

October 15, 2014

Felicia Marcus, Chair, and Members of the Board
State Water Resources Control Board
c/o Jeanine Townsend, Clerk to the Board
P.O. Box 100
Sacramento, CA 95812-0100

Submitted via email to: commentletters@waterboards.ca.gov



Re: Comment Letter—Dry Year Report Comments

Dear Chair Marcus and Members of the Board:

The Wheeler Institute for Water Law & Policy at the Center for Law, Energy & the Environment¹ respectfully submits the following comments in response to the State Water Resources Control Board's request for recommendations for near-term and longer-term actions the Board should take to more effectively implement and enforce California's water rights priority system in future dry years.

The Board's request is timely given the possibility that the current drought will extend into the 2015 water year, but it also shows foresight. Climate change has already begun to affect California's hydrology and water resources.¹ Not only is climate change directly implicated in the current drought² but projections show a myriad of impacts including on the distribution of water year types and frequency of dry years.³ Given that, in the near future, years like 2014 may not represent an anomaly but, rather, the new normal, the Board would be wise to act now to avoid a state of perpetual crisis in California's water future.

To more effectively implement and enforce California's water rights system, we recommend that the Board take the following actions:

- (1) Develop and implement a transparent, predictable framework for dry-year decision making.
- (2) Improve short-term and long-term data quality and reliability by (a) developing regulations to require more frequent electronic diversion-and-use reporting in at-risk watersheds during droughts, (b) encouraging improvements in the accuracy of diversion measurements, and (c) providing incentives for timely and accurate diversion reporting.
- (3) Reduce water rights uncertainty by (a) further encouraging development and adoption of temporary and long-term watershed-based cooperative agreements and other alternative mechanisms for dispute resolution and the quantification of disputed water rights and (b) encouraging adjudications through streamlining and other incentives (and consider seeking limited authority to initiate adjudications in drought-sensitive watersheds).
- (4) Expand the provision of clear, timely information on its website to improve transparency and stakeholder understanding of the "when," "why," and "how" of Board decision making.

All four of our recommendations squarely align with the Board's goal of "improv[ing] . . . confidence in the technical tools and analysis that will be used for making determinations on water availability relative to water rights priority."⁴

¹ This comment letter was primarily authored by Nell Green Nylen, with contributions from Holly Doremus, Michael Hanemann, Michael Kiparsky, Rapichan Phurisamban, and Hayley Oveson.



We expand upon each recommendation below.

1. The Board should develop and implement a transparent, predictable framework for dry-year decision making.

To enhance the predictability, efficiency, and effectiveness of the Board's actions during dry years, the Board should develop, effectively communicate, and use a contingency-based decision-making framework (hereinafter "framework").⁵ This recommendation is consistent with the Water Rights Division's suggestion in the wake of the 1976–77 drought that Board staff "plan and standardize methodology and procedures to better administer water rights during the normal year and future droughts."⁶ Abundant experience in other areas of government demonstrates that well-planned strategies are preferable to ad hoc measures developed on the fly in emergency situations.

Actions: Developing and implementing the framework would likely involve the following actions:

- a) First, the Board should identify and detail different actions that might be required to effectively implement and enforce California's water rights system under different dry-year scenarios. Some actions might be nested, interdependent, or presented as alternatives (possibly in a decision-tree format). The Board's own experience and expertise, informed by stakeholder input, should guide action selection, but the following may be useful starting points for identifying action areas:
 - Analyzing current and forecasting future water demand and availability for different priorities of right in different watersheds.
 - Informing stakeholders of potential water unavailability for their priority of right (and supporting data and analysis).
 - Invoking more frequent online diversion-reporting requirements for diverters in at-risk watersheds to improve the accuracy of water availability forecasting.
 - Determining that water is / will soon be unavailable to diverters.
 - Issuing curtailments.
 - Temporarily suspending or ending particular curtailments.
 - Monitoring curtailment compliance and effectiveness.
 - Investigating and responding to complaints.
 - Enforcing water-rights violations.
 - Evaluating the timeliness and effectiveness of ongoing actions.
 - Retrospectively evaluating each dry-year program.
- b) At the same time, the Board should work to identify and then set conditions, dates, or other thresholds that would trigger each potential action identified. Effective triggers would be specific, unambiguous, and actionable. Again, the Board's own experience and expertise, informed by stakeholder input, should guide trigger selection.
- c) Next the Board should formalize the framework by adopting one or more resolutions and (as appropriate) regulations that clearly describe the framework and explain the reasoning behind it.
- d) Subsequently, the Board should use the framework to guide its actual decision making.
- e) Throughout, the Board should strive to keep stakeholders informed of current and forecast conditions, impending Board decision-points, and opportunities to provide input.
- f) Finally, the Board should periodically evaluate and update the framework as experience accumulates and improvements are identified.

