STATE OF CALIFORNIA
STATE WATER RESOURCES CONTROL BOARD
INITIAL STATEMENT OF REASONS FOR REGULATORY ACTION
(Pre-publication of Notice Statement)

Division 3, Chapter 3.5, Article 2
Title 23, California Code of Regulations
Re: Urban Water Conservation

Background

Problem

California has experienced several major droughts throughout its recorded history. In response to the State's highly variable and seasonal climate, Californians have developed hundreds of water projects and programs – at local, regional, and statewide scales – while learning to adapt to periodic droughts and other hydrologic extremes. Growing awareness of the critical role water plays in the State's economy, health and safety, and environment has precipitated legislative actions and funding programs that have fundamentally transformed the way California's water is managed.

One of the most extreme examples of drought in California occurred in 1976 and 1977, with the 1977 water year ranking among the top five driest in California's recorded history. However, while the drought caused unprecedented shortages in the municipal, industrial, and agricultural water sectors, the 1976-1977 drought is often credited with initiating an era of water conservation awareness in California, the results of which are still evident today, including the formation of a drought emergency task force and emergency conservation actions. The 1976-1977 drought also caused numerous legislative proposals to be submitted (e.g., Assembly Bill 1395, which became the 1978 law establishing new water efficiency standards for toilets), all with the goal of increasing California's drought responses and resiliency.

Other recent statewide droughts include the 1987-1992 drought and the 2007-2009 drought. These droughts affected all communities and types of water users, and led to many of the conservation requirements and water efficiency guidelines in place today. California became the first state to adopt a water use efficiency target with the passage of SB X7-7 in 2009. SB X7-7 mandated the State achieve a 20 percent reduction in urban per capita water use by 2020, and directed water suppliers to develop individual targets for water use based on an historical per capita baseline. The "20x2020 Water Conservation Plan" set forth a statewide road map to increase the State's urban water efficiency and conservation opportunities.

2012 through 2014 are on record as California's driest three consecutive years. 2013 was the driest single year on record for numerous communities across the State, triggering emergency actions at State and local levels. The recent historical drought (2012–2016) placed an even greater emphasis on urban water conservation and efficiency. Beginning in January 2014 with the Governor's emergency drought proclamation, a series of executive orders directed Californians to conserve water. The executive orders required the State

Water Resources Control Board (State Water Board) to develop emergency water conservation regulations that mandated a statewide 25 percent reduction in overall urban water use. Between June 2014 and April 2017, the emergency regulations mandated urban water use reductions that resulted in the conservation of over 3.5 million acre-feet.

The 2014-2015 drought related actions and response activities culminated in Executive Orders B-37-16 in May 2016 and B-40-17 in April 2017. The EOs built on the temporary emergency conservation regulations and tasked State agencies with establishing a long-term framework for water conservation and drought planning. The actions directed in the EOs are organized around four primary objectives: (1) using water more wisely, (2) eliminating water waste, (3) strengthening local drought resilience, and (4) improving agricultural water use efficiency and drought planning.

To eliminate water waste, the Water Board has been tasked with permanently prohibiting practices that waste water, such as*:* Hosing off sidewalks, driveways and other hardscapes; washing automobiles with hoses not equipped with a shut-off nozzle; using non-recirculated water in a fountain or other decorative water feature; watering lawns in a manner that causes runoff, or within 48 hours after measureable precipitation; and irrigating ornamental turf on public street medians.

While the severity of the drought has lessened in California after winter rains and snow, significant impacts remain. For the fifth consecutive year, dry conditions persist in areas of the state, with limited drinking water supplies in some communities, diminished water for agricultural production and fish and wildlife, and severely depleted groundwater basins. Furthermore, California droughts will be more frequent and persistent, as warmer winter temperatures driven by climate change reduce water held in the Sierra Nevada snowpack and result in drier soil conditions.

Recognizing these new conditions, permanent regulations are needed to use water more wisely and efficiently, and to prepare for more frequent, persistent periods of limited supply in all communities and for all water uses, including fish, wildlife, and their habitat needs.

Purpose

The purpose of the proposed regulation is to prohibit wasteful and unreasonable urban water use practices. Article 10 of the California Constitution, section 2, states:

….that because of the conditions prevailing in this State the general welfare requires that the water resources of the State be put to beneficial use to the fullest extent of which they are capable, and that the waste or unreasonable use or unreasonable method of use of water be prevented, and that the conservation of such waters is to be exercised with a view to the reasonable and beneficial use thereof in the interest of the people and for the public welfare.

The State Water Board has initially determined that the each of the provisions of the proposed regulation will safeguard urban water supplies, minimize the potential for waste and unreasonable use of water, and realize the objectives of Executive Orders B-37-16 and

B-40-17, which directed the State Water Board to permanently prohibit certain wasteful water use practices.

Under title 23, division 3 of the California Code of Regulations, the proposed regulation would add a new chapter, chapter 3.5, and in that chapter would add *Article 2: Wasteful and Unreasonable Water Uses.* The proposed regulation would create, within this article, *Section 963: Wasteful and Unreasonable Water Use Practices*. In section 963, new provisions would prohibit several water use activities, except where necessary to address an immediate health and safety need or to comply with a term or condition in a permit issued by a state or federal agency.

Section 963, subdivision (a) contains definitions applicable to the prohibitions contained in subdivision (b).

Section 963, subdivision (b) (1) prohibits the following actions:

Subdivision (b)(1)(A) prohibits *the application of water to outdoor landscapes in a manner that causes runoff such that water flows onto adjacent property, non-irrigated areas, private and public walkways, roadways, parking lots, or structures*. This particular water use is discretionary and the State Water Board has determined that it is a wasteful and unreasonable use of a limited, precious, shared resource. Because the purpose of the proposed regulation is to permanently prohibit wasteful water use practices, this provision is necessary to that end.

Subdivision (b)(1)(B) prohibits *the use of a hose that dispenses water to wash a motor vehicle, except where the hose is fitted with a shut-off nozzle or device attached to it that causes it to cease dispensing water immediately when not in use.* This particular water use is discretionary and the State Water Board has determined that it is a wasteful and unreasonable use of a limited, precious, shared resource. Because the purpose of the proposed regulation is to permanently prohibit wasteful water use practices, this provision is necessary to that end.

Subdivision (b)(1)(C) prohibits *the application of potable water directly to driveways and sidewalks.* This particular water use is discretionary and the State Water Board has determined that it is a wasteful and unreasonable use of a limited, precious, shared resource. Because the purpose of the proposed regulation is to permanently prohibit wasteful water use practices, this provision is necessary to that end.

Subdivision (b)(1)(D) prohibits *the use of potable water in an ornamental fountain or other decorative water feature, except where the water is part of a recirculating system.* This particular water use is discretionary and the State Water Board has determined that it is a wasteful and unreasonable use of a limited, precious, shared resource. Because the purpose of the proposed regulation is to permanently prohibit wasteful water use practices, this provision is necessary to that end.

Subdivision (b)(1) (E) prohibits *the application of water to irrigate turf and ornamental landscapes during and within 48 hours after measurable rainfall of at least one-tenth of one inch of rain.* Defining *measurable* as one-tenth of an inch of rain is consistent with the

Federal Clean Water Act, which defines a measurable storm event as "greater than 0.1 inch rainfall" [40 CFR 122.26]. This particular water use is discretionary and the State Water Board has determined that it is a wasteful and unreasonable use of a limited, precious, shared resource. Because the purpose of the proposed regulation is permanently prohibit wasteful water use practices, this provision is necessary to that end.

