

Topic 10: Adaptive Management and Focus Areas

*Department of Water Resources - Sustainable Groundwater Management Program
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1.0 PURPOSE

The purpose of this paper is to provide information to advance the discussion with stakeholders and the public as the Department of Water Resources (DWR) develops regulations as required in the Sustainable Groundwater Management Act (SGMA). DWR identified a series of ten topics related to the development of Groundwater Sustainability Plan (GSP) regulations and Alternatives to GSP regulations that were deemed of special interest to further discuss with stakeholders and the public. Specifically covered within this paper is information related to Topic 10: Adaptive Management and Focus Areas.

The adaptive management and focus area(s) are concepts that local agencies could use to enhance GSP implementation by adjusting a GSP's objectives and/or actions to changing conditions, and/or focusing limited resources on areas in the basin of most need. Implementation of these concepts could provide flexibility to local managers to meet their sustainability goals. The adaptive management concept is dependent on an understanding of some of the descriptions provided in the Measurable Objectives and Interim Milestones Topic Paper #2.

For the purposes of this discussion, the following definition of these terms is offered:

- **Adaptive Management** – Is a process where planning goals, objectives, and/or actions may be further developed, modified, or replaced based on the discovery of new knowledge in response to changing physical conditions or reduction of uncertainty. Implementation of adaptive management initiates change through consideration of other planning components identified on the iterative cycle (**Figure 1**).
- **Focus Area** – The Focus Area is a relatively simple and intuitive concept where groundwater managers prioritize the groundwater challenges in their GSPs and focus monitoring, management actions, projects, etc., in the areas of most need. This concept is based on the recognition that State and local agencies have limited resources and these resources need to be managed most efficiently to accomplish the goals of SGMA and obtain groundwater sustainability statewide. This concept should not be construed as an opportunity to allow areas of the basin to go unmonitored or unmanaged. In addition, potential implementation of this concept is unrelated to Groundwater Sustainability Agency (GSA) formation, would not lessen the need for completion of GSPs for the entire basin, or remove the potential for probationary status. Rather, this concept acknowledges the need for flexibility, for example, when setting up a monitoring grid (i.e., the density and location), types of management actions, and projects.

FIGURE 1 – THE ADAPTIVE MANAGEMENT CYCLE

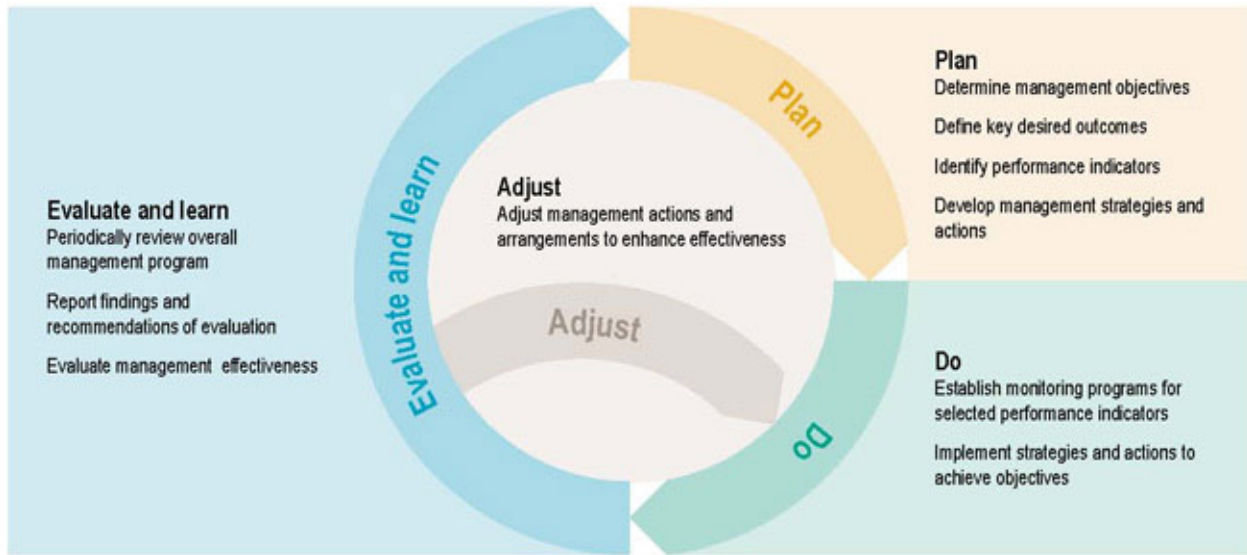


Figure 1 Source: Murray-Darling Basin Authority website:
http://www.mdba.gov.au/media-pubs/publications/environmental-watering-plan/ewp/ewp_ch2

