



*Bringing
Water
Together*

Water Use Efficiency Work Group

Bi-Monthly Meeting

August 18, 2021

10:00 AM – 12:00 PM

www.acwa.com

Meeting Agenda

August 18, 2021 ● 10:00 AM – 12:00 PM

- A. Chair Welcome** — Elizabeth Lovsted
- B. Drought Update** — Chelsea Haines
- C. Urban Water Use Efficiency Updates** — Elizabeth Lovsted
 - A. Water Loss Performance Standards - Amy Talbot
 - B. Indoor Standard - Amy McNulty
 - C. Commercial, Industrial and Institutional Standards — Chelsea Haines
 - D. Variance and Bonus — Nicholas Schneider
 - E. Outdoor Water Budget Development & Implementation - Fiona Sanchez
- D. AWWA Updates** — Sue Mosberg

Drought Update

Chelsea Haines

Governor Order - N-10-21

- Call for Californians to achieve voluntary 15 percent reduction in water use
- Sept. 21

Other Considerations

- 50 Counties
- UWMP/ WSCP Due
- Curtailments

<https://www.acwa.com/member-agency-drought-information/>

HOME / OUR WORK / CLIMATE RESILIENCE

DROUGHT

APR 21, 2021

California has experienced many periods of drought and weather extremes, which due to climate change, are occurring more frequently. Governor Newsom expanded his Drought Proclamation for the second time July 8, 2021 to include Inyo, Marin, Mono, Monterey, San Luis Obispo, San Mateo, Santa Barbara, Santa Clara and Santa Cruz counties. There are now a total of 50 counties under a targeted State of Emergency due to drought. As conditions within the state shift, more counties may be added to the proclamation. In addition, Newsom released an Executive Order asking Californians to voluntarily reduce their water use by 15% from their 2020 levels.



In May, Newsom also announced his [\\$5.1 billion budget proposal](#) to bolster the state's drought and water resilience, including investments in water infrastructure and \$1 billion in federal Rescue Plan Act funds to help Californians pay their water bill debt due to the financial impacts of COVID-19.

Water and wastewater agencies continue to prepare by utilizing lessons learned from the 2012-'16 drought. ACWA member agencies continue to support local investments in water supply resilience and continue to make water efficiency a California way of life so the state is always prepared for these climactic extremes. [Learn more about how member agencies are responding here.](#)

[LEARN HOW MEMBER AGENCIES ARE RESPONDING](#)

2021 Updates



Water Use Efficiency



Member Agency Efforts



Toolkits



Resources



NEWSROOM

All News

News Releases

Member Innovation

Member Submitted News

Voices on Water

Newsletters

Water News



SUBMIT YOUR WATER RESILIENCE STORY

Share what your agency has been doing to prepare for dry periods.

SUBMIT

Urban Water Use Efficiency Updates

Elizabeth Lovsted

Component	Timing	Lead Agency
Permanent monthly reporting	Since Oct. 1, 2020	SWRCB
Water loss standards	End of 2020 2021	SWRCB
Recommendation on indoor standards	January 2021 June 2021	DWR
Residential irrigable land measurements	January 2021 Final - August 2021	DWR
Recommendation on WUE standards*	October 2021	DWR
UWMP/WSCP updates	July 2021	DWR
Adoption of WUE standards*	July 2022	SWRCB
Annual water shortage assessment	June 2022	DWR

*WUE standards include:

- Outdoor residential use standard
- Standard for CII outdoor landscape area with dedicated irrigation meters
- Performance measures for CII water use
- Appropriate variances
- Guidelines and methodologies for calculating urban water use objectives

Urban Water Use Efficiency Updates

Indoor Standard

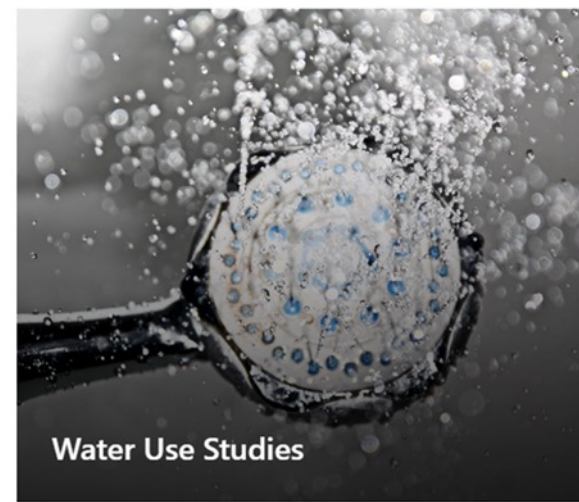
- July 19 – DWR Workshop
- Focused on meeting standard
- **Final Report in August**

