Summary of Recommendations for Performance Measures for Commercial, Industrial, and Institutional Water Use

WUES-DWR-2021-15

A Report to the State Water Resources Control Board Prepared Pursuant to California Water Code Section 10609

September 2022

California Department of Water Resources
Water Use Efficiency Branch

Note: This report is part of the package of reports developed by the California Department of Water Resources to meet the requirements of Senate Bill 606 and Assembly Bill 1668 of 2018 for urban water use efficiency.

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Abbreviations and Acronyms

2013 CII Task Force Report	2013 Commercial, Industrial, and Institutional Task Force Water Use Best Management Practices Report to the Legislature
2017 Framework	Making Water Conservation a California Way of Life, Implementing Executive Order B-37-16
2018 Legislation	2018 Legislation on Water Conservation and Drought Planning (Senate Bill 606 [Hertzberg] and Assembly Bill 1668 [Friedman], as amended)
AB	Assembly Bill
ACWA	Association of California Water Agencies
APN	assessor's parcel number
AWWA	American Water Works Association
BMP	best management practice
CalWEP	California Water Efficiency Partnership
CCR	California Code of Regulations
CII	commercial, industrial, and institutional
CII-BMP	commercial, industrial, and institutional water use best management practice
CII-BMPs Performance Measure	Commercial, Industrial, and Institutional Water Use Best Management Practices Performance Measure
CII Classification System PM	Commercial, Industrial, and Institutional Water Use Classification System Performance Measure
CII-DIMWUS	Commercial, Industrial, and Institutional Outdoor Irrigation of Landscape Areas with Dedicated Irrigation Meters Water Use Efficiency Standard
CII Water Supplier BMPs	commercial, industrial, and institutional water use best management practices implemented by urban retail water suppliers
CII Water User BMPs	commercial, industrial, and institutional water use best management practices implemented by commercial, industrial, and institutional water users or associated property owners or managers
Conversion Threshold PM	Conversion Threshold Performance Measure

CPUC	California Public Utilities Commission
CUWA	California Urban Water Agencies
CUWCC	California Urban Water Conservation Council (now California Water Efficiency Partnership)
CWA	California Water Association
DIM	dedicated irrigation meter
DWR	California Department of Water Resources
gpcd	gallons per capita per day
In-Lieu Technologies PM	In-Lieu Technologies Performance Measure
IRWUS	Indoor Residential Water Use Efficiency Standard
KPI	key performance indicator
Legislature	California State Legislature
MWELO	Model Water Efficient Landscape Ordinance
NAICS	North American Industry Classification System
ORWUS	Outdoor Residential Water Use Efficiency Standard
Recommendation Package	Urban Water Use Efficiency Recommendation Package
ROI	return on investment
SB	Senate Bill
SLA	Special Landscape Area
State	State of California
State Water Board	State Water Resources Control Board
UWUO	urban water use objective
WC	California Water Code
WELO	Water Efficiency Landscape Ordinance
WLS	Water Loss Standard

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Executive Summary

The California State Legislature passed the 2018 Legislation on Water Conservation and Drought Planning (Senate Bill 606 [Hertzberg] and Assembly Bill 1668 [Friedman], as amended; hereinafter referred to as the "2018 Legislation"), which included provisions for advancing urban water use efficiency through developing and implementing various water use efficiency standards, variances, and performance measures. This report is submitted pursuant to California Water Code (WC) Section 10609.10, which directs the California Department of Water Resources (DWR), in coordination with the State Water Resources Control Board (State Water Board), to conduct necessary studies and investigations and recommend performance measures for commercial, industrial, and institutional (CII) water use for the State Water Board's adoption. Consistent with WC Section 10609.10, DWR's recommendations include performance measures for a CII water use classification system (CII Classification System PM) that addresses significant uses of water, CII water use best management practices (BMP) for urban retail water suppliers (CII-BMPs Performance Measure); setting minimum size thresholds for converting mixed-use CII meters to dedicated irrigation meters (DIM) or equivalent technologies (Conversion Threshold PM); and technologies that can be used in-lieu of a DIM or equivalent technology (In-Lieu Technologies PM). These recommendations also include key performance indicators and implementation schedules.

DWR developed the recommendations for the performance measures based on the legislative directive. In particular, the WC also requires the recommended CII water use performance measures to be consistent with *Commercial, Industrial, and Institutional Task Force Water Use Best Management Practices Report to the Legislature* (DWR, 2013a and 2013b). The technical and financial feasibility recommendations provided in that report are aimed at supporting the economic productivity of the State of California's (State) CII sectors (WC Section 10609.10(c)). The documentation of the implementation of the CII water use performance measures is required in the urban retail water supplier's Annual Water Use Report filing (WC Section 10609.24(a)(3)). However, quantification of water use per category is not required as the associated CII water use is excluded in the quantification reporting per provisions related to the urban water use objective.

Consistent with the legislative directive, DWR used a public process involving a diverse group of stakeholders in the review and development of the performance measures. The Water Use Studies Working Group and the Standards, Methods, and Performance Measures Working Group that DWR established to assist in implementing the 2018 Legislation were the primary stakeholders involved in the development process for the CII water use performance measures. Additional stakeholders included State agencies, cities, counties, urban retail water suppliers, environmental organizations, and other interested parties. Working group members and stakeholders were provided with many

opportunities to comment on and inform the suitability and practical application of each recommended performance measure. Their input informed development and refinements for the applicable scope and specific thresholds for implementation of each performance measure. Technical feasibility, financial considerations, and associated potential economic effects on CII sectors were also considered during the development process.

In responding to stakeholder input, DWR incorporated the consideration of the limited authority urban retail water suppliers may have to unilaterally implement certain actions without explicit cooperation from CII water users in formulating performance measures. DWR, through extensive review of literature, survey information, and stakeholder engagement, explored implementation considerations and potential effects on urban retail water suppliers to inform the technical and financial feasibility of implementing the performance measures.

Based on the research, technical studies, and stakeholder feedback, DWR recommends four CII water use performance measures as follows.

- **CII Classification System PM**. DWR recommends a CII water use classification system that is water-centric, with complete coverage of all CII water uses. The recommended classification system comprises 19 categories of CII water use, providing adequate differentiation among different CII sectors to facilitate data collection and future references without being overly detailed to create unnecessary burdens on urban retail water suppliers during implementation.

- **CII-BMPs Performance Measure**. DWR recommends a performance measure requiring urban retail water suppliers to develop a CII-BMP implementation plan specific to their local conditions for the top 20 percent of CII water users ranked according to their CII water use volume. Process water may be included in the volume for identifying the focused group of CII water users, but it is not subject to the CII-BMPs Performance Measure (although encouraged).

- **Conversion Threshold PM**. DWR recommends a performance measure requiring urban retail water suppliers to collaborate with CII water uses, property managers, and property owners to convert mixed-used meters to DIMs (or equivalent technologies) for CII landscape areas that are more than 1 acre, measured on a per-parcel basis, or to implement the recommended in-lieu technologies under the In-Lieu Technologies PM that are designed to achieve improved water use efficiency (hereinafter referred to as “In-Lieu Technologies”). Landscape areas served by converted DIMs will be subject to the requirements of the Commercial, Industrial, and Institutional Outdoor Irrigation of Landscape Areas with Dedicated Irrigation Meters Water Use Efficiency Standard.

- **In-Lieu Technologies PM**. DWR recommends a performance measure, directly related to the Conversion Threshold PM discussed above, that would facilitate implementation of technologies to be used in-lieu of requiring DIMs (or equivalent technologies) for those irrigated landscape areas served by mixed use meters that exceed the conversion threshold. The In-Lieu Technologies, under the In-Lieu Technologies PM, includes water budget-based rate structures, water budget-based management without a rate structure, hardware improvements with enhanced performance, remote sensing combined with other data and hardware improvements, landscape plant palette transformation programs, and others as approved by the State Water Board. Additionally, DWR recommends that urban retail water suppliers include programs for offering assistance to CII water users implement BMPs for communication, irrigation system maintenance, and irrigation scheduling.

Table ES-1 shows DWR's recommended six-year schedule for performance measure implementation following the State Water Board's adoption and presents the primary key performance indicators for all four performance measures. Urban retail water users are required to report their progress in implementing the CII water use performance measures in their respective Annual Water Use Report filings.

DWR's recommendations for each performance measure are included in their corresponding reports that are incorporated by reference. These recommendations are prepared per the requirements of the 2018 Legislation and are to be transmitted to the State Water Board for adoption. DWR's recommendations for CII water use performance measures and associated annual reporting requirements are also included in the report, *Recommendations for Urban Water Use Efficiency Standards, Variances, Performance Measures, and Annual Water Use Reporting* (WUES-DWR-2021-01A), which provides the complete context of the Urban Water Use Efficiency Recommendation Package and its implementation.

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Table ES-1 California Department of Water Resources' Recommended Streamlined Schedule for Implementation of Commercial, Industrial, and Institutional Water Use Performance Measures

Implementation Year Starting after State Water Resources Control Board Adoption Date	**CII Classification System PM** **Primary KPI**: CII water users mapped for classification	**CII-BMPs Performance Measure** **Primary KPI**: CII-BMP metrics identified in the CII-BMP Program designed for implementing CII-BMPs based on the recommended thresholds[1] for focusing on major CII water use	**Conversion Threshold PM** **Primary KPI**: CII water user parcels reviewed for irrigated landscape area meeting the meter conversion threshold and selecting a compliance option[2]	**In-Lieu Technologies PM** **Primary KPI**: CII landscape areas confirmed for implementing In-Lieu Technologies under the Conversion Threshold PM
1	20% of all CII water users	Start implementing education and outreach BMPs (part of the CII-BMP Program) to all CII water users on new performance measure requirements	20% of all CII water user parcels[4, 6]	Complete In-Lieu Technologies implementation plan
2	40% of all CII water users	Complete CII-BMP Program development with metrics for targeted CII water users and actions based on 20% of all CII water users, classified[5] in Implementation Year 1	40% of all CII water user parcels[4, 6]	All CII landscape areas identified in the Conversion Threshold PM from Implementation Year 1
3	60% of all CII water users[3]	Start implementing CII-BMP Program against identified metrics If the thresholds[1] for targeted CII water users are not met in Year 2, complete CII-BMP Program development with metrics for targeted water users and actions based on 40% of all CII water users, classified[5] through Implementation Year 2	60% of all CII water user parcels[4, 6]	All CII landscape areas identified in the Conversion Threshold PM from Implementation Year 2
4	80% of all CII water users	CII-BMP Program implementation against identified metrics	80% of all CII water user parcels[4, 6]	All CII landscape areas identified in the Conversion Threshold PM from Implementation Year 3
5	100% of all CII water users	CII-BMP Program implementation against identified metrics and program update	100% of all CII water user parcels[4, 6]	All CII landscape areas identified in the Conversion Threshold PM from Implementation Year 4
6	100% of all CII water users with maintenance	CII-BMP Program implementation against identified metrics	100% of all CII water user parcels with maintenance	All CII landscape areas identified in the Conversion Threshold PM from Implementation Year 5
7 and afterwards	100% of all CII water users with maintenance	CII-BMP Program implementation against identified metrics	100% of all CII water user parcels with maintenance	All CII landscape areas identified in the Conversion Threshold PM with maintenance

Table ES-1 California Department of Water Resources' Recommended Streamlined Schedule for Implementation of Commercial, Industrial, and Institutional Water Use Performance Measures (contd.)

Implementation Year Starting after State Water Resources Control Board Adoption Date	CII Classification System PM	CII-BMPs Performance Measure	Conversion Threshold PM	In-Lieu Technologies PM
	Primary KPI: CII water users mapped for classification	**Primary KPI**: CII-BMP metrics identified in the CII-BMP Program designed for implementing CII-BMPs based on the recommended thresholds[1] for focusing on major CII water use	**Primary KPI**: CII water user parcels reviewed for irrigated landscape area meeting the meter conversion threshold and selecting a compliance option[2]	**Primary KPI**: CII landscape areas confirmed for implementing In-Lieu Technologies under the Conversion Threshold PM

Notes:
[1] The thresholds are both of the following: (1) excluding process water, CII water users whose individual total water use volume is in the top 2.5 percent of all CII water users in the service area; and (2) excluding process water, all CII water users within the CII water use classifications, per the CII Classification System PM, which covers the top 20% of CII water users in water use.
[2] Compliance options are either implementing a dedicated irrigation meter (or equivalent technology) or implementing in-lieu technologies.
The confirmed implementation of a dedicated irrigation meter conversion (or equivalent technology) is subject to requirements under the Commercial, Industrial, and Institutional Outdoor Irrigation of Landscape Areas with Dedicated Irrigation Meters Water Use Efficiency Standard.
[3] Urban retail water suppliers that experience significant hardship in complying with the primary KPI of the CII Classification System PM for Implementation Year 3 shall provide an alternative schedule and plan to complete mapping of all CII water users and address the subsequent schedule impacts on other CII water use performance measures for the State Water Resource Control Board's approval.
[4] Urban retail water suppliers that experience significant hardship in complying with the primary KPI of the Conversion Threshold PM can, in any year, provide an alternative schedule and plan to complete necessary landscape measurements for meter conversion considerations and address the subsequent schedule impacts on the In-Lieu Technologies PM.
[5] Classified under the CII Classification System PM
[6] Same CII water users classified under the CII Classification System PM
Key:
CII = commercial, industrial, and institutional
CII Classification System PM = Commercial, Industrial, and Institutional Water Use Classification System Performance Measure
CII-BMPs Performance Measure = Commercial, Industrial, and Institutional Best Management Practices Performance Measure
Conversion Threshold PM = Conversion Threshold Performance Measure
In-Lieu Technologies PM = In-Lieu Technologies Performance Measure
KPI = key performance indicator

1.0 Introduction

Senate Bill (SB) 606 (Hertzberg) and Assembly Bill (AB) 1668 (Friedman) of 2018, as amended (hereinafter referred to as the "2018 Legislation"), established a new foundation for long-term improvements in water conservation and drought planning to adapt to climate change and the resulting longer and more intense droughts in the State of California (State). These two bills provide expanded and new authorities and requirements to enable permanent changes and actions for those purposes, thereby improving the State's water future for generations to come.

