



MADDAUS WATER MANAGEMENT INC.

July 8, 2013

Mr. Jerry Gruber
Cambria Community Services District
1316 Tamsen Street, Suite 201
Cambria, CA 93428

Subject: Letter Report for “Updated Retrofit Equivalency Tables and Requirements for New Projects”

Dear Mr. Gruber:

Maddaus Water Management is pleased to submit our final report relating the planned update to Section 4.20.040 in the Cambria Community Service District Municipal Code. Per your request, MWM has retained the existing overall methodology and provided an update to the values in the tables used to define the basis for fixture retrofit points into and determine the retrofit points out of the “Points Bank.”

This letter report explains the methodology and provides the updates requested for use in the future code update. We are available to answer any questions or add further clarifying explanations you may deem useful to expand on the level of detail in the report as needed.

Very Truly Yours,

Lisa Maddaus, P.E.

Project Manager

Enclosure

1. Introduction

Cambria Community Services District (CCSD) recently adopted a Water Use Efficiency Plan (February 2013). One principal task for the implementation of the Plan is to complete an update of existing CCSD Municipal Code to align the Plan with water savings goals and to specifically update the Chapter 4.20 associated with requirements for new water connections. To accomplish this task, Maddaus Water Management (MWM) was contracted to provide the revised tables currently presented in Chapter 4.20.040 that relate to the existing procedures for retrofit points.

2. Background on Prior Procedures

CCSD has in Municipal Code Chapter 4.20, a retrofit points system which originally came into existence in 1997. The system functions where conservation is achieved by some approved CCSD intervention (e.g., high flush volume with a lower flush, or higher efficiency, toilet documented as replaced or a rebate provided) using the approved list and using estimated water savings. The equivalent water savings for the intervention is then tracked in a “points bank.” When a new application is submitted for water a new connection, its demand offset is equated to conservation points that are either (a) acquired through documented retrofits at an existing CCSD water customer or (b) if sufficient points are available within the points bank, then demand offset points may be purchased through payment of an “in-lieu points fee.” One point is defined to be a unit of water savings or use expressed as 1.47 gallons per day (gpd), or 0.0016 acre-feet per year (af/y). The points fee was \$50 per point. In the future, the point fee is planned to be established by the CCSD based on an approved conservation program budget.

This system has had ongoing activity to accumulate points, however due to the moratorium on new connections placed in 2001, there have been no “new” connections other than projects that were in process when the moratorium occurred (pipeline projects), a limited number of grandfathered connections, and exempted affordable housing projects. Applicants for new water connections were placed on one of three Wait Lists: Residential; Commercial, and Affordable Housing. Since the local coastal program (LCP) was amended for Cambria (and as shown in the current 2008 LCP edition), the projected water demand from every new water connection is required to be offset by water conservation. CCSD staff administers the LCP demand offset requirement through the issuance of demand offset letters on each individual project that delineate where the conservation points occurred within its water service area. Debits from the points bank are made by CCSD staff as each demand offset letter is developed for a new water connection. Based on the ability to provide demand offsets using the most efficient water use criteria documented in the CCSD’s adopted Water Use Efficiency Plan (i.e., active conservation retrofits or replacement with new fixtures meeting current higher efficiency plumbing code standards), there is a currently approved CCSD resolution 09-2013 that establishes CCSD’s intent to move forward with interim intent to serve letters for new connections from the existing CCSD wait lists. Such new connections from an existing CCSD wait list would abide with the demand offset requirement of the LCP.

3. Need for Updates

The update for Chapter 4.20.040, does not change procedures, there is only an update to the following:

- Water savings values for current technologies
- Adding new fixtures eligible for retrofit points
- Revised usage values for new homes based on an analysis of existing home usage in the CCSD service area

The basis for the water savings estimates was the same as used in the Decision Support System Least Cost Planning Model developed for CCSD as part of the Water Use Efficiency Plan.