The Board should closely coordinate Tasks (a) and (b), actively seeking robust stakeholder input on the form and substance of potential actions and triggers as well as how the Board can most effectively communicate with stakeholders. As recent Board meetings and workshops have shown, developing feasible and effective requirements can be challenging,⁷ and input from a range of stakeholders will help the Board identify both critical concerns and creative solutions.⁸

Given the strong possibility that dry conditions will continue during the 2015 water year,⁹ the Board should begin the process of developing an initial framework as soon as possible.

Need: During the current drought, the Board has used different approaches at different times without a clear map for when, why, or how it would act. On January 17th, the Board issued a general *Notice of Surface Water Shortage and Potential for Curtailment of Water Right Diversions* alerting diverters that, “if dry weather conditions persist[ed],” the Board would “notify water right holders in critically dry watersheds of the requirement to limit or stop diversions of water under their water right, based on their priority.” Between January and mid-May, California saw some, but not much, precipitation. In late April, the Board put “curtailment analysis” graphs on its website that “project[ed] when more junior rights will need to be curtailed” to protect senior water rights in several watersheds.¹⁰ The Sacramento-San Joaquin watershed graphs indicated that the Board thought water was already or would soon be unavailable for many or all post-1914 rights, at least some pre-1914 rights, and riparian rights. In mid-to-late May, the Board tackled emergency regulations for curtailing diversions due to insufficient flow for endangered fish in three Sacramento River tributaries, and between May 27th and June 30th, it curtailed some or all post-1914 appropriative rights in the Sacramento, Russian, San Joaquin, and Eel River watersheds. On July 2nd, the Board adopted statewide emergency regulations that would affect the way it issues future curtailments of post-1914 rights, but it has not yet used them.

Without a clear drought decision-making strategy, the Board struggled to find an appropriate balance between acting, overreacting, and doing too little too late.¹¹ Even though the Board made efforts to explain its actions and reasoning, the lack of an overall plan of approach led to inconsistencies and confusion, ultimately hindering stakeholders’ water-use planning. For example, the reason for the lag time between the general January notice and the first appearance of curtailment analyses on the Board’s website in late April is not clear. Providing a range of potential scenarios accompanied by appropriate caveats would have allowed diverters to make better-informed choices before late April. Similarly, although conditions looked dire in January and the Governor signed SB 104 (enhancing the Board’s emergency regulatory authority) on March 1, it took the board until May to discuss general curtailment regulations, and until July to adopt them. In the interim, stakeholders were left wondering how the Board was prioritizing its actions and what might or might not be coming next.

Developing and implementing a framework would bring order to the Board’s decision-making process during dry years, with substantial benefits for both the Board and stakeholders. These include:

- *More timely and effective decision making:* The scenario planning and forethought required to develop the framework, as well as the structure it would bring to the decision-making process, would make the Board more nimble, empowering more timely and effective decisions during future droughts. Building an evaluation process into the system would help the Board take advantage of lessons learned, improving decision making over time.
- *Greater predictability:* A dry-year decision-making framework will make Board actions more predictable and understandable for diverters and other stakeholders, helping to mitigate the considerable uncertainty that results from changing hydrologic conditions and current data limitations¹² and to enable more effective planning by stakeholders.

2. The Board should improve short-term and long-term data quality and reliability by (a) developing regulations to require more frequent electronic diversion and use reporting in at-risk watersheds during droughts, (b) encouraging improvements in the accuracy of diversion measurements, and (c) providing incentives for timely and accurate diversion reporting.