SB 606 and AB 1668 are direct outcomes of California Governor Edmund G. Brown Jr.'s Executive Order B-37-16, issued in May 2016. The recommendations in an April 2017 report, *Making Water Conservation a California Way of Life, Implementing Executive Order B-37-16* (2017 Framework) (DWR et al., 2017), and subsequent extensive legislative outreach efforts informed the development of SB 606 and AB 1668. For additional information on SB 606, AB 1668, and the 2017 Framework, refer to *Making Water Conservation a Way of Life: Primer of 2018 Legislation on Water Conservation and Drought Planning, Senate Bill 606 (Hertzberg) and Assembly Bill 1668 (Friedman)* (DWR and State Water Board, 2018).

The 2017 Framework built on the efforts of water conservation during the 2012 through 2016 drought, and the implementation of Governor Brown's California Water Action Plan (first released in 2014 and then updated in 2016). The 2017 Framework outlines a suite of actions that can be implemented under existing authorities; and recommends additional actions, where necessary, that can be implemented with new or expanded authority given by the California State Legislature (Legislature). To that end, the Legislature enacted the 2018 Legislation, which provides complementary authorities and requirements that affect water conservation and drought planning for urban retail water suppliers, agricultural water suppliers, and small water suppliers and rural communities.

One of the four primary goals in Executive Order B-37-16 was to "use water more wisely," and the majority of the new and expanded authority of involved parties relate to achieving that goal, with the addition of California Water Code (WC) Chapter 9 (commencing with WC Section 10609) of Part 2.55 of Division 6. The 2018 Legislation does not change existing implementation of the Water Conservation Act of 2019 (also known as SB X7-7, commencing with WC Section 10608); the statewide goal of a 20 percent reduction in urban per capita water use by 2020 is still in place, and water use by individual customers is not limited.

The 2018 Legislation requires the California Department of Water Resources (DWR), in coordination with the the State Water Resources Control Board (State Water Board), to

conduct necessary studies and investigations and recommend for adoption by the State Water Board:

- Standards for outdoor residential use (WC Section 10609.6).
- Standards for outdoor irrigation of landscape areas with dedicated irrigation meters (DIM) or other means of calculating outdoor irrigation use in connection with commercial, industrial, and institutional (CII) water use (WC Section 10609.8).
- Performance measures for CII water use (WC Section 10609.10).
- Appropriate variances for unique uses that can have a material effect on water use of an urban retail water supplier's urban water use objective (UWUO) (WC Section 10609.14).

DWR is also required to recommend for adoption by the State Water Board guidelines and methodologies for urban retail water suppliers for calculating their UWUO (WC Section 10609.16). To maintain consistency with the State policy encouraging potable reuse, as defined in WC Section 13561, a bonus incentive is allowed for urban retail water suppliers that deliver water from groundwater basins, reservoirs, or other sources that are augmented by potable reuse water (WC Section 10609.20). The bonus incentive is to adjust the urban retail water supplier's UWUO by the volume of eligible potable reuse water delivered to residential customers and landscape areas with DIMs (or equivalent technologies) in connection with CII water use.

1.1 New Approach to Urban Water Use Efficiency

Among other things, the 2018 Legislation contains provisions for advancing urban water use efficiency through developing and implementing various water use efficiency standards, variances, and performance measures per WC Section 10609. This new water conservation framework is different than SB X7-7, which was established in 2009. The focus of SB X7-7 was to reduce statewide urban water use by 20 percent in 2020 compared to baseline calculated in 2010. The 2018 Legislation requires a bottom-up estimate from urban retail water suppliers of their UWUO based on the aggregated efficient water use volume by considering four urban water use efficiency standards and appropriate variances. The four standards are:

- Indoor Residential Water Use Efficiency Standard (IRWUS).
- Outdoor Residential Water Use Efficiency Standard (ORWUS).

- Commercial, Industrial, and Institutional Outdoor Irrigation of Landscape Areas with Dedicated Irrigation Meters Water Use Efficiency Standard (CII-DIMWUS).
- Water Loss Standard (WLS).

CII water use not associated with DIMs (or equivalent technologies) for outdoor irrigation of landscape areas is excluded from the UWUO.

Each of the procedural requirements to formalize these four standards for implementation is different. The 2018 Legislation includes a default progressively reduced IRWUS (WC Section 10609.4(a)). In November 2021, in collaboration with the State Water Board, DWR submitted the joint recommendations for IRWUS to the Legislature for further consideration, per WC Section 10609.4(b). Consequently, the Legislature passed the corresponding SB 1157 in August 2022 to provide additional direction for implementation. Separately, the State Water Board is currently conducting a rulemaking process to adopt the proposed WLS, which was originally authorized by SB 555 of 2015. For ORWUS and CII-DIMWUS, the 2018 Legislation requires DWR, in coordination with the State Water Board, to conduct necessary studies and investigations and develop recommendations to the State Water Board by October 1, 2021 (WC Sections 10609.6 and 10609.8).

Another major difference between the SB X7-7 requirements and those of the 2018 Legislation is that the anticipated outcome was measured on a statewide level per SB X7-7 and on an individual urban retail water supplier level per the 2018 Legislation. Recognizing the diversity of water use to support local economic, social, and environmental needs and varying climate conditions in the State, the 2018 Legislation requires DWR, in coordination with the State Water Board, to conduct necessary studies and investigations. It also requires DWR to develop recommendations for adoption by the State Water Board by October 1, 2021, for appropriate variances for unique uses that can have a material effect on an urban retail water supplier's UWUO and the corresponding thresholds of significance (WC Section10609.14). In this context, DWR interpreted that a material effect means that this unique water use, although used in an efficient manner, when not excluded from an urban retail water supplier's UWUO, could unfairly jeopardize the ability of an urban retail water supplier to comply with the UWUO calculated using the standards adopted per the 2018 Legislation.

As a supporting recommendation, the 2018 Legislation requires DWR to develop accompanying guidelines and methodologies for calculating the UWUO (WC Section 10609.16) and provide the recommendation to the State Water Board for adoption, along with DWR's recommendations on ORWUS, CII-DIMWUS, and appropriate variances by June 30, 2022 (WC Section 10609.2). The 2018 Legislation further requires DWR and the State Water Board to solicit broad public participation throughout the development and adoption processes (WC Section 10609(b)(3)).

Not all urban water uses are included in the UWUO. The 2018 Legislation includes considerations to manage CII water use separately, because CII water use can be complex and diverse and have direct connections to economic productivity. Additionally, there is currently insufficient information available to properly set standards or variances for CII water use, if even feasible, as there is for other categories of urban water use (e.g., indoor residential, outdoor residential). However, progress should still be made to improve CII water use efficiency. Therefore, the 2018 Legislation requires that DWR develop recommendations on performance measures for CII water use other than water use for CII outdoor irrigation of landscape areas with DIMs (or equivalent technologies) (already included as one of the standards) and process water (excluded from both the UWUO and CII water use performance measures). More detailed discussion is provided in Section 1.2.

This performance measure approach for CII water use in the 2018 Legislation is different from the previous SB X7-7 requirements. The SB X7-7 water conservation framework required urban retail water suppliers to set conservation targets in gallons per capita per day (gpcd) and accounted for CII water use in a lumped reduction format with process water excluded. However, reporting CII water use in gpcd could be misleading, because CII water use may not have a direct correlation to the number of permanent residents in the service area. Reporting CII water use in gpcd or other metrics without the context of associated economic activities is not effective for showing progress in increased CII water use efficiency; efficient water uses of similar or different CII-related economic activities can vary significantly in volume depending on a number of factors. Therefore, urban retail water suppliers are often required to provide additional justification or descriptions for CII water use efficiency that cannot be demonstrated by using gpcd statistics or other metrics, including factors that may hinder the anticipated progress, such as lack of authority to unilaterally implement improvements or best management practices (BMP) without explicit cooperation of CII water users.

Under the 2018 Legislation, urban retail water suppliers are not required to report the volume of CII water use, except for the outdoor irrigation water use under CII-DIMWUS. However, urban retail water suppliers are required to report the performance measures in their Annual Water Use Report, including the actions they take to improve CII water use efficiency and associated outcomes. This more granular approach to improving CII water use efficiency is consistent with the approach to the volumetric reporting requirements under the UWUO and provides an opportunity for understanding the causations between performance measure actions and resulting water use efficiency improvements.

1.2 Commercial, Industrial, and Institutional Water Use Performance Measures

Following the 2012 to 2016 drought, the State reevaluated its water use practices and resolved to prioritize long-term water conservation and drought planning. In a broader sense, the 2018 Legislation calls for increased water conservation and more efficient use of water. In particular, WC Section 10608(e) states, "The success of [S]tate and local water conservation programs to increase efficiency of water use is best determined on the basis of measurable outcomes." Providing measurable outcomes of increased water use efficiency requires the evaluation of baseline water use conditions for comparative purposes. However, recognizing that the diverse conditions preclude determination of baseline water use for varying water use in CII sectors in the State, the 2018 Legislation requires DWR to make recommendations on CII water use performance measures for CII water uses other than outdoor irrigation for landscapes with DIMs (or equivalent technologies).

In the context of CII water use, recommendations on sustainable water use and demand reduction performance measures must, "[s]upport the economic productivity of California's agricultural, commercial, and industrial sectors" (WC Section 10608.4(j)), but that, "…does not require a reduction in the total water used in the agricultural or urban sectors, because other factors, including, but not limited to, changes in agricultural economics or population growth may have greater effects on water use. This part does not limit the economic productivity of California's agricultural, commercial, or industrial sectors" (WC Section 10608.8(c)).

DWR was required to conduct necessary studies and investigations and make recommendations on performance measures for CII water use to the State Water Board for its adoption by no later than October 1, 2021, as specified in AB 1668 and codified in WC Section 10609.10. In this context, "CII water use" means water used by commercial water users, industrial water users, institutional water users, and large landscape water users (WC Section 10608.12(d)), with the following supporting definitions.

> *"Commercial water user" means a water user that provides or distributes a product or service* (WC 10608.12(e)).
>
> *"Industrial water user" means a water user that is primarily a manufacturer or processor of materials as defined by the North American Industry Classification System code sectors 31 to 33, inclusive, or an entity that is a water user primarily engaged in research and development* (WC 10608.12(i)).
>
> *"Institutional water user" means a water user dedicated to public service. This type of user includes, among other users, higher education*

> *institutions, schools, courts, churches, hospitals, government facilities, and nonprofit research institutions* (WC 10608.12(j)).
>
> *"Large landscape" means a nonresidential landscape as described in the performance measures for CII water use adopted pursuant to WC Section 10609.10* (WC Section 10608.12(l)).

In addition, per WC Section 10608.12(n), "performance measures" are:

> *…actions to be taken by urban retail water suppliers that will result in increased water use efficiency by CII water users. Performance measures may include, but are not limited to, educating CII water users on best management practices, conducting water use audits, and preparing water management plans. Performance measures do not include process water.*

Furthermore, per WC Section 10608.12(p), "process water" means:

> *…water used by industrial water users for producing a product or product content or water used for research and development. Process water includes, but is not limited to, continuous manufacturing processes, and water used for testing, cleaning, and maintaining equipment. Water used to cool machinery or buildings used in the manufacturing process or necessary to maintain product quality or chemical characteristics for product manufacturing or control rooms, data centers, laboratories, clean rooms, and other industrial facility units that are integral to the manufacturing or research and development process is process water. Water used in the manufacturing process that is necessary for complying with local, [S]tate, and federal health and safety laws, and is not incidental water, is process water. Process water does not mean incidental water uses.*

As previously mentioned, except for landscape irrigation with DIMs (or equivalent technologies), CII water use is not part of the UWUO that urban retail water suppliers need to report on quantitively in their respective Annual Water Use Reports. Water use efficiency in CII sectors is instead addressed through implementation of CII water use performance measures. The 2018 Legislation directs DWR to develop and recommend CII water use performance measures that include the following:

- CII water use classification system to address significant uses of water.
- Minimum size threshold for converting mixed-use CII meters to DIMs or in-lieu technologies.

- BMPs, which may include, but are not limited to, water audits and water management plans for CII customers above a certain recommended size, volume of use, or other threshold.

The 2018 Legislation further requires that the recommended CII water use performance measures be consistent with *Commercial, Industrial, and Institutional Task Force Water Use Best Management Practices Report to the Legislature* (DWR, 2013a and 2013b) (WC Section 10609.10(c)), hereinafter referred to as the "2013 CII Task Force Report." The Task Force consisted of stakeholders and experts convened by DWR and the California Urban Water Conservation Council, which is now the California Water Efficiency Partnership (CUWCC, now CalWEP), to develop BMPs for CII water users, as directed by WC Section 10608. The following recommendations by the Task Force (DWR, 2013a) are particularly relevant to the development of CII water use performance measures:

> ***Recommendation 5-7:*** *DWR should work with the Association of California Water Agencies (ACWA), CUWCC [now CalWEP], California Urban Water Agencies (CUWA), California Public Utilities Commission (CPUC), California Water Association (CWA), and American Water Works Association (AWWA) to develop a full-spectrum, water-centric standardized classification system of customer categories. This classification system should include consistent use of North American Industry Classification System (NAICS) codes and assessors' parcel numbers (APNs).*
>
> ***Recommendation 5-8:*** *DWR, in consultation with a stakeholder advisory committee and through a public process, should develop a system and implementation plan for water production, delivery, and use data collection for classification and for reporting and tracking at the user, water service provider, [S]tate, and federal levels. One or more of the following options should be considered:*
>
> - ***Option 5-8.1****: DWR should develop a water-centric water use and user classification system.*
> - ***Option 5-8.2****: Water service providers should classify water users using a common classification system and transition their customer databases to incorporate this system.*
> - ***Option 5-8.3****: Water service providers should consider recording and maintaining key data fields, such as assessor's [sic] parcel numbers for customers. This would enable the linking of water usage data with information from other sources for purposes of metrics, water demand analysis, and demand projections.*

- ***Option 5-8.4****: Water service providers and self-supplied water users meeting defined criteria should be required to report water use to the [S]tate.*

- ***Option 5-8.5****: Water service providers, CUWCC [now CalWEP], and water users should expand on landscape irrigation water use categorizations that recognize and promote BMPs for separate metering, especially for larger and mixed use sites.*

Recommendation 6-3: *Water and energy service providers should incorporate water audits into their efficiency programs, consider financial incentives for BMP implementation, and provide other technical assistance as appropriate.*

Recommendation 6-4: *Organizations representing businesses and industry, water service providers, CUWCC [now CalWEP], other interested parties, and DWR should educate CII water users or entities on the BMPs and approaches to doing audits and performing a cost-effectiveness analysis.*

The ”Recommendations” section (Section 5.2) of the 2013 CII Task Force Report states:

This section does not currently recommend any single metric for use in all CII sectors.