Outdoor Standard

- June 30 – Standards and Methodology Workgroup Meeting
 - Proposed ET adjustment factor of 0.7
 - Irrigable not irrigated (INI) used as buffer (20% of INI)
- **Next workshop: August 25, 2021**

CII Performance Measures

- Classification Categories
- Threshold for dividing meters
- Best Practices



Urban Water Use Efficiency Updates

Variance & Bonus

- Horses and Livestock
- Dust Control
- Seasonal Population
- Sustaining Wildlife
- Fire/Emergency
- High TDS Recycled Water
- Potable Reuse Incentive
- Evaporative Coolers

Threshold and
calculation options
proposed

Water Loss Performance Standards

- Fall? – Formal Rulemaking with 45-day public comment period

Water Supply and Demand Assessment

- Draft guidance document
- August? - Workshop

Urban Water Use Efficiency Updates



ACWA Working Groups:

Bi-Monthly WUE – Third Wednesday every other month from 10:00 am – noon

Indoor – Mondays from 2:00 – 3:00 PM

Outdoor – Tuesdays from 2:00 – 3:00 PM

CII – Every other Wednesday from 3:00 – 4:00 PM

Variance & Bonus – TBD

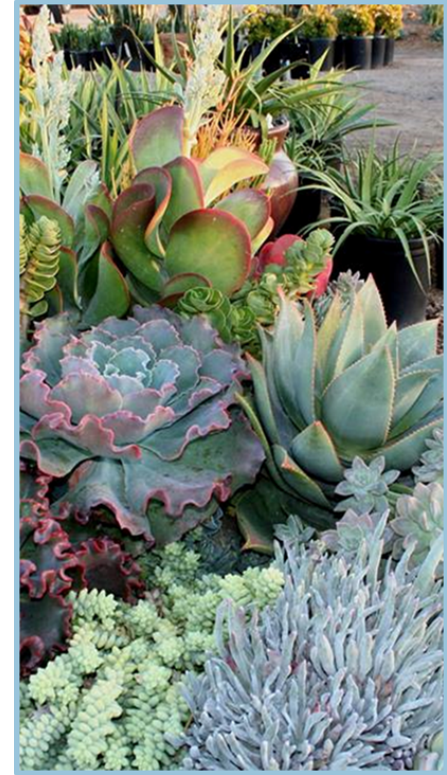
Water loss – As needed

* To be added to a subcommittee, please contact chelseah@acwa.com

Water Use Efficiency Updates

Promoting Efficiency

- Proactive approach
 - Develop white papers/letters with recommendations
- Technical staff meetings
 - Present proposals and recommendations
- Bi-weekly meetings with DWR management



Urban Water Use Efficiency

ACWA Work Group Advocacy

Indoor Standard

- Additional study required before state agencies should make a recommendation
- Stakeholder engagement

Outdoor Standard

- Evapotranspiration adjustment that reflects efficiency
- Inclusion of irrigable area
- Technical assistance before enforcement



Urban Water Use Efficiency

ACWA Work Group Advocacy

CII Performance Measures

- Classification categories start with CII
- Focus on new development for dedicated meter (no threshold for existing)
- Flexibility in implementation best practices

