May 9, 2022

California Coastal Commission
Central Office, Santa Cruz, CA

Subject: Defining "conclusive evidence" of a sustainable water supply and parameters to establish conclusive evidence relative to the Los Osos Basin

Dear Coastal Commission Staff,

The LOSG is submitting these recommendations for a "metric" for the Los Osos portion of the Estero Area Update that will meet the standard of "conclusive evidence" required by Special Condition 6 of the LOWWP CDP.

Consistent with the condition and findings of the Coastal Commission, the Commission expects the County to provide "conclusive evidence" of a sustainable water supply prior to approval of new development, and as the basis for identifying buildout limits and mechanisms to stay within those limits in the Los Osos area in its update of the Estero Area Plan (the Los Osos Community Plan or LOCP) and related documents.

We appreciate staff's sharing insights on the "conclusive evidence" standard in a Feb. 15, 2022 teleconference, and inviting us to share our thoughts and position. We also appreciate the foresight of Commission staff in 2010 in adding this Condition to the LOWWP CDP recognizing the potential for harm to area resources should the 30-year building moratorium be lifted. Given the long history of Basin degradation and the intense pressures to develop the area, the "conclusive evidence" standard will be critical to the sustainability of the Basin, community, and area resources in the future.

Definition of a sustainable water supply

Given the impacts of climate change locally and throughout the state, and the high cost of water and wastewater in the community of Los Osos, we believe the Basin provides the only potentially sustainable water source for the community for the foreseeable future because imported water is not reliable and desalination is not likely to be feasible environmentally or economically (e.g., with no direct outfall to the ocean).

It is our position that the term "sustainable water supply" can be defined as the ability of the Basin to support indefinitely all beneficial uses that it currently provides for dependent resources (e.g., the population, visitors, farms, and natural resources including ESHA). By the Basin, we mean all parts of the Los Osos Basin from under the Morro Bay National estuary west of the community of Los Osos inland (i.e., the portion of the Basin subject to current Basin management). As we define it, the Basin currently includes parts in the

Western Area that are intruded by seawater, but which we believe can and should be restored for beneficial uses including drinking.

LOSG's basic position

We agree that the standard must be clear, objective, and enforceable to avoid conflict and provide direction for the County of San Luis Obispo and landowners in the area. We also agree that the standard must be applied Basin-wide to be effective and equitable. We concur also that the standard cannot be met by modeled sustainable yield estimates or projected yield increases with the implementation of Basin Plan programs (e.g., Infrastructure Programs B, C, and D).

As we state in our letter to the Coastal Commission dated October 1, 2020, LOSG's basic position is the following:

> *To meet the* (conclusive evidence) *standard the County would be required to meet one or more clearly articulated and measurable physical objectives based on sufficient and objectively reliable well monitoring data collected over a sufficient time period in order to establish that seawater intrusion is reversed to prescribed locations and water levels are raised to prescribed elevations high enough basin-wide. The objective is to keep the Basin safe from seawater intrusion and all other harmful effects through adverse conditions such as droughts and climate change and ensure the Basin is capable of supplying sufficient water for existing and any new or expanded development* (see Pages 1&2)

When considering how this would look as a set of parameters, we reviewed SGMA BMPs and Special Condition 5 of the LOWWP, which are both data-driven, outcome-based processes for achieving a sustainable basin. Our recommended parameters are based on both.

LOSG's recommended parameters for "conclusive evidence" of a sustainable water supply

Measurable objectives that quantify desired physical conditions in the Basin for all sustainability indicators (conditions that have reduced beneficial uses or threaten beneficial uses in the future). Measurable objectives would be quantified using sufficient high quality monitoring data to conclusively show objectives are met. Objectives would also include quantified margins of safety that account for climate change, adverse impacts from management actions, and other impacts and uncertainties to ensure adequate Basin capacity and resiliency to provide "conclusive evidence" of a sustainable water supply. Incremental additional quantified thresholds in excess of objectives would be set to allow incremental development. Margins would be conservative and consider worst-case scenarios.