Subdivision (b)(1) (F) prohibits *the serving of drinking water other than upon request in eating or drinking establishments, including but not limited to restaurants, hotels, cafes, cafeterias, bars, or other public places where food or drink are served and/or purchased.* This particular water use is discretionary and the State Water Board has determined that it is a wasteful and unreasonable use of a limited, precious, shared resource. Because the purpose of the proposed regulation is to permanently prohibit wasteful water use practices, this provision is necessary to that end.

Subdivision (b)(1) (G) prohibits *the irrigation of turf on public street medians or publicly owned or maintained landscaped areas between the street and sidewalk, except where the turf serves a community or neighborhood function.* This particular water use is discretionary and the State Water Board has determined that it is a wasteful and unreasonable use of a limited, precious, shared resource. Because the purpose of the proposed regulation is to permanently prohibit wasteful water use practices, this provision is necessary to that end.

Section 963, subdivision (c) requires that *operators of hotels and motels shall provide guests with the option of choosing not to have towels and linens laundered daily. The hotel or motel shall prominently display notice of this option in each guestroom using clear and easily understood language.* This particular water use is discretionary and the State Water Board has determined that it is a wasteful and unreasonable use of a limited, precious, shared resource. Because the purpose of the proposed regulation is to permanently prohibit wasteful water use practices, this provision is necessary to that end.

To prevent the waste and unreasonable use of water, Section 963, subdivision (d) allows for penalties to be issued to homeowners' associations or community service organizations or similar entities that violate existing law regarding certain water uses, specifically section 4735, subdivisions (a) (b) (c) and (d) of the Civil Code. Violations of those existing prohibitions can lead to wasteful and unreasonable water use. Because the purpose of the proposed regulation is to permanently prohibit wasteful water use practices, this provision is necessary to that end.

To prevent the waste and unreasonable use of water, section 963 subdivision (e) allows for penalties to be issued to any city, county, or city and county that violates existing law regarding certain water uses, specifically section 8627.7 of the Government Code. Violations of those existing prohibitions can lead to wasteful and unreasonable water use. Because the purpose of the proposed regulation is to permanently prohibit wasteful water use practices, this provision is necessary to that end.

Section 963, subdivision (f) establishes a penalty for *the taking of any action prohibited in subdivision (b) (d) or (e), or the failure to take any action required in subdivision (c)…*as*…an infraction punishable by a fine of up to five hundred dollars ($500) for each day in which the*

violation occurs. The State Water Board has determined that this particular provision would deter those who might otherwise engage in the defined wasteful and unreasonable uses of water. Because the purpose of the proposed regulation is to permanently prohibit wasteful water use practices, this provision is necessary to that end.

Each of these provisions is necessary to prohibit the waste and unreasonable use of water. The following description of benefits applies similarly to each of these aforementioned provisions.

Benefits

The proposed regulation will safeguard urban water supplies, minimize the potential for waste and unreasonable use of water, and realize the directives of Executive Orders B-37-16 and B-40-17. Each of the specific prohibitions on water uses and other end user requirements are necessary to prevent the waste and unreasonable use of water and promote water conservation. Between June 2014 and April 2017, the emergency regulations catalyzed water use reductions conserving over 3.5 million acre-feet. The Water Board reasonably assumes 1% of those savings (or 12,489 acre feet per year) is attributable to the prohibitions and end-user requirements themselves. Should the proposed regulation be adopted, continued water savings would be achieved.

In general, water conservation has many benefits, including conserving water for source-watershed stream flows; conserving energy, as nearly 20 percent of California's electricity use is embedded in moving and consuming water; generating additional economic activity, such as investments in drought-tolerant landscaping; increased water quality in receiving waters due to lower runoff volume; increased awareness and a shared sense of responsibility among urban water users; reduced potential for severe economic disruption due to future water shortages; and more equitable management of water supplies.

Though the potential overall water saving from the proposed regulation are likely to be relatively minor, the water savings associated with the proposed regulation would nonetheless realize or promote a number of the aforementioned benefits. Each of these benefits is discussed below. The proposed regulation would not by itself necessarily achieve a significant level or amount of these benefits, relative to a comprehensive suite of conservation actions like water pricing changes or mandatory supply reductions; but, by prohibiting some of the more wasteful and discretionary water use practices, it can reasonably be expected to have a positive impact on each of the areas described below.

Protecting watersheds

Water efficiency can help stretch water supplies and contribute to the protection of aquatic environments. Water efficiency can preserve stream flows by preventing or delaying the need to build additional infrastructure and conserve (and even restore) flows in already-exploited watersheds. In *Water Efficiency for In-stream Flow: Making the Link in Practic*e, the Alliance for Water Efficiency (AWE) describes how municipal water efficiency programs contribute to a more natural flow regime in California's Russian River. To create better habitat conditions for Coho salmon and steelhead in the summer and Chinook salmon in the fall, local water agencies invested in a number of water conservation

strategies, including public education campaigns, cash-for-grass incentives, and rainwater catchment and greywater system rebates (AWE 2011).

Other documented examples of how urban water conservation has helped protect in-stream flows include, in California, the work of the Sacramento Water Forum to conserve American River flows (SWF 2017), and, outside of CA, the work of metropolitan Seattle agencies to conserve Cedar and Deschutes River flows (AWE 2011). These examples demonstrate that water conservation can directly protect watersheds by reducing consumption and dedicating those savings to in-streams flows.

Conserving energy

The proposed regulation would reduce GHG emissions by reducing the amount of energy needed to make water available for urban uses. A considerable amount of energy is embedded in California's water infrastructure. Over 19% of California's energy is used to supply, treat, and consume water and then to collect and treat wastewater (CEC 2006). Of that, about 40% is consumed by the water sector itself—primarily for supply and conveyance but also for water distribution, water treatment, and wastewater collection and treatment; the remaining 60 percent is attributable to the electricity used by customers as water is consumed—primarily for heating and pumping (Park and Croyle 2012). The energy intensity of a particular quantity of water depends on a number of factors, most importantly how (e.g., indoors or outdoors) and where (e.g., San Francisco or Los Angeles) it's consumed.

The corollary is that the energy savings associated with conserving any given quantity of water will similarly depend on where and how it's used. Water conservation in Southern California will generally yield more energy savings from pumping and treating water than conservation efforts in Northern California, where water requires less energy to travel. It is also true that indoor water use generally offers the greatest energy savings because indoor users require wastewater collection, treatment, and discharge. Furthermore, indoor use of hot water is particularly energy intensive due to the energy required for hot water heaters. Energy savings associated with conserving water outdoors would only be associated with reduced supply, conveyance, treatment and distribution (Elkind 2011). The proposed regulation would primarily result in reduced outdoor use, and any related energy savings and reductions in GHG emissions would come from the prohibition of some of the more wasteful outdoor water use practices.

Approximately 7.2% of the state's overall electricity use is embedded in the supply, conveyance, treatment and distribution of water (Park and Croyle 2012). When water is conserved outdoors, the energy inputs embedded in those processes are avoided — and those avoided energy inputs vary considerably depending on where the water comes from and where it goes.

To better understand the geographically variable energy intensities of water in California, the California Public Utilities Commission (CPUC) developed the Water-Energy calculator; it computes average outdoor energy intensities for each of California's hydrologic regions (CPUC 2017). Using those outdoor water use intensity values, the UC Davis Center for

Water-Energy efficiency calculated the energy savings associated with the volume of water conserved during a few months of the declared drought emergency. The electricity savings from statewide water conservation totaled 460 GWh, the equivalent of taking about 50,000 cars off the road for a year (UC Davis 2017).

