

Economic and Fiscal Impacts of the Proposed Regulation to Permanently Prohibit Certain Wasteful Water Use Practices

Attachment to STD 399

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The Proposed Text of the Regulation

Title 23. Waters

Division 3. State Water Resources Control Board and Regional Water Quality Control Boards

Chapter 2. Appropriation of Water

~~Article 22. Prevention of Waste and Unreasonable Use~~

Chapter 3. Determination of Right to the Use of Water

Article 2. Adjudications Under Water Code Sections 2500 Through 2900

Chapter 3.5. Conservation and the Prevention of Waste and Unreasonable Use

Article 1. Prevention of Waste and Unreasonable Use

~~§ 955. Claims to Water Supplied by District or Water Company. [Renumbered]~~

~~§ 855. § 955. Policy and Definition.~~

(a) In investigating any uses of water and making the determinations required by this article, the board shall give particular consideration to the reasonableness of use of reclaimed water or reuse of water.

(b) As used in this article, “misuse of water” or “misuse” means any waste, unreasonable use, unreasonable method of use, or unreasonable method of diversion of water.

Authority cited: Section 1058, Water Code.

Reference: Sections 100, 275, 1240, 1251, 1253 and 1257, Water Code; and Section 2, Article X, California Constitution.

~~§ 956. Divided Interests. [Renumbered]~~

~~§ 856. § 956. Investigations.~~

The board staff shall investigate an allegation of misuse of water:

- (1) when an interested person shows good cause, or
- (2) when the board itself believes that a misuse may exist.

Authority cited: Section 1058, Water Code.

Reference: Sections 100, 183, 275 and 1051, Water Code; and Section 2, Article X, California Constitution.

~~§ 957. Undivided Interests. [Renumbered]~~

~~§ 857. § 957. Notifications, Hearings and Orders.~~

(a) If the investigation indicates that a misuse of water has occurred, the board staff shall notify interested persons and allow a reasonable period of time in which to terminate such misuse or demonstrate to the satisfaction of the board staff that misuse has not occurred.

(b) At the end of the time set by the board staff, and upon application of any interested person or upon its own motion, the board may hold a hearing to determine if misuse has occurred or continues to occur.

(c) If the misuse is alleged to have occurred or to continue to occur in connection with exercise of rights evidenced by a permit or license issued by the board, the board shall notice the hearing as a permit revocation hearing pursuant to Water Code Section 1410.1, or as a license revocation

hearing pursuant to Water Code Section 1675.1, as appropriate; or as a preliminary cease and desist order hearing pursuant to Water Code Section 1834.

(d) The board may issue an order requiring prevention or termination thereof.

Authority cited: Section 1058, Water Code.

Reference: Sections 100, 275, 183, 1051, 1401, 1675.1 and 1834, Water Code.

~~§ 958. General Requirements for Proofs of Claims. [Repealed]~~

~~§ 858. § 958. Noncompliance with Order Regarding Misuse Under Water Right Entitlement.~~

If a permittee or licensee does not comply with any order issued pursuant to Section ~~857~~957 within such reasonable period of time as allowed by the board, or such extension thereof as may for good cause be allowed by the board, and if such order includes a finding that waste, unreasonable use, method of use, or method of diversion has occurred in connection with exercise of a right evidenced by a permit or license issued by the board, a revocation action may be commenced by the board:

(a) If the hearing has been noticed as a permit or license revocation hearing, and if the board finds that misuse has occurred or continues to occur, the board may order the permit or license revoked or impose appropriate additional or amended terms or conditions on the entitlement to prevent recurrence of the misuse;

(b) If the hearing pursuant to Section ~~857~~957 has been noticed as a preliminary cease and desist order hearing, and if the board finds that misuse has occurred or continues to occur, the board may issue a preliminary cease and desist order.

Authority cited: Section 1058, Water Code.

Reference: Sections 1410, 1675 and 1831, Water Code.

~~§ 959. Specific Requirements for Irrigation Proofs. [Repealed]~~

~~§ 859. § 959. Noncompliance with Other Order.~~

If a person other than a permittee or licensee does not comply with any order issued pursuant to Section ~~857~~957 within such reasonable period of time as allowed by the board, or such extension thereof as may for good cause be allowed, and if such order includes a finding that such person has misused or continues to misuse water, the board may request appropriate legal action by the Attorney General.

Authority cited: Section 1058, Water Code.

Reference: Section 275, Water Code.

~~§ 960. Uses Other than Irrigation. [Repealed]~~

~~§ 860. § 960. Alternative Procedure.~~

The procedure established in this article shall be construed as alternative to, and not exclusive of, the procedures established in Chapter 5 of Title 23, California Administrative Code, in accordance with Section 4007 therein.

Authority cited: Section 1058, Water Code.

Reference: Section 275, Water Code.

~~§ 961. Signature of Deponent. [Renumbered]~~

~~§ 962. Objections. [Renumbered]~~

~~§ 862.~~ § 962. Russian River, Special.

Budding grape vines and certain other crops in the Russian River watershed may be severely damaged by spring frosts. Frost protection of crops is a beneficial use of water under section 671 of ~~this chapter~~ 2 of this division. During a frost, however, the high instantaneous demand for water for frost protection by numerous vineyardists and other water users may contribute to a rapid decrease in stream stage that results in the mortality of salmonids due to stranding. Stranding mortality can be avoided by coordinating or otherwise managing diversions to reduce instantaneous demand. Because a reasonable alternative to current practices exists, the Board has determined these diversions must be conducted in accordance with this section.

(a) After March 14, 2012, except for diversion upstream of Warm Springs Dam in Sonoma County or Coyote Dam in Mendocino County, any diversion of water from the Russian River stream system, including the pumping of hydraulically connected groundwater, for purposes of frost protection from March 15 through May 15, shall be diverted in accordance with a board approved water demand management program (WDMP). For purposes of this section, groundwater pumped within the Russian River watershed is considered hydraulically connected to the Russian River stream system if that pumping contributes to a reduction in stream stage to any surface stream in the Russian River watershed during any single frost event.

(b) The purpose of the WDMP is to assess the extent to which diversions for frost protection affect stream stage and manage diversions to prevent cumulative diversions for frost protection from causing a reduction in stream stage that causes stranding mortality. The WDMP, and any revisions thereto, shall be administered by an individual or governing body (governing body) capable of ensuring that the requirements of the program are met. Any WDMP developed pursuant to this section shall be submitted to the board by February 1 prior to the frost season.

(c) At a minimum, the WDMP shall include (1) an inventory of the frost diversion systems within the area subject to the WDMP, (2) a stream stage monitoring program, (3) an assessment of the potential risk of stranding mortality due to frost diversions, (4) the identification and timelines for implementation of any corrective actions necessary to prevent stranding mortality caused by frost diversions, and (5) annual reporting of program data, activities, and results. In addition, the WDMP shall identify the diverters participating in the program and any known diverters within the area subject to the WDMP who declined to participate. The WDMP also shall include a schedule for conducting the frost inventory, developing and implementing the stream stage monitoring program, and conducting the risk assessment.

(1) Inventory of frost diversion systems: The governing body shall establish an inventory of all frost diversions included in the WDMP. The inventory, except for diversion data, shall be completed within three months after board approval of a WDMP. The inventory shall be updated annually with any changes to the inventory and with frost diversion data. The inventory shall include for each frost diversion:

- (A) Name of the diverter;
- (B) Source of water used and location of diversion;
- (C) A description of the diversion system and its capacity;
- (D) Acreage frost protected and acres frost protected by means other than water diverted from the Russian River stream system; and
- (E) The rate of diversion, hours of operation, and volume of water diverted during each frost event for the year.

(2) Stream stage monitoring program: The governing body shall develop a stream stage monitoring program in consultation with National Marine Fisheries Service (NMFS) and California Department of Fish and Game (DFG). For the purposes of this section, consultation involves an open exchange of information for the purposes of obtaining recommendations. The governing body is authorized to include its own expert scientists and engineers in the consultation, and request board staff to participate, when desired. The stream stage monitoring program shall include the following:

(A) A determination of the number, type, and location of stream gages necessary for the WDMP to monitor and assess the extent to which frost diversions may affect stream stage and cause stranding mortality;

(B) A determination of the stream stage that should be maintained at each page to prevent stranding mortality;

(C) Provisions for the installation and ongoing calibration and maintenance of stream gages; and

(D) Monitoring and recording of stream stage at intervals not to exceed 15 minutes.

(3) Risk assessment: Based on the inventory and stream stage information described above, and information regarding the presence of habitat for salmonids, the governing body shall conduct a risk assessment that evaluates the potential for frost diversions to cause stranding mortality. The risk assessment shall be conducted in consultation with NMFS and DFG. The governing body is authorized to include its own expert scientists and engineers in the consultation, and request board staff to participate, when desired. The risk assessment shall be evaluated and updated annually.

(4) Corrective Actions: If the governing body determines that diversions for purposes of frost protection have the potential to cause stranding mortality, the governing body shall notify the diverter(s) of the potential risk. The governing body, in consultation with the diverters, shall develop a corrective action plan that will prevent stranding mortality. Corrective actions may include alternative methods for frost protection, best management practices, better coordination of diversions, construction of offstream storage facilities, real-time stream gage and diversion monitoring, or other alternative methods of diversion. Corrective actions also may include revisions to the number, location and type of stream stage monitoring pages, or to the stream stages considered necessary to prevent stranding mortality. In developing the corrective action plan the governing body shall consider the relative water right priorities of the diverters and any time delay between groundwater diversions and a reduction in stream stage. The corrective action plan shall include a schedule of implementation. To the extent feasible, the corrective action plan shall include interim corrective actions if long-term corrective actions are anticipated to take over three years to fully implement. The diverters shall implement corrective actions in accordance with the corrective action plan, or cease diverting water for frost protection.

(5) Annual Reporting: The governing body shall submit a publically available annual report of program operations, risk assessment, and corrective actions by September 1 following the frost season that is the subject of the report. The report shall include:

(A) The frost inventory, including diversion data.

(B) Stream stage monitoring data.

(C) The risk assessment and its results, identification of the need for any additional data or analysis, and a schedule for obtaining the data or completing the analysis.

(D) A description of any corrective action plan that has been developed, any corrective actions implemented to date, and a schedule for implementing any additional corrective actions.

(E) Any instances of noncompliance with the WDMP or with a corrective action plan, including the failure to implement identified corrective actions. The report shall document consultations with DFG and NMFS regarding the stream stage monitoring program and risk assessment and shall explain any deviations from recommendations made by DFG or NMFS during the consultation process. In addition, the annual report shall evaluate the effectiveness of the WDMP and recommend any necessary changes to the WDMP, including any proposed additions or subtractions of program participants. Any recommendations for revisions to the WDMP shall include a program implementation plan and schedule. The board may require changes to the WDMP, including but not limited to the risk assessment, corrective action plan, and schedule of implementation, at any time.

(d) The governing body may develop and submit for the Deputy Director for Water Rights' approval, criteria, applicable to any participant in its WDMP, for identifying groundwater diversions that are not hydraulically connected to the Russian River stream system. The governing body may

submit to the Deputy Director a list of groundwater diverters that appear to meet these criteria and could be exempted from this section. The Deputy Director is authorized to exempt the listed groundwater diverters, or identify the reason for not exempting the listed groundwater diverters. Beginning three years from the effective date of this section, if an individual groundwater diverter can independently demonstrate to the satisfaction of the Deputy Director that the diversion is not hydraulically connected to the Russian River stream system, the Deputy Director is authorized to exempt the groundwater diverter from this section.

