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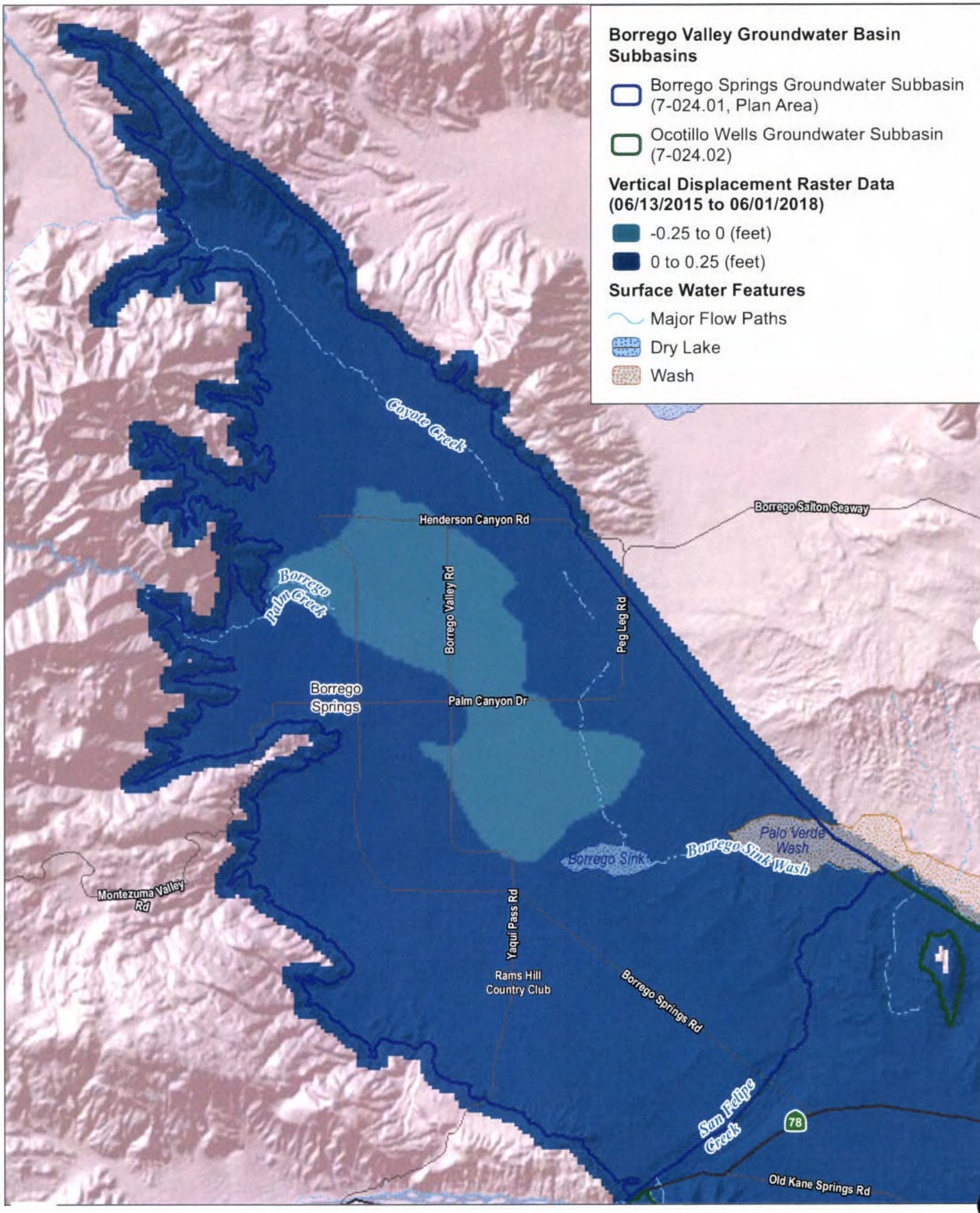