Generating additional economic activity

Several of the wasteful water uses prohibited by the proposed regulation (e.g., the prohibitions affecting runoff) may result in the more efficient irrigation of urban landscapes. Reducing outdoor water waste could generate additional economic activity, such as investments in water efficient landscaping. Substantial expenditures to use water more efficiently outdoors may benefit the landscaping sector, perhaps by helping to catalyze a new, drought oriented sub-sector of the landscaping services sector, thereby creating new employment, as well as, over time, likely reducing prices for this type of amenity. Furthermore, reducing the amount of water used for landscaping may direct those savings to other economically beneficial uses (Moss et al. 2015). It is not expected that the proposed regulation will have a significant impact on shifting landscapes to more drought tolerant plantings, but landscape companies may see increased calls for irrigation system upgrades, or changed landscape topographies, to avoid runoff as prohibited by the proposed regulation.

Improved water quality

Dry-weather discharges contain pollutants that compromise aquatic ecosystems. Dry-weather urban runoff can be a source of pesticides, nutrients, bacteria and metals. For arid and semi-arid streams dominated by urban runoff and effluent, pollutants conveyed during the dry-season can represent a substantial portion of total annual loading. Recent studies have shown that dry-weather loading of nutrients, pesticides, and other constituents can be a significant contributor of pollutants to receiving waters (Pitton et al. 2016, Stein and Ackerman 2007, Stein and Tiefenthaler 2005, McPherson et al. 2002, 2005). For example, dry-weather flows contribute more than 50 percent of the annual pollutant loads of some metals in Los Angeles basin watersheds (Stein and Ackerman 2007). A five-year study of eight California sites found that the majority (76 percent) of annual microbial loading occurred during the dry season (Reano et al. 2015).

Few studies have examined how reduced outdoor water use affects the water quality of runoff. However, an Orange County residential runoff reduction study found that increased outdoor water efficiency reduced the amount of runoff (by 50 percent at one site) while the concentration of pollutants such as nutrients, organophosphate pesticides, trace elements and bacteria remained the same (IRWD 2004). In essence, the IRWD study suggests that, with the reduction of dry weather runoff, pollutant loading may decrease. The proposed regulation may benefit water quality by reducing the amount of runoff and, by extension, total pollutant loading in the dry-season.

Increased conservation awareness

The proposed regulation would define ten water use practices as wasteful and unreasonable per Article X, section 2 of the California constitution, potentially compelling those urban water agencies that have not already prohibited the aforementioned practices

to now do so. Depending on the degree of local education and enforcement, urban water users may place an even greater value on this vital resource and adjust their behavior accordingly. Numerous studies have shown that defining injunctive norms (i.e., norms that govern how a person *should* behave) can catalyze even greater conservation rates (Steg et al. 2014). By defining the addressed water use practices as wasteful and unreasonable, the proposed regulation assigns judgment. Coupled with the descriptive normative messaging typically employed in water conservation campaigns (e.g., notices comparing one household's use to other homes in the neighborhood), a strong injunctive message (e.g., watering driveways is wasteful) may instill an even greater conservation ethic.

Reduced potential for severe economic disruption

Wasteful and unreasonable uses of water threaten the California economy, now more than ever. Looking ahead, the co-occurring warm and dry conditions that gave rise to the recent drought are not "exceptional" but rather very probable (Diffenbaugh et al. 2015). Eliminating waste and unreasonable use of water safeguards California's economy, ensuring our most vulnerable sectors are more resilient to projected climate change impacts. Permanently prohibiting some of the most wasteful and discretionary water use practices, and increasing the visibility of water conservation and efficiency can reduce the potential for economic disruption in multiple sectors, particularly the agricultural and electricity sectors.

Agriculture: The 2012-2016 drought reduced the amount of surface water available to farmers, like all other sectors. Despite offsetting much of the surface water reductions with increased groundwater pumping, the drought impacted California's agricultural sector. Table 1 summarizes the results of the 2014-2016 economic impact reports the UC Davis Center for Watershed Sciences generated for the California Department of Food and Agriculture.

	2014	2015	2016
Surface water reduction	6.6 MAF*	8.7 MAF	2.6 MAF
Groundwater pumping increase	5.1 MAF	6.0 MAF	1.9 MAF
Net shortage	**1.5 MAF**	**2.7 MAF**	**0.7 MAF**
Total economic cost	$2.2 billion	$2.7 billion	$603 million
Total job losses	17,000	21,000	4,700

Table 1: Summary of agricultural impacts of the California drought (2014-2016)

As shown in Table 1, groundwater pumping largely offset the impacts to California's agricultural sector. However, the shortages nonetheless resulted in substantial costs (due to idled land, lost revenue, increased pumping, etc.), peaking in 2015 with an estimated loss of $2.7 billion and 21,000 jobs (Howitt et al., 2015). Unaccounted for in the UC Davis assessment is the cost of massive and unsustainable groundwater pumping.

While continued groundwater overdraft temporarily benefits farmers, in the long run it too is costly, requiring farmers and surrounding communities to dig deeper wells, find alternative sources of water and repair infrastructure damaged by subsidence (Cooley et al. 2015).

Electricity: The Pacific Institute examined the effects of drought on California's hydroelectricity generation. In an average year, hydropower provides 18 percent of the state's electricity needs; during the drought, it averaged 10.5 percent. Through September 2016, hydroelectricity production dropped by 66,000 GWh. The replacement sources of energy were both more expensive and more polluting, costing ratepayers $2.45 billion and increasing power plant emissions by 10 percent (Gleick 2017).

Economic disruption summary: Using water reasonably and efficiently safeguards California's economy by protecting our most vulnerable sectors, particularly the agricultural and electricity sectors. Impacts to these sectors could ripple throughout the economy, as was the case in Australia during the millennium drought. At its peak, the "Big Dry" was estimated to have reduced Australia's GDP by 1.6 percent. A 1.6 percent hit to California GDP would reduce state output by more than $30 billion (Moss et al. 2015). Making conservation a California way of life reduces the potential for such severe economic disruption.

More Equitable Management of Water Supplies

A 2017 Pacific Institute report analyzed the impact of the 2012-2016 on California's most vulnerable communities. The report found that disadvantaged communities were gravely affected. Supply shortages and rising costs affected people's access to safe, affordable water in their homes. Additionally, declines in salmon populations, exacerbated by the drought, prevented some California Native American tribes from obtaining fish that are an essential part of their diet and an integral part of their spiritual and cultural traditions. Inequitable access to water in California existed before the drought began in 2012, but lack of water made the outcome of these inequities more severe (Feinstein et al., 2017). Making conservation a California way of life reduces the potential that future droughts will as severely impact disadvantaged communities.

Mandated Technologies

The proposed regulation would not mandate the use of specific technologies or equipment.

Economic Impact Assessment

The Impacts

By prohibiting wasteful water use practices, the proposed regulation will conserve water. Water conservation has many benefits (see, Benefits section I.c. supra), but it also has consequences. Declining water sales translate to declining utility revenues, complicating efforts to continue conservation programs while covering the costs of water treatment and delivery as well as infrastructure repair and replacement (AWE 2014). To recuperate the revenue lost as customers conserve, utilities must adjust rates. The Water Board estimates that the proposed regulation would result in annual statewide savings of 12,489 AF. Assuming these savings would be distributed in proportion to the population served by urban water suppliers (see Table 2), individual urban water suppliers would incur minor utility net revenue losses.