(e) Compliance with this section shall constitute a condition of all water right permits and licenses that authorize the diversion of water from the Russian River stream system for purposes of frost protection. The diversion of water in violation of this section, including the failure to implement the corrective actions included in any corrective action plan developed by the governing body, is an unreasonable method of diversion and use and a violation of Water Code section 100, and shall be subject to enforcement by the board. The board has continuing authority to revise terms and conditions of all permits and licenses that authorize the diversion of water for purposes of frost protection should future conditions warrant.

Authority cited: Section 1058, Water Code.

Reference: Section 2, Article X, California Constitution; and Sections 100, 275 and 1051.5, Water Code.

Article 2. Wasteful and Unreasonable Water Uses

§ 963. Wasteful and Unreasonable Water Use Practices.

The State Water Resources Control Board (State Board) has determined that it is a waste and unreasonable use of water under Article X, section 2 of the California Constitution to divert or use water inconsistent with subdivision (a) regardless of water right seniority, given the need for the water to support other more critical uses.

(a) As used in this article:

(1) "Commercial agricultural use meeting the definition of Government Code section 51201, subdivision (b)" includes irrigation, frost protection and heat control, but does not include cleaning, processing or other similar post-harvest activities.

(2) "Total potable water production" means all potable water that enters into a water supplier's distribution system, excluding water placed into storage and not withdrawn for use during the reporting period, or water exported outside the supplier's service area.

(3) "Urban water supplier" means a supplier that meets the definition set forth in Water Code section 10617, except it does not refer to suppliers when they are functioning solely in a wholesale capacity, but does apply to suppliers when they are functioning in a retail capacity.

(4) "Water year" means the period from October 1 through the following September 30. Where a water year is designated by year number, the designation is by the calendar year number in which the water year ends.

(b)(1) The use of water is prohibited as identified in this subdivision for any of the following actions:

(A) 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;

(B) 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;

(C) The application of potable water directly to driveways and sidewalks;

(D) The use of potable water in an ornamental fountain or other decorative water feature, except where the water is part of a recirculating system;

(E) 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. In determining whether measurable rainfall of at least one-tenth of one inch of rain occurred in a given area, enforcement may be based on records of the National Weather Service, the closest CIMIS station to the parcel, or any other reliable source of rainfall data available to the entity undertaking enforcement of this subdivision;

(F) 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;

(G) 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; and

(2) Notwithstanding subdivision (b)(1), the use of water is not prohibited by this article under the following circumstances:

(A) To the extent necessary to address an immediate health and safety need. This may include, but is not limited to, street sweeping and pressure washing of public sidewalks and the use of potable water in a fountain or water feature when required by law to be potable.

(B) To the extent necessary to comply with a term or condition in a permit issued by a state or federal agency.

(C) When the water is used exclusively for commercial agricultural use meeting the definition of Government Code section 51201, subdivision (b).

(c) To promote water conservation, 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.

(d)(1) To prevent the waste and unreasonable use of water and to promote water conservation, any homeowners' association or community service organization or similar entity is prohibited from:

(A) Taking or threatening to take any action to enforce any provision of the governing documents or architectural or landscaping guidelines or policies of a common interest development where that provision is void or unenforceable under section 4735, subdivisions (a) and (b) of the Civil Code;

(B) Imposing or threatening to impose a fine, assessment, or other monetary penalty against any owner of a separate interest for reducing or eliminating the watering of vegetation or lawns during a declared drought emergency, as described in section 4735, subdivision (c) of the Civil Code; or

(C) Requiring an owner of a separate interest upon which water-efficient landscaping measures have been installed in response to a declared drought emergency, as described in section 4735, subdivisions (c) and (d) of the Civil Code, to reverse or remove the water-efficient landscaping measures upon the conclusion of the state of emergency.

(2) As used in this subdivision:

(A) "Architectural or landscaping guidelines or policies" includes any formal or informal rules other than the governing documents of a common interest development.

(B) "Homeowners' association" means an "association" as defined in section 4080 of the Civil Code.

(C) "Common interest development" has the same meaning as in section 4100 of the Civil Code.

(D) "Community service organization or similar entity" has the same meaning as in section 4110 of the Civil Code.

(E) "Governing documents" has the same meaning as in section 4150 of the Civil Code.

(F) "Separate interest" has the same meaning as in section 4185 of the Civil Code.

(3) If a disciplinary proceeding or other proceeding to enforce a rule in violation of subdivision (d)(1) is initiated, each day the proceeding remains pending shall constitute a separate violation of this regulation.

(e) To prevent the waste and unreasonable use of water and to promote water conservation, any city, county, or city and county is prohibited from imposing a fine under any local maintenance ordinance or other relevant ordinance as prohibited by section 8627.7 of the Government Code.

(f) The taking of any action prohibited in subdivision (b) (d) or (e), or the failure to take any action required in subdivision (c), is an infraction punishable by a fine of up to five hundred dollars (\$500) for each day in which the violation occurs. The fine for the infraction is in addition to, and does not supersede or limit, any other remedies, civil or criminal.

(g) A decision or order issued under this article by the Board or an officer or employee of the Board is subject to reconsideration under article 2 (commencing with section 1122) of chapter 4 of part 1 of division 2 of the Water Code.

Authority: Section 1058, Water Code.

References: Article X, Section 2, California Constitution; Sections 4080, 4100, 4110, 4150, 4185, and 4735, Civil Code; Sections 102, 104, 105, 275, 350, and 10617, Water Code; *Light v. State Water Resources Control Board* (2014) 226 Cal.App.4th 1463.

Section I. Background

Regulatory Context

2012 through 2015 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 drought placed an even greater emphasis on urban¹ water conservation and efficiency. Beginning in January 2014, with the Governor's drought emergency proclamation, a series of successive executive orders directed Californians to conserve water via emergency conservation regulations. 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 were followed by Executive Orders (EO) B-37-16 in May 2016 and B-40-17 in April 2017. The EOs tasked State agencies with establishing a long-term framework for water conservation and drought planning. The EO actions are organized around four primary objectives: using water more wisely, eliminating water waste, strengthening local drought resilience, and improving agricultural water use efficiency and drought planning.

To eliminate water waste, the State Water Resource Control Board (State Water Board or Board) has been directed to *permanently prohibit practices that waste water*. The wasteful water uses prohibited by the proposed regulation build on the existing emergency conservation regulations and include the following:

1. 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;
2. 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;
3. The application of potable water to driveways and sidewalks;
4. The use of potable water in an ornamental fountain or other decorative water feature, except where the water is part of a recirculating system;
5. The application of water to irrigate turf and ornamental landscapes during and within 48 hours after measurable rainfall of at least one-tenth of an inch;
6. 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;
7. The irrigation of turf on public street medians or publically owned or maintained landscaped areas between the street and sidewalk, except where the turf serves a community or neighborhood function.

¹ This regulation would not affect agricultural water uses.

The proposed regulation also requires specific actions of the Commercial, Industrial, and Institutional (CII) sector:

8. Hotels and motels must provide guests with the option of having towels and linens laundered, and prominently display this option.

The proposed regulation also prohibits specific actions of local agencies and homeowners' associations:

9. Cities, counties, and cities and counties may not prevent or punish residents for water conservation in violation of existing statutes;
10. Homeowners' associations may not prevent or punish residents for landscaping that reduces watering during a declared drought emergency in violation of existing statutes or prevent or punish residents for water conservation in violation of certain existing statutes.

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, particularly 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 water use 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 major savings.

The proposed regulation would not have a major economic impact. Prohibiting the aforementioned wasteful water use practices would result in annual water savings of 12,489 acre feet per year, or 0.21 percent of the nearly 6 million acre feet urban water suppliers produced between June 2014 and May 2015 (SWRCB Reporting database 2017). Using these savings as the foundation of its analysis, the State Water Board estimates the proposed regulation would, in its most expensive year, result in direct economic and fiscal

costs of \$2,313,022 and \$11,747,147 respectively. The highest one-time cost to a household would be \$1.12. The Water Board estimates the maximum direct economic and fiscal benefits would be \$8,790,771 and \$6,508,912 respectively. While its economic impact is small, the proposed regulation represents a necessary and practical step forward. See the associated regulatory and environmental documents for an analysis of the regulation's non-economic impacts.

Purpose of this Document

Government Code Sections 11346.2, 11346.3, 11346.5 and Health and Safety Code section 57005 establish requirements for assessing the estimated economic impact of a proposed regulation. Sections 6600 through 6615 of the California State Administrative Manual (SAM) describe the corresponding statutory requirements for the Department of Finance Standard Form 399 (Form 399). Pursuant to statutory requirements and in accordance with SAM guidance, the State Water Board has prepared a Form 399. The purpose of this document is to provide supplemental information for the Form 399. In Section II, the State Water Board includes the completed Form 399, and provides additional information to answer each of the requisite questions. In Section III, the State Water Board describes the methods used to estimate direct and total costs and benefits. Section III also outlines the assumptions made in the analysis.

Section II. Standard Form 399

STATE OF CALIFORNIA — DEPARTMENT OF FINANCE

ECONOMIC AND FISCAL IMPACT STATEMENT (REGULATIONS AND ORDERS)

STD. 399 (REV. 12/2013)

ECONOMIC IMPACT STATEMENT

DEPARTMENT NAME State Water Resources Control Board	CONTACT PERSON Madalene Ransom	EMAIL ADDRESS Madalene.Ransom@waterboards.ca.gov	TELEPHONE NUMBER 916-322-8417
DESCRIPTIVE TITLE FROM NOTICE REGISTER OR FORM 400 Water Conservation and the Prevention of Wasteful and Unreasonable Use			NOTICE FILE NUMBER Z

A. ESTIMATED PRIVATE SECTOR COST IMPACTS *Include calculations and assumptions in the rulemaking record.*

1. Check the appropriate box(es) below to indicate whether this regulation:

- | | |
|---|---|
| <input checked="" type="checkbox"/> a. Impacts business and/or employees | <input type="checkbox"/> e. Imposes reporting requirements |
| <input checked="" type="checkbox"/> b. Impacts small businesses | <input type="checkbox"/> f. Imposes prescriptive instead of performance |
| <input checked="" type="checkbox"/> c. Impacts jobs or occupations | <input checked="" type="checkbox"/> g. Impacts individuals |
| <input checked="" type="checkbox"/> d. Impacts California competitiveness | <input type="checkbox"/> h. None of the above (Explain below): |

For more details see Section A.1 of the Supplement

*If any box in Items 1 a through g is checked, complete this Economic Impact Statement.
If box in Item 1.h is checked, complete the Fiscal Impact Statement as appropriate.*

2. The State Water Resources Control Board estimates that the economic impact of this regulation (which includes the fiscal impact) is:
(Agency/Department)

- Below \$10 million
 Between \$10 and \$25 million
 Between \$25 and \$50 million
 Over \$50 million *[If the economic impact is over \$50 million, agencies are required to submit a Standardized Regulatory Impact Assessment as specified in Government Code Section 11346.3(c)]*

3. Enter the total number of businesses impacted: 10,361

Describe the types of businesses (Include nonprofits): Private Suppliers, Restaurants, Hotels & Motels, Landscapers (Section A.3.1)

Enter the number or percentage of total businesses impacted that are small businesses: Restaurants 20%

4. Enter the number of businesses that will be created: insignificant eliminated: insignificant

Explain: Impacts are too small to encourage creation or elimination (Section A.4)

5. Indicate the geographic extent of impacts: Statewide

Local or regional (List areas): _____

6. Enter the number of jobs created: unknown and eliminated: unknown

Describe the types of jobs or occupations impacted: Restaurants, Hotels, and Motels likely will have no change in the number of jobs.
Landscaping jobs may change focus from water-loving plants to drought tolerant plants and landscapes (Section A.6)