Bonus Credit

- “Water in equals water out” accounting

Variances

- Reasonable calculations and applicability
- Account for cumulative impact

Water Supply and Demand Assessment

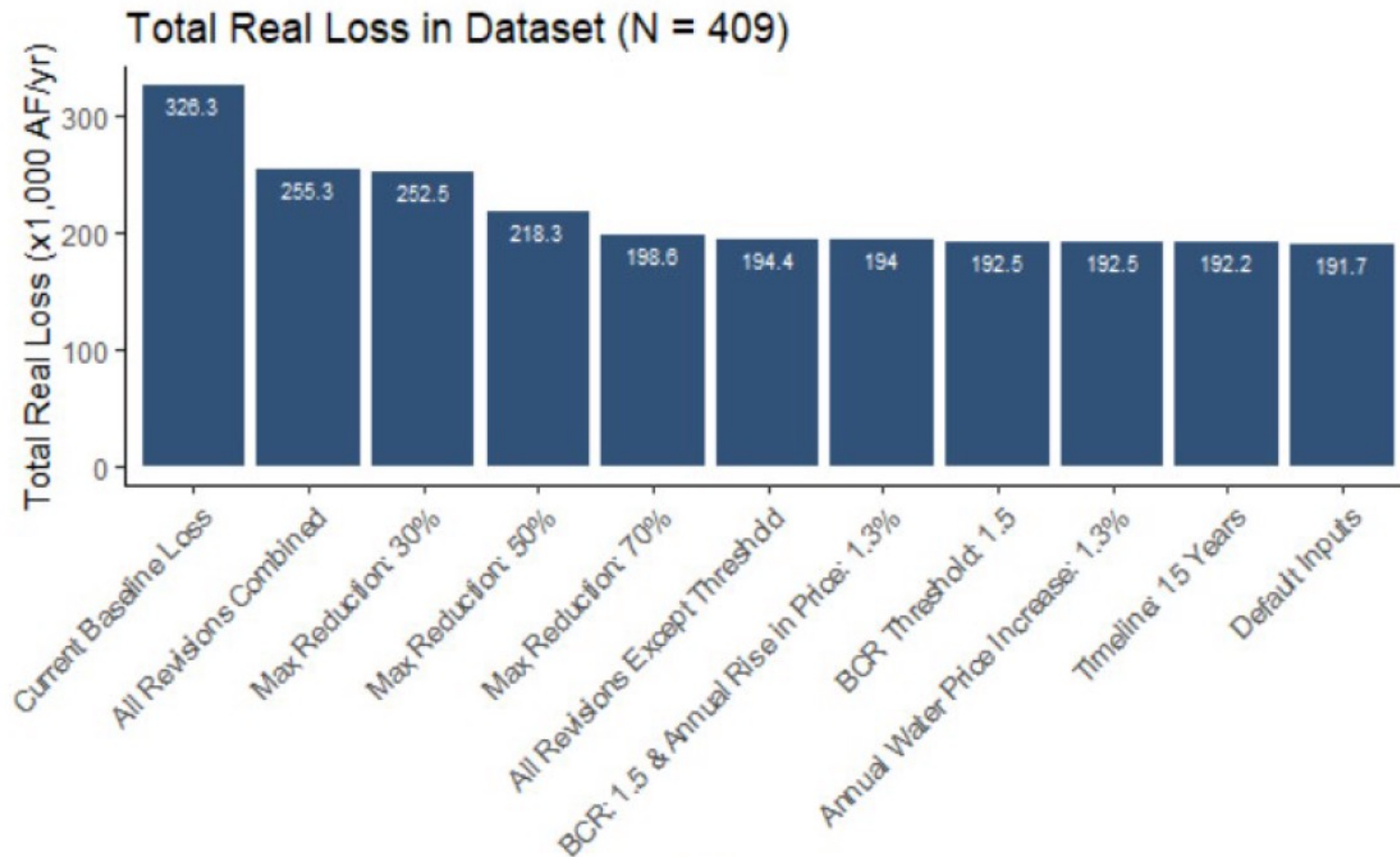
- Provided sample reports

Water Loss Performance Standards

Amy Talbot

- **WSO Model Changes Memo**

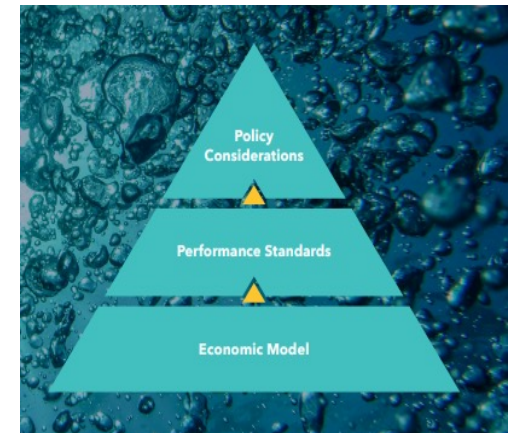
Figure 1: Total Allowable Real Loss Under Various Scenarios