Statewide Water Production, June 2014-May 2015 (AF)				5,884,413
Total Savings due to the prohibitions (AF/yr)				12,489
Total Population (served by urban water suppliers in 2015)				35,489,411
Distribution of water savings in proportion to population served				
	Number of suppliers	**Percent of population served = Percent of Total Savings**	**Savings Range (AF)**	**Total Savings (AF)**
	1	11.21%	500-1,400	1,400
	14	23.95%	100-499	2,991
	35	18.63%	50-99	2,326
	359	46.22%	0-49	5,772
Total	**409**	**100%**		**12,489**

Table 2: Supplier savings relative to supplier production.

The Water Board assumes the proposed regulation would result in annual statewide savings of 12,489 AF, and that suppliers would see savings in proportion to the population they serve. For example, in 2015, the Los Angeles Department of Water and Power (LADWP) served over 4 million people (or 11.21% of the "total population"). The proposed regulation may help LADWP conserve about 1,400 AF/yr, or about 0.22 percent of their total 2015 demand of 614,800 AF (LADWP 2015). The proposed regulation may help the majority of urban water suppliers (i.e., 359 of the 409) each conserve less than 50 AF/year. For example, in 2015, the City of Davis served over 69 thousand people (or about 0.1% of the "total population"). City of Davis may conserve 23.5 AF/yr, or about 0.25 percent of their total 2015 demand of 9,212 AF/year (City of Davis 2015).

There are two primary reasons why the proposed regulation is unlikely to lead to major statewide costs. First, through existing permits and policies, many of the state's urban areas already address the most wasteful of the to-be-prohibited practices (i.e., those practices pertaining to outdoor use). Secondly, the proposed regulation is unlikely to catalyze substantial water savings, as only prohibiting wasteful uses has been shown to conserve relatively little compared to other conservation strategies.

Type-of-use-restrictions (a.k.a., prohibitions), without accompanying changes in pricing, achieve modest reductions (Dixon and Moore 1996, Olmstead and Stavins 2009, Mini 2015, Manago and Hogue 2017). For example, when the Los Angeles Department of Water and Power (LADWP) instituted mandatory outdoor water restrictions in 2008, the rate of outdoor water use declined 6 percent compared to an averaged 2001-2007 baseline; when LADWP additionally raised rates, the rate of outdoor use declined by an average of 35 percent between 2009 and 2014 (Manago and Hogue 2017).

Water demand tends to decrease as prices increase. Rates can be strategically used to influence demand, particularly outdoor residential demand, which is more elastic (i.e., more responsive to changes in price) than residential indoor demand (Epsey and Shaw 1997, Dalhusien 2003, Olmstead 2007, Baerenklau et al 2013). The proposed regulation would only prohibit certain wasteful practices. Because it would not also require water agencies to change rates in a manner to incentivize the mandated conservation practices, the analysis assumes the prohibitions themselves will not lead to significant savings.

The Water Board assumes that the proposed regulation would result in savings commensurate with the savings attributable to the prohibitions under the emergency

conservation regulations[1]. We estimate that 1 percent of the June 2014 to April 2017 savings (12,498 acre-feet per year (AF/yr) are due to the prohibitions. See Table 3.

Hydrologic Region	*AF Saved from June 2014 to April 2017*	*AF Saved due to prohibitions*	***Annual** AF Savings due to prohibitions*
	A	B	C
Central Coast	131,150	1,312	463
Colorado River	115,850	1,158	409
North Coast	27,905	279	98
North Lahontan	8,504	85	30
Sacramento River	509,086	5,091	1,795
San Francisco Bay	582,310	5,823	2,054
San Joaquin River	238,309	2,383	840
South Coast	1,538,675	15,387	5,426
South Lahontan	84,976	850	300
Tulare Lake	304,592	3,046	1,074
Total	3,541,357	35,414	12,489

Table 3: Statewide Water Conservation by hydrologic region (June 2014-April 2017)

To estimate the water savings, we relied on the Water Board's Urban Water Supplier Reporting database. In July 2014, the Water Board first adopted drought emergency conservation regulations. Among other actions, the emergency regulations required urban water suppliers to submit to the Board monthly reports including information about current and 2013 (baseline) monthly production volumes. Comparing current production data to the baseline enables us to track water savings over time.

The State Water Board has calculated cumulative water savings and monthly water savings every month since this type of water use reporting became required. The Board's monthly calculation indicates how much water suppliers have conserved since the emergency regulations were first adopted in June 2014. Column A of Table 3 shows how much water Californians saved in each hydrologic region between June 2014 and April 2017 (a 2.8-year period). For reasons described in subsequent paragraphs, the State Water Board attributes 1% of those savings to prohibitions against wasteful water uses.[2] Column B shows the cumulative savings due to the prohibitions (A*1%); column C, the annually averaged savings over the 2.8-year period.

The total reported savings from 2014-2017 (i.e., the 3.5 million AF) reflect not only the prohibitions (required by the emergency conservation regulations) but also the 2014 drought proclamation and the 2015 mandate. The 2014 proclamation called on Californians to voluntarily conserve water, with a goal of reducing statewide urban water

[1] The prohibitions addressed in the proposed regulation would prohibit almost exactly the same wasteful water use practices as were prohibited by the emergency drought conservation regulations.
[2] Along with the reporting requirements, the June 2014 emergency conservation regulations also prohibited certain wasteful and unreasonable uses of water (the same uses that would be prohibited by the proposed regulation).

use by 20 percent. Between April 2014 and April 2015, statewide conservation efforts reached 9 percent, based on water use data reported to the Board. With drought conditions worsening in 2015, on April 2, 2015, the Governor Brown issued Executive Order B-29-15, mandating, among other things, that Californians reduce statewide potable urban water use by 25 percent. When the Governor's mandate went into effect, Californians responded immediately, reducing water use by 23.9 percent between June 2015 and June 2016. The State Water Board assumes the voluntary goal and the mandatory reductions resulted in most of the total water savings, and that the prohibitions alone resulted in a much smaller portion.

The total reported savings additionally reflect the impact of pre-existing policies. California became the first state to adopt a water use efficiency target with the passage of SB X7-7 in 2009. SB X7-7 mandated the state achieve a 20 percent reduction in urban per capita use by 2020. The reduction goal is also known as "20x2020." SB X7-7 directed water suppliers to develop individual targets for water use based on a historic per capita baseline. The savings observed between June 2014 and April 2017 additionally reflect the past and on-going work of water agencies to reduce urban water use per the SB X7-7 mandate.

The State Water Board also considered the role of Urban Water Management Plans (UWMPs, or Plans) in spurring water savings. The Urban Water Management Planning Act requires urban water suppliers to prepare and adopt a Plan, and to update it at least once every five years. The Plans provide a framework for long term water planning and must contain information about: water deliveries and uses; water supply sources; demand management measures; and water shortage contingency planning. The contingency analysis must include information about "mandatory prohibitions against specific water use practices…." (DWR 2016).

Within the UWMPs, mandatory prohibitions vary depending on what stage of water shortage has been declared. Typically, suppliers will include between three and five stages in a water shortage contingency analysis, with each subsequent stage reflecting decreasing water supplies (DWR 2016). Stages are defined at the urban supplier's discretion: they can be defined quantitatively (e.g., Stage 1 represents a 10% supply reduction) or qualitatively (e.g., a stage 1 represents a "mild water shortage"). The higher the stage, the more stringent the prohibitions will be. See Table 4 for a hypothetical example.

