

DOCKETED

Docket Number:	17-AAER-08
Project Title:	Sprinkler Spray Bodies
TN #:	218947
Document Title:	Edward R. Osann Comments Water Pressure Reported by Urban Retail Water Suppliers
Description:	N/A
Filer:	System
Organization:	Edward R. Osann
Submitter Role:	Public
Submission Date:	6/15/2017 8:08:24 PM
Docketed Date:	6/16/2017

Comment Received From: Edward R. Osann

Submitted On: 6/15/2017

Docket Number: 17-AAER-08

Water Pressure Reported by Urban Retail Water Suppliers

Please accept for the record the attached memorandum documenting the reported water pressure of urban water suppliers in California.

Additional submitted attachment is included below.

MEMO: System Water Pressure – California

April 14, 2017

Susan Lee, NRDC

Data

The data used to calculate Utility System Water Pressure in California was obtained from the consulting firm Water Systems Optimization (WSO), which was contracted by California Department of Water Resources (DWR) to compile the data. The data was compiled from water loss audits that were included in the California urban water management plans for the first time in 2016. These water loss audits were not validated.

This data set is highly relevant to a forthcoming rulemaking by the California Energy Commission on pressure regulating sprinkler bodies, since system water pressure for California utilities can be extracted. The higher the system pressure, the greater the water savings that will result from sprinkler bodies that hold supply pressure constant at a low level.

Method

To utilize the WSO 2015 Audit Master Sheet for our purposes, the data was filtered to limit the dataset to retail water providers and to avoid anomalies. The following steps were taken to filter out the utilities with anomalies out of the 326 entries:

1. Removed all water suppliers that are noted as “wholesaler” (Column E).
 - a. 22 utilities were listed as a wholesaler.
 - b. 3 utilities were not listed as a wholesaler in the database but were wholesalers.
Removed Central Basin Municipal Water District, San Gabriel Valley Municipal Water District, and San Luis Obispo County Flood Control & Water Conservation District, Zone 3
2. Removed all water suppliers that have no value (i.e., an empty cell) for Average Operating Pressure (Column BD).
 - a. 7 utilities had no values.
3. Removed all water suppliers that have no value (i.e., an empty cell) for Population (Column N).
 - a. 4 utilities had no values.
4. Removed and/or reconcile duplicate or multiple entries.
 - a. Reconciled multiple entries
 - Tuolumne Utilities District: Removed multiple entries except the entry with the highest water supplied value since Average Operating Pressure was the same in all entries
 - City of Shafter: Removed multiple entries except the entry with the highest water supplied value since Average Operating Pressure was the same in all entries.
 - b. Removed duplicate entries: City of Santa Rosa, Crescenta Valley Water District, and City of Dinuba
5. Other Adjustments to resolve apparent anomalies:
 - a. Bakman Water Company’s Population was changed to 16,797 (UWMP 2015)
 - b. City of Santa Clara’s Population was changed to 120,973 (UWMP 2015), and Average Operating Pressure was changed to 68 psi (audit report posted by DWR)
 - c. Eastern Municipal Water District’s Population was changed to 546,146 (UWMP 2015)

- d. San Gabriel County Water District's Population was changed to 39,238 (UWMP 2015)

After the review and adjustments to the spreadsheet, 281 retail water utilities remained for analysis.

Using the adjusted WSO 2015 Audit Master Sheet, we calculated the average of all system operating pressure values and the population weighted average of all system operating pressure values. The population weighted system operating pressure will allow us to present a more realistic average of system pressure for the state as a whole rather than averaging the pressure reported by individual utilities, large and small. The average of all system operating pressure values and the population weighted average of all system operating pressure values were calculated for utilities serving populations under 50,000, utilities serving populations over 50,000, and for all 281 utilities together.

Equation for average of all system operating pressure value:

$$Avg = \frac{x_1+x_2+\dots+x_n}{n}, \text{ where } x \text{ is system operating pressure and } n \text{ is number of utilities.}$$

Excel equation: =AVERAGE([Average Operating Pressure 1], [Average Operating Pressure 2], ..., [Average Operating Pressure n])

i.e.

$$=AVERAGE(WSO_2015_Audit_Master_Sheet!BC2:BC136)$$

Equation for population weighted average of all system operating pressure value:

$$Weighted\ Avg = \frac{x_1p_1+x_2p_2+\dots+x_np_n}{p_1+p_2+\dots+p_n}, \text{ where } x \text{ is system operating pressure, } p \text{ is population, and } n \text{ is number of utilities.}$$

Excel equation: =SUMPRODUCT([Average Operating Pressure 1], [Average Operating Pressure 2], ..., [Average Operating Pressure n]), ([Population 1], [Population 2], ..., [Population n])/SUM([Average Operating Pressure 1], [Average Operating Pressure 2], ..., [Average Operating Pressure n])

i.e.

$$=SUMPRODUCT(WSO_2015_Audit_Master_Sheet!BC2:BC136,WSO_2015_Audit_Master_Sheet!M2:M136)/SUM(WSO_2015_Audit_Master_Sheet!M2:M136)$$

Results

The database includes 281 retail water service areas with a combined 2015 estimated population of 30.9 million. This covers utilities serving about 90% of all utility customers in California. The lowest average system pressure reported by any utility was 45 psi and the highest reported average system pressure was 200 psi. We found that the average operating pressure reported by all 281 utilities was 74.4 psi. However, the population-weighted average pressure for all utilities is higher, 77.5 psi.

Utility System Water Pressure in California

California Utilities	Number of Utility Audits	Population of Utility Service Area	Average of All System Operating Pressure Values (psi)	Population Weighted Average of All System Operating Pressure Values (psi)
Utilities serving populations under 50,000	135	3,288,164	73.2	73.4
Utilities serving populations over 50,000	146	27,612,205	75.6	78.0
All Utilities	281	30,900,369	74.4	77.5

Notes:

Population estimate (2015) for California: 38.99 million (US Census)

Estimated population (2010) served by public water systems: 34.8 million (USGS)