

Nevada to increase this storage volume by an additional 75,000 acre-feet, requires Metropolitan to pay compensation to Southern Nevada for the additional stored water, and allows Metropolitan access to the additional stored amounts.

### **Terms of the Agreement**

Under the Third Amendment, Metropolitan would pay Southern Nevada \$44.375 million, and Southern Nevada will provide Metropolitan with a total of 150,000 acre-feet of water during 2015. Access to the water stored by Southern Nevada will allow Metropolitan to keep more water in reserve if the drought continues. Upon request by Southern Nevada, Metropolitan will return up to a total of 125,000 acre-feet to Southern Nevada in future years and Southern Nevada will reimburse Metropolitan annually for an equivalent proportion of the amount paid by Metropolitan based on the amount of water returned, escalated to account for inflation.

The Third Amendment also includes provisions to protect Lake Mead from reaching critically low levels due to the increased storage. If Metropolitan has returned less than 75,000 acre-feet to Southern Nevada prior to 2027 and Lake Mead declines to an elevation of 1,045 feet or below, Metropolitan will create 50,000 acre-feet of Intentionally Created Surplus (ICS) per year until the combination of ICS created, and water returned to Southern Nevada, equals 75,000 acre-feet. Prior to 2027, Metropolitan agrees that it will only request delivery of such ICS if Lake Mead is at or above an elevation of 1,080 feet.

### **Conclusion and Implications**

The Third Amendment allows Metropolitan and Southern Nevada to share water supply and cash flow, helping both agencies meet current needs. According to Southern Nevada, its long-range water resource plans show that the banked water reserves will not be needed by Nevada within the next decade or more. (Kathryn Horning)

## **UNION OF CONCERNED SCIENTISTS PROPOSES BEST PRACTICES TO ACHIEVE GOALS OF THE SUSTAINABLE GROUNDWATER MANAGEMENT ACT**

In September of 2015, the Union of Concerned Scientists (UCS) released a report entitled “Measuring What Matters: Setting Measureable Objectives to Achieve Sustainable Groundwater Management in California.” The report proposes best practices for developing the “measurable objectives” required under the 2014 Sustainable Groundwater Management Act (SGMA) to achieve “sustainability” of groundwater basins. Specifically, UCS proposes that “measurable objectives” should include a host of attributes to be effective, including: clear baselines, quantitative thresholds, protective triggers, regular monitoring and measurement, be able to account for uncertainty, and be able to adapt to changing conditions. UCS further recommends developing a common statewide framework for setting basin-level thresholds, developing common assumptions regarding water use, and identifying existing shared data sources. The report thus proposes a path to develop concepts for long-term implementation of SGMA.

### **Background**

While SGMA provides a process to comprehensively regulate groundwater within the state of California, some concepts were left undefined by the California Legislature. Generally, the act requires “measurable objectives” to “achieve the sustainability goal” within any given basin (Water Code § 10727.2(b)(1)). These goals, in turn, are to prevent “undesirable results” such as a reduction in groundwater storage, seawater intrusion, degradation in water quality, or subsidence. However, the SGMA does not prescribe what “measurable objectives” are to include or how they are to be developed.

The UCS is an organization that strives to:

...combine technical analysis and effective advocacy to create innovative, practical solutions for a healthy, safe, and sustainable future.

UCS’s recent report takes the position that, in order to be effective and fair among basins, specific

elements are required within “measurable objectives” incorporated within a Groundwater Sustainability Plan (GSP).

### Elements of Effective Measurable Objectives

First, UCS advises that clear baselines are needed to ensure transparency and avoid conflict. Indeed, the California Department of Water Resources (DWR) is tasked with developing regulations for the formation of GSPs that assess baseline conditions concerning hydrology, water demand, and regulatory restrictions on or reductions in surface water supply. (Water Code § 17033.2(b)(2).) However, while a GSP may address undesirable results that occurred before January 1, 2015, it is not in fact required to do so. Thus, according to UCS, the danger is that various GSPs may utilize widely different baselines as a result of whether they incorporate undesirable impacts that occurred prior to January 1, 2015.