Stage		**Example Prohibitions**
0	Normal	Application of potable water to outdoor landscapes that causes runoff.
1	Moderate	Hosing of hardscape surfaces, except for health and safety needs.
2	Significant	Outdoor watering more than 3 days per week.
3	Severe	Outdoor watering more than 2 days per week.
4	Critical	Outdoor irrigation.

Table 4: Hypothetical example of the various stages of water shortage contingency plans

During the recent and unprecedented California drought, urban water suppliers invoked water shortage contingency plan stages (WSCP) requiring significant conservation measures (as reported in the Urban Water Supplier Reporting database). For many utilities,

later-stage prohibitions are considerably more restrictive than those required by the proposed regulation, suggesting that any savings due to the prohibitions required via the emergency conservation regulations would be small relative to those required via later-stage WSCPs.

Finally, the State Water Board based its assumption that 1 percent of the total reported savings can be attributed to the prohibitions on an examination of changes to outdoor winter water use. The Board examined outdoor winter water use because, according to the results of an analysis the Board completed (see 399 supplement), only 16 of the 40 randomly sampled UWMPs included the prohibition restricting irrigation during and within 48 hours after measurable rainfall (the fifth prohibition in Table 5). Looking at the relatively uncommon *no-irrigating-when-it's-raining* prohibition provided an opportunity to distinguish the influence of the state-mandated prohibitions from those attributable to locally-driven drought responses and policy choices.

	The application of water to outdoor landscapes in a manner that causes runoff such that water flows onto adjacent property,....	The use of a hose that dispenses water to wash a motor vehicle, except where the hose is fitted with a shut-off nozzle.	The application of potable water to hardscapes.	The use of potable water in an ornamental fountain ..... unless with a recirculating system	The application of water to irrigate turf and ornamental landscapes during and within 48 hours after measurable rainfall...	The serving of drinking water other than upon request in eating or drinking establishments	The irrigation of turf on public street medians...	Hotels and motels must provide guests with the option of having towels and linens laundered, and prominently display this option.
Prohibition #	1	2	3	4	5	6	7*	8
% of suppliers w/ equivalent prohibitions	95%	98%	98%	88%	40%	80%	18%	65%

Table 5: Percentage of sampled suppliers with Plans including equivalent prohibitions.

*Even fewer suppliers included prohibition 7 (irrigation of turf on public medians...) in Plans. Analyzing its impact would also provide an opportunity to distinguish the influence of the state-mandated prohibitions from those attributable to locally-driven drought responses and policy choices. However, the Water Board determined estimating its impact would be impossible given data constraints. See **Medians** discussion in the 399 supplement.

To analyze the impact of the fifth prohibition, the Water Board compared pre-drought winter water use (2013) to winter water use during the drought (2014, 2015, and 2016). The Board first estimated what percentage of the reported winter savings occurred outdoors. The Water Board based the estimate of what percentage of the water savings

occurred outdoors in part on a 2003 Pacific Institute document, *Waste Not, Want Not: The Potential for Urban Water Conservation in California.* Table 4 in Appendix B (Outdoor Residential Water Use and the Potential for Conservation) lists estimated average California outdoor water use each month of the year.

According to the Pacific Institute estimates, an average of 4 percent of California winter residential water use occurs outdoors. The Water Board assumed proportionate winter water savings, i.e. that 4 percent of the water conserved during the winter months is due to outdoor water conservation measures. We then compared the gallons saved outdoors (Column D in Table 6) to the 2013 pre-drought winter baseline (Column A), which indicated that winter water savings represented, respectively, 0.36 percent, 0.72 percent, and 0.88 percent of the 2013 winter baselines (Column E).

Winter[1] year	**2013 winter baseline[2] (AF)**	**Winter production (AF)**	**AF saved**	**AF saved outdoors**	**% of 2013 baseline**
	A	**B**	**C (A-B)**	**D** (C*4%)	**E** ({D/A} *100)
14/15	1.6 million	1.46 million	144 thousand	5.8 thousand	0.36%
15/16	1.58 million	1.29 million	288 thousand	11.5 thousand	0.72%
16/17	1.57 million	1.23 million	347 thousand	13.8 thousand	0.88%

[1]Winter is December through March. [2] Since reporting began in June 2014, urban water suppliers have refined their 2013 baseline estimates. Hence, the 2013 baseline varies.

Table 6: Winter Water Savings due to the no-irrigating-when-it's-raining prohibition

To distinguish the influence of the state-mandated prohibitions, the State Water Board assumed 1) that prohibitions 1-4, 6 and 8 will result in de minimis new savings, since most urban water suppliers already have equivalent prohibitions in place (See Table 5); 2) the percent of the total estimated savings due to the *no-irrigating-when-it's raining* prohibition is equal to the percent of outdoor winter savings relative to the 2013 winter baseline; and 3) that, because *no-irrigating-when-its raining* is a relatively rare prohibition, its impact is a reasonable proxy for estimating the percent estimated savings due to the prohibitions en masse. To account for additional savings potentially attributable to the other prohibitions, the State Water Board conservatively rounded the 0.65% average (i.e., (0.36% + 0.72% + 0.88%)/3) up to an even 1%.

To summarize, the Water Board assumes that comparing the 2013 winter water use baseline to outdoor winter water savings during the drought is the best approximation of the effects of the prohibitions en masse for the following reasons:

- The *no-irrigating-when-it's raining* prohibition will save the most water during the months of December-March, and is a relatively uncommon local prohibition (Table 5).
- Californians embraced other wintertime outdoor conservation measures, especially during the historic drought. Measures included not irrigating at all during the winter months. Inasmuch, attributing winter-time savings to the *no-irrigating-when-it's raining* prohibition is likely a conservative over-estimate of the prohibition's impact. Likewise, our estimate of the total volume save overestimates the impact of the prohibitions in general.
- The impact of the prohibitions is relatively small given the influence of preexisting policies, such as UWMPs, SBX7-7, the 2014 proclamation calling on Californians to

voluntarily reduce water use by 20 percent, and the 2015 mandatory water use reductions.

The State Water Board, based on the best available data and studies, conservatively estimated that 1 percent of the cumulative statewide water savings, averaged over a 2.8 year period during the drought, (totaling 12, 489 AF/yr) may be attributable to **all** of the prohibitions mandated by the drought emergency conservation regulations. We assume that the proposed regulation would result in commensurate annual savings.

The Economic Costs

Having estimated the annual average savings due the prohibitions, the Board analyzed the economic impact of the proposed regulation. The following paragraphs summarize the **economic costs**. See Standard Form 399 and the associated supplement for more detailed information about the sources, assumptions and calculations informing the Board's economic impact assessment.

The State Water Board estimates the proposed regulation, over its lifetime, will have statewide economic (not fiscal) direct costs totaling $15,966,396. Looking at costs over the proposed regulation's "lifetime" requires defining the lifetime. The State Water Board assumed a 20-year lifetime and assigned a yearly discount rate of 0.5 percent. To calculate the present value of the 20-year stream, the Water Board summed the annual present values, assumed to decline by 0.5 percent per year. Table 7 shows the first five years of the 20-year horizon. The State Water Board estimates that annual costs will become and remain $0 starting in Year 3.