The Board should make a concerted effort, beginning now, to remedy the substantial data limitations that continue to impair its ability to implement and enforce California's water rights system. The Board needs more accurate and comprehensive information about water rights, diversions, and use in order to better understand potential water unavailability, to notify diverters about potential unavailability in a timely and informative fashion, and to appropriately issue, monitor, and enforce curtailments.¹³

California has been slow to remedy the data deficiencies that plague its water rights system. Many of the recommendations made by the Water Rights Division in its retrospective report on the 1976–77 drought addressed the gathering and disseminating of accurate information in order to facilitate timely, strategic responses during future water shortages. For example, the Division recommended “that provisions should be included in law which accelerate the filing of statements of use by pre-1914 diverters and riparians”—data that “would have greatly assisted the work of the Dry Year Program.”¹⁴ Not until 2009 did the legislature finally boost diversion reporting,¹⁵ and major concerns remain about the quality, timeliness, and accuracy of the data demanded and eventually produced.¹⁶

Actions: We recommend that the Board take the following actions to acquire more timely and accurate data to improve drought-time decision making and to improve the quality and reliability of the diversion data it receives more generally:

- a) ***Develop regulations requiring more frequent electronic diversion and use reporting in at-risk watersheds during droughts:*** Post-1914 diverters currently must provide monthly diversion data on an annual basis, while pre-1914 appropriators and riparian diverters must provide monthly data every three years. The upshot is that during the 2014 drought, the Board and the State and Federal Projects lack current data with which to estimate and forecast diversions.¹⁷ Timelier data submissions during times of potential water shortage would support more accurate water unavailability forecasting, making possible finer-grained and less controversial curtailment decisions.¹⁸ Therefore, *as soon as possible*, the Board should request legislative authorization to develop and adopt regulations requiring more frequent online reporting of diversions in a particular watershed when an appropriate drought-related threshold (see Recommendation 1) has been met. Initially, the Board could simply require the quicker release of data that is already collected—in other words, it would require monthly diversion data to be reported monthly. However, the Board should move as rapidly as is feasible to a shorter reporting time scale that would facilitate effective, responsive management during a drought.
- b) ***Encourage improvements in the accuracy of diversion measurements.*** Beginning in 2012, SBX7-8 has required diverters filing Statements of Water Diversion and Use to measure the amount of water diverted using “the best available technologies and best professional practices” unless they can show that this is “not locally cost effective.”¹⁹ The statute gave no definition for “locally cost effective,” but the Board issued guidance that allows diverters to simply explain why they concluded a measuring device was not locally cost effective as long as they described the “alternative measuring methods used in lieu of measuring devices.”²⁰ The Board may be able to improve diversion-data quality and reliability by more strictly applying the measuring requirements under section 5103(e) of the Water Code or by providing other incentives for upgrading measurement methods.
- c) ***Provide incentives for timely and accurate diversion reporting.*** The Board should consider providing diverters with an incentive or reward for timely and accurate reporting. One possibility would be to create a new category of long-term transfer (e.g., a 10-year transfer) that would receive accelerated/streamlined review if, e.g., the diverter had diligently complied with reporting requirements for the last 10 years.

3. The Board should reduce water rights uncertainty by (a) further encouraging development and adoption of temporary and long-term watershed-based cooperative agreements and other alternative mechanisms for dispute resolution and the quantification of disputed water rights and (b) encouraging adjudications through streamlining and other incentives (and considering seeking limited authority to initiate adjudications in drought-sensitive watersheds).

While there has been significant progress with the development of eWRIMS and the implementation of the reporting required by 2009 legislation, in comparison with other Western states, California still has an inadequate system for recording water rights held under prior appropriation and for ensuring the enforcement of priority. This inadequacy jeopardizes the integrity of California water rights.

Uncertainty about water rights has long crippled California's water rights system, further impairing effective and timely drought response. The 1978 Governor's Commission report identified the main causes of uncertainty, including inadequate quantification and recordation of non-statutory (pre-1914 appropriative and riparian) rights.²¹ The Delta Vision Committee reiterated these problems in its 2008 report and endorsed a recommendation for the Board to "clarify existing water rights in many parts of the State in light of poorly defined or unreported riparian and appropriative water right claims and the unquantified needs of fish and wildlife."²² While the 2009 legislation made important strides toward improving data collection and resolving water rights issues in the Delta, more needs to be done.