The adaptive management process is based upon four primary concepts illustrated in an iterative cycle: Plan, Do, Evaluate, and Adapt. This process allows flexibility to adjust management strategies and actions to address incorrect assumptions or changing conditions made during the planning process while maintaining the overall vane of the sustainability goal. This dynamic management strategy enables the reduction of basin mechanics uncertainty and applies lessons learned during progress toward the primary goal.

The terms “adaptive management” and “focus areas” are not defined explicitly in SGMA, but provisions to address modification of plans and management objectives are identified in California Water Code (Water Code) Section (§) 10728.2. In addition, Water Code § 10733.8 describes the 5-year review process for GSPs and the opportunity for adaptive management (corrective action) activities to be suggested by DWR to addresses GSP deficiencies. Water Code § 10727.2(b)(3) and subsections describe the implementation period, and potential for extending the period, based upon active projects to address issues in which progress is being demonstrated toward the sustainability goal – these represent entry points for adaptive management practices. Select provisions of the Water Code are provided in Section 3.0 of this document.

2.0 BACKGROUND

In 2014, legislation was passed that provides a statewide framework for sustainable groundwater management in California (Senate Bill [SB] 1168, Assembly Bill [AB] 1739, and SB 1319). This legislation, referred to as the SGMA, is intended to support local groundwater management through the oversight of a Groundwater Sustainability Agency (GSA). Only local agencies can elect to be a GSA. To avoid intervention by the State Water Resources Control Board (SWRCB), the SGMA requires that all area of a

basin be covered by one or more GSAs in all high- and medium-priority basins or subbasins by June 30, 2017. The legislation requires high- and medium-priority basins subject to critical conditions of overdraft to be managed under a GSP by January 31, 2020, and requires all other groundwater basins designated as high- or medium-priority to be managed under a GSP by January 31, 2022, and to require GSAs to achieve sustainability goals by 2040 or 2042.

This document presents preliminary draft information to promote discussion and is subject to revision. Furthermore, because this discussion paper addresses a variety of issues raised by individuals and entities outside of DWR, inclusion of the issues in this document does not constitute an endorsement of any particular issue. DWR invites comment and input on the preliminary draft information and questions presented in this document. Comments should be submitted to sgmps@water.ca.gov.

3.0 RELEVANT CALIFORNIA WATER CODE PROVISIONS

The following are Water Code provisions related to adaptive management.

Water Code § 10728.2 – Periodic Review and Assessment

A groundwater sustainability agency shall periodically evaluate its groundwater sustainability plan, assess changing conditions in the basin that may warrant modification of the plan or management objectives, and may adjust components in the plan. An evaluation of the plan shall focus on determining whether the actions under the plan are meeting the plan’s management objectives and whether those objectives are meeting the sustainability goal in the basin.

Water Code § 10728.2 describes the review process by **GSAs** to evaluate whether the management objectives are obtainable and the interim milestones are being met in pursuit of the sustainability goal. It also provides for the consideration of modification of the GSP to address disparities from the plan or changing conditions.

Water Code § 10733.8 – Department Review of Plans at Least Every Five Years

At least every five years after initial submission of a plan pursuant to Section 10733.4, the department shall review any available groundwater sustainability plan or alternative submitted in accordance with Section 10733.6, and the implementation of the corresponding groundwater sustainability program for consistency with this part, including achieving the sustainability goal. The department shall issue an assessment for each basin for which a plan or alternative has been submitted in accordance with this chapter, with an emphasis on assessing progress in achieving the sustainability goal within the basin. The assessment may include recommended corrective actions to address any deficiencies identified by the department.

Water Code § 10733.8 describes the review process by **DWR** to evaluate whether the management objectives are obtainable and the interim milestones are being met in pursuit of the sustainability goal. It also provides for the consideration of modification of the GSP to address disparities from the plan or changing conditions.