4. Revised Fixture Retrofit Points Table

The pre-retrofit and post-retrofit values were determined from the single family (SF) and multifamily (MF) home billing water demand using average gallons per day per account (i.e., household in the single family case) use between 2006-2008 (Water Use Efficiency Plan, Table 4-2). Indoor use estimates for each type of fixture used in the DSS Model are based on minimum winter indoor use per account. The Model is an “end use model” that further breaks down indoor home use by percent of indoor use by type of fixtures based on detailed end use studies. Two principal studies references are the California Single Family Home Water Use Efficiency Study (California Department of Water Resources, 2011) and the Residential End Uses of Water Study (American Water Works Association, 1999). Additionally, the assumed people per household is based on the 1990 and 2000 United States Census data at CCSD staff direction, given the 2010 US Census represented depressed economic conditions in the CCSD service area.

The table values are based on the following references used to determine the residential fixture flow rates shown in Table 1 from historically higher fixture flow rates (to be reported when application or documented when an incentive from CCSD is provided) to currently best available technology natural replacements as of January 2013:

- 2010 California Green Building Codes: <http://www.bsc.ca.gov/home/calgreen.aspx>
- Plumbing code standards in California Code of Regulations Title 20 Appliance Efficiency Standards: <http://www.energy.ca.gov/appliances/>
- USEPA WaterSense labeling program performance standards: www.epa.gov/watersense
- CCSD’s Ordinance 06-2012 that updated certain water efficiency criteria.

Due to the variable nature of water use at commercial facilities, the pre- and post-retrofit water savings estimates necessitate careful review by Cambria CSD staff and depending on the project may require inspections. As a result, all commercial retrofit projects may be eligible for retrofit points that will be handled on a case by case basis where a special study report is required to establish savings values and document approved retrofit points prior to actual replacement and verified after installation prior to points being confirmed as included in the points bank.

The following Table 1 presents the updated Fixture Retrofit Points Table to be adopted by CCSD in the future.

Table 1. Eligible Water Conservation Measures and Associated Water Savings

Water Savings Associated With Various Conservation Measures									
Conservation Measure	Pre-retrofit usage (gallons per use)	Post-retrofit usage (gallons per use)	Water savings (gallons per use)	Uses per person per day	Number of users	Savings per day per account (gal)**	Savings per year per account (gal)	Savings per year per account (AFY)	Equivalent points***
SF Showerhead replacement (ME to HE)	18.3	13.9	4.4	0.71	2.21	6.90	2520	0.008	4.70
SF Showerhead replacement (LE to HE)	23.5	13.9	9.6	0.71	2.21	15.06	5498	0.017	10.25
MF Showerhead replacement (ME to HE)	18.3	13.9	4.4	0.64	2.7	7.60	2775	0.009	5.17
MF Showerhead replacement (LE to HE)	23.5	13.9	9.6	0.64	2.7	16.59	6055	0.019	11.28
SF Toilet replacement (3.5 to 1.28)	4	1.3	2.7	5.05	2.21	30.13	10999	0.034	20.50
SF Toilet replacement (3.5 to 0.8)	4	0.8	3.2	5.05	2.21	35.71	13035	0.040	24.29
SF Toilet replacement (1.6 to 1.28)	1.8	1.3	0.5	5.05	2.21	5.58	2037	0.006	3.80
SF Toilet replacement (1.6 to 0.8)	1.8	0.8	1	5.05	2.21	11.16	4074	0.013	7.59
MF Toilet replacement (3.5 to 1.28)	4	1.3	2.7	5.05	2.21	30.13	10999	0.034	20.50
MF Toilet replacement (3.5 to 0.8)	4	0.8	3.2	5.05	2.21	35.71	13035	0.040	24.29
MF Toilet replacement (1.6 to 1.28)	1.8	1.3	0.5	5.05	2.21	5.58	2037	0.006	3.80
MF Toilet replacement (1.6 to 0.8)	1.8	0.8	1	5.05	2.21	11.16	4074	0.013	7.59
Commercial Toilet replacement (3.5 to 1.28)	4	1.3	2.7	varies	varies	varies	varies	varies	varies
Commercial Toilet replacement (3.5 to 0.8)	4	0.8	3.2	varies	varies	varies	varies	varies	varies
Commercial Toilet replacement (1.6 to 1.28)	1.8	1.3	0.5	varies	varies	varies	varies	varies	varies
Commercial Toilet replacement (1.6 to 0.8)	1.8	0.8	1	varies	varies	varies	varies	varies	varies
SF Clotheswasher replacement (ME to HE)	36	19	17	varies	varies	varies	varies	varies	varies
SF Clotheswasher replacement (LE to HE)	43	19	24	0.36	2.21	19.09	6969	0.021	12.99
MF Clotheswasher replacement (ME to HE)	36	19	17	0.3	2.7	13.77	5026	0.015	9.37
MF Clotheswasher replacement (LE to HE)	43	19	24	0.3	2.7	19.44	7096	0.022	13.22
Urinal replacement (ME to HE)	1	0.5	0.5	varies	varies	varies	varies	varies	varies
Urinal replacement (LE to HE)	3	0.5	2.5	varies	varies	varies	varies	varies	varies
Hot Water Recirculator*	48	37.92	10.08	---	---	10.08	3679	0.011	6.86
Cisterns/Greywater Permit**	varies	varies	varies	---	---	varies	varies	varies	varies
Commercial Irrigation Upgrades**	varies	varies	varies	---	---	varies	varies	varies	varies
MF Irrigation Upgrades**	varies	varies	varies	---	---	varies	varies	varies	varies
AMR (leak account detection)**	varies	varies	varies	---	---	varies	varies	varies	varies
Large Meter Replacement**	varies	varies	varies	---	---	varies	varies	varies	varies

