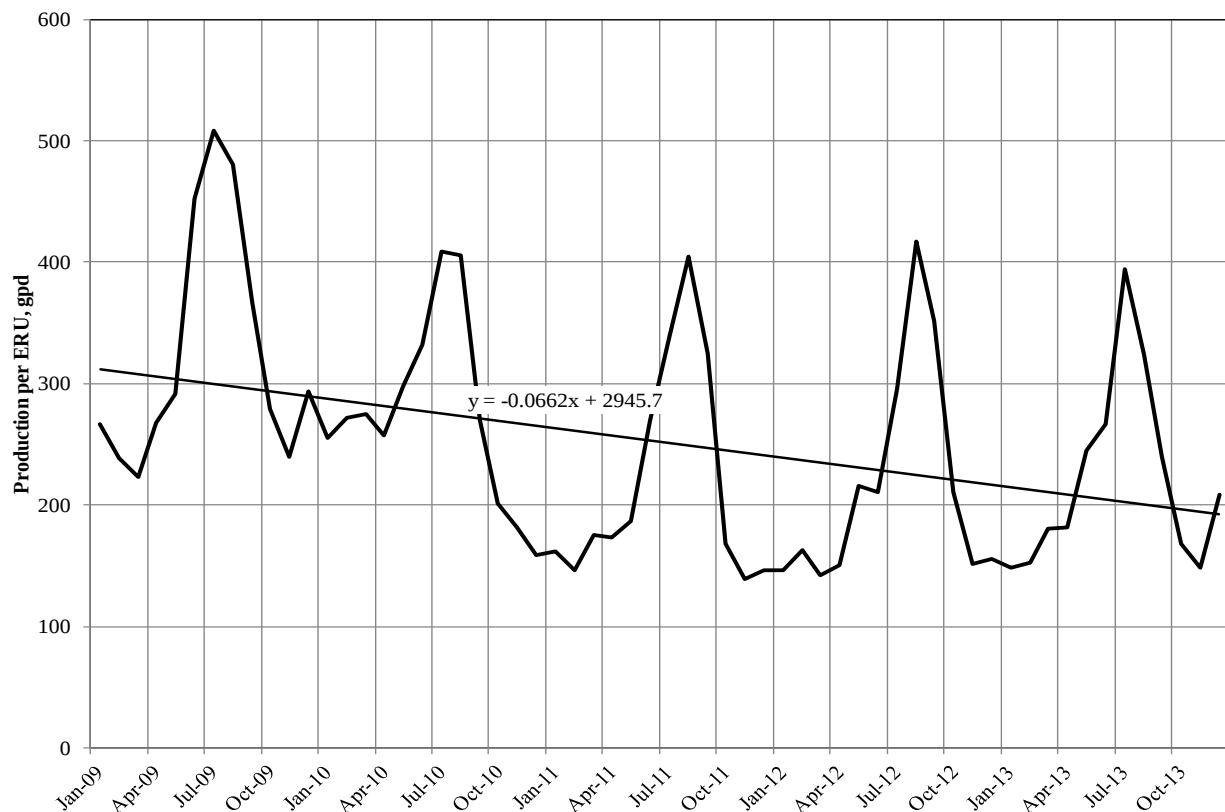
Most small rural water systems consist primarily of single-family residential types. In the aggregate, these residential customers have a fairly typical overall demand pattern. Non-residential, or multi-family (apartment, condominiums, etc.) customers may have significantly different patterns of demand. These customers are designated by comparing them to the average single-family residential unit. Non-residential customer water use can then be expressed in terms of the number of full-time single-family residences that would create a similar demand for water service. This non-residential component is then considered as “equivalent residential units” (ERU’s).

It is important to realize that the quantity of water associated with an ERU is system specific. The ERU level for one system may not apply to another system with differing demographics or water use patterns. Moreover, an ERU “level of service” for any specific system may in itself

change with time (may not be the same from year to year) as water use patterns in a particular water system change for various reasons (demographics, conservation activities, etc.).

This is significant because lowering the quantity of water represented by an ERU means that the utility will be able to meet the growing demands on its system for a longer period of time before expensive capital improvements and upgrades are necessary thereby saving money for the utility and its members.

Has Surfside been meeting its goal of reducing its water use by an average of 1% per year on an ERU basis?



The above chart shows water use patterns for 2009 through 2013. The trend line formula in the above water use chart indicates a trend line slope of -0.0662 gpd per ERU per day. That is to say, after one day the average reduction in usage rate was 0.0662 gpd per ERU, after two days it was 0.1324

gpd per ERU, after three days it was 0.1986 gpd per ERU, and so on. Over the data period this is a decline in water use rate of 121 gpd per ERU. Since the average water use rate reduction per ERU changed over time as did the number of ERUs, the savings on a day to day basis was calculated using a spreadsheet calculator and totaled. The total of water savings over the five-year period calculates to 103.8 million gallons. This is an average savings of 56,831 gallons per day over the data period.

Although overall water savings for the five year period is significant, until the water system is 100% metered it is difficult to quantify how much of that savings is due to increased water conservation efforts on the part of Surfside members compared to improved distribution system leakage.

It is significant to note that Surfside added 43 new connections from January 2009 to December 2013. Therefore, total residential demand increased during that period of time while total water use decreased. It is reasonable to conclude the water savings is the result of 1) increased water use awareness due to the Water Meter Installation Project that started in 2012; and 2) reduced distribution system leakage due to the Water Main Replacement project and a concerted effort to repair water main leaks.

**Goal #2** Establish a program to monitor lost and unaccounted-for water.

It is not possible to accurately measure "lost or unaccounted-for water" (the use of these terms has been discontinued by the Department of Health in favor of "distribution system leakage") until the water system is 100% metered. It is possible to estimate distribution system leakage. The method is described in Goal #3.

**Goal #3** Reduce annual average lost and unaccounted-for water to no more than five percent over the long-term 20 year planning horizon.

Although it is impossible to quantify distribution system leakage until the water system is 100% metered, it is possible to estimate distribution system leakage. The following formula is used:

Whereas: TP= Total Water Pumped from J-Wellfield  
AU= Total Authorized Water Use (by water department)  
RM= Total Residential Metered Water  
CM= Total Commercial Metered Water  
MR= Total Metered Residential Members  
UR= Total Unmetered Residential Members  
EL= Total Estimated Distribution System Leakage

$$EL = TP - (AU + RM + CM) - (RM \div MR) \times UR$$

Example:

Total Water Pumped from Wellfield is 850,000 Gallons (TP)

Total Authorized Use is 25,500 Gallons (AU)

Total Residential Metered Use is 350,000 Gallons (RM)

Total Commercial Metered Use is 95,000 Gallons (CM)

Total Metered Residential Members is 1,100 Members (MR)

Total Unmetered Residential Members is 950 Members (UR)

$$850,000 - 470,500(25,500+350,000+95,000) = 379,500$$

$$379,500 - 302,273 (350,000 \div 1,100) \times 950 =$$

77,227 Gal. Distribution System Leakage (DSL)

DSL equals 9% of Total Water Pumped.

Using this method of calculating DSL Surfside is consistently below 5% DSL for 2014. The Program to monitor DSL will only become more accurate as the system comes closer to 100% metered.

**END OF REPORT**

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