Actions: We recommend that the Board:

- a) ***Further encourage development and adoption of temporary and long-term watershed-based cooperative agreements and other alternative mechanisms for dispute resolution and the quantification of disputed water rights.*** Building on the on-the-ground knowledge of water users, local and regional agreements regarding water allocation during times of shortage can be effective mechanisms for optimizing human water use while safeguarding ecosystems. For example, during the summer of 2014, voluntary drought agreements between diverters in the Mill and Antelope Creek watersheds and the California Department of Fish and Wildlife were able to provide "watershed-wide protection comparable to or greater than" the Board's emergency curtailment regulations to protect fish flows.²³

Other types of voluntary agreements can provide mechanisms for dispute resolution, lending long-term predictability and transparency to water allocation during dry periods. For example, the Kings River Agreement created a monthly water schedule, which entitles each member agency to a pre-specified amount based on daily natural flow.²⁴ The system is run by a private watermaster, who administers water allocation and ensures compliance with the agreement.

Through well-planned and properly administered voluntary agreements, diverters can avoid Board-issued curtailments, so they can more easily plan and invest resources. Therefore, the Board should more actively promote the development and adoption of watershed-based voluntary agreements by, for example, providing financial or regulatory incentives and technical support.

- b) ***Encourage adjudications through streamlining and other incentives (and consider seeking limited authority to initiate adjudications in drought-sensitive watersheds).*** Adjudication clearly defines water rights based on natural flows and offers predictability in drought situations. More generally, adjudication can help address the over-allocation of water resources.²⁵ Basic mechanisms for determining water rights already exist in the statutory adjudication procedure within the Water Code.

The Board should encourage and create incentives for diverters to seek statutory adjudication to improve certainty about water access in times of shortage. The Board could reward diverters in multiple ways for participating in an adjudication. One possibility would be to develop and offer a streamlined adjudication process. Those who participated could also receive a second benefit—

like access to accelerated/streamlined review for a new category of long-term transfer (as for Recommendation 2(c) above).

In some situations, the benefits of adjudication may not be obvious to potential petitioners although the net watershed benefit of adjudication is expected to be substantial. To address this circumstance the Board could consider seeking the authority to initiate adjudications in drought-sensitive watersheds.²⁶ This authority would allow the Board to take a more proactive role in resolving water conflicts. However, administration of water rights in adjudicated watersheds is only effective where there is timely access to accurate, reliable data (see Recommendation 2).

4. The Board should expand the provision of clear, timely information on its website to improve transparency and stakeholder understanding of the “when,” “why,” and “how” of Board decision making.

As our comments indicate, and the Board and stakeholders broadly recognize, implementing and enforcing California’s water rights system is no easy task. The task is made more difficult by data deficiencies, ongoing debates over legal issues, and other sources of confusion, which can breed mistrust and exacerbate uncertainty.

Actions: The Board can overcome a lot of unnecessary confusion by increasing the transparency surrounding “when,” “why,” and “how” it makes decisions. Therefore, to the extent feasible, the Board should expand its efforts to provide clear and timely information on its website about its dry-year decision-making process, current and forecast water demand and availability data and analyses, and other important information. For example, the Board could more completely map out its potential future actions by creating and communicating the framework we describe in Recommendation 1. The Board should make potentially important information available as early as is feasible. It should clearly describe and explain analytical/data limitations and sources uncertainty. Additionally, the Board could standardize update schedules and formats for particular types of information.

Conclusion:

In sum, to more effectively implement and enforce California’s water rights system, we recommend that the Board take the following actions:

- (1) Develop and implement a transparent, predictable framework for dry-year decision making.
- (2) Improve short-term and long-term data quality and reliability by (a) developing regulations to require more frequent electronic diversion-and-use reporting in at-risk watersheds during droughts, (b) encouraging improvements in the accuracy of diversion measurements, and (c) providing incentives for timely and accurate diversion reporting.
- (3) Reduce water rights uncertainty by (a) further encouraging development and adoption of temporary and long-term watershed-based cooperative agreements and other alternative mechanisms for dispute resolution and the quantification of disputed water rights and (b) encouraging adjudications through streamlining and other incentives (and consider seeking limited authority to initiate adjudications in drought-sensitive watersheds).
- (4) Expand the provision of clear, timely information on its website to improve transparency and stakeholder understanding of the “when,” “why,” and “how” of Board decision making.

We appreciate the opportunity to comment on this important issue. If it would be helpful, we would be happy to clarify or discuss our recommendations further.

Sincerely,



Nell Green Nysten
Research Fellow
Wheeler Institute for Water Law & Policy
ngreennylen@law.berkeley.edu

About the Wheeler Institute

The Wheeler Institute for Water Law & Policy develops interdisciplinary solutions to ensure clean water for California. Established in 2012 at the Center for Law, Energy & the Environment (CLEE) at Berkeley Law, the Institute conducts projects at the intersection of law, policy and science.