Costs over a 20-Year Lifetime for BUSINESSES AND INDIVIDUALS					
Real Interest Rate, 20-year, i	0.50%				
First Year of Time Horizon, January 1	2018				
Last Year of Time Horizon, January 1	2038				
Year, Position in the Time Horizon	Year 1	Year 2	Year 3	Year 4	Year 5
Year, Calendar, t	2018	2019	2020	2021	2022
Discount Factor = 1 / (1 + i) ^ (t - 2018)	1.000	0.995	0.990	0.985	0.980
Economic Direct Cost of Private Suppliers and Customers					
Year, Position in the Time Horizon	Year 1	Year 2	Year 3	Year 4	Year 5
Costs, Economic (not Fiscal) 2015 $	2,313,022	13,721,641	0	0	0
Present Value, each year	2,313,022	13,652,374	0	0	0
Sum of Present Values (for Direct Economic Costs)	15,966,396				

Table 7: Lifetime economic costs of the proposed regulation

The costs change in the first two years; thereafter, the State Water Board assumes they remain constant, in real terms. The pink highlighted cells in Table 7 show the direct economic costs for Year 1, Year 2 and Year 3. The following paragraphs explain how the Board estimated those costs.

In the first year (Year 1), the Board assumes the following:

- Californians conserve water due to the proposed regulation and these water savings cause water suppliers to lose revenue. Gross revenue loss to private[3] suppliers= total supplier revenue losses * 15%.)
  - The suppliers absorb this loss in the first year; in other words, they do not pass on lost revenue costs to customers in the first year.
- Customers and private suppliers purchase nozzles.
- Urban suppliers pass on nozzle costs to customers as a one-time surcharge.

Table 8 summarizes those impacts.

Year 1: Direct Economic Costs (2015 $)	
GrossRevenue Loss to Private Suppliers	2,046,504
Nozzle Cost to Private Suppliers	$12,622
Nozzle Cost to Households in Water Charges	$84,632
Nozzle Cost to Households' Direct Purchases	$169,264
Total DIRECT Economic Cost, First Year	$2,313,022

Table 8: First year, direct economic costs

In the second year (Year 2), the Board assumes the following:

- As a one-time surcharge to customers, the urban suppliers pass on the revenue loss costs they incurred in Year 1.

- By Year 2, urban suppliers will have permanently adjusted fixed service charges so that they do not lose revenue as customers continue to conserve. Using less water, customers would not pay more.

Table 9 summarizes those impacts.

Year 2: Direct Economic Costs (2015 $)	
Customers Repay Gross Rev Loss to All Suppliers	$13,721,641
Total DIRECT Cost, Second Year	$13,721,641

Table 9: Second year, direct economic costs

Impacts to Businesses

Ability to Compete

The proposed regulation will not likely reduce the ability of California businesses to compete. This regulation is a step toward drought resilience. Vulnerability to future droughts may reduce California's competitiveness. Reducing vulnerability by increasing resilience will at a minimum maintain and at best enhance California's competitiveness.

Creation or Elimination of Jobs and Businesses

The State Water Board initially determines no businesses or jobs would be created or eliminated by the proposed regulation. As explained in greater detail in the Form 399 supplement, which has been circulated with this Initial Statement of Reasons and is

[3] As explained in the 399 supplement, the Water Board assumes 15% of the urban water suppliers are private suppliers.

available on the Board's website at www.waterboards.ca.gov/water_issues/programs/conservation_portal/regs, the proposed regulation is unlikely to trigger changes in the affected industries such that new staff would be hired or existing staff let go; similarly, it would not create a market niche that would create new businesses, nor impose costs so high that it would eliminate existing businesses. Behavioral changes by water users are likely to fall within the range of offered services and expertise of existing businesses and not necessitate significant changes within existing businesses, let alone sector-wide.

The Expansion of Business

Landscaping businesses may expand as a result of the proposed regulation. These businesses can help water customers (1) install and manage more efficient irrigation systems to prevent runoff, (2) install and maintain irrigation systems that respond to weather conditions, (3) manage the retrofitting or rebuilding of inline fountains, and (4) provide technical and horticultural assistance for drought-tolerant or xeriscape plantings. The magnitude of expansion will depend on how Californians respond to the prohibitions, but is not expected to be significant.

The Economic Benefits

The most significant economic benefit of the proposed regulation is its contribution to California's future water security. Robustly estimating the statewide value of this contribution would be wholly speculative based on existing data and studies. This proposed regulation defines specific water uses as waste and unreasonable, increasing conservation, which, in turn, increases drought resilience; it also imposes penalties on HOAs and cities when they do not comply with existing law.

In general, the State Water Board perceives several categories of potential benefits, including increased streams flows, decreased energy use, increased activities in drought-based industries, increased water quality, increased awareness about water waste, reduced probability of severe economic disruptions, and more equitable management of water. In addition, the Board expects potential benefits to small businesses such as restaurants (saving water and energy by washing fewer glasses), landscapers (increased demand for irrigation design, installation, and management), and small and large hotels & motels (saving water and energy by washing less linen). These benefits are unlikely to significantly impact the state's economy.

To complete the economic impact analysis, the State Water Board considered two categories of probable benefits, where the Board could base its estimates on available data. Those categories are (1) Variable Cost Savings; and (2) Offset Demand Savings. The Board based these estimates on the water savings due to the prohibitions, 12,489 AF/yr.

The State Water Board estimates the proposed regulation, over its lifetime, will have statewide economic (not fiscal) benefits totaling $167,748,630. Looking at benefits over the proposed regulation's "lifetime" requires defining the lifetime. The State Water Board assumed a 20-year lifetime and assigned a yearly discount rate of 0.5 percent. To calculate the present value of the 20-year stream, the Water Board summed the annual present values, assumed to decline by 0.5 percent per year (e.g., $8,790,771 in the first year; 8,747,036 in the second year, etc.). Table 10 shows the first five years of the annual present

values, and, in the last and highlighted row, their sum: $167,748,630. For comparison, Table 10 also shows the first five years of total direct benefits for the 20-year horizon. The Board estimates that annual benefits of $8,790,771 will be constant in future 2015 dollars starting in Year 1.

To estimate the benefits, the State Water Board assumed the following:

- Private suppliers realize variable cost savings (See Variable Cost Savings). Private Supplier variable cost savings= total supplier variable cost savings * 15%.
- Private suppliers realize offset demand savings (See Offset Demand Savings). Private Supplier offset demand savings= total supplier offset demand savings * 15%.
- All urban suppliers pass on variable cost and offset demand savings to customers.

Direct Benefits over a 20 Year Lifetime for BUSINESSES AND INDIVIDUALS					
Real Interest Rate, 20-year	0.50%				
First Year of Time Horizon, January 1	2018				
Last Year of Time Horizon, December 31	2038				
Year, Position in the Time Horizon	Year 1	Year 2	Year 3	Year 4	Year 5
Year, Calendar, t	2018	2019	2020	2021	2022
Discount Factor = 1 / (1 + i) ^ (t - 2018)	1.000	0.995	0.990	0.985	0.980
Economic Direct Benefit to Private Suppliers and Customers					
Year, Position in the Time Horizon	Year 1	Year 2	Year 3	Year 4	Year 5
Variable Cost Savings to Private Suppliers	$431,755	$431,755	$431,755	$431,755	$431,755
Offset Demand to Private Suppliers	$709,175	$709,175	$709,175	$709,175	$709,175
Variable Cost Savings to all Customers (benefits from Private + Public Suppliers)	$2,894,884	$2,894,884	$2,894,884	$2,894,884	$2,894,884
Offset Demand Savings to all Customers (benefits from Private + Public Suppliers)	$4,754,957	$4,754,957	$4,754,957	$4,754,957	$4,754,957
Total Direct Benefits, Economic (future $)	$8,790,771	$8,790,771	$8,790,771	$8,790,771	$8,790,771
Present Value, each year	$8,790,771	8,747,036	8,703,519	8,660,217	8,617,132
Sum of Present Values for Direct Economic Benefits: $167,748,630					

Table 10: Lifetime direct, economic benefit of the proposed regulation.