Furthermore, the CII Task Force cautions against setting regulatory minimum standards for water use efficiency metrics that would be applicable to specific CII establishments, sectors, or subsectors. Even within subsectors, it would be difficult to set uniform standards across CII establishments (defined as individual CII water user sites) because of the variability in the types of products made or services provided and the many confounding factors in how water is used.

The 2013 CII Task Force Report presents the following option for further study or action to improve data collection and reporting. This option is specifically related to the development of a water use and user classification system (DWR, 2013b):

Option 1*: DWR should develop a water use and user classification system. The system should comprehensively address all sectors of water use, not just CII water users. The system should be designed for all water use establishments to be classified using a full-spectrum water-centric coding system integrated with national, [S]tate, regional, and local goals and objectives for water resources planning and management. The classification system should include common definitions for water use*

sectors for consistent aggregation of data. Consideration should be given to using a commonly accepted coding system, such as NAICS, as a basis for definitions.

Section 7.3.5 of Volumes I and II of the 2013 CII Task Force Report provides recommendations for large landscape BMPs (DWR 2013a and 2013b).

Per WC Section 10609.10(d), the State Water Board, in coordination with DWR, must adopt the performance measures on or before June 30, 2022. Documentation of the implementation of CII water use performance measures is required in the urban retail water supplier's Annual Water Use Report filing (WC Section 10609.24(a)(3)).

1.3 Purpose of the Report

Per legislative requirements and with stakeholder engagement, DWR conducted studies and investigations to develop and recommend the following four CII water use performance measures for adoption by the State Water Board.

- Commercial, Industrial, and Institutional Water Use Classification System Performance Measure (CII Classification System PM).
- Commercial, Industrial, and Institutional Water Use Best Management Practices Performance Measure (CII-BMPs Performance Measure).
- Conversion Threshold Performance Measure (Conversion Threshold PM).
- In-Lieu Technologies Performance Measure (In-Lieu Technologies PM).

This report provides a summary of recommendations on each of the four CII water use performance measures. This report and supporting documents that are incorporated by reference are produced by DWR per requirements of the 2018 Legislation.

Relationship to California Department of Water Resources' Urban Water Use Efficiency Recommendation Package

DWR has completed a significant body of work to meet the requirements of the 2018 Legislation and provide recommendations on different topics to the State Water Board for adoption. To streamline document development and recognize the inherent interrelationship among different topics and the need for overall consistency, DWR organized the various reports in an Urban Water Use Efficiency Recommendation Package (Recommendation Package) that allows mutual referencing and incorporates content by reference. All reports in this Recommendation Package are given a serial number in the form of "WUES-DWR-2021-xx." For each report, Appendix A includes the list of documents within the Recommendation Package that are incorporated by reference.

Specifically, this report, Summary of *Recommendations for Performance Measures for Commercial, Industrial, and Institutional Water Use* (WUES-DWR-2021-15), provides a summary of specifications and annual reporting requirements for CII water use performance measures. This report incorporates the content of the following reports for the four recommended CII water use performance measures, which include additional context, performance measure development process and approach, evaluation of options, and stakeholder input pertinent to individual performance measures.

- *Recommendations for Commercial, Industrial, and Institutional Water Use Classification System Performance Measure* (WUES-DWR-2021-17).
- Recommendations *for Commercial, Industrial, and Institutional Water Use Best Management Practices Performance Measure* (WUES-DWR-2021-16).
- *Recommendations for Dedicated Irrigation Meter Conversion Threshold for Commercial, Industrial, and Institutional Outdoor Irrigation Water Use Performance Measure* (WUES-DWR-2021-18).
- *Recommendations for In-Lieu Technologies for Dedicated Irrigation Meters for Commercial, Industrial, and Institutional Outdoor Irrigation Water Use Performance Measure* (WUES-DWR-2021-19).

The recommended streamlined implementation of these CII water use performance measures is summarized in this report for easy reference. These recommendations for CII water use performance measures and associated annual reporting requirements are also included in the report, *Recommendations for Urban Water Use Efficiency Standards, Variances, Performance Measures, and Annual Water Use Reporting* (WUES-DWR-2021-01A), which provides the complete context, development process, and resulting recommendations from DWR to the State Water Board for improving urban water use efficiency under the 2018 Legislation.

Effects on Existing Law and Regulations

DWR developed the recommendations on the CII water use performance measures pursuant to legislative directive. The recommended performance measures do not rescind or modify existing requirements for improving CII water use efficiency or authorities for implementing such actions.

1.4 Report Organization

This report is organized into six sections:

- **Section 1** – **Introduction** provides background information, the purpose of this summary report, and report organization.

- **Section 2** – **Scope of Commercial, Industrial, and Institutional Water Use Performance Measures** provides the summary of the clarified scope for developing CII water use performance measures.

- **Section 3** – **Approach for Performance Measure Development** describes the technical approach and stakeholder engagement that DWR conducted to support performance measure development.

- **Section 4** – **Recommendations for Commercial, Industrial, and Institutional Water Use Performance Measures** summarizes DWR's recommendations for the specifications, guidelines, and methodologies for the CII water use performance measures. Additional considerations for implementation are also included in this section.

- **Section 5** – **Glossary** provides a list of key terms and their definitions used in this report.

- **Section 6** – **References** provides a list of references used in this document.

This report includes one appendix:

- **Appendix A** provides the list of documents in DWR's Recommendation Package that are incorporated by reference.

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2.0 Scope of Commercial, Industrial, and Institutional Water Use Performance Measures

As directed in the 2018 Legislation and described in WC Section 10609.14, DWR, in coordination with the State Water Board, is to: (1) conduct necessary studies and investigations, and (2) recommend CII water use performance measures for adoption by the State Water Board. CII water use performance measures are not part of the UWUO calculation, but must be implemented (WC Section 10609.10(d)(2)), and their implementation must be documented in the urban retail water supplier's Annual Water Use Report (WC Section 10609.24(3)). In addition, performance measures do not include process water (WC Section 10608.12(n)). The 2018 Legislation provides DWR the general direction for the scope of DWR's studies, investigations, and thus, resulting recommendations; however, DWR needed to clarify the context and targeted outcome for each CII water use performance measure prior to making its recommendations.

2.1 Legislative Requirements

In accordance with WC Section 10609.10, DWR conducted studies and investigations, solicited stakeholder participation, and ensured consistency with the 2013 CII Task Force Report in developing the information necessary to make recommendations on the CII water use performance measures to the State Water Board:

> *(a) The department, in coordination with the board, shall conduct necessary studies and investigations and recommend, no later than October 1, 2021, performance measures for CII water use for adoption by the board in accordance with this chapter.*
>
> *(b) Prior to recommending performance measures for CII water use, the department shall solicit broad public participation from stakeholders and other interested persons relating to all of the following: […]*
>
> > *(1) Recommendations for a CII water use classification system for California that address significant uses of water.*
> >
> > *(2) Recommendations for setting minimum size thresholds for converting mixed CII meters to dedicated irrigation meters, and evaluation of, and recommendations for, technologies that could be used in lieu of requiring dedicated irrigation meters. […]*

> *(3) Recommendations for CII water use best management practices, which may include, but are not limited to, water audits and water management plans for those CII customers that exceed a recommended size, volume of water use, or other threshold.*
>
> *(c) Recommendations of appropriate performance measures for CII water use shall be consistent with the October 21, 2013, report to the Legislature by the Commercial, Industrial, and Institutional Task Force entitled "Water Use Best Management Practices," including the technical and financial feasibility recommendations provided in that report, and shall support the economic productivity of California's commercial, industrial, and institutional sectors.*

The 2018 Legislation further clarified that performance measures are actions to be taken by urban retail water suppliers that will result in increased water use efficiency by CII water users, and process water is excluded from performance measures (WC Section 10608.12(n)). The State Water Board is to adopt performance measures for CII water use on or before June 30, 2022 (WC Section 10609.10(d)(1)).

DWR conformed with WC Section 10609.10 by conducting the following key studies and research to facilitate recommendation development:

- Identify a CII water use classification system for data collection and reporting purposes.
- Assess applicable commercial, industrial, and institutional best management practices (CII-BMP) for implementation.
- Identify the threshold and schedule for implementation of CII-BMPs.
- Inform the recommendation for a minimum size threshold for converting mixed-use meters to DIMs (or equivalent technologies).
- Identify acceptable technologies to be implemented in lieu of converting mixed-use meters to DIMs (or equivalent technologies).

Based on the findings of these studies and research, DWR recommended four CII water use performance measures consistent with the requirements of WC Section 10609.10, namely: (1) CII Classification System PM, (2) CII-BMPs Performance Measure, (3) Conversion Threshold PM, and (4) In-Lieu Technologies PM. Separate reports that address each of these CII water use performance measures are included in DWR's Recommendation Package. Each report contains full descriptions of the specific studies, research, and public outreach conducted to support the development of each of the performance measures. Where applicable, the content of these documents are

incorporated by reference throughout this report. The content of these documents are incorporated by reference throughout this report, as applicable.

2.2 Existing Implementation and Context for Performance Measures

In addition to the legislative requirements outlined above, certain considerations and context are important for developing the CII water use performance measures to meet legislative requirements and facilitate intended CII water use efficiency.

Diverse Water Use for Supporting Commercial, Industrial, and Institutional Economic Activities

As previously discussed in Section 1, per the 2018 Legislation, the CII water use performance measures must recognize the broad diversity in CII facility types and sizes, equipment types, facility age, quantity and rate of operations, and number of fixtures, which makes addressing water use efficiency challenging in the CII sector. CII water user characteristics and end uses are not necessarily comparable across CII types or even within the same CII water user category, depending on a number of factors, including the intensity of production or services offered (Mitchell, 2019). The density and nature of economic activities supported by CII water use are other significant variables for urban retail water suppliers throughout the State. These findings are consistent with input from stakehodlers and urban retail water suppliers based on their own experiences in promoting CII water use efficiency.

The intended CII water use performance measures are closely associated with many actions normally referenced as part of the overall CII-BMPs. As thoroughly discussed in the 2013 CII Task Force Report and *Best Management Practices for Commercial, Industrial, and Institutional Water Use* (WUES-DWR-2021-16.T1), there is no single approach to implementing CII-BMPs due to the wide variability in CII water use and user characteristics. Generalizing the effectiveness for CII-BMPs is not supported by real-world conditions; rather, understanding these end uses is crucial for determining water efficiency and conservation opportunities.

Lack of Necessary Details and Consistency in Current Management Strategies

In addition to the diverse nature associated with CII water use, the setting and sophistication of practices employed by urban retail water suppliers can also vary significantly, resulting in meaningful differences in their abilities to facilitate or support the implementation of actions for improving CII water use efficiency. In reviewing the existing management of CII water use, DWR was not able to identify consistency in practices among urban retail water suppliers, because, as suggested by 2013 Task Force Report, every CII water user can be unique and the conditions and challenges faced by each urban retail water supplier can also be unique.

The current management strategies for improving CII water use efficiency are primarily based on the implementation of CII-BMPs and the progression of water use efficiency standards for fixtures and other equipment used for associated economic activities. Refer to *Best Management Practices for Improving Efficiency in Commercial, Industrial, and Institutional Water Use: Key Successes and Challenges in California* (WUES-DWR-2021-16.T1) for additional information. Under the existing regulatory framework provided by SB X7-7, the requirements for improving CII water use efficiency are embedded in a lumped statistic in gpcd. Therefore, the CII water use records and associated accounting system and staffing of many urban retail water suppliers often lack detail or capacity to support the implementation of CII water use performance measuresand, generally, the bottom-up, incremental accounting required by the 2018 Legislation for improving urban water use efficiency as a whole.

Attempts were made to develop different metrics for measuring CII water use efficiency. In general, water use efficiency metrics require detailed information about the CII water users and facilities, and multiple metrics may be necessary, as there is no single metric that can be used to assess water use efficiency for all CII water user types. For example, when high-quality information is available, building size can be correlated with water use for certain types of CII water use, such as office buildings. However, by example, a significant correlation between building size and office water use in Florida does not mean the relationship can be applied in Sacramento, California (Fedak et al., 2019). Additionally, building size was not well correlated with other types of CII water uses, such as restaurants. This is because building or facility size does not address factors that could affect water use, such as number of employees, meals being served, seating capacity, and number of customers – all could vary significantly from location to location (Fedak et al., 2019).

The previously mentioned varying density and nature of economic activities supported by CII water use throughout the State has had additional effects on the relative levels of significance of CII water use for urban retail water suppliers when developing strategies for improving CII water use efficiency. The number of CII water users within urban retail water suppliers' service areas varies from about 27 total CII accounts (0.6 percent of accounts) to more than 84,000 total CII accounts (11 percent of accounts). The makeup of accounts in each urban retail water supplier's service area will affect the decision for targeted CII sectors and groups for maximizing the effectiveness and efficiency in resource investment. Stakeholder input throughout the development process was consistent in requesting local flexibility and ability to customize their own programs and actions. Refer to *Best Management Practices for Commercial, Industrial, and Institutional Water Use* (WUES-DWR-2021-16.T1) for additional details regarding variability of CII sectors and water use.