Water Code § 10727.2(b)(3)(A) and (B)(iii) – Establishment of Measureable Objectives, Performance Periods, and Opportunities for Extension

10727.2(b)(3)(A) Notwithstanding paragraph (1), at the request of the groundwater sustainability agency, the department may grant an extension of up to 5 years beyond the 20-year sustainability timeframe upon a showing of good cause. The department may grant a second extension of up to five years upon a showing of good cause if the groundwater sustainability agency has begun implementation of the work plan described in clause (iii) of subparagraph (B).

10727.2(b)(3)(B) The department may grant an extension pursuant to this paragraph if the groundwater sustainability agency does all of the following:

- (i) Demonstrates a need for an extension.*
- (ii) Has made progress toward meeting the sustainability goal as demonstrated by its progress at achieving the milestones identified in its groundwater sustainability plan.*
- (iii) Adopts a feasible work plan for meeting the sustainability goal during the extension period.*

Water Code § 10727.2(b)(3)(A) and (B) describe entry points into the adaptive management process where, over a given implementation horizon, extensions can be granted when substantial progress has been made or specific work plans to address the conditions have been prepared and are being implemented.

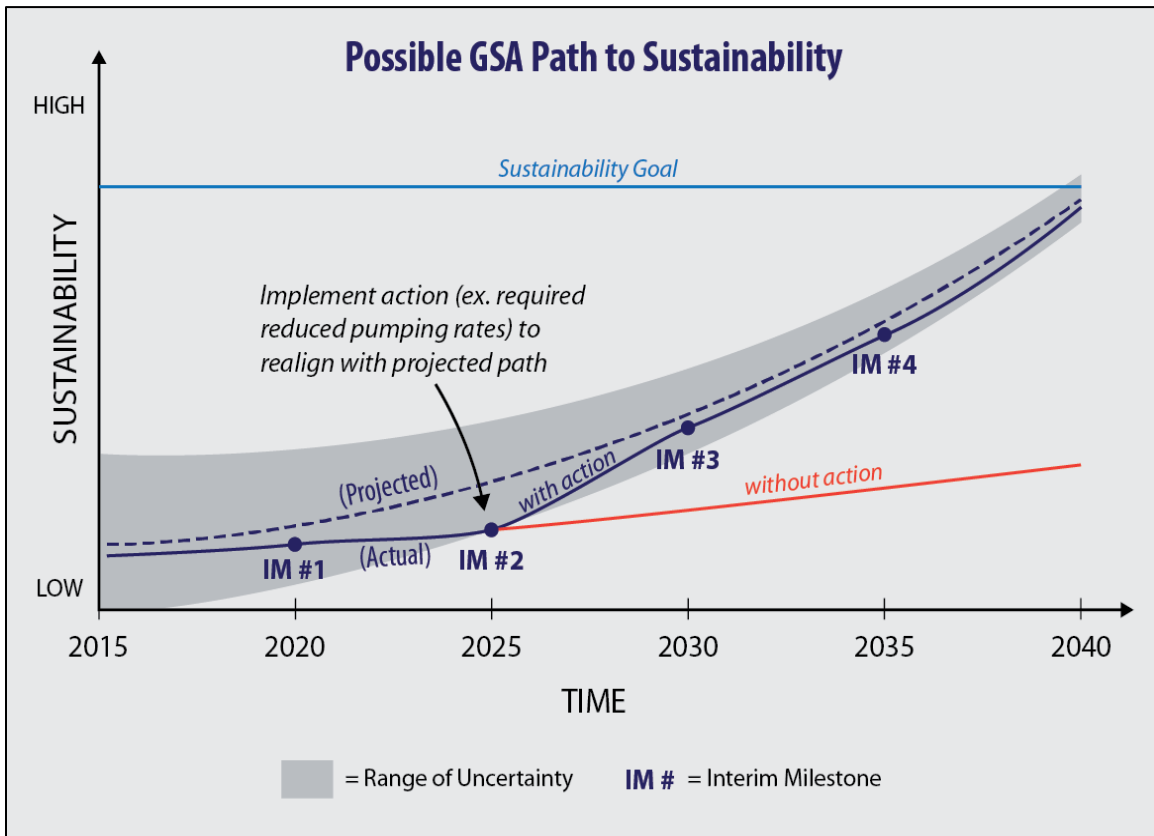
4.0 TOPIC QUESTIONS AND CONSIDERATIONS

The following are a series of topic-based considerations and questions designed to advance the discussion with stakeholders and the public as part of DWR's outreach activities.