Reasonable Alternatives

Alternatives to Proposed Regulation

As an alternative to the proposed regulation, the State Water Board considered prohibiting wasteful water use practices through National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer Systems (MS4s) permits.

The 1987 amendments to the Clean Water Act established a framework for regulating storm water system discharges under the NPDES program. Pursuant to section

402(p)(3)(B)(ii), NPDES permits regulating MS4 discharges must "effectively prohibit non-storm water discharges." Non-storm water discharge, also referred to as illicit or dry-weather discharge, is defined as any discharge to an MS4 that is not composed entirely of storm water—with some exceptions. Non-storm water discharge is considered "illicit" because MS4s are not designed to accept, process, or discharge it (EPA 2004).

Pursuant to 40 CFR 122.26 Section 2 (iv)(B)(1), MS4 Illicit Discharge Detection and Elimination (IDDE) programs shall address all sources of illicit discharges. However, certain non-storm water discharges only need to be addressed if they are identified by the MS4 permittee as sources of pollutants. Germane examples of potentially polluting illicit discharges include: landscape irrigation, irrigation water, lawn watering, individual residential car washing and street wash water. Regardless of the source of the non-storm water flow, MS4 permittees are required to develop programs that prevent, detect and remove illicit discharges. Once an illicit discharge is identified as a source of pollution, permittees are required to address it.

In California, the State Water Resources Control Board and the Regional Water Quality Control Boards (the Water Boards) have been authorized to administer the NPDES program since 1973. In 1990, as a first step in carrying out the requirements of the 1987 CWA amendments, EPA promulgated final regulations for storm water discharges from MS4s serving a population over 100,000. These are referred to as Phase 1 MS4 permits. In 1999, EPA issued the final "Phase II" regulations, which required storm water permits for small MS4s by 2003.

Since 1990, the California Regional Water Quality Control Boards (RWQCBs) have issued Phase 1 MS4 permits for medium (serving between 100,000 and 250,000 people) and large (serving 250,000 people) municipalities. Most of these permits are issued to a group of co-permittees encompassing an entire metropolitan area. In 2003, the State Water Board issued the first Phase II Small MS4s general permit, providing permit coverage for smaller municipalities (population less than 100,000), including non-traditional small MS4s, such as military bases, public campuses, prison and hospital complexes.

To integrate aspects of the proposed regulation into NPDES MS4 permits, the State Water Board's Climate and Conservation unit could work with the agency's stormwater programs to ensure future Phase-1 and Phase-2 permits prohibit wasteful water use practices. There are, however, several limitations to this alternative.

First, MS4 permits only address illicit discharges. Accordingly, those prohibitions that would not reduce runoff (e.g., those affecting indoor use) would be omitted. Secondly, discharges only need to be addressed if they have been identified by a permittee as sources of pollutants. Not all RWQCBs have identified the wasteful outdoor water use practices to be prohibited by the proposed regulation as sources of pollutants. The prohibitions would therefore vary across the state. Thirdly, the prohibition against watering while raining would be difficult to enforce as an NPDES permit condition, in addition to being possibly inconsistent with the purpose of MS4 permits, i.e., during wet weather runoff, the volume of irrigation water flowing off landscapes would arguably have a *de minimus* contribution to total pollutant loading.

In sum, as an alternative to the proposed regulation, relying on NPDES MS4 permits would considerably limit the scope and extent of the prohibitions.

The Adoption of Performance Standards as an Alternative

Pursuant to Government Code section 11346.2, subdivision (b)(4)(A), in the case of a regulation that would mandate the use of specific technologies or equipment or prescribe specific actions or procedures, the imposition of performance standards shall be considered as an alternative. As a third alternative, the State Water Board considered as a performance standard water use reduction targets. However, the Board rejected this as an alternative to the proposed regulation as it would require amending the Water Code. The State Water Board does not presently have authority to set establish and implement such standards.

No Change Alternative

The State Water Board could take no action, ignoring the directive of B-37-16 and the preceding Executive Orders. The California Constitution declares, at article X, section 2, that the water resources of the state must be put to beneficial use in a manner that is reasonable and not wasteful. The California Supreme Court has clarified that "What is a beneficial use at one time may, because of changed conditions, become a waste of water at a later time" (*Tulare Dist. v. Lindsay Strathmore Dist.* (1935) 3 Cal.2d 489, 567).

The statewide drought is over but the long-term challenge of water allocation between urban, agricultural, and environmental uses is increasing as population growth and climate change place additional stress on water resources. In addition, for the fifth consecutive year, dry conditions persist in areas of the state, with limited drinking water supplies in disadvantaged communities. Furthermore, water for agricultural production and environmental habitat remains diminished, groundwater basins severely depleted and California's forests ravaged—with as many as 100 million trees killed by drought. These conditions are likely to persist and intensify as warmer winter temperatures driven by climate change reduce water held in the Sierra Nevada snowpack and result in drier soil conditions (Bales et al. 2014, Diffenbaugh et al. 2015, Berg and Hall 2017).

Water conservation is the easiest, most efficient, and most cost-effective way to quickly reduce water demand and extend supplies, providing flexibility for all California communities. It is unreasonable to continue to use water in a manner that is unnecessarily wasteful. The prohibitions that would be enacted by the proposed regulation are necessary for the Board to fulfill the direction from the Governor in EO B-37-16 and are a necessary step forward towards making water conservation a California way of life.

Consideration of Alternatives

For the foregoing reasons, adoption of the proposed regulation is the most effective mechanism for eliminating water waste, pursuant to B-37-16 and the preceding Executive Orders. This approach is likely to be much more efficient than doing nothing or relying on water quality regulations to prohibit wasteful and unreasonable uses of water.

Impact on Small Businesses

According to DGS, a small business employs no more than 100 people and has average annual gross receipts of $15 million or less. The State Water Board cannot determine whether there will be any costs to small businesses.

The State Water Board assumes most California landscape businesses are small businesses. The Water Board assumes that any landscaping work resulting from the regulation would be similar in kind to work these businesses already perform. As such, small landscaping businesses would not have to incur costs to purchase new equipment or acquire new skills. The Water Board assumes no direct costs to small landscaping businesses.

The regulation may also impact small hotel and motel businesses. However, the Board could not estimate the initial or ongoing costs. The Board would need to estimate the number of rooms that do not already have signs with the required messaging. Considering that the emergency regulations' requirements for such signage have been in place since July 2014, it is unlikely that a significant number of existing hotels and motels do not already display this type of signage. The Board cannot determine the number of rooms currently lacking appropriate signage, if any. In the Water Board's random sample of UWMPs, 65% of the suppliers already have the same or a substantially similar requirement that hotels and motels "provide guests with the option of having towels and linens laundered…." This suggests many hotels and motels would display such signage even without the Board's requirement (See Table 5). Thus, the initial and ongoing costs to small hotels & motels would be insignificant.