The reality for lacking a consistent approach to managing CII water use efficiency statewide was fully reflected in the 2013 Task Force Report and *Best Management Practices for Commercial, Industrial, and Institutional Water Use* (WUES-DWR-2021-

16.T1). However, recognizing the diverse nature of CII water use, the needed consistency also requires adequate flexibility for customized implementation by urban retail water suppliers to fit unique local conditions. DWR's recommended CII water use performance measures, when adopted, will provide a beginning for a more proactive approach to improving CII water use efficiency.

Roles in Implementation of Commercial, Industrial, and Institutional Water Use Performance Measures

As previously mentioned, the intended CII water use performance measures are closely associated with many actions normally referenced to as part of the overall CII-BMPs, which includes actions implemented by CII water users, urban retail water suppliers, and collaboration of the two. However, the 2018 Legislation is explicit that CII water use performance measures are actions taken by urban retail water suppliers for improving CII water use efficiency. Therefore, it is important to recognize the limited authority of urban retail water suppliers to unilaterally implement certain actions that may affect how water use occurs on properties of CII water users. As such, there is a significant difference in roles of CII water users and urban retail water suppliers and corresponding drivers for implementing certain actions for improving CII water use efficiency and for determining adequate scopes for CII water use performance measures.

CII water users often consider the business case for implementing specific CII-BMPs, such as a DIM (or equivalent technology) or in-lieu technologies. A frequent consideration is the payback period – how long it takes for cost savings (e.g., reduction in water and wastewater charges) to exceed the initial up-front costs. Additional considerations may also include available staffing resources for implementation or maintenance, even for certain CII-BMPs with a favorable return on investment (ROI). In some cases, property owners may further restrict certain changes on their property. However, CII water users or property owners may implement certain CII-BMPs with unfavorable ROI from a strict economic sense in exchange for other benefits (e.g., reputations or qualification for additional local business incentives) that may not be related to direct revenues or profits.

With exceptions (e.g., implementation of the CII Classification System PM), urban retail water suppliers often assume a role to assist and incentive implementation of actions to improve CII water use efficiency in collaboration with CII water users. Progressive urban retail water suppliers may further facilitate and initiate additional coordination with other local agencies with permitting and regulatory authority for better outcomes. The dichotomy of CII water users and urban retail water suppliers are discussed in detail in *Recommendations for Commercial, Industrial, and Institutional Water Use Best Management Practices Performance Measure* (WUES-DWR-2021-16). Refer to *Best Management Practices for Improving Efficiency in Commercial, Industrial, and Institutional Water Use: Key Successes and Challenges in California* (WUES-DWR-

2021-16.T1) for types of CII-BMPs that can be implemented by water users and urban retail water suppliers, as well as their implementation challenges.

State and federal governments also play an important role in the improvement of CII water use efficiency through enacting legislation and policies, establishing water use efficiency standards and additional regulatory requirements, and, often more effectively, instituting incentives and assistance for broad adaptation and implementation. These are not within the scope of recommendations for CII water use performance measures; however, where appropriate, these considerations are also discussed.

2.3 Clarified Scopes of Performance Measures

Consistent with the legislative requirements, DWR considered that CII water use performance measures should focus on actions that the urban retail water supplier can unilaterally take to either implement processes or procedures to improve landscape water use efficiency or to assist, encourage, or incentivize actions by CII water users, property managers, or property owners for improving water use efficiency.

As previously discussed in Section 1, there are differences in management strategies with the 2018 Legislation for CII water use efficiency. Except for outdoor irrigation of landscape areas with DIMs in connection with CII water use, CII water use is not part of the quantitative reporting requirements for the UWUO. However, an urban retail water supplier's progress towards implementing CII water use performance measures is part of the annual reporting requirements.

Though process water is excluded from consideration for CII water use performance measures, DWR recognized that efficient use of process water remains an important element for overall CII water use efficiency improvements. However, the interconnection of process water with underlying economic activities that may be confidential or sensitive to business viability prompted the exclusion. Certain CII water users may be open to work with urban retail water suppliers for improvement, and certain urban retail water suppliers may have a management or rate structure that is conducive to incorporate process water. These are the common conditions among CII water users and urban retail water suppliers throughout the State.

The following provides additional clarifications for the scope of each performance measure. The interconnection among various CII water use performance measures requires an overall design for mutual support and consistency, and a coordinated and streamlined implementation as part of the recommendations. These considerations were incorporated in DWR's approach for developing CII water use performance measures discussed in Section 3.

Commercial, Industrial, and Institutional Water Use Classification System Performance Measure

DWR recognized that a CII water use classification system is an important starting point to improve the data collection for better understanding of the inherent diversity of CII water use and to inform future development of proper methods for assessing CII water use efficiency and associated improvement through time. Consistent with the legislative requirements, including the required consistency with recommendations of the 2013 Task Force Report, the CII water use classification system is to be comprehensive, with sufficient detail for data collection and subsequent analyses; it should not be overly burdensome, which could inhibit the successful launch of such a system. It should be water-centric, covering all types of CII water use, with an understanding that not all categories are applicable to every urban retail water supplier. The resulting CII water use classification system will not require urban retail water suppliers to change their billing system, but provide a standardized reporting protocol for statewide consistency in data collection and synthesis.

Commercial, Industrial, and Institutional Water Use Best Management Practices Performance Measure

Urban retail water suppliers often lack proper authority to implement certain CII-BMPs without explicit cooperation from CII water users. Therefore, CII-BMPs that can be implemented by urban retail water suppliers are those they can implement unilaterally without consent from CII water users and associated property owners (or their representative management entities); and those they can implement with either voluntary actions by CII water users or their property owners, or in response to requests (including applicable ordinances and other regulatory requirements), incentives, or other programs by urban retail water users. These are hereinafter referred to as “CII Water Supplier BMPs.”

Conversely, CII-BMPs implemented by CII water users or associated property owners or managers that can result in improvement of water use efficiency are hereinafter referred to as “CII Water User BMPs.” CII Water User BMPs are not part of the CII-BMPs Performance Measure, except where they may be implemented under programs initiated by urban retail water suppliers that are part of this performance measure (such as incentive programs that offer rebates for installation of CII Water User BMPs) or used to report on program success or challenges (such as the number of turf rebates provided to CII water users).

After examining different possible size thresholds against legislative requirements and reasonableness, DWR recognized that the threshold for requiring compliance with the CII-BMPs Performance Measure should be volume-based to address major CII water use. The threshold can be applied to a specific CII water use classification, or all classifications defined in the CII Classification System PM.

Conversion Threshold Performance Measure

After examining different possible size thresholds against legislative requirements and reasonableness, DWR considered that the conversion threshold in the Conversion Threshold PM be based on the size of irrigated CII landscape area served by a mixed-use meter. The conversion of mixed-use meters for landscape irrigation to DIMs (or equivalent technologies) will fundamentally change the way in which the associated landscape irrigation water use is managed, and the resulting water use is subject to the requirements of CII-DIMWUS. Alternatively, urban retail water suppliers can work collaboratively to implement adequate technologies in lieu of DIMs (or equivalent technologies) for water use efficiency improvement. These are the only two options for compliance.

In-Lieu Technologies Performance Measure

It is important to recognize the difference between technologies that are equivalent to a DIM and technologies that can be used in-lieu of a DIM. A DIM is used to measure the volume of water delivered to the landscape and reports data directly to the urban retail water supplier in some time interval and accuracy, depending on the specifications of the meter. Usually, the metered data are the basis of billing customers' water use. Therefore, an equivalent technology is defined as any other device or process that is not a DIM, but provides the same functions of direct measurement as a DIM and facilitates the same utilities to the urban retail water supplier as a DIM. Refer to *Recommendations for Commercial, Industrial, and Institutional Outdoor Irrigation of Landscape Areas with Dedicated Irrigation Meters Water Use Efficiency Standard* (DWR-WUE-2021-03) for additional details on qualified equivalent technologies.

DWR's recommended in-lieu technologies under the In-Lieu Technologies PM that are designed to achieve improved water use efficiency are hereinafter referred to as "In-Lieu Technologies." In-Lieu Technologies are intended to achieve the same outcome for the water use of a DIM that is subject to CII-DIMWUS; in the context of 2018 Legislation, the intended outcome is to improve water use efficiency for CII landscape irrigation. Therefore, In-Lieu Technologies should not be technologies that directly measure the CII landscape water use and report that water use directly to the urban retail water supplier as a DIM (or equivalent technology). Rather, In-Lieu Technologies should be technologies that increase water use efficiency using methods other than those providing a direct measurement of water use, and they may or may not provide data directly to urban retail water suppliers. However, urban retail water suppliers are still required to provide evidence that water use efficiency for CII landscape irrigation will be improved by deploying the In-Lieu technologies.

In addition, consistent with the definition for "technology" in *Merriam-Webster*[2] in-lieu technologies should not be limited to specific devices, equipment, or analytical methods. In-lieu technologies should also include application of processes or programs that improve CII landscape water use efficiency through the implementation of landscape water use efficiency management practices and technologies.

[2] *Merriam-Webster*, s.v. "technology (n.)," Accessed at: https://www.merriam-webster.com/dictionary/technology

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3.0 Approach for Performance Measure Development

The 2018 Legislation requires DWR to study, investigate, and make recommendations on CII water use performance measures to improve CII water use efficiency. In addition to necessary technical detail and implementation considerations, the interconnection among various CII water use performance measures requires an overall design for mutual support, and a coordinated and streamlined implementation as part of the recommendations.

This section provides a summary of the coordinated and consistent approach DWR used to develop CII water use performance measures, with incorporation of legislative requirements for stakeholder engagement and coordination with the State Water Board during the process.

3.1 Principles and Focus

DWR's approach to developing the recommendations for CII water use performance measures was an iterative process in collaboration with stakeholders and the State Water Board to assist DWR in formulating design criteria, conducting literature reviews, and refining options and associated implementation considerations. DWR leveraged the findings of studies, research, and stakeholder input to clarify the scopes (described in Section 2) and develop recommendations for CII water user performance measures.

The following provides a summary of resulting principles that DWR used to develop the recommendations for the CII water use performance measures. Details and considerations that are performance measure–specific are provided in corresponding recommendation reports that are incorporated in this report by reference, including *Recommendations for Commercial, Industrial, and Institutional Water Use Classification System Performance Measure* (WUES-DWR-2021-17), *Recommendations for Commercial, Industrial, and Institutional Water Use Best Management Practices Performance Measure* (WUES-DWR-2021-16), *Recommendations for Dedicated Irrigation Meter Conversion Threshold for Commercial, Industrial, and Institutional Outdoor Irrigation Water Use Performance Measure* (WUES-DWR-2021-18), and *Recommendations for In-Lieu Technologies for Dedicated Irrigation Meters for Commercial, Industrial, and Institutional Outdoor Irrigation Water Use Performance Measure* (WUES-DWR-2021-19).

Focus on Actions That Can Be Taken by Urban Retail Water Suppliers

Per WC Section 10608.12(n), peformance measures are actions taken by urban retail water suppliers that will result in increased water use efficiency by CII water users and

do not include process water. In many cases, water use efficiency improvements and/or implementation of the CII water use performance measures will require explicit consent by and cooperation with CII water users, property managers, and property owners. Among the four CII water use performance measures, the CII Classification System PM is the only one that urban retail water suppliers can unilaterally implement based on the requirements adopted by the State Water Board. For other CII water use performance measures, DWR needs to carefully differentiate the range of possible actions that are usually referenced as CII-BMPs in general.

In addition, although the 2018 Legislation excludes process water from the requirements of CII water use performance measures, not all process water use can be easily parsed out for consideration, and urban retail water suppliers would need to be sensitive that process water use could be related to confidential trade practices for intended economic activities. Therefore, DWR needs to include alternative specifications of relevant CII water use performance measures to accommodate this situation.

Exclude Quantification of Water Use in Key Performance Indicators or Reporting Requirements

As previously discussed, the 2018 Legislation recognized the diversity and level of complexity in the CII water use sector and the necessity of maintaining economic productivity. Therefore, except for CII outdoor irrigation with DIMs, management and improvement of water use efficiency in CII sectors are not based on standards or any specific quantification of CII water use, but rather are subject to compliance with performance measures.

Similar to the UWUO, DWR affirmed that urban retail water suppliers are to be evaluated for their implementation and resulting success of CII water use performance measures on an aggregated service area basis, but not on the level of individual CII water users. While a CII water use classification system will aid in the data collection and evaluation of urban CII water use and efficiency improvements, it will only be a starting point, with more extensive work needed in the future. The implementation of the CII Classification System PM would standardize the data collection for subsequent synthesis. Consistent with the legislative directive, DWR does not include any quantitative reporting requirements by CII classification (sector) or as a whole, or key performance indicators related to water use volume. However, DWR's recommendations do not prevent any urban retail water suppliers volunteering to provide quantified CII water use information as part of their Annual Water Use Report.

Address Major Water Use

The 2018 Legislation directs DWR to develop CII water use performance measures to address major water use. The emphasis is consistent with a relatively common observation among urban retail water suppliers that most CII water use is from the top

20 percent of CII water users, if not less, in their service area. Therefore, focusing on top water users can be a reasonable and preferable approach to make meaningful improvements in CII water use efficiency. It would also help improve the ROI on resources and activities for implementation.

DWR incorporated this principle into the specifications for CII water use performance measures by instituting thresholds for actions, as required by the 2018 Legislation, and in the streamlined implementation among different CII water use performance measures. With the implementation of the CII Classification System PM, focusing on top water users can also be applied to high water use CII sectors or CII water use classification categories (i.e., focusing on top CII water use classification categories). Generally, DWR anticipates that effective CII-BMPs for each sector (or classification) within a service area are likely to be similar; although DWR also recognizes that there still could be differences among CII water users within the same sector (or classification).