Potential Considerations to Include Adaptive Management Actions as Part of GSP Implementation

As local agencies establish GSPs for their respective basins, consideration of uncertainty should be incorporated to specifically include plans for adaptive management actions. **Figure 2** illustrates a planned pathway to meet the interim milestones, measurable objectives, and ultimately the basin's sustainability goal. However, the graph also illustrates that the outcomes may not always be predictable and the observed conditions may not always align with a previously planned condition. At this point of the implementation process, there is an opportunity to apply adaptive management practices to correct projected outcomes. Incorporation of corrective actions to address departures from the initial planning pathway will often save time and money and help ensure success over the longer planning horizon.

FIGURE 2 – INTERIM MILESTONES ARE NECESSARY TO TRIGGER ACTIONS IF MEASURABLE OBJECTIVES ARE NOT BEING ACHIEVED AS PLANNED



In many previous groundwater management plans (GWMPs), trigger levels and thresholds were established to initiate predefined management actions. The use of thresholds and triggers allows for initiation of adaptive management actions when key predefined conditions have been met.

These actions, if planned and initiated early, can help to maintain a successful trajectory towards the sustainability goal. It also provides an early approach to address potential non-compliance and may consequently support the potential need for additional time to meet the sustainability goal, as described in Water Code § 10727.2(b)(3).

Questions:

- What factors should DWR consider when evaluating a request for an extension?
- What level of coordination and communication should there be with DWR when a GSA changes GSP implementation in response to adaptive management?
- Should DWR utilize the “Annual Review” process to engage GSAs when deviation from the planned trajectory is observed and open discussion of adaptation or technical assistance?

Adaptive Management

Adapting groundwater management to new information and changing conditions, and to provide flexibility for local agencies to address uncertainties may provide an opportunity for GSAs to meet their measurable objectives without undue punitive actions. The intent of adaptive management is to establish an iterative planning process to aid in maintaining a trajectory toward the sustainability goal, without systematically defaulting into probationary status.

The adaptive management process should not be considered an opportunity to continuously change a GSP's measurable objectives and/or actions without strong justification that new knowledge (i.e., data and information) justifies a change. In addition, the implementation of adaptive management does not remove the need to meet SGMA requirements.

Questions:

- Should GSP regulations allow for inclusion of an adaptive management process? Is there a distinction between adaptive management and a contingency plan?
- Should plans be required to define trigger levels or thresholds and establish a point when adaptive management will be initiated? If, through the adaptive management process, a GSA wishes to change a measurable objective and/or action, what type of revision requirement (i.e., approved addendum) should be considered to the GSP?
- In addition, what type of data and information may be necessary to support changing a GSP's measurable objectives and/or management actions? If the adaptive management process starts a new iterative management loop, how long should the adaptive actions be allowed to run before probationary status is triggered?

Focus Areas

As stated above, because flexibility will be necessary for local agencies to address GSPs, the focus area approach allows for prioritization of localized regions or issues within a basin, which may be encountering undesirable results that need to be addressed with limited available resources. The process would recognize the need to address the highest-priority issues to close the gap towards the sustainability goal (i.e., "the biggest bang for the buck"). These focus areas may be identified during annual or 5-year updates and include modification or creation of milestones or management activities that will address the observed conditions. The flexibility of GSAs to operate within the focus area concept does not preclude the SGMA intent for compliance over the entire basin. Although specific problems or regions of a basin may be identified as having issues that require the most urgent attention, ultimately, groundwater sustainability must be achieved throughout the entire basin.

Questions:

- How should GSP regulations consider the concept of a focus area, if at all?
- Should a technical assistance program be established for the express purpose of addressing issues in focus areas in the basin?
- Could there be a separate reporting/communication requirement to demonstrate focus area progress (or adaptive management) actions to DWR?