Interim milestones would also be quantified to ensure progress toward the completion of objectives and ultimately a sustainability goal. The sustainability goal would be the achievement of all objectives (desired conditions) for a healthy and sustainable Basin. Setting objectives would require first assessing all conditions that have reduced or threaten beneficial uses.

A primary seawater intrusion objectives to support the current population through droughts and other impacts would be to reverse of seawater intrusion in both lower aquifers to points under the estuary. Seawater would be reversed to restore and preserve use of all Western Area supply wells impacted by intrusion (remove undesirable effects) and build resilience into the system—e.g., provide a drinking water supply that can be used during droughts that also provides a substantial freshwater barrier between the new pumping center near the commercial area and seawater. Thresholds would be set to push fronts further back and to exceed other objectives Basin-wide before additional development is added.

Objectives for seawater intrusion would be quantified using chloride monitoring data with a monitoring program that produces sufficient high-quality data to quantify objectives as contour lines consistent with SGMA. Water level and water in storage objectives would be quantified Basin-wide using sufficient high-quality water level monitoring data, and contaminant objectives would be quantified Basin-wide using sufficient high-quality water quality data consistent with SGMA. Water level data would not be used for setting minimum objectives for seawater intrusion recognizing that water levels can vary significantly at individual wells and can be influenced by seawater intrusion in impacted areas. However, water level data would be collected at the wells used for the collection chlorides to better understand seawater movement and behavior. Geophysics would also be used to gather more information about intrusion movement.

1. <u>Measures to ensure objectives are achieved within reasonable timeframes and maintained long term</u>. These would include but not be limited to:
   - time-specific interim milestones to achieve objectives (SGMA requires 5-year milestones),
   - adequate management programs and actions to achieve objectives,
   - adequate means to implement programs and actions, including the demonstration and commitment of adequate resources and authority (e.g., to implement mandatory well monitoring and conservation Basin-wide),
   - a time-specific sustainability goal that summarizes objectives and how they will be achieved, and
   - adequate outside agency oversight, support, and incentives to ensure minimum thresholds, objectives, and the sustainability goal are met.

2. <u>A monitoring program that provides sufficient high-quality data to accurately assess the Basin setting and conditions, quantify minimum thresholds and objectives, and conclusively show thresholds and objectives are met.</u> The program would provide data of sufficient quality, quantity, density, and distribution to support conclusive evidence.

How the parameters build on SGMA requirements and SGMA BMPs

SGMA requires Groundwater Sustainability Agencies (GSAs) to identify and assess "sustainability indicators" and to develop Sustainable Management Criteria (SMC) for each indicator. Sustainability indicators are defined as the "effects caused by groundwater conditions occurring throughout the basin, that when significant and unreasonable, cause undesirable results…" (SMC BMP, Page 35). The six general sustainability indicators SGMA recognizes include "chronic lowering of groundwater levels," "reduction in groundwater storage," "seawater intrusion," "degraded water quality," " land subsidence," and "depletions of interconnected surface water" (SGMA SMC, Page 17). (See "Resources/Documents Cited" below for documents abbreviated with acronyms and a link to documents.)

GSAs must quantify minimum thresholds and measurable objectives. The latter add a "reasonable margin of operational flexibility …between the minimum threshold and measurable objective that will accommodate droughts, climate change, conjunctive use operations, or other groundwater management activities" (see SGMA SMC, Page 21 and SMC BMP, Page 27).

GSAs must also set five-year interim milestones for each objective and summarize measurable objectives (desired outcomes) and how objectives will be achieved in a sustainability goal. SGMA further sets standards for monitoring networks and how monitoring will be used to set and verify thresholds and objectives, and it requires GSA's to demonstrate they have the resources to implement adequate programs to reach thresholds and objectives (SMC BMP, Pages 10, 27, 31: GMC BMP, Pages 4 & 7 and BMP SMC, Page 20).

The Sustainable Management Criteria BMP makes it clear that, to comply with SGMA, GSAs must make sure the GSA supports data-driven, outcome-based decision making and is not a model driven process that relies on theoretical and uncertain sustainable yield estimates to achieve objectives and goals.