Similarly, in selecting the minimum landscape size as the conversion threshold for mixed-use CII meters, DWR considered the importance of a reasonable size threshold that captures both major CII landscape water use and is technically and financially feasible for implementation. A DIM is not financially feasible for landscapes with area less than 40,000 square feet – and even then, only under conditions where measurable water savings are achieved. Certain scenarios associated with a mixed-use meter may warrant consideration for exemption, including the condition in which a mixed-use meter may serve only a minor amount of non-irrigation water use (e.g., drinking fountains and restrooms in a park). Another example of possible exemption is where a CII landscape served by a mixed-use meter in a highly efficient manner, splitting the meter or implementing in-Lieu Technologies, as defined in In-Lieu Technologies PM, produces few benefits. These varying conditions suggest focusing on major water use for designing CII water use performance measures is prudent. More importantly, knowing certain details of a mixed-use meter matter for practical reasons. Therefore, to the extent possible, the recommendations should provide some flexibility for these conditions.

Institute Consistency and Mutual Support for Implementation with Related Regulatory Requirements

DWR considered it important to institute consistency and mutual support in implementation with related regulatory requirements to streamline the actions for urban retail water suppliers, CII water users, and regulators. One major component is to incorporate the principles of the Model Water Efficient Landscape Ordinance (MWELO) in CII water use performance measures.

MWELO is a State regulation that sets water use efficiency standards for new developments and rehabilitated landscapes. The 2015 MWELO was the latest version

adopted as California Code of Regulations (CCR) Title 23, Sections 490 through 495, and is also referenced by CCR Title 24, Part 11, Chapters 4 and 5 (California Green Building Standards Code). All local agencies must adopt, implement, and enforce MWELO or a local Water Efficient Landscape Ordinance (WELO) that is at least as effective as MWELO. Usually, local agencies that adopt WELOs create a more stringent ordinance than MWELO.

The 2018 Legislation requires DWR to incorporate the principles of MWELO when developing the recommendations for ORWUS and CII-DIMWUS (WC Section 10609.9). This legislation also requires DWR to develop CII water use efficiency performance measures consistent with the recommendations from the 2013 CII Task Force Report (DWR 2013a and 2013b), which include consistent implementation of MWELO.

For consistency with ORWUS, CII-DIMWUS, and streamlined implementation among related regulations, DWR included the principles of MWELO into the design of the CII water use performance measures. These include consistent definitions for key terms like “new” and “rehabilitated” landscapes and “qualified exemptions,” and associated requirements of certain water management practices as they relate to outdoor irrigation water use. These relevant specifications should be further structured to accommodate future MWELO amendments to ensure continued consistent implementation.

Facilitate Customizable Implementation Driven by Local Data and Conditions

Through the literature review, input from professionals and trade organizations, and feedback from urban retail water suppliers and other interested parties, DWR recognized the CII water use performance measures need to allow sufficient flexibility for urban retail water suppliers to customize the performance measures and accommodate local conditions (i.e., the relative water use of CII water users in their respective service areas, the mix of economic activities supported by CII water use, and regional collaboration with other local agencies).

Urban retail water suppliers could develop a customed plan that could have better results by leveraging their experience and understanding of anticipated changes from the regulations adopted by the State Water Board based on DWR’s recommendations. DWR considers it prudent for the State to provide primary key performance indicators that focus on demonstrating overall progress and proven improvement in CII water use efficiency; although, not in a metric of quantified water use for the reasons mentioned above. As part of their customized plan, urban retail water suppliers can define additional key performance indicators for effectively demonstrating their focus and customized efforts for improving CII water use efficiency.

The importance of allowing implementation driven by local conditions is also applicable to data required for implementing CII water use performance measures. For example, DWR considered a study to collect CII landscape area measurements for a representative statewide set of urban retail water suppliers with sufficient diversity in

established landscapes and associated DIM water use of a subset of these landscape areas. Actual and estimated efficient water use on the landscapes could be assessed to provide an indication of potential landscape sizes associated with significant water use. Through discussion with stakeholders, this study concept, although promising and potentially helpful, was significantly deficient.

Even when aerial surveys and remote sensing are used to estimate the irrigated CII landscape area, field verification is necessary to map the actual area irrigated by DIMs and mixed-use meters, even when meters are geolocated, because CII landscapes can be served by one or many DIMs; a combination of DIM(s) and one or many mixed-use meters; and natural or private water sources. It is also not uncommon for a mixed-use meter serving a common landscape area to cross multiple parcels involving multiple parties. These seemingly confusing and counterintuitive conditions are expected to be delineated, improved, and better managed as implementation of CII water use performance measures continues; however, a transition period is expected with significant reliance on local knowledge.

Promote a Programmatic Approach for Efficiency and Effectiveness

Stakeholder input and the findings from DWR's studies, research, and investigations consistently suggested that rarely can one improvement action alone be implemented to realize the anticipated outcome for CII water use efficiency improvements. In many cases, actions under the CII water use performance measures are connected to other requirements, actions required by other urban water use standards, or other relevant existing regulations.

A straightforward example is that landscapes converted to a DIM (or equivalent technology) are subject to CII-DIMWUS and become a component of the urban retail water supplier's UWUO for efficient water use. Other examples can be more complex, and unintended consequences may need to be considered. CII landscapes are more likely to qualify as a Special Landscape Area (SLA), as defined in the recommended CII-DIMWUS. Converting an irrigated CII landscape served by a mixed-use meter that includes SLAs to a DIM would require separate measurement of the SLA portion of the landscape to make use of the higher water use allowance in the recommended CII-DIMWUS. More importantly, the resulting allowable water use budget after meter conversion may not be reduced.

In some cases, different actions, such as meter conversion, can be combined for a certain initiative, especially a short-term one. For instance, a meter conversion program can be combined with the CII-BMPs Performance Measure actions, such as outreach and education with incentive or training programs for landscape and irrigation system maintenance in order to achieve improved water use efficiency. Additionally, pay-for-performance programs are customized programs that combine outreach and education with incentive programs to improve water use efficiency. In these programs, CII water

users receive an incentive based on how well they perform in terms of water savings (i.e., water use efficiency improvement while maintaining existing production).

Budget-based rate structures that have been implemented in certain parts of the State also incorporates many CII-BMPs. Water use efficiency can be incorporated and agreed-upon when negotiating a budget and, thus, the resulting water use can be used as an indicator of water use efficiency if other conditions remain constant. Communication with CII water users when actual water use exceeds the budget also provides for outreach and education functions and generates opportunities to identify the cause of increased use. The resulting reduction in water use is rewarded by the avoided cost of paying for water use in high-rate tiers when exceeding the budget. While DWR recognizes the benefits of a budget-based rate structure for improving CII water use efficiency (or overall urban water use efficiency), this practice is not for everyone, and a successful budget-based rate structure requires significant planning for change and many years to mature.

While DWR recognized the importance of allowing a customized program formulation and implementation, it is important for urban retail water suppliers to demonstrate how the various components of the program can support each other and, collectively, achieve CII water use efficiency improvements. The overall coordinated design and administration could also reduce overall costs. DWR recognized that urban retail water suppliers could benefit from developing and implementing a CII Water Use Efficiency Improvement Program that covers all components of implementing the CII water use performance measures. However, DWR realizes it is equally important to allow urban retail water suppliers to determine if a single, all-inclusive program structure or multiple programs that meet the needs would be beneficial (especially when some have been established for years). The emphasis on integrated programmatic implementation remains the same.

As part of the integrated, programmatic implementation, DWR considered that various requirements, especially those anticipated accomplishments by milestone (years after adoption) during the transition period, can be coordinated and streamlined to facilitate a smoother implementation for all recommended CII water use performance measures. For example, urban retail water suppliers can engage the same CII water users each year for classification purposes and, if applicable, for conducting landscape area measurement for potential mixed-use meter conversion. As the CII-BMPs Performance Measure focuses on major water users above the conversion threshold, urban retail water suppliers could initiate their classification efforts by starting with top CII water users to facilitate early-identified CII water users for targeted implementation of the CII-BMPs Performance Measure. Therefore, DWR considered it prudent to design the corresponding key performance indicators to facilitate this practice. DWR also acknowledges that some urban retail water suppliers may experience significant hardship in meeting these key performance indicators due to, for example, financial challenges and limitations of organizational capacity. As such, DWR considered it

necessary to include remedial actions for urban retail water suppliers for an alternative schedule subject to approval by the State Water Board. DWR considers this approval requirement prudent, recognizing that the 2018 Legislation set a schedule for transitioning the State to a new, long-term regulatory framework by 2030.

Incorporate Considerations of Technical Feasibility, Financial Feasibility, and Economic Productivity

The 2018 Legislation requires DWR to recommend CII water use performance measures, considering technical and financial feasibility, and the underlying economic productivity of CII water use. Technical feasibility is easier to discern. Financial feasibility of each action taken by urban retail water suppliers or their effects on economic productivity are more difficult to assess. In this context, the exclusion of process water from CII water use performance measures was a big step to avoid unintended effects on economic productivity.

As previously mentioned, DWR's recommendations for CII water use performance measures focus on actions taken by urban retail water suppliers, recognizing that many improvement actions cannot be implemented without explicit consent and cooperation by CII water users. Similarly, financial feasibility is to be assessed from the viewpoint of the corresponding CII water user and the ROI; more precisely, the CII water user business case may be determined by factors that may not be fully shared with its corresponding urban retail water supplier.

A major comment received from stakeholders regarding the financial feasibility and economic productivity was related to the affordability of water, which is an urban retail water supplier–specific issue that is subject to factors of a much broader scope, including CII types within each service area, demographics, and socioeconomic dynamics.

With these challenges, DWR focused on streamlining the requirements and an outcome-oriented flexible implementation to reduce potential cost burdens on urban retail water suppliers and, potentially, CII water users. Therefore, for the CII-BMPs Performance Measure, DWR considered it prudent to allow urban retail water suppliers to design their customized implementation plan with targeted CII water users, covering several types of required actions that: (1) are proven to be effective and financially favorable, and (2) contribute to mitigating barriers created by lack of authority. The combination of and emphasis on these actions can be different among urban retail water suppliers; however, DWR requires evidence of improvement in CII water use efficiency through implementation of the planned actions as supporting information in their Annual Water Use Report.

Similarly, in designing the In-Lieu Technologies PM, DWR considered it important to avoid explicit enumeration of allowable technologies in detail due to continuous

improvement in available technologies and potential changes in water metering practices. However, the supporting evidence of improvement in CII water use efficiency through implementation of the In-Lieu Technologies PM are required to justify the use of certain technologies in lieu of a DIM. Also required is providing a complete description of accompanied actions, such as well-defined and financially-supported maintenance practices, to ensure the improvement is long lasting.

Urban retail water suppliers can define the level of detail of implementation using an outcome-focused approach to better meet their needs, as well as those of the CII water users. This approach will allow creativity and adjustments to produce solutions that are technically feasible and in line with financial considerations and business development of CII water users, which results in avoiding adverse impacts on their economic productivity.

Streamline Implementation of Performance Measures and Primary Key Performance Indicators

DWR considers a transition period is needed to allow urban retail water suppliers that currently have different levels of readiness and capacity for implementing the recommended CII water use performance measures to achieve a consistent level of performance. Currently, not all urban retail water suppliers have a well-developed program for CII water use efficiency and, thus, it would require resources and adequate time for a feasible transition to achieve a reasonable level of consistent implementation statewide. Even for those who have a long history of program implementation for CII water use efficiency, adjustments are likely required to conform to the new requirements of CII water use performance measures.

Further, the interconnection among various CII water use performance measures requires an overall design for mutual support and a streamlined implementation as part of the performance measures recommendations. Examples of key connections are identified between the individual recommended CII water use performance measures and CII-DIMWUS. The CII-BMPs Performance Measure is related to the other CII water use performance measures in that the conversion of mixed-use meters for landscape irrigation to DIMs will eventually change the way in which landscape water use is accounted for by some CII water users. DWR also anticipates that the CII water use data collected by urban retail water suppliers per the CII Classification System PM could be used to help them identify those CII users or user types that will most likely benefit from targeted CII-BMPs for water use efficiency purposes. DWR also clearly identified the interconnection among different CII water use performance measures and other urban water use efficiency standards, and incorporated these interconnections into the design of key performance indicators to improve the implementation efficiency and reduce burdens on urban retail water suppliers.

Encourage Regional Collaboration and Coordination

DWR recognized the benefits of regional implementation of the recommended performance measures. To that end, urban retail water suppliers should strive for potential regional collaboration and coordination for implementation of CII water use performance measures, and if possible, for the entire scope of urban water use efficiency. Potential coordination and cooperation with other local agencies, permitting, and land use authorities could be especially beneficial to mitigate challenges urban retail water suppliers may face in implementing activities to improve CII water use efficiency due to lack of authority. Financial and programmatic benefits are also possible through regional collaboration and coordination for data sharing, program administration, enforcement of actions, and education and outreach. Additionally, regional implementation could promote consistent messaging and implementation across a region to reduce confusion and balance business competitions among CII water users.

A regional implementation is consistent with many State initiatives for water management. It is an important strategy to leverage limited resources and capacity of each urban retail water supplier to get the maximum water use efficiency benefit. As such, DWR supports regional implementation; however, as the compliance determination is based on the individual urban retail water supplier's progress, urban retail water suppliers need to meet the reporting requirements for their respective Annual Water Use Report with adequate supporting information to show progress.

3.2 Stakeholder Process

Consistent with the legislative directive, DWR used a public process involving diverse stakeholders in the review and development of CII water-use related topics. The stakeholder process was part of the larger engagement process to implement the provisions of urban water use efficiency in the 2018 Legislation (see *Stakeholder Outreach Summary for Developing Urban Water Use Efficiency Standards, Variances and Performance Measures* [WUES-DWR-2021-20]). More focused stakeholder engagement specifically for CII water use performance measures started in March 2020, with periodic meetings and workshops held through early 2022.

DWR established two working groups to assist in implementing the 2018 Legislation, and these groups formed the basis of the stakeholder involvement process that included State agencies, cities, counties, urban retail water suppliers, environmental organizations, professionals, and other stakeholders and interested parties. The Water Use Studies Working Group was established in July 2019 to inform DWR in developing water use studies for setting up standards, variances, and performance measures. Concurrently, the Standards, Methods, and Performance Measures Working Group was also established to provide input to DWR on developing the structure and specifications of water use efficiency standards, variances, methodologies, and performance

measures. However, due to the close relationships between research on different CII water use performance measures and the implementation of urban water use efficiency standards and variances, members of both working groups were invited to participate in the same stakeholder meetings and workshops.