The Center for Law, Energy & the Environment (CLEE) at Berkeley Law educates the next generation of environmental leaders and develops policy solutions to pressing environmental and energy issues. The Center's current initiatives focus on reducing greenhouse gas emissions, advancing the transition to renewable energy, and ensuring clean water for California's future.

¹ See, e.g., Tim P. Barnett et al., *Human-Induced Changes in the Hydrology of the Western United States*, 319 SCIENCE 1080 (2008).

² See Daniel Swain et al., *The Extraordinary California Drought of 2013–14: Character, Context, and the Role of Climate Change*, in *Explaining Extreme Events of 2013 from a Climate Perspective*, 95 BULL. AM. METEOROLOGICAL SOC'Y S3, S7 (2014).

³ See Sarah E. Null & Joshua H. Viers, *In Bad Waters: Water Year Classification in Nonstationary Climates*, 49 WATER RES. RESEARCH 1137, 1146–47 (2013).

⁴ State Water Res. Control Bd., Notice of Solicitation Regarding Improvements to the Implementation and Enforcement of Water Rights During Drought Conditions, Sept. 10, 2014, available at http://www.swrcb.ca.gov/waterrights/water_issues/programs/drought/docs/notice_dryyear091014.pdf.

⁵ The Board should give careful thought to how it could effectively incorporate reasonableness and public trust considerations into developing and implementing the framework. See generally Dave Owen, *The Mono Lake Case, the Public Trust Doctrine, and the Administrative State*, 45 U.C. DAVIS L. REV. 1099, (2012); see also *Mono Lake at 20: Past, Present and Future*, A Berkeley Law Symposium, <http://www.law.berkeley.edu/MonoLake20.htm> (coming up on November 17th, 2014).

⁶ STATE WATER RES. CONTROL BD., DROUGHT 77: DRY YEAR PROGRAM 25 (1978). The Division explained that:

Special efforts should be made by the staff to plan and standardize methodology and procedures to better administer water rights during the normal year and future droughts. The staff should have lead time to plan for the worst on the assumption that the dry conditions of 1976–77 will continue for another year. Even if this assumption is not true, almost every year has several months of deficient flow in many streams. . . . Consequently, the operation of a program similar to this year's Dry Year Program should continue in order to properly administer water rights priorities as needed year after year.

The Division plans to ask the State Board to authorize the following tasks, as may be appropriate, in 1978 and future years. Some of these tasks are dependent on forecasted runoff of the Sacramento-San Joaquin River system:"

Id. at 25–26.

⁷ As an example, at the Board's September 24th, 2014, workshop, it became clear that 5 days would be too short a time for many diverters to respond to information requests under the statewide emergency curtailment regulations. One potential problem commenters identified: those estimating their monthly diversions based on the energy required for pumping would not be able provide data for the current month until they received their energy bills. The Board had adopted the 5-day time limit with little discussion in July.

⁸ See Kirsten Rudestam, *Loving Water, Resenting Regulation: Sense of Place and Water Management in the Willamette Watershed*, 27 Society & Natural Resources: An International Journal 20, 33 (2013) (noting that while water users in the selected

watershed expressed resistance to change and regulation, their “depth of knowledge, direct expertise, and concern for water’s management” may “generate valuable and unanticipated strategies for creatively addressing local water issues”).

⁹ See <http://californiawaterblog.com/2014/06/15/will-californias-drought-extend-into-2015/>

¹⁰ SWRCB Drought Updates email announcing new “Curtailed Analysis Webpage,” received Apr. 21, 2014.

¹¹ Although this comment advocates for additional Board actions, we acknowledge that a risk of resistance accompanies heightened levels of Board activity. See Matt Weiser, *California Drought Puts Spotlight on Water Theft*, SACRAMENTO BEE, Mar. 23, 2014 (quoting Senate President Pro Tem Darrel Steinberg, D-Sacramento, as saying “[h]istory has not been kind to past efforts where you ask for too much”).

¹² That, e.g., prevent the Board from making the fine-scale water availability determinations diverters would prefer to see. See Recommendation 2.