> *As described in SGMA, sustainable conditions within a basin are achieved when GSAs meet their sustainability goal and demonstrate the basin is being operated within its sustainable yield. Sustainable yield can only be reached if the basin is not experiencing undesirable results. The GSP Regulations focus the development of GSPs on locally defined, quantitative criteria, including undesirable results, minimum thresholds, and measurable objectives. Undesirable results must be eliminated through the implementation of projects and management actions, and progress toward their elimination will be demonstrated with empirical data (e.g., measurements of groundwater levels or subsidence). Quantitative sustainable management criteria allow GSAs to clearly demonstrate sustainability and allow the public and the Department to readily assess progress.*

> *Properly documenting the requirements identified in Sub-article 3, Introduction to Sustainable Management Criteria, in Article 5 of the GSP Regulations, is imperative to maintaining an outcome-based approach to SGMA implementation and must be completed for the Department to consider the approval of a GSP* (SMC BMP, Page 2)

Regarding the use of modeled sustainable yields, SGMA BMPs state

> *SGMA does not incorporate sustainable yield estimates directly into sustainable management criteria. Basin wide pumping within the sustainable yield estimate is neither a measure of, nor proof of, sustainability. Sustainability under SGMA is only demonstrated by avoiding undesirable results for the six sustainability indicators* (SMC BMP, Page 32) (Emphasis added).

Thus, SGMA provides a basic framework and baseline requirements for our parameters, but the requirements must be augmented to provide "conclusive evidence" of a sustainable water supply. For the Basin to be sustainable, several existing undesirable conditions must be improved. Therefore, our parameters would require objectives that improve conditions and restore uses and resilience, as needed, to ensure a healthy and sustainable Basin.

How the parameters build on Special Condition 5 of the LOWWP CDP

Special Condition 5 requires the County to develop a "Basin Plan" - not to be confused with the Basin Plan developed by the parties to the Los Osos Basin adjudication process. The parties consist of the County and three local water purveyors who now make up the Basin Management Committee (BMC). The Special Condition 5 Basin Plan has the following objective:

> *… to ensure that implementation of the project LOWWP), including the sites designated for disposal of treated effluent, is accomplished in a manner designed to maximize long-term ground and surface water and related resource (including wetlands, streams, creeks, lakes, riparian corridors, marshes, etc.) health and sustainability, including with respect to offsetting seawater intrusion as much as possible, within the Los Osos Groundwater Basin* (2010 LOWWP CDP) (Emphasis added.).

Special Condition 5 provides for a Recycled Water Reuse Program that "…will maximize (the reuse program's) ability to meet Basin Plan objectives, where the highest priority for reuse shall be replacing existing potable water use with recycled water use where feasible and appropriate." The program also requires 33 AFY of recycled water to be sent to Bayridge leach field, or as much as needed to "for maintaining Willow Creek and downstream resources in their pre-project state or better…" (see Paragraph 5a).

Special Condition 5 also requires the County to incorporate the LOWWP "Water Conservation Program" into the Condition 5 Basin Plan and design it to "to help Basin

residents to reduce their potable water use as much as possible" including with "enforceable mechanisms…" The Condition also requires the County to include provisions for use of …$5 million" to initiate the program and to "coordinate with purveyors.." to "integrate the program with purveyor implemented outdoor water use reduction measures" (see Paragraph 5b) (Emphasis added).

The County has submitted Annual Reports to comply with Special Condition 5, which rely heavily on the adjudicated Basin management process. These cite the results for the "Seawater intrusion front" (Zone D mapping), "Basin Yield Metric," "Water Level Metric," and "Chloride Level Metric" (see Annual Report for the RWMP for 2019, dated December 2020, Page 17). However, the BMC has failed to set interim and long-term success criteria for seawater intrusion and other undesirable conditions that, in fact, "demonstrate that the health and sustainability of the Plan area" are improving.