Working group members and other participants had ample opportunities to learn about the review of various performance measure options considered for DWR's recommendations and to provide feedback on these topics, including staffing and resource needs, and other implementation considerations. In order to solicit broad participation, DWR opened working group meetings and workshops to the public to allow additional input from other stakeholders, interested parties, and individuals.

DWR also conducted and responded to requests for additional topic-specific meetings and public outreach and engagement activities with both individual entities and groups of stakeholders to learn from their experiences, understand their specific concerns, and receive other feedback. Refer to *Stakeholder Outreach Summary for Developing Urban Water Use Efficiency Standards, Variances, and Performance Measures* (WUES-DWR-2021-20) for additional details on stakeholder outreach and engagement throughout the development of CII water use performance measures. Stakeholder outreach activities that are pertinent to specific CII water use performance measures are provided in the respective CII water use performance measure recommendation reports that are incorproated in this report by reference.

3.3 State Water Board Coordination and Collaboration

DWR's approach to CII water use performance measure was an iterative process in collaboration with stakeholders and the State Water Board to assist DWR in formulating design criteria, conducting literature reviews, and refining options and associated implementation considerations. DWR's recommendations on CII water use performance measures for coordinated implementation, which DWR prepared per requirements of the 2018 Legislation, are to be transmitted to the State Water Board for adoption.

DWR and the State Water Board recognized the importance of this continued coordination and collaboration to ensure the effective implementation of AB 1668 and SB 606 and to streamline the efforts. Staff and leadership from the two agencies met via Microsoft Teams meetings monthly. Topic-specific subgroups also met, as needed; some as often as weekly. Incremental conclusions and recommended actions from these subgroups were brought back to the agency level for further consideration. With respect to improving urban water use efficiency, the efforts of the two agencies were complementary, and built upon each other to establish sufficient mutual understanding about the findings from the body of work and rationales to support DWR's recommendations. Refer to *Stakeholder Outreach Summary for Developing Urban*

Water Use Efficiency Standards, Variances, and Performance Measures (WUES-DWR-2021-20) for additional details on coordination with the State Water Board during the development of the CII water use performance measures.

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4.0 Recommendations for Commercial, Industrial, and Institutional Water Use Performance Measures

Due to the recognized complexity and diversity in CII water use and necessity of maintaining economic productivity, water use efficiency in the CII sectors is not assessed based on established standards or quantification of water use; rather, it is subject to compliance with "performance measures" (note that this statement does not apply to CII outdoor irrigation with dedicated meters, which is subject to CII-DIMWUS). "Performance measures" means actions to be taken by urban retail water suppliers that will result in increased water use efficiency by CII water users. This section provides a summary of DWR's recommended CII water use performance measures, including the CII Classification System PM, CII-BMPs Performance Measure, Conversion Threshold PM, and In-Lieu Technologies PM.

The recommended CII water use performance measures are subject to additional review, approval, and potential modifications by the State Water Board during the adoption process. Regardless of the outcome, the following foundational conditions remain valid:

- The implementation of the recommended CII water use performance measures does not restrict urban retail water suppliers from implementing additional actions exceeding the requirements.
- The implementation of the recommended CII water use performance measures do not require urban retail water users to report in their Annual Water Use Report the quantity of the CII water use or the CII water use efficiency and amount of water savings as a whole or by classification (i.e., section).
- The recommended CII water use performance measures do not set or rescind existing requirements for CII water use efficiency improvement actions or authority for approving such actions.

4.1 Summary of Recommendations

The following provides a summary of DWR's recommendations and, where applicable, a discussion of the requirements and interrelationships among the different CII water use performance measures. Additional information is incorporated by reference.

Furthermore, to highlight the importance of an integrated and coordinated implementation of these CII water use performance measures, DWR's recommended implementation schedule and reporting requirements are consolidated in summary tables in each of the performance measure–specific recommendation reports (see *Recommendations for Commercial, Industrial, and Institutional Water Use Classification System Performance Measure* [WUES-DWR-2021-17], *Recommendations for Commercial, Industrial, and Institutional Water Use Best Management Practices Performance Measure* [WUES-DWR-2021-16], *Recommendations for Dedicated Irrigation Meter Conversion Threshold for Commercial, Industrial, and Institutional Outdoor Irrigation Water Use Performance Measure* [WUES-DWR-2021-18], and *Recommendations for In-Lieu Technologies for Dedicated Irrigation Meters for Commercial, Industrial, and Institutional Outdoor Irrigation Water Use Performance Measure* [WUES-DWR-2021-19].

Commercial, Industrial, and Institutional Water Use Classification System Performance Measure

Based on the evaluation of technical and financial feasibility and public feedback on three options, DWR recommends a CII water use classification system that is water-centric, with complete coverage of all CII water uses. The recommended classification system comprises the following 19 categories:

1. Water Recreation (e.g., public pools/water parks).
2. Recreation, non-water (e.g., athletic facilities, entertainment facilities, parks/cemeteries, golf course).
3. Food/Beverage (e.g., full service, fast food).
4. Laundry (e.g., laundromats, commercial/industrial laundries).
5. Lodging (e.g., hospitality, retirement homes).
6. Healthcare (e.g., hospitals, medical offices, medical and laboratory equipment and processes).
7. Offices.
8. Public Services (e.g., government, prisons and correctional facilities).
9. Sales (e.g., retail, shopping centers/malls, grocery stores and food markets).
10. Services (e.g., auto, personal).
11. Religious Buildings.

12. Education.
13. Vehicle Wash.
14. Industrial, non-manufacturing (e.g., temperature-controlled warehouses, non-temperature-controlled warehouses).
15. Manufacturing (e.g., aerospace and metal finishing industries; plating, printed circuit boards, and metal finishing; food processing and beverage manufacturing; high-tech industry (server facility/data center); petroleum refining and chemical industries; pharmaceutical and biotech industries; power plants).
16. Utility.
17. Mixed Use Commercial (e.g., strip malls, shopping centers, and other commercial spaces that are subject to frequent changes of tenants with different water use profiles to meet their corresponding business needs).
18. Dedicated Irrigation Meter.
19. Others (for those cannot be adequately categorized into the above categories).

These categories are sufficient to address major CII water uses and provide adequate differentiation among different CII sectors to facilitate data collection and future references. However, the system will not be overly detailed to create undue burdens on urban retail water suppliers for implementation.

DWR recommends a schedule for implementing the CII Classification System PM requiring urban retail water suppliers to complete their classifications within five years after the State Water Board's adoption.

- The minimum level of progress in account mapping per year is 20 percent of CII water accounts.
- If an urban retail water supplier does not meet the annual 20 percent mapping requirement, the urban retail water supplier is to include in its annual reporting an explanation and its plan to meet the full mapping requirement by Year 5.
- Should an urban retail water supplier experience a substantial hardship meeting the minimum level of progress, by Year 3, the urban retail water supplier will provide an alternative implementation plan to meet the full mapping requirement for the State Water Board's approval.

Implementation of the CII Classification System PM will not require urban retail water suppliers to reengineer their billing systems or any established account management

practices, but will require information mapping for reporting purposes. In addition, the recommended performance measure requires DWR to provide technical assistance and develop guidance for mapping CII water uses into the adopted CII Classification System PM.

DWR further recommends that urban retail water suppliers establish formal procedures to collect classification information and update account mapping classifications upon receipt of modified or new service requests to keep the classification mapping up to date. Urban retail water suppliers should also coordinate with the corresponding land use authority(ies) to add a requirement for consulting urban retail water suppliers, where appropriate, to inform changes and potential reclassifications.

After the State Water Board's adoption, DWR will develop mapping guidance to assist urban retail water suppliers in implementation based on NAICS with necessary customization, including land use designations (i.e., APNs) used by county assessor's offices for categorizing their water accounts for CII water use performance measure reporting purposes. Subject to further discussion and approval where necessary, DWR may coordinate with the State Water Board and other agencies to issue an advisory to local land use authorities (cities and counties) for cooperation and assistance to urban retail water suppliers in information-sharing during building permit issuances that may affect CII water use.

Refer to *Recommendations for Commercial, Industrial, and Institutional Water Use Classification System Performance Measure* (WUES-DWR-2021-17) for details on the development process, recommended specifications, performance measure, implementation schedule, and reporting requirements for the CII Classification System PM.

Commercial, Industrial, and Institutional Best Management Practices Performance Measure

DWR's recommendations on the CII-BMPs Performance Measure focus on: (1) CII Water Supplier BMPs that can be unilaterally implemented by urban retail water suppliers without explicit consent of CII water users or associated property owners (or their representative management entities), and (2) those that can be implemented with either voluntary actions from CII water users or their property owners, or in response to requests (including applicable ordinances and other regulatory requirements), incentives, or other programs implemented by urban retail water users.

CII Water User BMPs are not performance measures and are not part of the CII-BMPs Performance Measure, except where they may be included in actions considered in the CII-BMPs Performance Measure (such as incentive programs that offer CII Water User BMPs) or used to report on program success or challenges (such as the number of turf rebates provided to CII water users).

CII Water User BMPs considered in the CII-BMPs Performance Measure do not include process water BMPs, because process water is categorically excluded from the CII water use performance measures (WC Section 10608.12(n)). However, urban retail water suppliers are encouraged to collaborate with CII water users to implement process water BMPs, where feasible.

There is no single approach to implement CII-BMPs that would meet the needs of all urban retail water suppliers. This is because of the wide variability in CII water users and urban retail water suppliers' characteristics; what works for some CII water user types and urban retail water suppliers will not necessarily work for others. Therefore, selection of specific CII Water User BMPs that will be supported by urban retail water supplier programs are necessarily subject to confirmation that those BMPs will be most effective for a particular service area's CII water users.

DWR's recommended CII-BMPs Performance Measure would require urban retail water suppliers to design a CII-BMP implementation program specific to their respective service areas that considers local conditions and their experience from past efforts. The implementation program needs to include all of the five following categories of action contributing to improved water use efficiency:

- Outreach, technical assistance, and education.
- Incentives.
- Landscape irrigation and management practices.
- Operational practice updates.
- Collaboration and coordination.

Urban retail water suppliers will implement their customized CII-BMP implementation program targeting water users that exceed a threshold for sectors (or classifications) and an individual threshold with the following elements:

- These thresholds of significance are (1) the classifications (or sectors) of CII water users comprising the top 20 percent of CII water users in volume, and (2) the individual top 2.5 percent of CII water users, excluding process water use.
- The minimum CII-BMP implementation program elements includes at least one CII-BMP from each of the five recommended categories targeted to sectors and/or individual customers above the individual customer threshold.
- The BMPs implemented as part of the program are required to be supported with documentation demonstrating increased water use efficiency. Use of the BMP

does not require approval by the State Water Board or DWR, as long as the BMP is demonstrated to increase water use efficiency.

DWR also recommends an alternative pathway for those urban retail water suppliers that have long-term CII-BMP implementation programs for which additional water use efficiencies for CII water users above the threshold may not be achievable.

In addition, DWR recommends the schedule for implementing the CII-BMPs Performance Measure requiring urban retail water suppliers to complete their program development within three years after the State Water Board adopts the performance measure. Refer to *Recommendations for Commercial, Industrial, and Institutional Water Use Best Management Practices Performance Measure* (WUES-DWR-2021-16) for details on the development process, recommended specifications, performance measure, implementation schedule, and reporting requirements for the CII-BMPs Performance Measure.

Conversion Threshold Performance Measure

Based on the analysis conducted by DWR and stakeholder feedback, DWR recommends a conversion threshold of 1 acre of landscape area irrigated by a mixed-use meter on a per-parcel basis for converting to a DIM (or equivalent technology) or in-lieu technologies, except for the following:

1. Exempt landscapes as defined in MWELO and included in the recommended CII-DIMWUS.

    - Registered federal, State, and local historical sites.
    - Ecological projects that do not require a permanent irrigation system.
    - Mined-land reclamation projects that do not require a permanent irrigation system (pre-2015).
    - Existing plant collections, and botanical gardens and arboretums open to the public (pre-2015).
    - Water use for cemeteries built before 2015.

    These landscape areas are exempted from the meter conversion requirements; however, they remain subject to the CII-BMP Performance Measure.

2. A mixed-use CII meter with non-irrigation water use of no more than 5 percent of the total water use can be considered a DIM for CII landscape irrigation for the purposes of calculating the UWUO.

Urban retail water suppliers must implement one of the following actions for qualified CII outdoor landscape areas and report accordingly in their Annual Water Use Report:

- Convert a mixed-use CII meter that exceeds the conversion threshold to a DIM (or equivalent technology) and report associated landscape area and water use under CII-DIMWUS, following DWR's guidelines and methodologies for calculating the UWUO. For reporting purposes, the resulting DIMs should be classified as a "CII Dedicated Irrigation Meter."

- Implement the In-Lieu Technologies and adhere to the requirements per the In-Lieu Technologies PM.

DWR also recommends the schedule for implementing the Conversion Threshold PM requiring urban retail water suppliers to complete their landscape area measurements and determine whether a DIM or in-lieu technology will be implemented within five years after the State Water Board adopts the regulation. For efficiency, DWR recommends that each year, urban retail water suppliers conduct landscape measurements for outdoor landscape areas of the same CII water users for the purpose of CII classification system to determine the needs for meter conversion.

DWR's recommendations for the Conversion Threshold PM do not restrict CII water users from modifying landscape areas, including reducing the total landscape area on a parcel basis, if desired. Similarly, the recommendations do not restrict CII water users, in coordination with urban retail water suppliers, from implementing the In-Lieu Technologies PM for any irrigated landscape, including those irrigated with a DIM (or equivalent technology).

Refer to *Recommendations for Dedicated Irrigation Meter Conversion Threshold for Commercial, Industrial, and Institutional Outdoor Irrigation Water Use Performance Measure* (WUES-DWR-2021-18) for details on the development process, recommended specifications, performance measure, implementation schedule, and reporting requirements for the Conversion Threshold PM.