¹³ *C.f.* Theodore Grantham and Joshua Viers, *100 Years of California’s Water Rights System: Patterns, Trends, and Uncertainty*, 9 ENVIRON. RESEARCH LETTERS 1, 8 (2014) (arguing that “[f]oremost, efforts to reform surface water rights administration must be coupled with improved monitoring and quantification of riparian and pre-1914 appropriative rights” and that “the effectiveness of [innovative water management] strategies fundamentally relies on our ability to accurately measure and track water availability, movement, and uses”).

¹⁴ STATE WATER RES. CONTROL BD., DROUGHT 77: DRY YEAR PROGRAM 24 (1978). Furthermore, the report urged that “water rights data must be converted to computer storage and retrieval techniques so that information regarding water users with riparian, pre-1914, post-1914 and federal and state project contracts can be displayed in such a way as to have meaning to an effective monitoring and enforcement plan.” *Id.*

¹⁵ SBX7-8 was passed in 2009. SBX7-8 aimed to improve the quality of information on water diversions by imposing penalties for failure to report diversions and by eliminating an exemption from the 1965 reporting requirement for water diverters in the Delta. See, Michael Hanemann, Deborah Lambe and Daniel Farber, *Legal Analysis of Barriers to Adaptation for California’s Water Sector*, p. 12 (July 2012). However, the Delta Watermaster has since contended that the lack of adequate funding to process additional diversion statements required under SBX7-8 has seriously compromised the Board’s ability to effectively process those statements. *Id.* See also Craig M. Wilson, *Statements of Water Diversions and Use: Providing a Better Picture of Water Use in the Delta*, A Report to the State Water Resources Control Board and the Delta Stewardship Council (2011).

¹⁶ See Jason Dearen & Garance Burke, *California’s Flawed Water System Can’t Track Usage*, ASSOCIATED PRESS, May 27, 2014 (reporting that California’s water “system is based on self-reported, incomplete records riddled with errors and years out of date; some appear to be using far less water than records would indicate” and that “just 24 of [California’s water] rights holders reported using more than twice the volume of water that California’s vast system of state and federal dams and aqueducts ships to cities and farms in an average year”).

¹⁷ A February 19th Staff presentation states that the “2010 Statement Year is [the] only complete year of record for all Statements.” slide No. 4,

http://www.waterboards.ca.gov/waterrights/water_issues/programs/drought/docs/workshops/20140219_swrcb_drought_presentation.pdf

¹⁸ See, e.g., UC Davis Ctr. for Watershed Sci., *Drought’s No. 1 Lesson: Modernize Water Management*, CAL. WATER BLOG, Apr. 9, 2014, <http://californiawaterblog.com/2014/04/09/droughts-no-1-lesson-modernize-water-management/> (arguing that “[y]ou can’t manage what you don’t measure” and suggesting that “during severe droughts, water operations and protection of water right priorities need more thorough and frequent updates from all sources.

¹⁹ Cal. Water Code § 5103(e) (requiring monthly records of water diversions measured “using best available technologies and best professional practices” unless a diverter provides “documentation demonstrating that the implementation of those practices is not locally cost effective”).

²⁰ State Water Resources Control Board, *Guidance for Complying with Water Diversion Measurement Requirements for Statement Holders*, p. 2 (Dec. 2011) (noting that “[i]f necessary, the State Water Board may request additional information from the Statement holder to demonstrate that the implementation of best available technologies and best professional practices is ‘not locally cost effective’”).

²¹ GOVERNOR’S COMMISSION TO REVIEW CALIFORNIA WATER RIGHTS LAW, FINAL REPORT 17–21 (1978).

²² Delta Vision Committee Implementation Report, p. 9-10. (Dec. 2008).

²³ CDFW Memorandum to the State Water Resources Control Board regarding Mill and Antelope Creek Voluntary Agreements

²⁴ Kings River Water Association and Kings River Conservation District, *Kings River Handbook*.

²⁵ A recent study demonstrated that post-1914 water rights alone make claims on a quantity of water equivalent to approximately five times the mean annual runoff in the state. See Grantham, T.E. & Viers, J.H. 2014. 100 years of California’s Water Rights System: Patterns, Trends, and Uncertainty. *Environmental Research Letters* 9, p.6.

²⁶ See Delta Vision Committee Implementation Report, p. 9-10. (Dec. 2008) (arguing that the “Board needs the authority to initiate stream adjudications and collect adjudication costs from the parties diverting water”).