*Water use and savings on a "per day" basis, not per use basis units in gallons per day (gpd) per account. Units also converted to acre-feet per year (AFY) estimated savings for re

**Water savings to be estimated based on difference between existing use with original fixtures and new use with new fixtures.

For uses that are a measured on a volume basis, old/new volume = flow rate (gpm) times duration of use per day (minutes) = vol in gal/day; Savings = old minus new volume. Example would be flow rates and duration for irrigation upgrades.

For uses that are based on a per use estimate then savings = (old - new use vol per use) times number of uses per day. Example would be commercial toilets.

***Water savings for projects totaling more than 500 points savings to be measured on a "per day" basis using meter readings or means of quantification (i.e., datalogging) before and after retrofit

It is assumed that the devices in Table 1 above will be reviewed and updated on a regular, presumably annual basis by CCSD staff and adopted by Board Resolution as new technologies replace existing and as savings estimates are refined over time.

5. Revised Points Required for New Projects Table

To determine an updated basis for water use by different types of lot size, MWM performed an analysis of historical water use and information on lot size, number of bathrooms and bedrooms from the San Luis Obispo County Tax Assessor's Database (May 2012).

The following steps were taken to analyze past water use and determine updated point values:

- Acquisition and processing of County of San Luis Obispo provided parcel data and CCSD water billing data for individual parcels into a database providing monthly water use and parcel and building characteristics.
- Prepared preliminary correlations between bi-monthly water use per account and associated data for:
 - o Parcel size, square feet
 - o Number of bathrooms
 - o number of bedrooms
- Prepared of histograms to characterize relations number of occurrences (accounts) by the average gallons per account per day by types of homes, given the highest correlations were found between water use and parcel size and number of bathrooms. Figure 1 illustrates an example for median and 90th percentile for 3-bath homes with lot sizes between 4,001 and 6,000 square feet.