Water Loss Performance Standards

Amy Talbot

- **Compliance Plan**
- **Current loss versus solve for 1**
- **Apparent Loss Target?**
- **Anything else?**



Water Loss Performance Standards

Amy Talbot

- **UC Davis Economic Model Webinar**

- August 24, 2021 from 10:00-11:30 am

- **Speakers:**

- Amanda Rupiper, Postdoctoral Scholar, Department of Civil and Environmental Engineering, UC Davis
- Katrina Jessoe, Associate Professor, Department of Agricultural and Resource Economics, UC Davis
- Ellen Bruno, Assistant Cooperative Extension Specialist, UC Berkeley
- Frank Loge, Professor, Department of Civil and Environmental Engineering, UC Davis

- **Registration:**

https://ucdavis.zoom.us/webinar/register/WN_Vd1K6-ANQE-JTyw5yoBm-A

Water Loss Performance Standards

Next Steps

- **Formal Rulemaking:** ?????
- **Model Revisions:** April 15 revised Economic Model
 - Suppliers can submit updates to the model defaults by emailing a copy of the economic model with changed defaults and attached justification to orpp-waterconservation@Waterboards.ca.gov .
 - The deadline to submit updates to the model defaults will be the end of the 45-day comment period **(TBD)**.
- **Documentation** – Start/continue documenting water loss work and costs



Indoor Residential Water Use Standard

Amy McNulty, Nicholas Schneider

- **April 22** - DWR shared preliminary recommendations
- **May 4** – ACWA met with DWR Executive Director Nemeth to discuss concerns that DWR has not collaborated with stakeholders and analyzed impacts to water and wastewater management

Table 8-1. Comparison of Indoor Residential Water Use Standards (gpcd)

Starting Year	Current Statute	AB 1434	Joint DWR and Water Board Proposed Recommendation
2020	55	48	55
2025	52.5	45	47
2030	50	40	42

- **May 10** – DWR released the *“Public Review Draft Report to the Legislature on Results of the Indoor Residential Water Use Study”*
- **May 21** – DWR held additional working group and public workshop w/ ACWA input on agenda
- **May 24** – ACWA alert for Members to join coalition letter

Indoor Residential Water Use Standard

Amy McNulty, Nicholas Schneider

- **June 4** – ACWA submitted coalition comment letter. Concerns include:
 - Collaboration with water, wastewater and recycled water agencies
 - Analysis of impacts of a changed standard
 - Operational impacts
 - Cost impacts
 - Feasibility
 - Affordability
 - Other: Population, Telecommuting
 - Consideration within *Making Water Conservation a California Way of Life*
- **July 19** – DWR workshop & announcement that the recommendation would not be changed in response to comments
 - ACWA requested comments be included when DWR submits the recommendation



Indoor Residential Water Use Standard

Amy McNulty, Nicholas Schneider



Recommendation to the Department of Water Resources: *Additional Proposed Studies to Inform the Development of the Indoor Residential Water Use Standard*

The Association of California Water Agencies, California Association of Sanitation Agencies, California Municipal Utilities Association and WaterReuse California recommend that the Department of Water Resources (Department):

- 1) withdraw the joint recommendation (standard) included in the *Public Indoor Residential Water Use Standard*
- 2) work collaboratively with stakeholders – over the next six to twelve months – to develop a new standard. This analysis is one.

Our recommendation is consistent with the following:

The studies and investigations to assess the impacts of how the changing state of water and wastewater management, recycling and reuse systems, in

The Department's draft Report states, "Given the significant reduction in water use proposed, and the potential adverse impacts that the Department identified, a new standard is needed."

The Department's proposal would be to enact the authorization of legislation that would impact on expected water savings and water and wastewater management requirements to collaborate and a note that while the statutory requirement for investigations by January 1, 2021 is a joint standard is discretionary.