7. Will the regulation affect the ability of California businesses to compete with other states by making it more costly to produce goods or services here? YES NO

If YES, explain briefly: Competitiveness may increase as drought resilience increases (Section A.7)

**ECONOMIC AND FISCAL IMPACT STATEMENT
(REGULATIONS AND ORDERS)**

STD. 395 (REV. 12/2013)

ECONOMIC IMPACT STATEMENT (CONTINUED)**B. ESTIMATED COSTS** *Include calculations and assumptions in the rulemaking record.*1. What are the total statewide dollar costs that businesses and individuals may incur to comply with this regulation over its lifetime? \$ 15,966,396 (B.1)a. Initial costs for a small business: \$ unknown Annual ongoing costs: \$ unknown Years: (Section B.1)b. Initial costs for a typical business: \$ 33,756 Annual ongoing costs: \$ 0 Years: (Section B.1)c. Initial costs for an individual: \$ 1.12 in Year 2 Annual ongoing costs: \$ 0 Years: (Section B.1)d. Describe other economic costs that may occur: Other economic costs depend on how people react to the prohibitions.Runoff prohibition can be satisfied by stopping irrigation or planting xeriscape. (Section B.1.d)2. If multiple industries are impacted, enter the share of total costs for each industry: Because of data limitations, the Board could not estimate the share of total costs to landscapers and restaurants. (Section B.2)3. If the regulation imposes reporting requirements, enter the annual costs a typical business may incur to comply with these requirements. *Include the dollar costs to do programming, record keeping, reporting, and other paperwork, whether or not the paperwork must be submitted.* \$ (Section B.3)4. Will this regulation directly impact housing costs? YES NO

If YES, enter the annual dollar cost per housing unit: \$ _____

Number of units: _____

5. Are there comparable Federal regulations? YES NOExplain the need for State regulation given the existence or absence of Federal regulations: There are no federal regulations that address waste and unreasonable use of water (Section B.5)

Enter any additional costs to businesses and/or individuals that may be due to State - Federal differences: \$ _____

C. ESTIMATED BENEFITS *Estimation of the dollar value of benefits is not specifically required by rulemaking law, but encouraged.*1. Briefly summarize the benefits of the regulation, which may include among others, the health and welfare of California residents, worker safety and the State's environment: Future drought resilience, increased stream flows, decreased energy use, increased water quality from reduced runoff. Estimated benefits are (1) variable cost savings, and (2) offset demand savings. (Section C.1)2. Are the benefits the result of: specific statutory requirements, or goals developed by the agency based on broad statutory authority?Explain: Proposed regulation carries out directives in two Executive Orders. (Section C.2)3. What are the total statewide benefits from this regulation over its lifetime? \$ 167,748,630 (Section C.3)

4. Briefly describe any expansion of businesses currently doing business within the State of California that would result from this regulation:

Landscaping businesses may expand during the first years if demand for new types of services (irrigation, xeriscapes) develops. (Section C.4)**D. ALTERNATIVES TO THE REGULATION** *Include calculations and assumptions in the rulemaking record. Estimation of the dollar value of benefits is not specifically required by rulemaking law, but encouraged.*1. List alternatives considered and describe them below. If no alternatives were considered, explain why not: The alternative is to use the National Pollutant Discharge Elimination System, Municipal Separate Storm Sewer System. See Section D.1 for discussion.

**ECONOMIC AND FISCAL IMPACT STATEMENT
(REGULATIONS AND ORDERS)**

STD. 300 (REV. 1/22/01)

ECONOMIC IMPACT STATEMENT (CONTINUED)

2. Summarize the total statewide costs and benefits from this regulation and each alternative considered:

Regulation: Benefit: \$ 167,748,630 Cost: \$ 15,966,396
 Alternative 1: Benefit: \$ not estimated Cost: \$ not estimated
 Alternative 2: Benefit: \$ _____ Cost: \$ _____

3. Briefly discuss any quantification issues that are relevant to a comparison of estimated costs and benefits for this regulation or alternatives: Estimation would require a masters-level thesis effort investigating region-specific costs that vary widely. (Section D.3)

4. Rulemaking law requires agencies to consider performance standards as an alternative, if a regulation mandates the use of specific technologies or equipment, or prescribes specific actions or procedures. Were performance standards considered to lower compliance costs? YES NO

Explain: Section D.4

E. MAJOR REGULATIONS Include calculations and assumptions in the rulemaking record.

California Environmental Protection Agency (Cal/EPA) boards, offices and departments are required to submit the following (per Health and Safety Code section 57005). Otherwise, skip to E4.

1. Will the estimated costs of this regulation to California business enterprises exceed \$10 million? YES NO

*If YES, complete E2, and E3
If NO, skip to E4*

2. Briefly describe each alternative, or combination of alternatives, for which a cost-effectiveness analysis was performed:

Alternative 1: _____

Alternative 2: _____

(Attach additional pages for other alternatives)

3. For the regulation, and each alternative just described, enter the estimated total cost and overall cost-effectiveness ratio:

Regulation: Total Cost \$ _____ Cost-effectiveness ratio: \$ _____

Alternative 1: Total Cost \$ _____ Cost-effectiveness ratio: \$ _____

Alternative 2: Total Cost \$ _____ Cost-effectiveness ratio: \$ _____

4. Will the regulation subject to OAL review have an estimated economic impact to business enterprises and individuals located in or doing business in California exceeding \$50 million in any 12-month period between the date the major regulation is estimated to be filed with the Secretary of State through 12 months after the major regulation is estimated to be fully implemented?

YES NO

If YES, agencies are required to submit a Standardized Regulatory Impact Assessment (SRIA) as specified in Government Code Section 71346.3(c) and to include the SRIA in the Initial Statement of Reasons.

5. Briefly describe the following:

The increase or decrease of investment in the State: This proposed regulation could increase investment in the State because it is a move toward increased drought resilience. (Section E.5.a)

The incentive for innovation in products, materials or processes: May increase innovation in irrigation systems and landscape planting designs. (Section E.5.b)

The benefits of the regulations, including, but not limited to, benefits to the health, safety, and welfare of California residents, worker safety, and the state's environment and quality of life, among any other benefits identified by the agency: This proposed regulation may increase awareness of the value of water. (Section E.5.c)

PAGE 3

**ECONOMIC AND FISCAL IMPACT STATEMENT
(REGULATIONS AND ORDERS)**

STD. 399 (REV. 12/2013)

FISCAL IMPACT STATEMENT

A. FISCAL EFFECT ON LOCAL GOVERNMENT *Indicate appropriate boxes 1 through 6 and attach calculations and assumptions of fiscal impact for the current year and two subsequent Fiscal Years.*

- 1. Additional expenditures in the current State Fiscal Year which are reimbursable by the State. (Approximate)
(Pursuant to Section 6 of Article XIII B of the California Constitution and Sections 17500 et seq. of the Government Code).

§ 0 (Section F-A.1)

- a. Funding provided in _____
Budget Act of _____ or Chapter _____, Statutes of _____

- b. Funding will be requested in the Governor's Budget Act of _____
Fiscal Year: _____

- 2. Additional expenditures in the current State Fiscal Year which are NOT reimbursable by the State. (Approximate)
(Pursuant to Section 6 of Article XIII B of the California Constitution and Sections 17500 et seq. of the Government Code).

§ 11,747,147 (Section F-A.2)

Check reason(s) this regulation is not reimbursable and provide the appropriate information:

- a. Implements the Federal mandate contained in _____

- b. Implements the court mandate set forth by the _____ Court.

Case of: _____ vs. _____

- c. Implements a mandate of the people of this State expressed in their approval of Proposition No. _____

Date of Election: _____

- d. Issued only in response to a specific request from affected local entity(s).

Local entity(s) affected: _____

- e. Will be fully financed from the fees, revenue, etc. from: Customers (Section F-A.2.e)

Authorized by Section: Articles XIII C and D of the California State Constitution Code;

- f. Provides for savings to each affected unit of local government which will, at a minimum, offset any additional costs to each;

- g. Creates, eliminates, or changes the penalty for a new crime or infraction contained in _____

- 3. Annual Savings. (approximate)

§ 6,508,912 (Section F-A.3)

- 4. No additional costs or savings. This regulation makes only technical, non-substantive or clarifying changes to current law regulations.

- 5. No fiscal impact exists. This regulation does not affect any local entity or program.

- 6. Other. Explain _____

FISCAL IMPACT STATEMENT (CONTINUED)

B. FISCAL EFFECT ON STATE GOVERNMENT *Indicate appropriate boxes 1 through 4 and attach calculations and assumptions of fiscal impact for the current year and two subsequent Fiscal Years.*

1. Additional expenditures in the current State Fiscal Year. (Approximate)

\$ 0 (Section F-B.1)

It is anticipated that State agencies will:

a. Absorb these additional costs within their existing budgets and resources.

b. Increase the currently authorized budget level for the _____ Fiscal Year

2. Savings in the current State Fiscal Year. (Approximate)

\$ 0 (Section F-B.2)

3. No fiscal impact exists. This regulation does not affect any State agency or program.

4. Other. Explain _____

C. FISCAL EFFECT ON FEDERAL FUNDING OF STATE PROGRAMS *Indicate appropriate boxes 1 through 4 and attach calculations and assumptions of fiscal impact for the current year and two subsequent Fiscal Years.*

1. Additional expenditures in the current State Fiscal Year. (Approximate)

\$ _____

2. Savings in the current State Fiscal Year. (Approximate)

\$ _____

3. No fiscal impact exists. This regulation does not affect any federally funded State agency or program.

4. Other. Explain _____

FISCAL OFFICER SIGNATURE	DATE
	

The signature attests that the agency has completed the STD. 399 according to the instructions in SAM sections 6601-6616, and understands the impacts of the proposed rulemaking. State boards, offices, or departments not under an Agency Secretary must have the form signed by the highest ranking official in the organization.

AGENCY SECRETARY	DATE
	

Finance approval and signature is required when SAM sections 6601-6616 require completion of Fiscal Impact Statement in the STD. 399.

DEPARTMENT OF FINANCE PROGRAM BUDGET MANAGER	DATE
	

Economic Impact Statement: supplement

Estimated Private Sector Costs Impacts

A.1 - The following private sector businesses may be impacted:

Businesses impacted: Private urban water suppliers; hotels and motels; and restaurants.

Small businesses impacted: Hotels & motels; restaurants; and landscape businesses.

Jobs and occupations impacted: Landscape irrigation professionals

Individuals impacted: Customers of urban water suppliers

A.2 – The State Water Board estimates the direct economic impact of the proposed regulation will be \$14,060,169. The Board used this value in selecting the STD. 399’s "Between \$10 and \$25 million" category.

The State Water Board estimated the direct economic costs by summing the first year **economic** costs and benefits. We summarize those impacts in Table 1.

Total Direct Costs, Year 1 (2015 dollars) Calculations are displayed as integers, differences are due to rounding.			
Supplier (Public and Private) Costs, Year 1	Total	Fiscal	Economic
Gross Revenue Loss, Year 1 only (Customers are charged in Year 2)	\$13,721,641	\$11,675,137	\$2,046,504
Nozzles, Year 1 only	\$84,632	\$72,010	\$12,622
Customer Costs, Year 1			
Nozzles, Year 1 only	\$253,896	\$0	\$253,896
Total Direct Costs, Suppliers + Customers, Year 1	\$14,060,169	\$11,747,147	\$2,313,022

Table 1: Costs summary

A.3.1 – Number of businesses impacted: Total businesses impacted = 10,361.