The BMC has recognized problems with the Chloride Metric and Zone D intrusion mapping since 2015 indicating that both likely represent localized variations in intrusion rather than "broad intrusion front movement" (i.e., significant changes) in the front (see 2020 AMR, Pages 56 & 70). Moreover, the BMC has known that the monitoring program does not have enough dedicated Zone E wells to track the most severe intrusion in the Basin, which BMC staff agree poses "a significant threat to the Basin" (see 2020 AMR, Page 57 and BMC response to LOSG's March 2021 letter in BMC 5-19-21 mtg. agenda packet, pdf Page 39 – link provided in "Resources/Documents Cited" below).

The BMC also failed to fix known problems with its water level monitoring program and the Water Level Metric. For six years, Spencer Harris of Cleath-Harris Geologists, Inc. (CHG), who prepares its Annual Monitoring Reports, has been informing the BMC that elevation reference points should be surveyed by a licensed surveyor (see e.g., 2017 AMR, Page 73). In 2021 the BMC finally had the surveys completed. The results showed the water levels in most lower aquifer monitoring wells had been inaccurate by an average of almost 2 feet per well since 2015. Despite the inaccuracies—and related inaccuracies in the Water Level Metric (i.e., the values and trends reported to agencies)--the BMC Executive Director stated in a recent BMC meeting the data and metric would not be backdated.

Similarly, the BMC found in 2021 that it had not been setting and confirming the Basin sustainable yield since 2015, in accordance with the Stipulated Judgment (the agreement between BMC members that implements the Basin Plan and BMC). The BMC also found that the Basin Plan definition of sustainable yield was not consistent with SGMA and redefined it to be more consistent (see BMC 7-21-21 agenda packet, Pages 20-24 and BMC 10-27-21 mtg. agenda packet, Pages 25-26). These changes resulted in the sustainable yield estimate dropping from 2760 AFY to 2380 AFY and the Basin Yield Metric production target of 80% of sustainable yield (BYM 80) dropping to 1904 AFY. The sustainable yield

doesn't include a margin of safety to address modeling uncertainty per accepted practice, so the Basin Plan sets a goal of pumping at under the BYM 80.

The change in the sustainable yield and BYM 80 target had the effect of raising BYM results since 2016 to values above the 80% target (the BMC had reported the targets achieved for those years). These changes should be backdated in the reports to reflect that this BYM target was, in fact, never met.

In addition to the above problems with the Annual Reports sent to the Coastal Commission, the County did not "Identify …voids in the collected data," "Modify the RWMP (Plan required by Special Condition 5) based on current conditions,", and failed to implement adaptive measures including upgrades to its conservation program to address the "deterioration" of conditions in 2019 (see Annual Report for the RWMP for 2019, dated December 2020, Pages 16-18). The County and BMC instead put the conservation program on hold in 2020 and purveyor members endorsed the County's use of conservation for the Title 19 retrofit-to-build program, also deferring, rather than expediting, infrastructure upgrades to address worsening seawater intrusion (see 2020 AMR, Page 86 and Table 26). The County has also sent less recycled water than required to Bayridge Estates leach fields, intended to provide flows to ESHA as stated in Condition 5 (see 2020 AMR, Table 25, Page 85).

Thus, the BMC has failed to meet key requirements of every Special Condition 5 program—and BMC operations fall far short of being able to meet or provide a "conclusive evidence" standard for Basin sustainability. Thus, it is appropriate for the Commission to require amendments under Special Condition 5 that will "result in better resource protection and better means to achieve Basin Plan objectives" including the parameters we suggest for "conclusive evidence" of a sustainable water supply.

The County may contend that Condition 5 applies to only the implementation of the LOWWP and that it does not apply to the entire Basin. However, the language of Special Condition 5 clearly states that the annual reports will be required "each year that the project operates…" and the condition requires a monitoring program and success criteria that assess and demonstrate the effectiveness of the Basin Plan and the health and sustainability of "Los Osos Groundwater Basin" and dependent resources "over time."