Proposed Indoor Studies:

We recommend the Department undertake the following actions in collaboration with the Association of California Water Agencies, California Association of Sanitation Agencies, California Municipal Utilities Association and WaterReuse California. We recognize that conducting additional proposed studies for all water suppliers throughout the state is likely infeasible due to time and cost constraints. Rather, we are proposing the strategy outlined below, which includes representative studies that could be extrapolated to assess impacts on a regional and statewide scale, that would help inform the Department's final recommendation.

1. **Water System Impacts** – Solicit data from a representative sample of water suppliers in regions throughout the state on the reductions necessary to reach a range of indoor water use targets, the associated impacts to systems' operations and delivery processes (e.g., such as system flushing and treatment costs) and cost to implement an adaptation strategy. Results from representative water suppliers would be aggregated to infer statewide impacts to water and wastewater management.
2. **Water Reuse Impacts** – Provide existing indoor water estimates and a range of indoor water use targets to suppliers with water reuse projects. Assess the potential impacts, including costs, to systems and water quality impacts if recycled water supply is reduced, as well as additional supplies are needed to supplement the reduction in recycled water supply.
3. **Feasibility Analysis** – Solicit existing saturation studies to evaluate the amount of high efficiency fixtures versus higher use models for residential customers within a given service area and associated cost to further lower indoor water use (e.g., rebates versus direct install programs).
4. **Best Practices Study** – In collaboration with the Water Use Studies Working Group Members, define and conduct studies to identify best practices that could be attributed to efficient indoor water use (e.g., residents in use study, surveys of water agencies, etc.). The purpose of this effort is to understand the drivers for varying indoor water use.
5. **Population Data and Water Use Over Time** – Update the studies and investigations to include the most recent data and studies available, including the U.S. 2020 census data, permanent shifts to telecommuting, aging population, age of housing stock and passive savings. This data would identify indoor water use trends that will impact future use patterns.

Recommendations:

- Withdraw Joint Recommendation for IRWUS
- Collaborate with stakeholders over 6 – 9 months to analyze and quantify impacts of a changed standard

Conduct The Following Studies:

1. Water System Impacts
2. Water Reuse Impacts
3. Feasibility Analysis
4. Best Practices Study
5. Population and Water Use over Time

CII Performance Measures

Chelsea Haines

May 17 – DWR released white paper/
draft outline

August 3 – ACWA submitted comments

- Examples:
 - Recognized water suppliers' limited authority
- Concerns with audits and water management plans
 - Thresholds
 - Customers implementation
 - Cost and burden



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ACWA Recommendation for CII Performance Measures Best Management Practices for CII Water Use - White Paper Outline August 3, 2021

The Association of California Water Agencies (ACWA) has prepared the following input to help inform the Department of Water Resources' (DWR's) development of technical recommendations for feasible Commercial, Industrial, and Institution (CII) performance measures that include best management practices (BMPs). To streamline input, ACWA has provided the below comments, as well as the attached comments to DWR's May 17 draft Technical Memorandum – *Preliminary Draft Annotated Outline and Literature review: Summary of Technical Best Management Practices for Commercial, Industrial and Institutional Water Use*.

We appreciate DWR's consideration of ACWA's comments.

2. INTRODUCTION

Under 2.a. "Roles and Responsibilities," DWR should define the roles and responsibilities of DWR, the State Water Resources Control Board, and water suppliers. Additionally, DWR should acknowledge water suppliers' limitations in regards to requiring and enforcing CII customers to participate in performance measures.

6. PROFILE OF CA CII WATER USE

Under Section 6, DWR should describe the relationship between volume of water used by the CII sector versus the typical percentage of CII accounts for suppliers.

Under Section 6, DWR should clarify that CII demands must meet a minimum threshold of a supplier's total water demand in order to be subject to these requirements.

6.b.i. states that the "larger the portion of water consumption that comes from top users, the easier water conservation becomes by targeting these top users." ACWA notes that top water users can be efficient despite using a larger volume of water. A top water user is not necessarily indicative of water waste. For example, a restaurant with a higher water use than another user could simply have a greater number of customers, despite having made investments in water use efficiency. This is true at most higher use CII facilities where volume of production or users drives water use. DWR should revise the statement listed in 6.b.i. and acknowledge that there is a difference between high water usage that is efficient and high water usage that is wasteful.