Type of Business	Number
Private Urban Water Suppliers	61
Restaurants, Full Service	8,179 (Census a, 2015)
Hotels and motels	2,121 (Census b, 2015)
Landscape irrigation businesses	Unknown
Total Numbers	10,361

Table 2: Number of businesses

A.3.2 – The types of businesses that may be impacted by this regulation include hotels and motels, private urban water suppliers, landscape businesses, and restaurants.

A.3.3 - Percentage of total businesses impacted that are small businesses. According to the California Department of General Services (DGS), a small business employs no more than 100 people and has average annual gross receipts of \$15 million or less. The Water Board calculated the percent values by dividing by 40 the number of UWMPs with prohibitions

relevant to the business type (See **Sample of Urban Water Management Plans**). The Water Board indicated 0% of the urban water suppliers would be impacted because none meet the DGS definition of a small business.

Type of business	Percent impacted
Private Urban Water Suppliers	0%
Restaurants, Full Service	20%
Hotels	35%
Landscape businesses	82.5%

A.4 – The State Water Board assumes no **businesses** would be created or eliminated by the proposed regulation.

Hotels & Motels would be affected by the requirement that they “provide guests with the option of having towels and linens laundered, and prominently display this option.” However, this requirement does not create a market niche that would encourage entry nor does it impose costs high enough to encourage exit. The State Water Board assumes this particular requirement is extremely unlikely to create or eliminate any hotel or motel. The **Hotels and Motels** sub-section in **Section III. Methods and Assumptions, infra**, provides further justification for this conclusion.

Privately-owned urban water suppliers would not be created or eliminated due to this regulation. The costs privately-owned urban water suppliers would incur as a result of the proposed regulation are 1) minor and 2) passed onto customers. Thus, there is very little, if any, risk that the profitability of privately held water suppliers would be affected by the proposed regulation to the extent that any new supplier would enter the economy or an existing supplier would leave the economy.

Restaurants would be affected by the prohibition against “the serving of drinking water other than upon request in eating or drinking establishments....” The State Water Board assumes this particular prohibition is extremely unlikely to create or eliminate any “restaurant, hotel, cafe, cafeteria, bar, or other public place where food or drink are served and/or purchased.” The costs, if any, of complying with the prohibition are too small to encourage exit. The benefits (potential savings due to energy and water conservation) are similarly likely too small to encourage entry. Thus, the Board assumes this particular requirement is extremely unlikely to create or eliminate any restaurant. The **Restaurants** sub-section in **Section III. Methods and Assumptions, infra**, provides further justification for this conclusion.

Landscape Businesses and related industries may be impacted, but the State Water Board lacks available data to estimate these impacts. The following prohibitions may affect landscape businesses:

- 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;
- The application of water to irrigate turf and ornamental landscapes during and within 48 hours after measurable rainfall of at least one-tenth of an inch;
- The irrigation of turf on public street medians or publically owned or maintained landscaped areas between the street and sidewalk, except where the turf serves a community or neighborhood function.

Any changes in the landscape industry would depend greatly on how Californians respond. As described in the **Medians and Other wasteful outdoor water** use sub-sections in **Section III. Methods and Assumptions**, infra, Californians may respond in a variety ways to each of the prohibitions (e.g., by letting the lawn brown, by adjusting a wasteful irrigation system, by hiring a professional to adjust a wasteful irrigation system, etc.).

Given these multiple pathways to compliance, the State Water Board considered impacts to the following business types:

- Sod farmers: If a substantial percentage of those agencies that manage publicly owned, turf-only medians opt to replace water-intensive turf with a variety that needs no irrigation, sod growers may be compelled to shift production to a more drought-tolerant (i.e., requiring no irrigation) turf type.
- Xeriscape nurseries: Though replacement of existing landscapes would not be required by the proposed regulation, some water users may choose to comply by reconfiguring their outdoor landscape to prevent runoff as well as to achieve general outdoor water savings. If the prohibitions compel enough people to replace turf with water efficient plants, nurseries specializing in those plant types may experience an increase in demand.
- Landscape businesses: Those landscape businesses that provide irrigation equipment and services (including irrigation installation, repair, and maintenance) may experience an increased demand in order to improve or replace existing irrigation systems.

As previously stated, the potential impact of the proposed regulation on landscape businesses and related industries will depend on how Californians respond to the prohibitions. Because the State Water Board 1) lacks data enabling it to speculate what responses may be catalyzed by the prohibitions, and 2) lacks sufficient industry data (such as the number and types of landscape businesses) to perform any potential responsive actions, the Board was unable to construct a reasonable set of assumptions to estimate the number of businesses that would be created or eliminated. Based on available data and responses during the pendency of the Board's emergency regulations, the Board assumes that there are unlikely to be any businesses eliminated or created in general. Some businesses may shift their focus to accommodate behavioral changes spurred by the

prohibitions. 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 even within existing businesses, let alone sector-wide.

However, the State Water Board can reasonably assume any impacts to this sector from the aforementioned prohibitions are likely to be beneficial. In a 2015 document prepared for the Board, *Executive Order B-29-15 State of Emergency Due to Severe Drought Conditions: Economic Impact Analysis*, the authors find that expenditures to use water more efficiently outdoors will benefit the landscaping sector by helping to “catalyze a new, drought oriented sub-sector of the landscaping services sector...”

A.5 – The geographic extent of impacts is statewide. The regulation applies to all Californians.

A.6 – The State Water Board assumes no **jobs** would be created or eliminated by the proposed regulation. In general, the descriptions in A.4 also apply to this section.

Hotels & Motels would be affected by the requirement that they “provide guests with the option of having towels and linens laundered, and prominently display this option.” The State Water Board assumes this particular requirement is extremely unlikely to create or eliminate any hotel industry jobs. The requirements are not labor intensive. Hotels and motels may hire temporary staff to install the signs, but this labor demand is likely to be very small and, in many cases, has likely already occurred. The **Hotels and Motels** subsection in **Section III. Methods and Assumptions**, provides further justification for this conclusion.

Restaurants would be affected by the prohibition against “the serving of drinking water other than upon request in eating or drinking establishments....” The State Water Board assumes this particular prohibition is extremely unlikely to create or eliminate any jobs. The only change in standard food service operating procedures would be that servers do not bring water to a customer unless the customer requests it. The State Water Board assumes that this formality represents a minor fraction of servers’ workloads, and that prohibiting it would not significantly lessen their responsibilities such that any related jobs would be eliminated.

Jobs in the landscape industries may be impacted by the proposed regulation, but the State Water Board lacked the data to estimate these impacts. The following prohibitions may create or eliminate jobs in the landscape sector:

- 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;
- The application of water to irrigate turf and ornamental landscapes during and within 48 hours after measurable rainfall of at least one-tenth of an inch;

- The irrigation of turf on public street medians or publically owned or maintained landscaped areas between the street and sidewalk, except where the turf serves a community or neighborhood function.

Any changes in the landscape industry would depend greatly on how Californians respond. As described in the **Medians** and **Other wasteful outdoor water** use sub-sections in **Section III. Methods and Assumptions**, Californians may respond in a variety ways to each of the prohibitions (e.g., by letting the lawn brown, by adjusting a wasteful irrigation system, by hiring a professional to adjust a wasteful irrigation system, and/or by replacing existing landscapes, etc.).

Given these multiple pathways to compliance, the State Water Board considered impacts to the following business types:

- Sod farmers: If a substantial percentage of those agencies that manage publicly owned, turf-only medians opt to replace water-intensive turf with a variety that needs no irrigation, sod growers may be compelled to shift production to a more drought-tolerant turf type.
- Xeriscape nurseries: If the prohibitions compel enough people to replace turf with water efficient plants, nurseries specializing in those plant types may experience an increase in demand.
- Landscape businesses: Those landscape businesses that provide irrigation equipment and services (including irrigation installation, repair, and maintenance) may experience an increased demand in order to improve existing irrigation systems.

As previously, stated, of impact of the proposed regulation on landscape businesses and related industries will depend on how Californians respond to the prohibitions. Because the Water Board 1) lacked sufficient data about what percentage of tasks may be done in-house, and 2) lacked basic industry data (such as the number and types of landscape businesses), the Board could not construct a reasonable set of assumptions to estimate the number of jobs that would be created or eliminated.

However, we acknowledge that the aforementioned prohibitions are likely to beneficially impact this sector. In a 2015 document prepared for the Water Board, *Executive Order B-29-15 State of Emergency Due to Severe Drought Conditions: Economic Impact Analysis*, the authors find that expenditures to use water more efficiently outdoors will benefit the landscaping sector by helping to “catalyze a new, drought oriented sub-sector of the landscaping services sector....”

A.7 – 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.

Estimated Costs

B.1 – 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 3 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 3: Lifetime costs of the 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 3 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 (see **Estimating Annual Water Savings**) and these water savings cause water suppliers to lose revenue (See **Revenue Losses**). Gross revenue loss to private² 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 (See **Nozzles**).
- Urban suppliers pass on nozzle costs to customers as a one-time surcharge (See **One-time Surcharges**).

Year 1: Direct Economic Costs (2015 \$)	
Gross Revenue Loss to Private Suppliers	2,046,504

² As stated in **Percentage public and private urban water suppliers**, the Water Board assumes 15% of the urban water suppliers are private suppliers. We only consider costs to private suppliers in estimating Economic impacts. We consider impacts to public suppliers in the Fiscal section of the 399.

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 4: 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 (See **One-time Surcharges**).
- 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 (See **Adjusted service charges**).

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 5: Second year, direct economic costs

After Year 2, for all the years remaining in the time horizon, with all other conditions remaining the same, the costs and benefits due to the regulation remain constant in terms of 2015 dollars. The State Water Board assumes these costs to be \$0. Although other factors such as population increases may produce higher water costs, these cost increases would not be due to the proposed regulation.

B.1.a 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 Hotels and Motels). Thus, the initial and ongoing costs to small hotels & motels would be insignificant.

B.1.b A typical business that would be impacted by the proposed regulation, and the impacts to it reasonably estimated, is a private water supplier. The State Water Board considered the costs of the proposed regulation on private water suppliers. The proposed regulation would impact private water suppliers differently in the first and second years; after the second year, annual costs are expected to be \$0. Table 6 shows the annual costs to private water supplier.

Direct Economic Costs (2015 \$)	Year 1	Year 2	Years 3 -20
Gross Rev Loss to Private Suppliers	\$2,046,504	0	0
Nozzle Cost to Private Suppliers	12,622	0	0
Total Direct Costs for 61 Private Suppliers	\$2,059,126	\$0	\$0
Number of Private Suppliers	61		
Costs for a Typical Business	\$33,756	\$0	\$0

Table 6: Typical business costs

A private water supplier would initially be expected to incur costs in the first year of up to \$33,756. However, this estimate likely overestimates the true cost to private suppliers, given they generally have pre-approved revenue adjustment mechanisms, which enable them to recover fixed costs when sales decline from conservation efforts (Mitchell et al. 2017). The Board expects the first year to be the most expensive year because the suppliers may lose revenue as their customers conserve water. They also may purchase nozzles to distribute to customers. After the first year, suppliers would adjust charges to adequately cover fixed costs.

B.1.c The State Water Board assumes suppliers pass on their costs (i.e., revenue loss, and nozzle purchases) to customers, including households and Commercial, Industrial, and Institutional (CII) entities. For the purposes of this section of the 399, the Board considers the “initial costs to the individual” to be the initial costs to the individual household. The initial costs for households would largely occur in the second year, the year customers repay the supplier’s lost revenue from the first year. The highest one-time cost to a household is \$1.12 for Year 2. This is slightly more than one dollar. The Board estimates ongoing costs to be \$0.03 per year. See Table 7.