The County may also claim that it is only one member of the BMC and has a minority share of the vote. However, Dan Carl in a letter to the BMC in 2015 made it clear to the BMC, including the County, that the Basin Plan and Basin operations would have to comply with Special Conditions 5 & 6, the LCP, and related coastal policies and requirements. In October of 2021, we reminded the BMC of these requirements in a letter. However, as recently as last month, the BMC failed to take basic steps to improve the Chloride Metric and Zone D seawater intrusion front contour mapping, which the BMC uses to report the effectiveness of programs and seawater intrusion conditions to the Coastal Commission, State Water Board, and other agencies and stakeholders.

Some upgrades to BMC operations needed to meet the parameters

1. **Undesirable conditions**
   The Basin Plan and BMC operations currently address three undesirable conditions in the Basin: high nitrates in the upper aquifer, potential seawater intrusion in the upper aquifer, and seawater intrusion in the lower aquifers, primarily Zone D. The BMC would have to review Basin conditions, consider the six categories of SGMA indicators, and set minimum thresholds and objectives for all current and potential undesirable conditions. Some of these include seawater intrusion into Zone E, which is currently not measured and is not being addressed with its own set of monitoring wells and metric targets. To reverse seawater intrusion in Zone E, for instance, requires a target of 12' above mean sea level; whereas the current metric target is 8'. Zone E intrusion may require its own set of management actions, possibly injection. Other potential undesirable effects include low water levels and harm to private wells and ESHA resulting from shifts in pumping to the upper aquifer and inland with Infrastructure Programs B, C, and D. Also, existing and potential degradation of the Basin must be assessed, including PFAS contamination, salt build up, rising nitrates in the lower aquifers in some areas, and upper aquifer nitrate hot spots that may limit use of the upper aquifer by making denitrification less economically and environmentally feasible.

2. **Measurable thresholds, objectives, and interim milestones**
   The BMC would have to develop physically measurable objectives and interim objectives. Currently, the BMC has no interim objectives, and the metrics and other measures it has do not meet minimum SGMA or Special Condition 5 requirements. For instance, the Chloride Metric target currently provides the only seawater intrusion goal or objective based on monitoring. However, it is not represented as an intrusion front location (i.e., a contour line as required by SGMA). It further has too few wells and has data gaps due to unreliable data, e.g., from Well LA10, to accurately represent conditions and set thresholds, objectives, and milestones.

   The Water Level Metric target similarly does not have enough wells to represent conditions and has gaps due to poor quality data (see #3 below). Further, the metric is not based on water levels above a minimum threshold at each of a representative group of wells as required by SGMA.

   The sustainable yield and BYM 80 set pumping targets modeled to move seawater intrusion fronts to theoretical approximate locations under the estuary, but the targets are based on modeled sustainable yield estimates and estimated water use data (50% of the water in the Basin is not metered). For the yield and BYM targets to be measurable objectives, they would have to be represented by targeted values at chloride monitoring wells that verify the physical locations of the fronts.

   The BMC also has no interim milestones. The Basin Plan provides long-term broad estimates of the time it will take for the Chloride Metric target to be reached after the

Water Level Metric target (8' above MSL) is reached (about 20 years) and it provides an estimate for how long after the BYM 80 is reached the Water Level Target will be reached (about 10 years) (see Basin Plan, Page 108). However, these targets are much too far in the future and approximate to be used to assess program effectiveness. The 2016-2020 Annual Monitoring Reports show the BYM has been below the target of 80 since 2016. However, after six years, with the Water Level Metric reported to be at about 2.1' above mean sea level (about 6' below the target), and with available data showing seawater intrusion still active in both lower aquifers, the BMC is claiming that Basin operations are on track to stop seawater intrusion and meet expectations.