8. TYPES OF SECTOR WATER USE

8.a. indicates to "Specify different types of customers in sector." When referencing categories of customers, DWR should ensure the report aligns and is consistent with the proposed CII classification system.



Outdoor Water Use Standard

Fiona Sanchez

- Residential Area Measurements
 - Verification Process
- Outdoor Standard
 - DWR preliminary proposal
 - Concerns with DWR methodology
 - Residential and Dedicated Meter separate?
- Dedicated Irrigation Meters
- Thresholds for conversion to dedicated meters



Outdoor Water Use Standard

Residential Measurements

DWR to complete adjustments to Residential Landscape Area Measurement Data by August 30

- Data portal no longer available for water suppliers to verify adjustments

Use of Alternative Data

- *Section 10609.20 (2): An urban retail water supplier may use alternative data in calculating the urban water use objective if the supplier demonstrates to the department that the alternative data are equivalent, or superior, in quality or accuracy to the data provided by the department.*
 - Process and timing to be determined by DWR
 - How will alternative data use be incorporated into DWR analysis of proposed outdoor standard?

DWR Preliminary Outdoor Standard

Outdoor Efficiency Standard

Based on:

- MWELO design standards
 - Estimates of applied water to back-calculate ET Factor
 - Irrigable, irrigated landscape (II)
 - 20% Irrigable not Irrigated (INI) may be included only if a water supplier does not meet its Water Use Objective (WUO)
 - Does not account for real-world landscape performance and plant palettes
 - Does not account for higher watering requirements for special landscape areas and recycled water
- **0.7 ET Factor** for Irrigable Irrigated (II) LAM
 - **0.7 ET Factor** for 20 % Irrigable Not Irrigated (INI) LAM, only if WUO is not met
 - **0.7 ET Factor** for Special Landscape Areas and Recycled Water
 - **Remeasure and reevaluate**
No clear recommendation

Setting Outdoor Standard

Applicability of MWELO

- Roughly 80% of California's housing stock was built prior to the establishment of MWELO in 1993
- These pre-existing residential landscapes were not conceived or built to perform to the design standards found in MWELO



4 out of 5 homes
built *before* MWELO



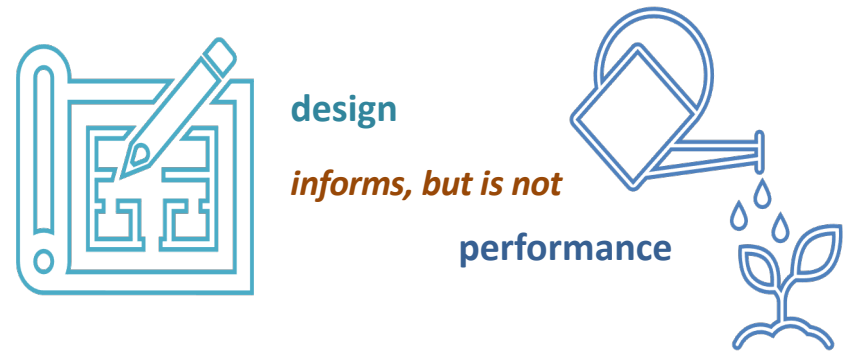
Year	1990 (pre-MWELO)	2000	2010	2019
Housing Units	11,182,513	12,214,550	13,680,081	14,235,201

Source: US Census of Population and Housing for
California, CA Dept. of Finance housing data from 2019

Setting Outdoor Standard

Landscape Design vs Performance



- The outdoor standard should incorporate the principles of the Model Water Efficient Landscape Ordinance (MWELO)
- It does not need to be based on or meet MWELO irrigation system design standards



FACTORS IN SETTING OUTDOOR STANDARD

Real-World Irrigation Efficiency

Distribution Uniformity (DU) Test Results from Across California

Agency / Organization	Spray Head DU (avg)	Rotating Nozzle DU (avg)	Notes
MWDOC	0.55; 0.58	N/A	Average DU at 1,014 Residential sites; 1,106 Commercial sites
	0.55	0.68	Range of sites throughout CA, retrofitting existing spray to new rotating nozzles
	0.50	N/A	DU ranges from 0.40 – 0.70
East Bay MUD	0.48	0.69	Retrofit program results of site going from spray to rotating nozzles.
Coachella Valley Water District	0.58 – 0.60	0.62 – 0.65	DU catch-can results from sites with different sprinkler-types