Direct Economic (not fiscal) Costs	Year 1	Year 2	Year 3
Gross Rev Loss Repaid by All Customers, \$	\$0	\$13,721,641	\$0
Nozzle Cost to All Customers	\$253,896	\$0	\$0
Total Direct Costs to Customers, \$/yr	\$253,896	\$13,721,641	\$0
Total Population Served by Urban Suppliers	36,489,411		
Average Number of Persons/Household	2.97		
Estimated Number of Households Served	12,285,997		
Estimated Cost per Individual Household, \$/yr	\$0.02	\$1.12	\$0

Table 7: Initial costs for an individual

B.1.d Other economic costs may occur depending on how people respond to the prohibitions. For example, households may respond to the prohibition against *irrigation that causes runoff* by replacing existing outdoor landscapes. If that were to happen, household costs would increase, landscapers who maintain lawns could lose business, and landscapers who specialize in replacement landscaping could gain business. However, households may also respond to that particular prohibition by simply irrigating less; in this scenario, economic costs would be much lower, possibly even a net savings.

B.2 The proposed regulation may impact several industries. Lacking the requisite data, the State Water Board could not reasonably estimate impacts on these industries. In general, the descriptions in A.4 (number of businesses created or eliminated) and A.6 (number of jobs created or eliminated) apply to this section.

B.3 There are no reporting requirements in this proposed regulation.

B.4 The State Water Board does not expect this regulation to impact housing costs. As discussed in **B.1.c** (costs to individuals), the Board estimates the proposed regulation will result in ongoing costs of \$0.00/year. The Board does not expect these minor costs to impact housing costs.

B.5 The proposed regulation does not duplicate or conflict with Federal regulations. There are no regulations in the federal Code of Regulations that address waste and unreasonable use or impose penalties to HOAs and cities. Therefore, the State Water Board assumes no additional costs due to differences between the State and Federal regulations.

Estimated Benefits

C.1 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 (See **Estimating Annual Water Savings**).

C.2 The proposed regulation would carry out directives in two Executive Orders: B-37-16 in May 2016 and B-40-17 in April 2017; it also implements the State Water Board's general authority to prevent the waste and unreasonable use of water. In accordance with those executive orders, the State Water Board has been tasked with eliminating water waste by permanently prohibiting some practices that waste water, such as: hosing off sidewalks, driveways and other hardscapes; washing vehicles with hoses not equipped with a shut-off nozzle; using non-recirculated water in a fountain or other decorative water features; watering lawns in a manner that causes runoff, or within 48 hours after measureable precipitation; and irrigating ornamental turf on public street medians.

C.3 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 8 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 8 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 Supplier³ 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 8: Lifetime direct, economic benefit of the proposed regulation.

C.4 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.

³ As stated in **Percentage public and private urban water suppliers**, the Water Board assumes 15% of the urban water suppliers are private suppliers. We only consider benefits to private suppliers in estimating Economic benefits. We consider impacts to public suppliers in the Fiscal section of the 399.

Alternatives to the Regulation

D. ALTERNATIVES TO THE REGULATION

D.1

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 alternative was rejected.

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 a 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.

For more detail about this alternative, see the Initial Statement of Reasons.

D.2 The State Water Board did not estimate the benefits or costs of the alternative because there are significant quantification issues.

D.3 The quantification issues are substantial.

Using the MS4 permits would require estimating region-specific costs that address specific local circumstances. Estimating a statewide cost for activities that would result in all permits complying with the same statewide conservation goal (such as no runoff) would require estimating the gap between the existing permit and the statewide goal and then estimating the cost of closing that gap. Furthermore, the State Water Board could only estimate the cost of implementing via permit those prohibitions that would also reduce illicit discharges. Thus, it would not be possible to estimate the cost of implementing all prohibitions included in the proposed regulation because only some prohibitions may be enforceable under the NPDES MS4 permit.

D.4 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 second 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 establish and implement such standards.

Major Regulations

E.1 The estimated costs of this regulation to California business enterprises do NOT exceed \$10 million.

The estimated direct costs to business enterprises are the estimated direct costs to the 61 Private Suppliers. The highest direct costs occur in Year 1 and are estimated to be \$2,059,126.

Direct Economic (not fiscal) Costs	Year 1
Gross Rev Loss to the 61 Private Suppliers	\$2,046,504
Nozzle Cost to the 61 Private Suppliers	\$12,622
Total Direct Costs for 61 Private Suppliers	\$2,059,126

Because E.i = NO, skip to E.4.

E.4 The highest estimated annual economic impact to business enterprises and individuals is \$27,443,282, which occurs in Year 2 after implementation.

	Year 1	Year 2	Year 3
Total Direct Cost to Business Enterprises (the 61 Private Suppliers)	\$2,059,126	0	0
Total Direct Cost to Individuals (the Customers of all Suppliers)	253,896	13,721,641	0
Total Direct Cost to Business Enterprises and Individuals	2,313,022	13,721,641	0
Assume Multiplier Value	2	2	2
Total Cost Impact to Business Enterprises and Individuals	4,626,044	27,443,282	0
Highest Cost Impact occurs in Year 2	27,443,282		

E.5 a This proposed regulation is a step in the direction of increased water security in the future. Increased security may encourage investment in California when compared with less certain future water supplies.

E.5 b This proposed regulation increases public attention to the value of water savings and may encourage innovation in products such as more efficient irrigation systems, materials such as drought tolerant plants and water saving mulches, and processes such as irrigation processes that are customized to specific plants, soils, and topography.

E.5 c The Benefit Section of the Initial Statement of Reasons provides a list of benefits that extend beyond those that can be monetized. In addition, the proposed regulation will likely contribute to a greater public consciousness about the value of water.

Fiscal Impact Statement

Fiscal Effect on Local Government

F-A. Fiscal Effect on Local Government For the purposes of this analysis, the State Water Board considers the public⁴ urban water suppliers "local government." The Board considers the impact of the proposed regulation on public water suppliers a fiscal impact.

F-A.1 None of the costs due to the proposed regulation are reimbursable by the State.

F-A.2 Additional expenditures not reimbursable by the State include public water supplier net revenue losses and nozzle purchases.

The Water Board assumes the following:

- Californians conserve water due to the proposed regulation (see **Estimating Annual Water Savings**) and these water savings cause urban suppliers to lose revenue (See **Revenue Losses**). Net revenue loss to public suppliers= total supplier revenue losses * 85%.
 - 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.
- Public suppliers purchase nozzles (See **Nozzles/Table 18: Estimated Nozzle Costs**).

Table 9 details those direct, fiscal costs.

Fiscal Cost = Revenue Loss to Public Suppliers + Nozzle Costs to Public Suppliers	
Gross Revenue Loss Public Suppliers	\$11,675,137
Nozzle Cost to Public Suppliers	\$72,010
Total DIRECT Fiscal Cost, First Year	\$11,747,147

Table 9: Direct, Fiscal costs

F-A.2.e These costs are not reimbursable by the State because they are fully financed from the fees the suppliers charge their customers.

The Right to Vote on Taxes Act, enacted in 1996 Prop. 218, amended the California constitution by adding articles XIII C and D. The revenue a public agency derives from a fee cannot exceed the funds required to provide the service.

F-A.3 The proposed regulation will result in \$6,508,912/year in direct fiscal benefits. Those benefits are equal to the sum of the public urban water supplier variable cost savings and the offset demand savings. See Table 10.

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

- Private suppliers realize variable cost savings (See **Variable Cost Savings**). Public Supplier variable cost savings= total supplier variable cost savings * 85%.

⁴As stated in **Percentage public and private urban water suppliers**, the Water Board assumes 85% of the urban water suppliers are public suppliers. We only consider costs to public suppliers in estimating Fiscal impacts. We consider impacts to public suppliers in the Economic section of the 399. .

- Private suppliers realize offset demand savings (See **Offset Demand Savings**). Public Supplier offset demand savings= total supplier offset demand savings * 85%.

Table 10 details those direct, fiscal benefits.

Fiscal Benefit = Variable Cost Savings + Offset Demand Savings		
Variable Cost Savings to Public Suppliers	\$2,463,129	See Table 20
Offset Demand Savings to Public Suppliers	\$4,045,783	See Table 22
Total Fiscal Benefits, \$/yr	\$6,508,912	

Table 10: Direct, Fiscal Benefits

Fiscal Effect on State Government

F-B.1 There are no additional expenditures in the current State Fiscal Year. It is anticipated that any additional costs will be absorbed within the State Water Board's existing request that has been fulfilled to hire programmatic and enforcement staff that will perform any additional tasks within their job descriptions.

F-B.2 No savings are likely in the current State Fiscal Year.

F-B.3 This proposed regulation does not affect any State agency or program after implementation.

F-C No federal funding will be impacted by the proposed regulation.

Section III. Methods and Assumptions

The following pages explain and index the State Water Board’s methods and assumptions. The State Water Board completed the calculations in Excel, using real numbers, i.e. numbers with decimal values. Within this document, the Board displays the results of these calculations as whole numbers, or integers. Using the displayed numbers in calculations may produce different results due to rounding.

“Annual” water savings

The State Water Board assumes the estimated annual savings are the same year after year. While savings are likely to vary annually—not only because people’s habits change depending on numerous factors (such as whether or not the state is in drought), but also because the State’s population is increasing—there is no way to specifically calculate these unknown variations. The Board used the best available existing data to estimate the annual savings during an average year. The State Water Board used the estimated water savings to complete the 399 analysis. For the purposes of this analysis, this document and the Form 399 refer to the savings as “annual” savings.

Estimating Annual Water Savings

At the foundation of the economic impact analysis is the estimated water savings *due to the proposed regulation*. Table 11 shows the estimated statewide water savings due to the proposed regulation are 12,489 acre-feet (AF) per year. To estimate the water savings, we used the Board’s Urban Water Supplier Production and Conservation Reporting database (Reporting database). The State Water Board first adopted drought emergency conservation regulations in June 2014. Among other actions, the emergency regulations required urban water suppliers to submit monthly production reports to the Board, including information about current and 2013 (baseline) production volumes. Comparing current production data to the baseline enables the Board to track water savings over time.

<i>Hydrologic Region</i> [DWR a, 2013]	<i>AF Saved from June 2014 to April 2017</i>	<i>AF Saved due to prohibitions</i> [column A * 1%]	<i>Annual AF Savings due to prohibitions</i> [column B / 2.8 years]
	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 11: Statewide Water Conservation by hydrologic region (June 2014-April 2017)

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 11 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.⁵ 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 (Office of the Governor 2014) and the 2015 mandate (Office of the Governor 2015). The 2014 proclamation called on Californians to voluntarily conserve water, with a goal of reducing statewide urban water 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 ongoing work of water agencies to reduce urban water use 20 percent against that baseline by 2020.

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

⁵ 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).

analysis must include information about “mandatory prohibitions against specific water use practices....” (DWR 2016).

Within the UWMPs, mandatory prohibitions are contained within water shortage contingency plan (WSCP) stages, and vary by agency and the declared water shortage stage. 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 12 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 12: Hypothetical example of the various stages of water shortage contingency plans

During the recent California drought, urban water suppliers invoked WSCPs requiring significant conservation measures (as indicated in the 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 expected to be achieved 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 **Sample of UWMPs** sub-section in the 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 13). 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.

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* [Gleick et al., 2003]. 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.

	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 13: 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** sub-section.

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 14) 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 in the 2014/15, 2015/16 and 2016/17 water years (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 14: 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 14); 2) the percent of the total estimated savings due to the *no-irrigating-when-its 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 14)
- 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 saved 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 mandate.

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.