3. **Monitoring Program and Networks**

The BMC would also have to add substantially more new lower aquifer monitoring wells to its program (It installed just one in six years.). The lower aquifer program in the Western and Central Areas (which is the portion of the program we reviewed) currently has substantial data gaps due to too few wells and wells producing poor-quality data. Spatial gaps in the lower aquifers are most obvious in the northern part of the Basin and in the eastern part of the Central Area. Spatial gaps also exist throughout most of the deep aquifer, Zone E. The program has only three Zone E wells in the entire Western Area to track seawater intrusion, all located near the estuary, although Zone E extends to the Central Area and possibly into it. CHG estimates Zone E intrusion is "laterally pervasive" throughout the Western Area (see 2020 AMR, Page 57). The Annual Monitoring Reports in 2019 and 2020 provide only a "generalized plan view interpretation" of Zone E intrusion based on historical data due to too few monitoring wells (see 2020 AMR, Page 57).

The gaps resulting from poor quality data are mainly in the historic pathway of seawater intrusion in the Western Area and under the commercial area, where most of the monitoring wells and community supply wells are located (Most supply wells are also monitoring wells). Many of these wells have one or more problems adversely impacting data: mixed aquifer screening, well-bore leakage, pumping interference, and/or localized mounding. Well LA10, a key well used for the Chloride Metric and the Zone D intrusion front contour mapping, has all four factors, making both the metric and Zone D mapping unreliable at best.

The substantial gaps in the program make assessment of the Basin setting and Basin conditions impossible, as well as quantifying and verifying measurable physical thresholds, objectives, and interim milestones. Objectives for seawater intrusion, for instance, can't be set because the program includes too few wells producing reliable and accurate data to draw and confirm objectives as contour lines with any confidence.

Spencer Harris (of CHG) recommends in the 2020 Annual Monitoring Report that the BMC evaluate the feasibility of more wells and the modification of wells to "improve seawater intrusion definition in both Zone D and Zone E (2020 AMR, Page 57). The BMC approved the evaluation of wells, in addition to an evaluation and recommendations for improvements for the Chloride Metric. CHG apparently completed the evaluations in early 2022, and recommended the modification of at least three wells, in addition to

installation of at least one new well. However, the BMC Executive Director recently reported that the evaluations will not be released until further notice. Further, the BMC budget in 2022 for monitoring program upgrades is just $27,000 (although the BMC is spending $330,000 on a modeling upgrade). $27,000 is about enough money to modify one well.

Conclusion

Again, we appreciate your reaching out and sharing insights, and your interest, knowledge of, and commitment to Los Osos Groundwater Basin sustainability. Your dedication to the protection of Los Osos Area resources represents the best, and possibly the only, chance for the Los Osos community, ESHA, and agriculture in the area to have a sustainable water source. Seawater intrusion has been allowed to destroy the Basin for over 40 years, and once again effective action is being delayed for the same reasons and by the same entities that have delayed effective action for all that time.

If the Basin is to be a sustainable water source, the County, purveyors, overseeing agencies, and all users of the Basin must commit to setting and achieving time-specific measurable objectives that address all threats to the Basin and conclusively show, based on sufficient high-quality data, that the Basin is sustainable for at least the current population. We thank the Commission for having the insight to require data-driven, outcome-based, comprehensive management of the Basin in 2010 with Special Conditions 5 and 6 of the LOWWP CDP. Your foresight and continued involvement are essential for the Basin, at long last, to become a sustainable water source.

Sincerely,

Patrick McGibney, Chair
Los Osos Sustainability Group (LOSG)

Resources/Documents Cited

1. The above SGMA discussion is based on three documents developed by the Department of Water Resources (DWR): *Sustainable Management Criteria BMP* (Draft), November 2018; *SGMA and Sustainable Management Criteria*, May 4, 2018; *Monitoring Networks and Identification of Data Gaps*, December 2016. The documents are abbreviated herein as SMC BMP, SGMA SMC, and MNG BMP respectively and are available on the DWR website at: https://water.ca.gov/Programs/Groundwater-Management/SGMA-Groundwater-Management/Best-Management-Practices-and-Guidance-Documents.

2. The BMC Basin Plan, Stipulated Judgment, Annual Monitoring Reports (AMRs) and meeting agenda packets cited above can be found on the SLO County BMC webpage at: https://www.slocounty.ca.gov/Departments/Public-Works/Committees-Programs/Los-Osos-Basin-Management-Committee-(BMC).aspx