Duplication or Conflict with Federal Regulations

The proposed regulation does not duplicate or conflict with Federal regulations. There are no regulations in the federal Code of Regulations that address the same issues as are addressed by the proposed regulation. This regulation relates to waste and unreasonable use of water, and federal regulations do not address this.

Cited Technical, Theoretical, and Empirical Documents

Alliance for Water Efficiency (AWE) (2011). Water Efficiency for Instream Flow: Making the Link in Practice.

Alliance for Water Efficiency (AWE) (2014). Building Better Water Rates for an Uncertain World.

American Water Works Association (AWWA) (2012). Principles of Water Rates, Fees, and Charges. AWWA Manual M1, Sixth Edition.

Baerenklau, K., Schwabe, K., and A. Dinar (2013). Do Increasing Block Rate Water Budgets Reduce Residential Water Demand? A Case Study in Southern California. *Water Science and Policy Center Working Paper*, 01-0913.

Bales, R. C., Rice, R., & Roy, S. B. (2014). Estimated Loss of Snowpack Storage in the Eastern Sierra Nevada with Climate Warming. Journal of Water Resources Planning and Management, 141(2), 04014055.

Berg, N., & Hall, A. (2017). Anthropogenic warming impacts on California snowpack during drought. Geophysical Research Letters, 44(5), 2511-2518.

California State Board of Equalization (BOE) (2017). California Constitutional Provisions: Article XIII D Assessment and Property-Related Fee Reform, Section 6.

California Energy Commission (CEC) (2006). Refining Estimates of Water-Related Energy Use in California.

City of Davis, 2015. Urban Water Management Plan. https://wuedata.water.ca.gov/public/uwmp_attachments/4281583487/Davis%202015%20UWMP_FINAL-20160613.pdf

Cooley, H., Donnelly, K., Phurisamban, R., & Subramanian, M. (2015). Impacts of California's Ongoing Drought: Agriculture. *Pacific Institute*: Oakland, CA, USA.

Dalhuisen, J. M., Florax, R. J., De Groot, H. L., & Nijkamp, P. (2003). Price and income elasticities of residential water demand: a meta-analysis. *Land economics*, 79(2), 292-308.

Diffenbaugh, N. S., Swain, D. L., & Touma, D. (2015). Anthropogenic warming has increased drought risk in California. *Proceedings of the National Academy of Sciences*, 112(13), 3931-3936.

Dixon, L. S., Moore, N. Y., & Pint, E. M. (1996). Drought management policies and economic effects in urban areas of California. 1987–1992, *California Urban Water Agencies*. ISBN 0-8330-5467-1.

Espey, M., Espey, J., & Shaw, W. D. (1997). Price elasticity of residential demand for water: a meta-analysis. Water resources research, 33(6), 1369-1374.

Feinstein, L., Phurisamban, R., Ford, A., Tyler, C., & Crawford, A. (2017). Drought and Equity in California. *Pacific Institute*. Oakland, CA.

Gleick, P. H., Wolff, G. H., & Cushing, K. K. (2003). Waste not, want not: The potential for urban water conservation in California. Appendix B, Table B-4. *Pacific Institute*. Oakland, CA.

Gleick, P. (2017). Impacts of California's Five-Year (2012-2016) Drought on Hydroelectricity Generation. *Pacific Institute*. Oakland, CA.

Gray, B. E. (2015). The Reasonable Use Doctrine in California Water Law and Policy.

Hanak, E., Lund, J., Cutter, W. B., Gray, B., Houston, D., Howitt, R., ... & Sumner, D. (2012). Water and the California Economy. Public Policy Institute of California.

Hildebrand, M., Gaur, S., & Salt, K. J. (2009). Water conservation made legal: water budgets and California law. *American Water Works Association*. Journal, 101(4), 85.

Howitt, R., Medellín-Azuara, J., MacEwan, D., Lund, J., & Sumner, D. (2014). Economic analysis of the 2014 drought for California agriculture. Center for Watershed Sciences, University of California, Davis.

Howitt, R., Medellín-Azuara, J., MacEwan, D., Lund, J., & Sumner, D. (2015). Economic analysis of the 2015 drought for California agriculture. UC Davis Center for Watershed Sciences.

Howitt, R., Medellín-Azuara, J., MacEwan, D., Lund, J., & Sumner, D. (2016). Economic analysis of the 2015 drought for California agriculture. UC Davis Center for Watershed Sciences.

Irvine Ranch Water District (IRWD). (2004). *The Residential Runoff Reduction Study*.

Los Angeles Department of Water and Power (LADWP). 2015. Urban Water Management Plan.

Manago, K. F., and T. S. Hogue (2017). Urban Streamflow Response to Imported Water and Water Conservation Policies in Los Angeles, California. JAWRA Journal of the American Water Resources Association.

Mini, C., T.S Houge, and S. Pincetl (2015). The Effectiveness of Water Conservation Measures on Summer Residential Water Use in Los Angeles, California. *Resources, Conservation, and Recycling*. 94: 136-145.

Mukherjee, M., Mika, K., & Gold, M. (2016). Overcoming the Challenges to Using Tiered Water Rates to Enhance Water Conservation. California Journal of Politics and Policy, 8(3), 0_1.

Mono Lake Committee (2017). The Mono Lake Story. <www.monolake.org/about/story> Last accessed June 16, 2017.

Moss, S., McCann, R., Mitchell, D. and E. Stryjewski (2015). Executive Order B-29-15 State of Emergency Due to Severe Drought Conditions—Economic Impact Analysis. *Prepared for the State Water Resources Control Board by M.Cubed.*

Moss, S., McCann, R., Mitchell, D. and E. Stryjewski (2015a). Appendix A: Severe Drought Conditions Threaten California Economy—Lessons from Australia. *Prepared for the State Water Resources Control Board by M.Cubed.*

Oki, L. and D. Haver (2011). Evaluating Best Management Practices (BMPs) effectiveness to Reduce Volumes of Runoff and Improve the Quality of Runoff from Urban Environments. *Prepared for SWRCB*.

Olmstead, S. M., & Stavins, R. N. (2009). Comparing price and nonprice approaches to urban water conservation. Water Resources Research, 45(4).

Olmstead, S. M., Hanemann, W. M., & Stavins, R. N. (2007). Water demand under alternative price structures. *Journal of Environmental Economics and Management*, 54(2), 181-198.

Reano, Dane C., et al. "Long-term characterization of residential runoff and assessing potential surrogates of fecal indicator organisms." Water research 74 (2015): 67-76.

Sacramento Water Forum (SWF) (2017). Water Conservation: Saving Water, Securing the Future. <www.waterforum.org/water-supply/water-conservation/> Last accessed June 19, 2017.

State Water Resources Control Board (SWRCB) (2105). Storm Water Resource Plan Guidelines.

SWRCB (1994). Decision and Order Amending Water Right Licenses to Establish Fishery Protection Flows In Streams Tributary to Mono Lake and to Protect Public Trust Resources at Mono Lake and in the Mono Lake Basin.

Steg, L., Bolderdijk, J. W., Keizer, K., & Perlaviciute, G. (2014). An integrated framework for encouraging pro-environmental behaviour: The role of values, situational factors and goals. Journal of Environmental Psychology, 38, 104-115.

Tucson Water (2017). C2E Tucson—2016 Annual Report Highlights: Save Water, Save Rivers, Build Community.

US Environmental Protection Agency (EPA) (2004). Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments. *Prepared by the Center for Watershed Protection and Robert Pitt, University of Alabama.*