Analytical Baseline

The Board's drought emergency water conservation regulations were first adopted in July 2014. Since then, the emergency regulations have been readopted several times, most recently in February 2017. For the most part, the prohibited practices did not change as the regulations were otherwise modified and readopted. In April 2017, in response to Governor Brown's ending of the drought emergency (Executive Department-2017), the State Water Board rescinded elements of the drought emergency water conservation regulations, but not the prohibitions against wasteful water use practices. Those prohibitions—addressing almost exactly the same wasteful water use practices as the proposed permanent conservation regulations—remain in effect through November 2017. At the time of this document's circulation, the entire State is subject to these prohibitions.

However, because the purpose of this document is to analyze the economic impact of the proposed permanent conservation regulations, the Board's drought emergency water conservation regulations have been excluded from the analytical baseline. They are

temporary measures, adopted while the Governor had suspended review for certain drought emergency actions, including the Board’s drought emergency water conservation regulations. This analysis does, however, consider the influence of other policy mechanisms, in particular the 2015 Urban Water Management Plans (UWMPs, or Plans), the provisions of which will continue to be in place regardless of the proposed regulation. Thus, they are appropriately part of the analytical baseline.

According to the Board’s random sampling of UWMPs, most if not all suppliers already prohibit some of the wasteful water uses addressed by the proposed regulation. Urban water suppliers have been required to describe such restrictions in their UWMPs since 1983. The Water Code requires the Plans to include information about demand management measures including "water waste prevention ordinances" (Wat. Code, § 10631, subd. (f)) and, as part of drought contingency planning, "...mandatory prohibitions against specific water use practices during water shortages...." (Wat. Code, § 10632).

In service areas where urban water suppliers already prohibit the same wasteful water use practices as would be prohibited by the proposed regulation, the permanent regulations’ prohibitions would not create new obligations or responses and would therefore not cause any independent economic impact.

Sample of Urban Water Management Plans

The State Water Board randomly sampled forty UWMPs and reviewed whether those urban water suppliers already held equivalent or substantively similar prohibitions against wasteful water uses. The Board developed assumptions about the statewide presence of equivalent prohibitions from the analysis of the 40-sample subset of UWMPs.

At the time of the Board’s analysis, 365 of these Plans were publically available on the Department of Water Resources (DWR) website. The Board carefully reviewed 40 of these Plans, or approximately 10 percent of the total. To randomly select the forty Plans, the Board first divided the Plans into quartiles based on service area population. The Board then selected a varying number of Plans from each quartile. The number of Plans for each quartile was proportional to the population of that quartile relative to the total population served by the reporting urban water suppliers.

Table 15 outlines the quartile selection method. Table 16 lists, in ascending order of population, the urban water suppliers whose Plans the Water Board reviewed. It also shows service population.

Quartile	Population	% of population served	# of sampled Plans
Quartile 1	Less than 22,842	3.3%	1
Quartile 2	22,843 to 45,802	7.9%	4
Quartile 3	45,803 to 97,292	16.2%	7
Quartile 4	More than 97,293	72.6%	28
Total	5,118,246	100.0%	40

Table 15: Quartile selection method

Urban Water Supplier Name	Population Served
Rubio Canyon Land And Water Association	9,182
Golden State Water Company - South Arcadia	26,930
Burlingame, City Of	31,109
San Gabriel County Water District	39,238
Golden State Water Company - Norwalk	45,514
Golden State Water Company - Artesia	50,238
Valley County Water District	55,703
California Water Service Company South San Francisco	61,223
La Habra, City Of	61,843
Olivenhain Municipal Water District	70,522
Buena Park, City Of	82,791
Hesperia, City Of	92,177
Valencia Water Company	97,300
Desert Water Agency	98,400
Great Oaks Water Company Incorporated	99,301
California Water Service Company Chico District	102,155
Walnut Valley Water District	102,622
Torrance, City Of	105,358
Daly City, City Of	105,810
Clovis, City Of	108,227
Antioch, City Of	108,298
Palmdale Water District	118,227
Jurupa Community Service District	119,034
Suburban Water Systems - Whittier/La Mirada	120,710
Roseville, City Of	123,572
Victorville Water District	128,005
Fullerton, City Of	140,827
Sunnyvale, City Of	148,028
Elsinore Valley Municipal Water District	149,322
Santa Margarita Water District	156,949
Corona, City Of	167,764
Moulton Niguel Water District	170,326
California Water Service Company Stockton	170,414
Stockton, City Of	170,417
Los Angeles County Waterworks District 40 - Antelope Valley	208,068
Otay Water District	217,339
Modesto, City Of	259,187
Helix Water District	270,375
Alameda County Water District	344,278
Irvine Ranch Water District	381,463
Total Population Served by Sampled Suppliers	5,118,246

Table 16: Urban Water Suppliers whose Plans the State Water Board reviewed

The State Water Board examined the plans of each supplier listed in Table 16, noting which of the proposed prohibited wasteful water uses were already permanently prohibited, or were prohibited under Stage-1 drought conditions. The Board assumes that Stage-1

conditions are the “new normal,” given anthropogenic climate change increases drought risk in California. The warm and dry conditions that gave rise to 2012-2015 drought are not exceptional, but rather very probable (Diffenbaugh et al., 2015). Hence, if a supplier prohibited one of the proposed prohibitions under Stage-1 drought conditions, we considered it prohibited for all water supply conditions.

Adjustment Factor

The State Water Board used results from the random sampling analysis to infer what percentage of Californians may be impacted by the permanent prohibitions. The Board developed an adjustment factor of 7.6, as shown in Table 17 below. The adjustment factor is equal to one (1) divided by the “sample percent,” or the percent of the state population represented by the sample (i.e., 13.15 percent, or 5,118,246/38,907,642). The Board used that adjustment factor to infer statewide numbers. For example, in examining the sampled UWMPs, the Board found that 4.9 million of the 5.1 million customers in the “total sample population” receive water from suppliers that already prohibit *the use of a hose that dispenses water to wash a motor vehicle, except where the hose is fitted with a shut-off nozzle*. To infer what percentage of the entire state might receive water from suppliers that already require automatic shut-off nozzles, the Board multiplied the affected sample population (e.g., 4.9 million) by the adjustment factor (i.e., 7.60), and then divided that figure (37.24 million) by the 2015 population (38.9 million). The Board inferred that 95.7 percent of the state receives water from suppliers that already require automatic shutoff nozzles; and 4.3 percent of the state receives water from suppliers that do NOT.

Adjustment Factor to infer Statewide Estimates from Sample Data	
POP1 = Total Sample Population (sum of the 40 sampled Suppliers' populations) [SWRCB Economist calculation]	5,118,246
POP2 = Total State Population [CA DOF 2017]	38,907,642
Sample Percent: Percent of State Population represented in the Sample, POP1/POP2.	13.15%
Adjustment Factor: Factor to adjust the Sampled population data up to the Statewide level (1 / Sample Percent)	7.60

Table 17: Inference Adjustment Factor

Nozzles

In order to estimate the costs associated with the prohibition against “the use of a hose that dispenses water to wash a motor vehicle, except where the hose is fitted with a shut-off nozzle...” (a.k.a., the Nozzle prohibition), the State Water Board needed to determine how many California households would be newly subject⁶ to this prohibition. To make that

⁶ “Newly subject” in that they have not already been subject to a similar prohibition by their local supplier or municipality. The estimates in this section are conservative in that the entire state has been subject to an almost identical emergency regulation-required prohibition since 2014. Therefore, the estimated statewide one-time cost associated with purchasing a shut-off nozzle for a hose may be as low as zero. As described in the **Analytical Baseline** section, however, the Board’s analysis in this document has removed water savings and responses attributable to the Board’s emergency regulations. It does, however, consider the influence of other policy mechanisms, in particular the 2015 Urban Water Management Plans (UWMPs, or Plans), the provisions of which will continue to be in place regardless of the proposed regulation.

determination, the Board performed a series of simple calculations assuming that the sampled urban water supplier data represent the entire state.

In order to determine what percentage of the state is already subject to a similar local nozzle prohibition, the Board relied on a random sample of forty Urban Water Management Plans⁷ (UWMPs). The Board then tallied how many people receive water from the sampled suppliers that **do NOT** already prohibit residential car washing without an automatic shut-off nozzle (i.e., 5.1 million minus 4.9 million, or 105,810). After determining the number of people within the “total sample population” who are NOT already subject to the nozzle prohibition, the Board multiplied that figure by the Adjustment Factor (7.6), and inferred that 804,341 Californians may be affected by the nozzle prohibitions.

The Board assumed that customers need only one nozzle per household. There are 2.97 people per household (DOF 2017), thus the Board assumed there are **270,822** households (i.e., 804,148/2.97) that might need a nozzle to comply with the proposed prohibition. Based on conversations with a few suppliers, the Board further assumed that 75 percent of those households would not actually need an automatic shutoff nozzle, as those households would have already purchased nozzles, independent of any state or supplier requirements. In other words, the Board assumes **67,706** (i.e., 270,822 * 25%) households would need to acquire automatic shutoff nozzles.

The State Water Board furthermore assumed that 50% of these households would purchase nozzles at **\$5.00/nozzle** and 50% would receive the nozzles from suppliers, who would purchase them at a wholesale price of **\$2.50/nozzle**.

Using these assumptions, households would directly spend **\$169,264** on purchasing automatic shutoff nozzles and suppliers would directly spend **\$84,632**. As 85% of urban water suppliers are public entities and 15% are private, **\$72,010** of supplier nozzle costs would be fiscal costs and **\$12,622** economic costs. Table 18 summarizes these costs and assumptions. The Board included the costs highlighted in Table 18 to estimate total economic and fiscal costs, as entered in Sections B and F of the 399.

STATEWIDE Households that might need a nozzle	270,822
Percent of Households that need a nozzle	25%
STATEWIDE Number of Households that would need a nozzle	67,706
Percent of Nozzles purchased by Suppliers, both Public and Private	50.00%
STATEWIDE Number of Nozzles purchased by all Suppliers	33,853
Household Price	\$5.00
Supplier Price	\$2.50
Household Direct Nozzle Cost	\$169,264
Supplier (Public + Private) Direct Nozzle Cost	\$84,632
Public Urban Water Supplier Nozzle Costs (Fiscal)	\$72,010
Private Urban Water Supplier Nozzle Costs (Economic)	\$12,622

Table 18: Estimated Nozzle Costs

⁷ UWMPs contain requisite Water Shortage Contingency Analyses, in which urban water suppliers must describe permanent and drought-triggered prohibitions on end-uses. See previous Water Savings discussion.

Restaurants

Based on the results of the randomly sampled UWMPs, 32 of the 40 (80%) of the suppliers already prohibit “the serving of drinking water other than upon request in eating or drinking establishments....” Given that 80% of the sampled utilities already have an equivalent or substantively similar prohibition in-place, that relevant industry groups such as the California Restaurant Association have expressed no concern about this regulation, and that there is no readily available data or studies upon which to disaggregate any specific cost attributable to this particular prohibition, the State Water Board did not specifically include the impact of the serving-water-without-asking prohibition in this analysis. Rather, the Board assumed any impacts would be based on the total water savings analysis, to the extent that the Board’s general estimate of water savings due to the prohibitions en masse captures the water savings of this prohibition specifically (see **Estimating Annual Water Savings**).