- Use of a design standard of 0.8 for Irrigation System Efficiency does not reflect the reality of irrigation efficiency in existing landscapes or how landscapes perform over time
- Retrofitting with high efficiency irrigation equipment does not achieve 0.8

FACTORS IN SETTING OUTDOOR STANDARD

Irrigation Efficiency and Plant Requirements

- Proposed ET Factor of 0.7 is calculated from an unrealistic irrigation efficiency assumption (80%) that arbitrarily limits Plant (Landscape) Factors and does not reflect existing landscapes
- Chart calculates the *overall* landscape plant factor (column D) and the ET Factor (column F) is *based on* different Irrigation Efficiency values (column E)
- Even a high IE value of 80% results in ETF of 0.84 for existing landscape plant palette

ET Factors Under Different Landscape Factor and Irrigation Efficiency Scenarios

A	B	C	D D = avg(A X C)	E	F F = D/E
Plant Factor	Plant Type Description	% of Area in Landscape	Overall Landscape Plant Factor	Irrigation Efficiency (IE)	ET Factor (based on IE)
0.3	Low water use plants		0.67	0.45	1.49
0.5	Woody shrubs/trees	35%		0.55	1.22
0.6	Warm season grass			0.625	1.07
0.8	Cool season grass	60%		0.70	0.95
0.8	Annuals	5%		0.80	0.84

Example: Existing suburban residential landscape

Cool season turf mixed landscape, composite plant factor = 0.67

X Target IE of 62.5%, as presented in the previous slide

=

1.07 ET Factor

FACTORS IN SETTING OUTDOOR STANDARD

Issues with DWR Methodology

- Back-calculating an Outdoor Standard from applied outdoor use is not based on horticultural principles or irrigation science
- Estimating outdoor water use from eAR data and residential LAM compounds multiple sources of error
- Many residential landscapes irrigated by Dedicated Irrigation Meters; reported eAR residential water use does not include water applied to those landscapes. Result will arbitrarily lower ET Factors.

ET Factor Matrix		Plant/Landscape Factor							
		0.20	0.40	0.50	0.56	0.60	0.70	0.80	1.00
Irrigation Efficiency	45%	0.44	0.89	1.11	1.24	1.33	1.56	1.78	2.22
	50%	0.40	0.80	1.00	1.12	1.20	1.40	1.60	2.00
	55%	0.36	0.73	0.91	1.02	1.09	1.27	1.45	1.82
	60%	0.33	0.67	0.83	0.93	1.00	1.17	1.33	1.67
	62.5%	0.32	0.64	0.80	0.90	0.96	1.12	1.28	1.60
	70%	0.29	0.57	0.71	0.80	0.86	1.00	1.14	1.43
	75%	0.27	0.53	0.67	0.75	0.80	0.93	1.07	1.33
	80%	0.25	0.50	0.63	0.70	0.75	0.88	1.00	1.25
	85%	0.24	0.47	0.59	0.66	0.71	0.82	0.94	1.18
	90%	0.22	0.44	0.56	0.62	0.67	0.78	0.89	1.11
	95%	0.21	0.42	0.53	0.59	0.63	0.74	0.84	1.05

ET Factors Omitted by DWR

Existing landscapes

Special Lndsp Areas

ACWA Proposal

DWR Proposal

- DWR omitted considering ET Factors over 1.0. Many reasonable combinations of Irrigation Efficiencies (rows) and Plant/Landscape Factors (columns) produce ET Factors over 1.0.
- ACWA proposal for an **ET Factor of 1.0** still aspirational – yet informed by realistic and existing landscape and irrigation system performance.