Second, quantitative—not qualitative—thresholds are encouraged. The report advises qualitative thresholds such as “to protect and enhance the quality of the groundwater” in a basin are not sufficient under SGMA. UCS encourages the development of thresholds that use quantitative measurements to signal when conditions have reached an unacceptable point. Examples include establishing quantitative groundwater levels, groundwater storage volume, or spring water flows. UCS believes that only once these quantitative thresholds are established can future allowable pumping rates be properly developed.

Third, UCS advocates for an early warning system comprised of protective triggers that identify when groundwater conditions are worsening or approaching the thresholds. Groundwater Sustainability Agencies (GSAs) may utilize a green-, yellow-, and red-light trigger system, whereby certain legal or management actions are initiated to halt or reverse the adverse impacts when each level is reached. A basic example of a trigger system is when an aquifer reaches predetermined groundwater levels, with action triggered if groundwater levels decline past certain predetermined points. UCS also advises that fixed triggers such as firm groundwater levels are easier to communicate and provide a better basis for planning than variable triggers such as those based on a standard deviation below long-term averages for wet, normal and dry year scenarios.

Fourth, UCS acknowledges that under SGMA there are no specific methods designated to assess

groundwater overdraft. While chronic overdraft is prohibited, a GSA could assess potential overdraft by a number of methods, including measuring groundwater extractions, monitoring groundwater levels, employing modeling, or analyzing indirect data such as electricity usage for pumping. Further, modeling may be carried out by using satellite measurements of groundwater storage volumes or satellite measurements of water used for evapotranspiration in a given region. UCS advises that whatever method is used, measurements should be regular and allow the GSA to adaptively manage the basin.

Fifth, UCS recommends that any uncertainty regarding baselines, measurable objectives, and estimates of future conditions should be explicitly stated. Specifically, estimates of future land uses, future water uses, the impacts of climate change, and water reliability may contain great uncertainty, and any GSA should acknowledge this uncertainty and account for future change in its adaptive management strategy. The report further suggests that in basins where uncertainty is high, protective triggers be set conservatively in order to protect against exceedance of established thresholds.

Lastly, UCS advises that adaptive management must be built into any GSP. SGMA requires milestones be set to track progress toward sustainability goals, and a GSA should be prepared to continually incorporate new information and respond to changing conditions. According to UCS, this approach will not only create more effective management, but also assist GSAs in complying with SGMA’s requirement of having DWR assess the GSP every five years (Water Code § 10733.8) and periodically evaluating its own GSP (Water Code § 10728.2.).

### Framework for Adopting Measurable Objectives

Once the principles of measurable objectives are understood, UCS advises measurable objectives and quantitative thresholds should be adopted pursuant to a specific framework. The report proposes a six-step framework to evaluate the propriety of any threshold:

1. Whether the threshold exceeds existing legal standards;
2. Whether the threshold was developed through a transparent public process;

3. Whether the threshold causes potential negative impacts;
4. Whether the threshold violates thresholds of neighboring basins;
5. Whether the threshold has high levels of uncertainty; or
6. Whether the threshold conflicts with any other threshold.

Thresholds that do not exceed existing legal standards, are developed through a transparent process, identify and address any adverse impacts, do not violate thresholds of neighboring basins, and have high levels of certainty will—according to UCS—most likely be successful in the long term. If a threshold does not meet one of these steps, UCS recommends the threshold be revised accordingly.

UCS, in conjunction with the California Water Foundation, also calls for a state approach to setting thresholds, triggers and milestones under SGMA.

In support, UCS recommends identifying existing data sources for basin conditions such as an expansion of California Statewide Groundwater Elevation Monitoring (CASGEM) or Interferometric Synthetic Aperture Radar (InSAR) satellite data. Common data assumptions for the development of thresholds are also advocated, including assumptions regarding growth forecasts, water demands, climate change, and drought planning.

### **Conclusion and Implications**

As GSAs are identified throughout the state, and as DWR develops regulations to evaluate GSPs, attention will increasingly turn to exactly how GSA's may meet SGMA's requirements. UCS's report provides a methodology to consider in developing the measurable objectives required by SGMA as well as a framework structure to adopt specific thresholds. Whether UCS's recommendations will be implemented by DWR or by any individual GSA remains to be seen. DWR is expected to adopt regulations for evaluating GSPs by June 1, 2016.

(David E. Cameron, Meredith Nikkel)

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