Hotels and Motels

Based on the results of the randomly sampled UWMPs, 26 of the 40 (65%) of the suppliers already require that hotels and motels provide guests with the option of having towels and linens laundered, and they prominently display that option. Given that—

- 65% of the sampled utilities already have an equivalent or substantively similar requirement in-place;
- Relevant industry groups such as the California Hotel and Lodging Association have expressed no concern over this regulation;
- Free signage and/or sample in-room language is available through industry associations, water districts, and national programs such as ENERGYSTAR and WaterSense;
- Any additional signs or educational material purchased by a hotel would be a one-time cost; and
- Many hotels and motels have already invested in compliant signage, either independently or in response to the emergency drought conservation regulations, first adopted in July 2014, extended multiple times, and set to expire November 2017,

—the State Water Board did not separately account for the potential impact of this requirement in its analysis. Rather, the Board assumed any impacts would be based on the total water savings analysis, to the extent that the general estimate of water savings due to the prohibitions en masse captures the water savings of this prohibition specifically (see **Estimating Annual Water Savings**).

Medians

Based on the results of the randomly sampled UWMPs, only 7 of the 40 (17%) of the suppliers already prohibit “the irrigation of turf on public street medians or publically owned or maintained landscaped areas between the street and sidewalk....” Estimating the

economic impact of this prohibition is complicated for a number of reasons. First, the State Water Board does not know and cannot reasonably estimate how many acres of publically owned turf exists on medians in California. That data is not currently available, and can only be estimated using expensive remotely-sensed landscape data the Board does not have access to. The analysis would also require significant support from GIS staff, combined with significant outreach to local governments to clarify who has responsibility for the median.

Even if the Board could estimate acreage and the locations, it does not have the resources to estimate how public entities would respond once the prohibition becomes permanent. An inexpensive option would be to stop watering a turf-only median all together; a more expensive option would be to remove the turf and replace it with xeriscape. There are multiple options with a wide-range of costs. The options are affected by a number of variables, such as location, plant selection, public opinion, the extent of the affected area, etc. In order to develop assumptions, the Board would have to commit to an extensive research project to collect (1) the acreages and locations, (2) broad estimates of how local entities would respond, or (3) the Board would have to identify and contact local entities directly.

It is possible that this particular prohibition could have an economic impact. However, not knowing how many acres of turf exist on publically owned or maintained medians in the State, and being unable to determine and reasonably distribute compliance costs, the Board did not attempt to quantify the economic impact of this particular prohibition. However, the Board assumes that most affected municipalities and governmental entities will choose the least-costly response, and that some portion of the impacts will be reflected in total water savings analysis. The estimate of the total water savings due to the prohibitions will include savings from the median-prohibition (see **Estimating Annual Water Savings**).

Other wasteful outdoor water use

The following prohibitions do not necessarily require market purchases; however, they would likely require behavioral changes.

- 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.
- The application of potable water to driveways and sidewalks.
- The application of water to irrigate turf and ornamental landscapes during and within 48 hours after measurable rainfall of at least one-tenth of an inch.

The Board recognizes that changing customer behavior can have non-market costs. For example, the proposed regulations would require Californians to irrigate their landscapes without causing runoff. Preventing runoff may require a person to set aside the time to adjust a home irrigation system or to pay a professional to do so. The Board does not have the data needed to estimate the potential economic impact for each of these prohibitions.

Similarly, the Board does not have data regarding how many Californians would need to adjust irrigation systems to prevent runoff, how long it would take the average person to adjust a wasteful system, what these people would otherwise be doing during that time, and what the economic impact of the supplanted activities would be.

The prohibitions against *irrigation while it's raining* and *irrigation that causes runoff* could also result in affected water users hiring a landscape irrigation professional to adjust, repair and/or replace wasteful irrigation systems. However, the Board has no data or studies upon which to estimate impacts to Landscape Irrigation Businesses for reasons described in the following sub-section.

Given that—

- 95% of the sampled utilities already have an equivalent or substantively similar prohibition against “the application of water to outdoor landscapes in a manner that causes runoff such that water flows onto adjacent property,....”
- 98% of the sampled utilities already have an equivalent or substantively similar prohibition against “the application of potable water to hardscapes...”
- The majority of NPDES MS4 Phase I Permits and the Phase II General Permit already prohibit substantively similar wasteful water uses as a mechanism to control dry-weather urban runoff and protect water quality (See Appendix A of Initial Study/Negative Declaration *Analyzing the Impact of Permanently Prohibiting Certain Wasteful Water Use Practices*); and
- The Board cannot reasonably estimate the economic impact of any behavior changes catalyzed by the aforementioned prohibitions, nor the economic impact of the prohibitions on landscape irrigation businesses

—the State Water Board did not separately account for the potential impact of the “runoff” and “hardscapes” prohibitions in its analysis. Rather, the Board assumed any impacts would be based on the total water savings analysis, to the extent that the general estimate of water savings due to the prohibitions en masse captures the water savings of these prohibitions specifically. As only 40 percent of the sampled utilities included in their UWMPs an equivalent or substantively similar prohibition against irrigation during and within 48 hours after measurable rainfall, Water Board did specifically account its impact (see **Estimating Annual Water Savings**).

Landscape Irrigation Businesses

The following prohibitions may affect landscape irrigation businesses:

- 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;
- The application of water to irrigate turf and ornamental landscapes during and within 48 hours after measurable rainfall of at least one-tenth of an inch;

- The irrigation of turf on public street medians or publically owned or maintained landscaped areas between the street and sidewalk, except where the turf serves a community or neighborhood function.

The Board determined that estimating statewide economic impacts of the aforementioned prohibitions on landscape irrigation businesses is not feasible. Any changes in the landscape industry would depend greatly on how, and where, affected customers respond. As described in the **Medians** and **Other wasteful outdoor water** use sub-sections, Californians may respond in a variety ways to each of the prohibitions (e.g., by letting their lawn go brown, by individually adjusting a wasteful irrigation system, by hiring a professional to adjust a wasteful irrigation system, and/or by replacing a lawn with xeriscape, etc.). Furthermore, the costs and benefits of each response will differ depending on a number of variables, including project difficulty, personal preference, location, plant selection, and project scale. The Board did not attempt to quantify the economic impact of the aforementioned prohibitions on landscape irrigation businesses, given such variable costs and inadequate and unavailable data.

However, the aforementioned prohibitions may beneficially impact landscape irrigation businesses. In a 2015 document prepared for the State Water Board, *Executive Order B-29-15 State of Emergency Due to Severe Drought Conditions: Economic Impact Analysis*, the authors find that expenditures to use water more efficiently outdoors will benefit the landscaping sector, 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” (Moss 2015).

Fountains

Based on the results of the randomly sampled UWMPs, 35 of the 40 (87%) of the suppliers already prohibit “the use of potable water in an ornamental fountain or other decorative water feature, except where the water is part of a recirculating system.” Given that—

- 87% of the sampled utilities already have an equivalent or substantively similar prohibition in place;
- Residential fountains have almost universally used recirculating systems for decades;
- Based on a small survey of CA utilities, few public fountains use non-recirculating (or, in-line) systems; and
- The cost of retrofitting a historic in-line public fountain is prohibitively high. Rather than retrofit those fountains to comply with the proposed regulation, the surveyed utilities have already and would in the future let in-line fountains run dry,

—the State Water Board did not specifically include the impact of the fountain prohibition in this analysis. Rather, the Board assumed any impacts would be based on the total water savings analysis, to the extent that the general estimate of water savings due to the

prohibitions en masse captures the water savings of this prohibition specifically (see **Estimating Annual Water Savings**).

Penalties

The proposed regulations also prohibit the following actions:

- Cities, counties, and cities and counties may not prevent or punish residents for water conservation in violation of existing statutes.
- Homeowners' associations may not prevent or punish residents for landscaping that reduces watering during a declared drought emergency in violation of existing statutes or prevent or punish residents for water conservation in violation of certain existing statutes.

Under the proposed regulation, violating the regulation's prohibitions would be an infraction punishable by a fine of up to five hundred dollars (\$500) for each day in which the violation occurs. The emergency conservation regulations prohibited the same actions and assigned the same penalty (See Cal. Code Regs., tit. 23, § 864, subd. (d)). Since the adoption of the emergency conservation regulations in July 2014, the Board has not itself initiated enforcement for an alleged violation of the prohibitions. Furthermore, it appears that, based on the monthly reports of suppliers required by the emergency regulations and separate communications with suppliers, the small number of monetary penalties that were issued during the drought by local public agencies were largely, if not exclusively, in response to local ordinances and not the emergency regulations. However, unlike with the Board's emergency regulations, the proposed regulation would not grant local public agencies enforcement authority.

The Board assumes the consequences of non-compliance will continue to deter would-be violators, and that the Board will not have to issue fines in the future, or would at most issue a small number of monetary penalties that would have a de minimis statewide economic impact. Accordingly, the Board assumes any impacts would be accounted for in the total water savings analysis, to the extent that our general estimate of water savings due to the prohibitions en masse captures the water savings of these prohibitions specifically (see **Estimating Annual Water Savings**).

Enforcement

The proposed regulation does not require enforcement by the State Water Board, nor does it empower suppliers to enforce the prohibitions on behalf of the Board (See Wat. Code, § 377 [authorizing public entities to enforce certain local ordinances and resolution and emergency regulations adopted by the State Water Board]). Since the adoption of the emergency conservation regulations in July 2014, the State Water Board has not itself initiated enforcement proceedings for violations of any of the prohibitions against wasteful water uses. While the State Water Board stands ready to initiate enforcement actions for violations of its regulations, based on its experience with the drought emergency water conservation regulations, any enforcement of the proposed regulation would be performed

with existing resources including by staff who, with the lifting of the emergency conservation regulations in November 2017, will have the capacity to provide compliance assistance, including enforcement where appropriate.

Percentage public and private urban water suppliers

Urban water suppliers in California are comprised public and private utilities. The State Water Board estimates that urban water suppliers that are governmental agencies (public) would incur approximately 85 percent of the total costs to urban water suppliers. Investor-owned utilities and privately owned mutual water companies (private) would incur 15 percent of the total impact.

Revenue Losses

To estimate revenue losses, the State Water Board relied on a 2017 document shared with the Board by M.Cubed. M.Cubed surveyed California’s urban retail water suppliers, collecting information on water rates and population served (Mitchell 2017). M.Cubed detailed the water rates in either dollars per hundred cubic feet (\$/CCF), dollars per hundred gallons (\$/CG), or dollars per thousand gallons (\$/TG), and included additional information, such as supplier hydrologic region and county. Using the M.Cubed data, the State Water Board converted all rates into dollars per acre foot (\$/AF), grouped the suppliers by hydrologic region, and then estimated the median water rate for each region.

The Water Board used the median water rate to estimate the revenue suppliers would lose as customers ceased the wasteful water practices listed in the proposed regulation. The Board assumed that, as customers eliminated the prohibited practices in the first year of the regulation’s implementation, water suppliers would lose revenue equal to net revenue loss (\$/AF) multiplied by anticipated water savings (AF) (see **Estimating Annual Water Savings**). Column C in Table 19 shows **gross** revenue lost in the first year (\$/year).

Hydrologic Regions	Savings due to the Prohibitions(AF)	Gross Revenue Loss (\$ lost/AF)	Gross Revenue Loss (\$ lost/yr)
	A	B	C
Central Coast	463	\$1,649	\$763,487
Colorado River	409	\$730	\$298,570
North Coast	98	\$1,015	\$99,470
North Lahontan	30	\$552	\$16,560
Sacramento River	1,795	\$582	\$1,044,690
San Francisco Bay	2,054	\$1,922	\$3,947,788
San Joaquin River	840	\$647	\$543,480
South Coast	5,426	\$1,184	\$6,424,384
South Lahontan	300	\$870	\$261,000
Tulare Lake	1,074	\$304	\$326,496
Totals	12,489		13,721,641

Table 19: Median Supplier Revenue Loss by Hydrologic Region

The gross revenue loss rate is equal to the median water rate for each hydrologic region, based on the aforementioned M.Cubed survey.