Irrigable Landscape

Landscapes Change Over Time

- Legislation states outdoor standard shall be based on *irrigable* landscape, without limitation
- Provisional recommendation using only 20% of Irrigable Not Irrigated (INI) area and limiting it to only when a water supplier does not meet its Water Use Objective (WUO), is not consistent with the legislation
- Use of irrigable intended to address landscape change over time
- Recommend 0.55 ETF for 100% of INI
- Reevaluate and remeasure INI in 5 years



Summary of Outdoor Standard Proposals

	DWR Proposal	ACWA Initial Proposal 04/21	Revised ACWA Proposal 08/21
Irrigable Irrigated (II) – Potable – ET Factor	0.7	0.8	1.0
II & INI– Recycled Water and Special Landscape Area (SLA) – ET Factor	0.7	1.0	1.2 ETF of 1.2 for flushing salts and maintaining SLAs
Irrigable Not Irrigated (INI) – Potable – ET Factor	0.7	0.55	0.55 New landscape irrigation and plantings more efficient
Percent INI Included	20% Only if supplier does not meet WUO	100%	100%
Irrigation Efficiency Assumption	0.8	-	0.625
ETF capped in analysis	0.1 – 1.0		No
INI Area Re-assessment	None, or TBD	-	Re-evaluate in 5 years
Overall Formula	$(0.7 \times II) + (0.7 \times 0.2 \times INI)^*$ $= (0.7 \times II) + (0.14 \times INI)^*$ <p>*if needed</p>	$0.8 \times II$ $+$ $(1.0 \times \text{Recycled and SLA II and INI})$ $+$ $(0.55 \times \text{Potable INI})$	$(1.0 \times II)$ $+$ $(1.2 \times \text{Recycled and SLA II and INI})$ $+$ $(0.55 \times \text{Potable INI})$

Outdoor Water Use Standard


Outdoor Water Budget - Summary

- Standards and Methodologies Workgroup Meeting
 - August 25, 2021
- DWR to finalize Residential LAM Data
 - August 30, 2021
- Outdoor Factors and Recommended Standards
 - DWR to develop recommendations by October 1, 2021
- Supplier Calculated Water Use Objective
 - Due January 1, 2024
- ACWA continues to collaborate with DWR staff regarding outstanding issues

Variance and Bonus

Nicholas Schneider

Each Urban supplier should request and may be able to receive a variance when calculating its urban water use objective.



An urban retail water supplier may have certain unique uses that can have a material effect on its urban water use objective. DWR will recommend appropriate variances and, for each variance, the associated threshold of significance for consideration in adoption by the State Water Board. Appropriate variances may include, but are not limited to, the following (CWC §10609.14 **(AB)**):

1. Significant use of evaporative coolers
2. Significant populations of horses and other livestock
3. Significant fluctuations in seasonal populations
4. Significant landscaped areas irrigated with recycled water having high levels of total dissolved solids
5. Significant use of water for soil compaction and dust control
6. Significant use of water to supplement ponds and lakes to sustain wildlife
7. Significant use of water to irrigate vegetation for fire protection
8. Significant use of water for commercial or noncommercial agricultural use

Each urban retail water supplier should request and may receive approval from the State Water Board for use of adopted variances in calculating its urban water use objective. The State Water Board shall make the approved variances by urban retail water supplier and associated supporting data available on its website.

CA-NV AWWA (& Partners) Update

Sue Mosburg

CA-NV AWWA Water Loss Training

View a complete schedule of upcoming course & workshops at:

www.ca-nv-awwa.org/schedule

Evaluating Water Loss Performance Standards—An Economic Leak Loss

Reduction Model - UC Davis: Center for Water-Energy Efficiency (CWEE) August 24 10:00 -11:30

Water Audit Validator (WAV)

All WAV certificates due to expire in 2021 have been automatically extended through 2022.

- WRF project 5057 – Level 1 Water Audit Validation Guidance Manual v2 (for Audit software V6) available
- WAV Renewal training August, September, November 2021

Water Use Efficiency

- Levels 1, 2 & 3
- Classes & Certification



**Virtual Event –
Annual Fall Conference
October 18-21, 2021**

Critical Elements of Effective Water Efficiency Programs – The New AWWA G480-20 Standard -
Alliance for Water Efficiency August 26, 11am –
webinar

WaterSmart Innovations: Conference & Exposition
October 6-7, 2021 – Las Vegas, NV

**North American Water Loss Conference (NAWL):
AWWA** December 7-9, 2021 – Austin, TX

Questions and Comments?

Chelsea Haines, Regulatory Relations Manager

Chelseah@acwa.com