In-Lieu Technologies Performance Measure

Related to the CII Conversion Threshold PM, the In-Lieu Technologies PM recommends implementing technologies to be used in-lieu of requiring DIMs (or equivalent technologies) for those irrigated landscape areas served by mixed-use meters that exceed the conversion threshold. Recognizing that the legislation states that performance measures are actions taken by urban retail water suppliers to improve CII water use efficiency, based on studies, investigations, and stakeholder input, DWR recommends the following in-lieu technologies that have demonstrated or expected improvements in CII water use efficiency:

- Water budget–based rate structures.

- Water budget–based management without a rate structure.
- Hardware improvements with enhanced performance.
- Remote sensing combined with other data and hardware improvements.
- Landscape plant palette transformation programs.
- Others (as approved by the State Water Board).

Additionally, DWR recommends that urban retail water suppliers include necessary water management programs to implement communication, irrigation system maintenance, and irrigation scheduling BMPs that are consistent with the CII-BMPs Performance Measure to support demonstration of long-lasting water use efficiency.

DWR also recommends the schedule for implementing the In-Lieu Technologies PM requiring urban retail water suppliers to complete their landscape in-lieu technologies within five years after the first year of landscape measurement under the Conversion Threshold PM, with a total of up to six years for completing the implementation.

- Urban retail water suppliers need to prepare an In-Lieu Technologies Implementation Plan in Year 1 to outline the selection of in-lieu technologies and schedule for implementation, procedural and maintenance requirements, and a budget and financing plan.
- Starting Year 2, urban retail water suppliers have up to one year after the confirmed CII landscape areas for implementing the In-Lieu Technologies that are identified in the previous year under the Conversion Threshold PM.

Refer to *Recommendations for In-Lieu Technologies for Dedicated Irrigation Meters for Commercial, Industrial, and Institutional Outdoor Irrigation Water Use Performance Measure* (WUES-DWR-2021-19) for details on the development process, recommended specifications, performance measure, implementation schedule and reporting requirements for the In-Lieu Technologies PM.

Implementation Schedule for Performance Measures and Reporting Periods for the Annual Water Use Report

Each recommended CII water use performance measure has its own implementation schedule, as previously mentioned. The multi-year implementation schedule for the recommended performance measures is divided into “Implementation Year,” which starts from the date after the State Water Board adopts the new regulations. The overall implementation allows a total of six years for transition; starting in Implementation Year 7, the implementation plan will be stabilized, and urban retail water suppliers could focus on updates and maintenance efforts to remain compliant.

Table 4-1 shows DWR's recommended schedule for streamlined implementation of the CII water use performance measures with their corresponding primary key performance indicators.

The 2018 Legislation allows, on a calendar or fiscal year basis, urban retail water suppliers to submit their Annual Water Use Report that contains the reporting of the calculated UWUO, actual water use consistent with the scope of the UWUO, and implementation of CII water use performance measures of the previous year. AB 1414 of 2019 further amended the due date for the first Annual Water Use Report from November 1, 2023, to January 1, 2024, to streamline the annual reporting schedules for urban water use efficiency and water audit by urban retail water suppliers. Based on AB 1414, the reporting period for the first Annual Water Use Report due on January 1, 2024 (2024 Report) will be January 1, 2022, through December 31, 2022, for urban retail water suppliers filing their report on a calendar basis, and July 1, 2022, through June 30, 2023, for those filing on a fiscal year basis.

The annual schedule and associated reporting periods for urban retail water suppliers to submit their Annual Water Use Report to DWR most likely will not be aligned with Implementation Years that refer to the State Water Board's adoption date. Evaluating milestones (e.g., the end of Implementation Year 2) specified in the primary key performance indicators for anticipated progress occurs during the reporting period. In other words, an Annual Water Use Report could have information on implementation of CII water use performance measures spanning two consecutive Implementation Years. Urban retail water suppliers should report the implementation and milestone progress based on Implementation Year according to their corresponding annual reporting period.

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Table 4-1 California Department of Water Resources' Recommendations on Streamlined Implementation of Commercial, Industrial, and Institutional Water Use Performance Measures

Implementation Year Starting after State Water Resources Control Board Adoption Date	**CII Classification System PM** **Primary KPI**: CII water users mapped for classification	**CII-BMPs Performance Measure** **Primary KPI**: CII-BMP metrics identified in the CII-BMP Program designed for implementing CII-BMPs based on the recommended thresholds[1] for focusing on major CII water use	**Conversion Threshold PM** **Primary KPI**: CII water user parcels reviewed for irrigated landscape area meeting the meter conversion threshold and selecting a compliance option[2]	**In-Lieu Technologies PM** **Primary KPI**: CII landscape areas confirmed for implementing In-Lieu Technologies under the Conversion Threshold PM
1	20% of all CII water users	Start implementing education and outreach BMPs (part of the CII-BMP Program) to all CII water users on new performance measure requirements	20% of all CII water user parcels[4, 6]	Complete In-Lieu Technologies implementation plan
2	40% of all CII water users	Complete CII-BMP Program development with metrics for targeted CII water users and actions based on 20% of all CII water users, classified[5] in Implementation Year 1	40% of all CII water user parcels[4, 6]	All CII landscape areas identified in the Conversion Threshold PM from Implementation Year 1
3	60% of all CII water users[3]	Start implementing CII-BMP Program against identified metrics If the thresholds[1] for targeted CII water users are not met in Year 2, complete CII-BMP Program development with metrics for targeted water users and actions based on 40% of all CII water users, classified[5] through Implementation Year 2	60% of all CII water user parcels[4, 6]	All CII landscape areas identified in the Conversion Threshold PM from Implementation Year 2
4	80% of all CII water users	CII-BMP Program implementation against identified metrics	80% of all CII water user parcels[4, 6]	All CII landscape areas identified in the Conversion Threshold PM from Implementation Year 3
5	100% of all CII water users	CII-BMP Program implementation against identified metrics and program update	100% of all CII water user parcels[4, 6]	All CII landscape areas identified in the Conversion Threshold PM from Implementation Year 4
6	100% of all CII water users with maintenance	CII-BMP Program implementation against identified metrics	100% of all CII water user parcels with maintenance	All CII landscape areas identified in the Conversion Threshold PM from Implementation Year 5
7 and afterwards	100% of all CII water users with maintenance	CII-BMP Program implementation against identified metrics	100% of all CII water user parcels with maintenance	All CII landscape areas identified in the Conversion Threshold PM with maintenance

Table 4-1 California Department of Water Resources' Recommendations on Streamlined Implementation of Commercial, Industrial, and Institutional Water Use Performance Measures (contd.)

Implementation Year Starting after State Water Resources Control Board Adoption Date	CII Classification System PM **Primary KPI**: CII water users mapped for classification	CII-BMPs Performance Measure **Primary KPI**: CII-BMP metrics identified in the CII-BMP Program designed for implementing CII-BMPs based on the recommended thresholds[1] for focusing on major CII water use	Conversion Threshold PM **Primary KPI**: CII water user parcels reviewed for irrigated landscape area meeting the meter conversion threshold and selecting a compliance option[2]	In-Lieu Technologies PM **Primary KPI**: CII landscape areas confirmed for implementing In-Lieu Technologies under the Conversion Threshold PM

Notes:
[1] The thresholds are both of the following: (1) excluding process water, CII water users whose individual total water use volume is in the top 2.5 percent of all CII water users in the service area; and (2) excluding process water, all CII water users within the CII water use classifications, per the CII Classification System PM, which covers the top 20% of CII water users in water use.
[2] Compliance options are either implementing a dedicated irrigation meter (or equivalent technology) or implementing in-lieu technologies.
The confirmed implementation of a dedicated irrigation meter conversion (or equivalent technology) is subject to requirements under the Commercial, Industrial, and Institutional Outdoor Irrigation of Landscape Areas with Dedicated Irrigation Meters Water Use Efficiency Standard.
[3] Urban retail water suppliers that experience significant hardship in complying with the primary KPI of the CII Classification System PM for Implementation Year 3 shall provide an alternative schedule and plan to complete mapping of all CII water users and address the subsequent schedule impacts on other CII water use performance measures for the State Water Resource Control Board's approval.
[4] Urban retail water suppliers that experience significant hardship in complying with the primary KPI of the Conversion Threshold PM can, in any year, provide an alternative schedule and plan to complete necessary landscape measurements for meter conversion considerations and address the subsequent schedule impacts on the In-Lieu Technologies PM.
[5] Classified under the CII Classification System PM
[6] Same CII water users classified under the CII Classification System PM
Key:
CII = commercial, industrial, and institutional
CII Classification System PM = Commercial, Industrial, and Institutional Water Use Classification System Performance Measure
CII-BMPs Performance Measure = Commercial, Industrial, and Institutional Best Management Practices Performance Measure
Conversion Threshold PM = Conversion Threshold Performance Measure
In-Lieu Technologies PM = In-Lieu Technologies Performance Measure
KPI = key performance indicator

4.2 Implementation Challenges and Considerations – A Perspective of Stakeholders

Stakeholders provided significant input on many potential challenges and obstacles in implementing the performance measures and related requirements for improving urban water use efficiency. This section provides general descriptions of challenges that could not be addressed completely by DWR's recommendations and serves as additional contextual considerations for the pending regulatory process.

Commercial, Industrial, and Institutional Water Use Classification System

The CII Classification System PM does not require urban retail water suppliers to change their billing systems or other established account management practices, but does require information mapping for reporting purposes. Urban retail water suppliers should follow DWR's account mapping guidance developed following the State Water Board's adoption. This mapping guidance may also include additional advice for urban retail water suppliers to transition to the CII water use classification system, including collection of additional information when processing water account changes. Urban retail water suppliers should report on their progress in implementing the CII Classification System PM in their Annual Water Use Report.

Commercial, Industrial, and Institutional Best Management Practices Performance Measure

Major challenges stakeholders raised during the development process for the CII-BMPs Performance Measure included the limitations of authority, financial and organizational capacities, incentives for implementation, and effectiveness of certain CII-BMPs. Sections 2 and 3 of this report discuss some of these challenges, which were also identified or echoed by DWR's literature research and investigation, including the technical report, *Best Management Practices for Commercial, Industrial, and Institutional Water Use* (WUES-DWR-2021-16.T1).

DWR has considered these challenges in its recommendations through flexible requirements and streamlined implementation schedules. However, certain challenges for implementing the CII-BMPs Performance Measure may persist.

- **Financial Feasibility and Economic Productivity**. DWR recognizes that the diversity among locations, sectors, and CII water users within various sectors does not lend itself to quantified standards or metrics for CII water use efficiency. This challenge, when coupled with other factors detailed in Section 3, make a direct assessment on financial feasibility and effects on economic productivity difficult.

- **Affordability**. The insufficient organizational capacity of an urban retail water supplier to accommodate the new requirements under the 2018 Legislation, including those of the CII-BMPs Performance Measure, would eventually translate into the cost of services for residents and CII water users in its service area. The level of affordability depends on many factors, as described in Section 3. As such, general assessments for affordability are likely not helpful. Affordability for CII water users would further tie to business competitiveness and market advantages.

DWR formulated the recommendations using a tactical approach to avoid or minimize the potential financial burdens to urban retail water suppliers and to CII water users. While these considerations are important for implementation, it is likely that direct application or analyses may have to wait and depend on the results of data collection after several years of implementation of the CII water use classification system. Before then, it will remain a confusing subject and, potentially, a debatable point for implementing CII-BMPs, contributing to the needs of technical and financial assistance that are commonly expressed by urban retail water suppliers and stakeholders.

Conversion Threshold Performance Measure

DWR recommends provisions for urban retail water suppliers that may have unique circumstances that temporarily or substantially prevent them from implementing the Conversion Threshold PM in accordance with the recommended six-year schedule. As partners of the State in water conservation, urban retail water suppliers will face challenges implementing the Conversion Threshold PM with their CII water users who have irrigated landscapes, served by mixed-use meters, that are greater than the minimum size conversion threshold. Evaluating the technical and financial feasibility of a conversion is unique for each CII customer. Implementing In-Lieu Technologies or reducing the irrigated landscape may be easier; but urban retail water suppliers will still need additional support to encourage them to adopt and correctly implement the Conversion Threshold PM. These challenges are discussed further below.

Account and Landscape Area Measurement Data

- **Identifying mixed-use meter irrigated landscapes**. Many urban retail water suppliers do not have measurements of the landscape areas associated with mixed-use meters. Urban retail water suppliers will face difficulties with identifying mixed-use meters and the associated irrigated landscape areas. In addition, some urban retail water suppliers do not have separate billing classifications for DIMs (or equivalent technologies), making it difficult for them to identify which meters may be mixed-use. Furthermore, many CII landscapes are served by both mixed-use meters and DIMs (or equivalent technologies). Many urban retail water suppliers will have to identify mixed-use landscapes and measure associated irrigated landscape areas.

- **Measuring the associated landscape area.** Measuring an irrigated CII landscape area requires coordination among the property owner, landscape manger, building owner, and the urban retail water supplier for either direct field measurements or for ground-truthing aerial imagery. This requires substantial resources for the costly and time-consuming measurements.

Feasibility of Converting a Mixed-Use Meter to Dedicated Meter

Stakeholders identified that mixed-use meter conversions often require incentive programs, and these conversions are frequently not cost-effective for most CII landscapes. In addition, as noted in Section 3, converting a mixed-use meter to a DIM (or equivalent technology) does not guarantee water savings. The benefits need to outweigh the costs and complexity of converting to a DIM for the conversion to be cost-effective for the CII water user. Additional findings noted by DWR include the following:

- Additional investments and assistance to change water use behavior is necessary and may include professional water management services, water audits, and tracking water budgets.

- Converting mixed-use meters is not cost effective for CII customers without incentives offered by urban retail water suppliers, and sometimes not even then, depending on the complexity of the system and how much water or wastewater rate savings may be achieved.

- There are significant challenges with evaluating the feasibility of converting a mixed-use meter, including assessing the existing pipe configurations, hardscapes, irrigation system layouts, potential tie-ins, mature trees, existing buildings, flow and pressure requirements, and local/municipal requirements. Achieving cost-effectiveness with splitting a mixed-use meter becomes more difficult to achieve with two or more lateral tie-ins to the irrigation system.