The Water Board’s revenue loss calculation likely overestimates the cost of the proposed regulation. The Board assumed **all** urban water supplier price structures do **not** reflect fixed costs. In this scenario, urban water suppliers would rely on cash reserves to cover fixed costs in the first year of the regulation’s implementation; in the second year, they would roll out post hoc rate adjustments and surcharges to recover the previous year’s revenue shortfalls. This conservative assumption likely overestimates the proposed regulation’s costs. In reality, some urban water suppliers maintain price structures that better, if not entirely, reflect fixed costs. For such suppliers, conservation would not compromise their net financial position, as any revenue losses would be offset by variable cost savings. A recent survey completed by the Public Policy Institute of California suggests that many California utilities do price water to adequately cover fixed costs. Of those utilities surveyed, 35 percent reported that the drought and the state’s conservation mandate did not impair their net financial position (Mitchell et al. 2017).

Variable Cost Savings

The State Water Board estimated variable cost savings, \$/AF, due to non-delivery of water no longer needed by customers as a result of the prohibited uses. The variable cost savings values come from a 2016 document prepared for the Board by M.Cubed, *Proposed Regulatory Framework for Extended Emergency Regulation for Urban Water Conservation: Fiscal and Economic Analysis* [Mitchell 2016]. On pg. 17, the authors explain variable production costs, writing “revenue loss estimates (must be) adjusted to remove variable cost savings assumed to be \$200 per AF in most regions, and \$250 in the South Coast, Central Coast, and San Francisco Bay regions. These costs savings are primarily reduced energy and operating expenses associated with not conveying, pumping, treating, and distributing the water.” After distributing the water savings across the hydrologic regions (State Water Board sorted the data by region), the total annual variable cost savings were estimated to be \$2,894,884. See Table 20.

Hydrologic Regions	Variable Cost Savings (\$/AF)	AF per Year Saved due to Prohibitions	Variable Cost Savings, \$/yr
Central Coast	\$250	463	\$115,627
Colorado River	\$200	409	\$81,711
North Coast	\$200	98	\$19,682
North Lahontan	\$200	30	\$5,998
Sacramento River	\$200	1,795	\$359,065
San Francisco Bay	\$250	2,054	\$513,389
San Joaquin River	\$200	840	\$168,083
South Coast	\$250	5,426	\$1,356,561
South Lahontan	\$200	300	\$59,934
Tulare Lake	\$200	1,074	\$214,833
Totals:		12,489	\$2,894,884

Table 20: Variable Cost Savings by Hydrologic Region

Offset Demand Savings

The California Department of Finance (DOF) projects that the state will grow at an annualized rate of 0.76 percent, adding 6.5 million people by 2036 (DOF 2017). California’s **urban** water use (including residential use and commercial, industrial and institutional (CII)

use) averaged 5.6 million acre feet (MAF) between 2013 and 2016. If that water were equally proportioned among California’s 39.4 million people (2016 population), the state’s annual urban per capita use would be about 0.14 acre feet, or 42,360 gallons, per year.

To meet the increasing demand of a growing population, California’s urban water suppliers may need more water—perhaps as much as 45,500 acre feet per year $((0.14 \text{ AF} * 6.5 \text{ million people})/20 \text{ years})$. Additional supply could come from new sources such as expanded surface water storage, recycled water, and desalination; it could also come from the more efficient use of already developed supplies. Urban water suppliers understand that conservation is the cheapest and most readily available source of “new” water, and have accordingly invested in demand management programs, including conservation activities such as education and outreach efforts, household audits, and rebates for fixtures, appliances, and turf.

The proposed regulation may result in annual water savings that, statewide, could meet more than 25% of annual future water needs (i.e., $(12,489/45,500) * 100 = 27\%$). However, on a supplier-by-supplier basis, the annual savings are not as significant, representing less than 0.25 percent of a supplier’s annual production (See Table 21). The Water Board assumes that, to obtain such relatively small volumes of “new” water, an urban water supplier would not invest in expensive new infrastructure such as dam; rather, that supplier would moderately expand the scope of its demand management program.

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
	1	11.21%
	14	23.95%
	35	18.63%
	359	46.22%
Total	409	100%

Table 21: 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”). As a result of the proposed regulation, the 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).

The State Water Board assumes the proposed regulation would save a volume of water that an urban supplier would otherwise only realistically obtain by expanding its demand management program. Therefore, urban suppliers may realize additional financial savings

equal to delayed, or offset, demand management programming costs. The Water Board assumes that the financial savings associated with not having to independently invest in a similar effort (i.e., local restrictions on particular water uses) would be relatively inexpensive. In other words, the cost of promulgating local restrictions would be more likely to mirror the cost of lower-bound conservation activities (e.g., education and outreach programs) rather than the cost of higher-bound conservation activities (e.g., residential turf replacement rebates). The Water Board used an estimated lower bound cost of \$381/AF (DWR 2013 b). See Table 22.

Hydrologic Regions	Offset Demand Savings (\$/AF)	AF per Year Saved due to Prohibitions (AF)	Offset Demand Savings (\$/yr)
Central Coast	\$381	463	\$176,094
Colorado River	\$381	409	\$155,551
North Coast	\$381	98	\$37,468
North Lahontan	\$381	30	\$11,418
Sacramento River	\$381	1,795	\$683,546
San Francisco Bay	\$381	2,054	\$781,864
San Joaquin River	\$381	840	\$319,976
South Coast	\$381	5,426	\$2,065,969
South Lahontan	\$381	300	\$114,096
Tulare Lake	\$381	1,074	\$408,974
Totals:		12,489	\$4,754,957

Table 22: Offset Demand Savings by Hydrologic Region

Adjusted service charges

Water supplier costs are either *fixed* or *variable* depending on the characteristics of their expenditures. *Fixed* costs remain relatively unchanged throughout the year, irrespective of the volume of water produced; they include expenditures to build infrastructure. *Variable* costs vary directly with the volume of water produced; they include expenditures such as electrical and chemical costs.

The State Water Board assumes the estimated annual savings are the same year after year (see “**Annual**” **water savings**). Specifically, the Board estimates that, in the first year of the regulation’s implementation, these savings will result in supplier gross revenue losses of \$13,721,641 (See **Revenue Losses**). The Board assumes suppliers will recoup these losses through a one-time surcharge during the second year of the regulation’s implementation. Thereafter, the Board assumes suppliers will increase fixed service charges so they can continue to cover fixed costs. However, the Board assumes that, because customers would be consuming less water, their total costs would not increase due to increased fixed charges that result from the proposed regulation.

One-time Surcharges

The State Water Board estimates the proposed regulation would result in gross revenue losses of \$13,721,641 (See **Revenue Losses**). Specifically, the Board assumes suppliers will recoup these losses through a one-time surcharge during the second year of the regulation’s implementation. The Board also estimates that the proposed regulation would result in water suppliers purchasing automatic shut-off nozzles resulting in a \$84,632 cost

during the first year of the regulation's implementation. Because this is a small cost, and the Board is assuming that suppliers would be recouping their revenue losses after those have been quantified, the Board similarly assumes suppliers will recoup their nozzle-purchase costs through a one-time surcharge during the first year of the regulation's implementation.

Cited Works

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.

CA DOF 2017: CA Department of Finance, Forecasting, Demographics, Data, Estimates, Table Name = E-1 cities, Counties, and the State Population Estimates with Annual Percent Change retrieved 3/10/2017 from <http://www.dof.ca.gov/Forecasting/Demographics/Estimates/E-1/>

CA SWRCB Water Production and Conservation Reporting, Current Reporting Data, June 2014 – July 2017 Urban Water Supplier Report Dataset (Excel) available at http://www.waterboards.ca.gov/water_issues/programs/conservation_portal/conservation_reporting.shtml

Census a, 2015: US Census Bureau, 2015 County Business Patterns for NAICS 722511 (Full Service Restaurants). Only counted ones in service areas that do not have the water prohibition.

Census b, 2015: US Census Bureau, 2015 County Business Patterns for NAICS 721110 (Hotels & Motels excluding casinos). Only counted ones in service areas that do not have the water prohibition.

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

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 et al. 2015,. Anthropogenic warming has increased drought risk in California. *Proceedings of the National Academy of Sciences*, 112(13), 3931-3936. EO B-29-15, Executive Department, State of California, retrieved 9/4/2017 from https://www.gov.ca.gov/docs/4.1.15_Executive_Order.pdf

DWR 2013a, California Water Plan Update 2013, Volume 1, Chapter 3, page 3-11. Provides definition of hydrologic region. For detailed information about each of the 10 regions, See Volume 2 - Regional Reports. Note: Twelve regions are listed, however two are "overlays", data assembled for specific analytical purposes different from the current study. <http://www.water.ca.gov/waterplan/cwpu2013/final/>

DWR 2013b, California Water Plan Update 2013, Volume 3, Chapter 3. Urban Water Use Efficiency, page 3-32. The 2008 dollars were inflated to 2015 and entered into the table. http://www.water.ca.gov/waterplan/docs/cwpu2013/Final/Vol3_Ch03_UrbanWUE.pdf

DWR 2016, "Guidebook for Urban Water Suppliers" 2015 Urban Water Management Plans, Final, March 2016, <http://www.water.ca.gov/urbanwatermanagement/uwmp2015.cfm>

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.

Executive Department 2017, State of California, Executive Order B-40-17, https://www.gov.ca.gov/docs/4.7.17_Exec_Order_B-40-17.pdf

Gleick et al., 2003, "Waste Not, Want Not: The Potential for Urban Water Conservation in California", Pacific Institute, November 2003, Appendix B. Note: Appendix B is a separate document. http://pacinst.org/wp-content/uploads/2013/02/appendix_b3.pdf

Los Angeles Department of Water and Power (LADWP). 2015. UWMP. https://wuedata.water.ca.gov/public/uwmp_attachments/3381116569/2015%20Urban%20Water%20Management%20Plan-LADWP.pdf

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. Hogue, 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.

Mitchell et al. 2016: Mitchell, David et al., *Proposed Regulatory Framework for Extended Emergency Regulation for Urban Water Conservation Fiscal and Economic Impact Analysis*, report to SWRCB, January 2016. https://www.waterboards.ca.gov/water_issues/programs/conservation_portal/docs/econ_impact_report_012216.pdf

Mitchell 2017: Excel workbook sent from David Mitchell to the SWRCB via email dated 6/2/2017. Data are water rates and populations served for all urban retail water suppliers.

Mitchell, D., E. Hanak, K. Baerenklau, A. Escrivá-Bou, H. McCann, M. Perez-Urdiales, and K. Schwabe (2017). *Building Drought Resilience in California's Cities and Suburbs*. Public Policy Institute of California.

Moss 2015: Moss, Steven, *Executive Order B-29-15 State of Emergency Due to Severe Drought Conditions Economic Impact Analysis*, Report prepared for the State Water Resources Control Board, May 2015. http://waterboards.ca.gov/waterrights/water_issues/programs/drought/docs/emergency_regulations/econ_analysis.pdf

Office of the Governor 2014, "Governor Brown issues executive order to redouble state drought action", <http://www.water.ca.gov/waterconditions/declaration.cfm>, scroll down to Proclamation of a Continued State of Emergency, April 25, 2014.

Office of the Governor 2015 "Governor Brown driest first ever statewide mandatory water reductions", <https://www.gov.ca.gov/news.php?id=18910>, April 1, 2015.

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.

Wat. Code §10631 subd(f) requires providing a description of the supplier's water demand management measures.

http://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?lawCode=WAT§ionNum=10631

Wat. Code §10632 requires that Plans include water shortage contingency analysis.

https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?sectionNum=10632.&lawCode=WAT