Figure 1. Example of Correlations of the Historical Water Use by Lot Size

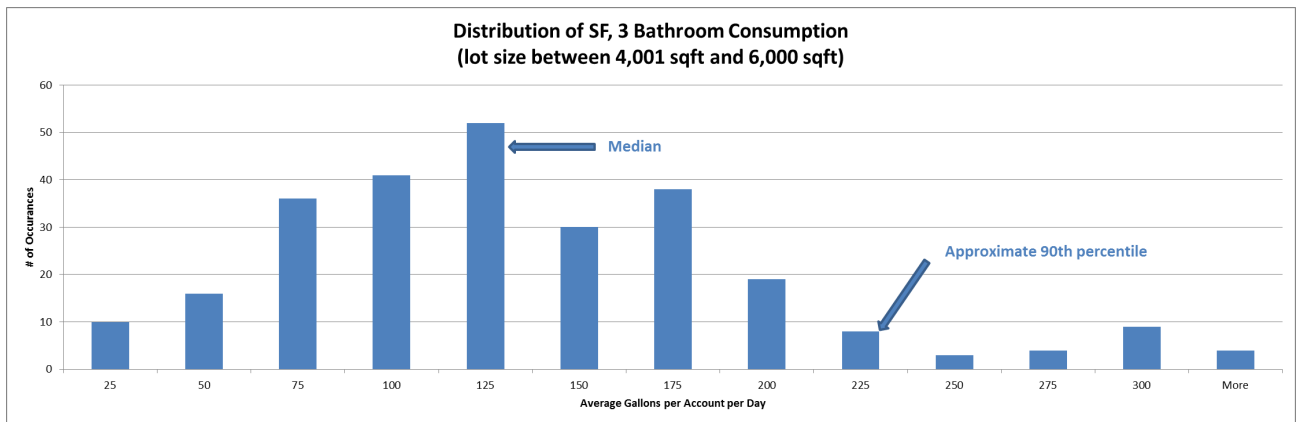


Table 2 presents the updated Development of Retrofit Points Table by each lot size category.

Points required to build increase with larger lot sizes and more bathrooms. Points are based on the 90th percentile for the respective category as illustrated in Figure 1. These point values may be updated by CCSD staff review and adopted Board Resolution. It is assumed that 1-bath single family residential projects will be required to be mitigated the points at the level of a 2-bath project. Additionally projects with more than 4 baths will be handled on a case by case basis where an additional number of points will be determined based on the type and efficiency level of fixtures being installed. Multi-family dwelling common wall condominium units are required to meet the points for the 2-bath single family residential, less than 4,000 square foot project on a per unit basis. Therefore, total project points for multi-family projects will be determined based on a summation of the types of common wall condominium units being installed for the project. All commercial projects will be determined based on a budget for future estimated water usage using the same factor of 1.47 gallons per day, or 0.0016 af/y per point basis.

Table 2. Points Required to Build New Project

Points Required to Build New Project			
Parcel Size	Number of Baths		
	1-2 Bath	3 Bath	4 + Bath
Sq. ft.			
<4000	120 pts	120 pts	120 pts
4,001-6000	120 pts	135 pts	135 pts
6,001-8000	135 pts	155 pts	190 pts
8,001-10000	170 pts	170 pts	205 pts
>10,000	190 pts	190 pts	230 pts
Each common-wall condominium, or attached multi-family unit		120 points*	
Commercial (per EDU)		TBD**	
* Based on average single family home in CCSD service area			
**TBD = To be determined values indicates requires a special study based on development plans			

6. In-Lieu Points Fees

Historically, points were assigned a value of \$50 per point. In the future, MWM recommends that the point in-lieu fee be supported by the cost to CCSD to maintain the conservation program. It is further suggested that this fee be updated on a regular basis along with other District fees and charges schedules and be adopted as part of Board Resolution with the Master Fee Schedule.

7. Recommendations

MWM makes the following recommendations:

- New connections should pay the full cost of developing the retrofit points needed based on the 90th percentile occurrence level.
- The points fee will be updated as needed by CCSD Master Fee Schedule adopted on an as needed basis.
- CCSD will continue to use the procedure and update annually fixtures and point values on a periodic basis, may be annually.
- Track and compile retrofits and new connections and water saved and used and develop a data base for future updates.
- Handle applications on new commercial accounts on a case by case basis and where appropriate process data from existing like accounts to develop refined estimates on points needed for new accounts.
- Track money spent to implement conservation plan and water savings achieved and use data to periodically update the cost of a retrofit point.