- Splitting a mixed-use meter will often require the CII customer to pay a new monthly fixed charge for the new DIM, based on the meter size, which increases the fixed cost to the CII customer without a guarantee of project payback.

- Outdoor water savings take time to achieve, given both implementation timing and establishment periods required for drought-tolerant landscaping to succeed (LADWP, 2021).

Other Considerations

Many CII water users may not have the resources or people to implement the offered water efficiency programs. For many, the lack of productivity cost, or additional landscaping cost, exceeds the cost of wasted water.

In-Lieu Technologies Performance Measure

DWR has taken into consideration the identified challenges and necessary considerations for recommendations for In-Lieu Technologies, as detailed above. For reference and additional context, DWR also summarized the perspectives of urban retail water suppliers and stakeholders regarding implementation challenges and considerations below.

Several suggestions and recommendations were proposed by stakeholders in the various working groups and the public meetings. These are not specific recommendations, but are included as suggestions, since improving urban water use efficiency depends on the successful implementation of the final water use standards and performance measures adopted by the State Water Board. These suggestions and recommendations also recognize that the successful implementation of the new water use standards, UWUOs, and performance measures requires complementary actions by the State to assist urban retail water suppliers as they implement the new framework. DWR heard repeatedly from stakeholders that technical and financial support for urban retail water suppliers is key for the successful implementation of the new framework.

DWR includes these stakeholder recommendations and suggestions to underscore their importance for future consideration. However, to reiterate: these ideas are not recommendations from DWR to the State Water Board. It will require time, effort, and funding to implement these suggestions, and the pace of implementation will depend upon the feasibility and availability of resources and competing priorities.

Feasibility of In-Lieu Technologies with a CII Mixed-Use Meter

Stakeholders identified that implementing In-Lieu Technologies with a CII mixed-use meter often require incentive programs, and it is frequently not a high priority or cost-effective for most CII water users. In addition, installing efficient water use technologies does not guarantee water savings without ongoing BMPs.

- More time should be allowed for urban retail water suppliers to perform outreach and coordination with their CII water users to comply with the 2018 Legislation.
- Stakeholders have recommended that DWR acknowledge urban retail water suppliers' authority limitations with their CII water users. They can only offer services and programs and cannot require customer participation.
- Implementing efficient water use technologies for landscapes with CII mixed-use meters does not guarantee water savings will occur. Additional technical assistance and investments to change water use behavior is necessary and may include professional water management services, water audits, and tracking water budgets for each CII water user.

- Implementing the In-Lieu Technologies PM for landscapes with CII mixed-use meters is often not cost effective for CII customers without incentives offered by urban retail water suppliers, and sometimes not even then, depending on the complexity of the system and how much water or wastewater rate savings may be achieved.

Other Considerations

- Many CII water users may not have the resources or people to implement offered water efficiency programs. For many, the lack of productivity cost, or additional landscaping cost, exceeds the cost of wasted water.

- Since 2000, Irvine Ranch Water District has provided incentives in the amount of $1.95 million to CII customers and has leveraged other incentive funding from regional wholesalers, including the Metropolitan Water District of Southern California and Municipal Water District of Orange County in the amount of $4.4 million. Projects and devices include, but are not limited to, water-efficient plumbing fixtures, weather-based irrigation controllers, cooling tower controllers and custom pay-for-performance process improvements. Over 62,000 devices and/or projects have been installed or completed, resulting in an estimated annual savings of 3,930 acre-feet and more than 41,000 acre-feet in estimated lifetime savings (IRWD, 2021).

Other General Implementation Considerations for Improving Urban Water Use Efficiency

Several suggestions and general recommendations were proposed by stakeholders in the various working group meetings and public meetings. These suggestions and general recommendations recognize that the successful implementation of the new water use efficiency standards and UWUOs requires complementary actions by the State to assist urban retail water suppliers as they implement the new framework. DWR heard repeatedly from stakeholders that technical and financial support for urban retail water suppliers is key for the successful implementation of the new framework.

DWR includes these suggestions and general recommendations to underscore their importance for future consideration, because improving urban water use efficiency depends on the successful implementation of the final water use efficiency standards adopted by the State Water Board. Again, these ideas are not specific recommendations from DWR to the State Water Board. DWR may consider these suggestions raised by stakeholders when new standards are approved by the State Water Board. DWR recognizes that it will require time, effort, and funding to implement these suggestions; and the pace of implementation will depend upon the feasibility and availability of resources and competing priorities.

Stakeholder suggestions specific to CII-BMPs Performance Measure included the following:

- **Data Streamlining.** Required tracking and reporting will require additional resources. Reporting should be streamlined, with DWR working with stakeholders to identify useful data points to collect and eliminate unnecessary reporting.
  - DWR recommends that State Water Board address the need for centralization and consolidation of data inquires with high-quality templates, guidance documents, and State-sponsored implementation support.
  - Reporting performance measure compliance to the State should use a checkbox system or form to indicate which activities from each of the five BMP categories the agency is implementing. Additionally, there should be an option to report on whether the measure is being implemented on a regional basis.

General stakeholder suggestions and recommendations included the following:

- **Technical Assistance**
  - The State should consider providing technical assistance to urban retail water suppliers, in particular, smaller urban retail water suppliers with limited resources for implementation and reporting of UWUOs, variances, actual water use, and other progress reports to DWR.
  - The State should consider providing technical assistance and guidance to urban retail water suppliers on measuring landscapes associated with CII-DIMs.
  - The State should consider providing technical assistance to urban retail water suppliers on how customers can improve outdoor water use efficiency while protecting existing landscapes. This includes landscapes with higher plants factors, urban wildlife habitat, and urban shade trees.
- **Financial and Local Assistance**
  - The State should consider providing direct financial assistance programs, not rebates, for low-income communities to assist with mitigating potential water affordability and to support the human right to water.
  - The State should consider providing financial assistance to urban retail water suppliers, wastewater, and recycled water utilities to mitigate the financial

impact of new UWUOs and support the implementation of water use efficiency programs.

  - The State should consider offering incentives to urban retail water suppliers to support customer water use efficiency via local assistance grants and loan programs.

- **Outreach and Messaging**

  - The State should augment efforts by the Save Our Water campaign to assist customers in understanding the need for water and wastewater rate changes.

  - The State should support additional statewide messaging to incentivize customers to participate in water use efficiency programs and upgrades.

- **Data**

  - Stakeholders recommended that DWR provide aerial CII landscape area measurements and assistance for mapping CII-DIM locations and ground-truthing associated irrigated areas.

  - The State should consider providing urban retail water suppliers updated landscape area measurement data every five years.

- **Other**

  - Stakeholders have recommended that the standard and performance measures allow more time for urban retail water suppliers to perform outreach and coordination with their CII water users.

  - The State should encourage local jurisdictions responsible for MWELO to improve MWELO implementation and enforcements.

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5.0 Glossary

The following key terms are listed below for easy reference. Where applicable, existing definitions from statutes and regulations are provided.

commercial, industrial, and institutional water use. Water used by commercial water users, industrial water users, institutional water users, and large landscape water users, as defined in California Water Code Section 10608.12(d).

commercial water user. A water user that provides or distributes a product or service, as defined in California Water Code Section 10608.12(e).

conversion threshold. The minimum size threshold for converting mixed-use commercial, industrial, and institutional dedicated irrigation meters or In-Lieu Technologies.

dedicated irrigation meter. A meter used only for irrigation of outdoor landscape areas. However, a mixed-use meter with no more than five percent of total delivered water serving non-landscape irrigation purposes can also be considered a dedicated irrigation meter for the purpose of the urban water use objective and actual water use calculations and reporting.

equivalent technology. Any other device or process that is not a dedicated irrigation meter that measures the volume of water delivered to the landscape and reports directly to the urban retail water supplier, on the same time interval as service area dedicated irrigation meters, and with the same accuracy as service area dedicated irrigation meters, such that it can be used for billing purposes if an urban retail water supplier chooses to do so.

evapotranspiration factor. An adjustment factor when applied to reference evapotranspiration that adjusts for plant factors and irrigation efficiency which are two major influences upon the amount of water that needs to be applied to the landscape.

industrial water user. A water user that is primarily a manufacturer or processor of materials as defined by the North American Industry Classification System code sectors 31 to 33, inclusive, or an entity that is a water user primarily engaged in research and development, as defined in California Water Code Section 10608.12(i).

In-Lieu Technologies. Technologies that improve landscape water use efficiency by any means other than the direct measurement of water use that is an equivalent technology. In-Lieu Technologies refers to the devices, equipment, or analytical methods that are defined in the California Department of Water Resources' recommended In-Lieu Technologies Performance Measure.

institutional water user. A water user dedicated to public service. This type of user includes, among other users, higher education institutions, schools, courts, churches, hospitals, government facilities, and nonprofit research institutions, as defined in California Water Code Section 10608.12(j).

large landscape. A nonresidential landscape as described in the performance measures for commercial, industrial, and institutional water use adopted pursuant to California Water Code Section 10609.10, as defined in California Water Code Section 10808.12(l).

lot size. The total parcel area, less the building footprint.

maximum applied water allowance. The upper limit of annual applied water for the established landscaped area, as specified in the Model Water Efficient Landscape Ordinance. It is based upon the area's reference evapotranspiration, the evapotranspiration factor, and the size of the landscape area.

mixed-use meter. A meter serving both indoor water use and outdoor landscape irrigation.

performance measures. Actions to be taken by urban retail water suppliers that will result in increased water use efficiency by commercial, industrial, and institutional water users. Performance measures may include, but are not limited to, educating commercial, industrial, and institutional water users on best management practices, conducting water use audits, and preparing water management plans. Performance measures do not apply to process water, as defined in California Water Code Section 10608.12(n).

reference evapotranspiration. The evapotranspiration rate from an extended surface of 3- to 6-inch-tall (8- to 15-centimeter-tall) green grass cover of uniform height, actively growing, completely shading the ground, and not short on water (the reference evapotranspiration rate reported by the California Irrigation Management Information System).

service connection. The point of connection between the customer's piping or constructed conveyance, and the water system's meter, service pipe, or constructed conveyance (California Health and Safety Code Section 116275(s)).

Special Landscape Area. An area of the landscape dedicated solely to edible plants, areas irrigated with recycled water, water features using recycled water and areas dedicated to active play such as parks, sports fields, golf courses, and where turf provides a playing surface, as defined in California Code of Regulations, Title 23, Section 491(iii).

Urban retail water supplier. A water supplier, either publicly or privately owned, that directly provides potable municipal water to more than 3,000 end users or that supplies more than 3,000 acre-feet of potable water annually at retail for municipal purposes, as defined in California Water Code Section 10608.12(t).

urban water use objective. An estimate of aggregate efficient water use for the previous year based on adopted water use efficiency standards and local service area characteristics for that year, as described in California Water Code Section 10609.20, as defined in California Water Code Section 10608.12(u).

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6.0 References

DWR (California Department of Water Resources). 2013a. “Commercial, Industrial, and Institutional Task Force Water Use Best Management Practices Report to the Legislature.” Volume I: A Summary. October 21.

_____. 2013b. “Commercial, Industrial, and Institutional Task Force Water Use Best Management Practices Report to the Legislature.” Volume II. October 21.

DWR and State Water Board (California Department of Water Resources and State Water Resources Control Board). 2018. Making Water Conservation a California Way of Life. Primer of 2018 Legislation on Water Conservation and Drought Planning Senate Bill 606 (Hertzberg) and Assembly Bill 1668 (Friedman). Accessed at: https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Water-Use-And-Efficiency/Make-Water-Conservation-A-California-Way-of-Life/Files/PDFs/Final-WCL-Primer.pdf?la=en&hash=B442FD7A34349FA91DA5CDEFC47134EA38ABF209

DWR et al. (California Department of Water Resources, State Water Resources Control Board, California Department of Food and Agriculture, California Public Utilities Commission, and California Energy Commission). 2017. Making Water Conservation a California Way of Life, Implementing Executive Order B-37-16. Accessed at: https://cawaterlibrary.net/wp-content/uploads/2017/06/20170407_EO_B-37-16_Final_Report.pdf

Appendix A – Urban Water Use Efficiency Recommendation Package Reports Incorporated by Reference

DWR (California Department of Water Resources). September 2022. Recommendations for Urban Water Use Efficiency Standards, Variances, Performance Measures, and Annual Water Use Reporting. DWR Report Number: WUES-DWR-2021-01A.

DWR (California Department of Water Resources). September 2022. Recommendations for Commercial, Industrial, and Institutional Outdoor Irrigation of Landscape Areas with Dedicated Irrigation Meters Water Use Efficiency Standard. DWR Report Number: WUES-DWR-2021-03

DWR (California Department of Water Resources). September 2022. Recommendations for Commercial, Industrial, and Institutional Water Use Best Management Practices Performance Measure. DWR Report Number: WUES-DWR-2021-16.

DWR (California Department of Water Resources). September 2022. Best Management Practices for Improving Efficiency in Commercial, Industrial, and Institutional Water Use: Key Successes and Challenges in California. DWR Report Number: WUES-DWR-2021-16.T1.

DWR (California Department of Water Resources). September 2022. Recommendations for Commercial, Industrial, and Institutional Water Use Classification System Performance Measure. DWR Report Number: WUES-DWR-2021-17.

DWR (California Department of Water Resources). September 2022. Recommendations for Dedicated Irrigation Meter Conversion Threshold for Commercial, Industrial, and Institutional Outdoor Irrigation Water Use Performance Measure. DWR Report Number: WUES-DWR-2021-18.

DWR (California Department of Water Resources). September 2022. Recommendations for In-Lieu Technologies for Dedicated Irrigation Meters for Commercial, Industrial, and Institutional Outdoor Irrigation Water Use Performance Measure. DWR Report Number: WUES-DWR-2021-19.

DWR (California Department of Water Resources). September 2022. Stakeholder Outreach Summary for Developing Urban Water Use Efficiency Standards, Variances, and Performance Measures. DWR Report Number: WUES-DWR-2021-20.