DATUM: NAD 1983. DATA SOURCE: TRE Altamira InSAR Dataset

DUDEK January 2020 0 1 2 Miles

Figure 2.2-17
Land Subsidence

Groundwater Sustainability Plan for the Borrego Springs Groundwater Subbasin

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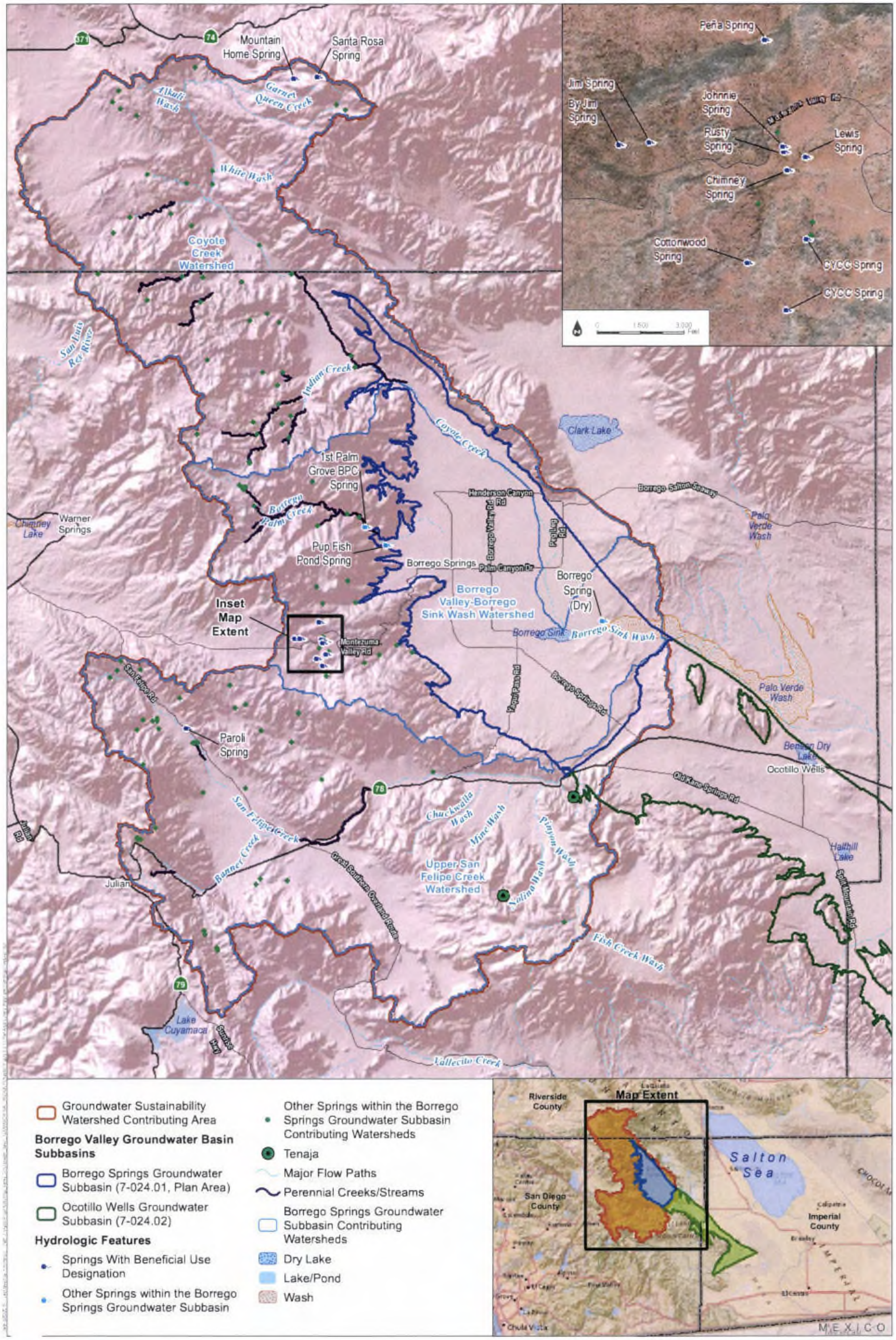

DATUM: NAD 1983 DATA SOURCE: DWR 2015, USGS NHD 2017, State Parks 2017

DUDEK January 2020 0 1.5 3 Miles

Figure 2.2-18
Plan Area Surface Water and Hydrologic Features
Groundwater Sustainability Plan for the Borrego Springs Groundwater Subbasin

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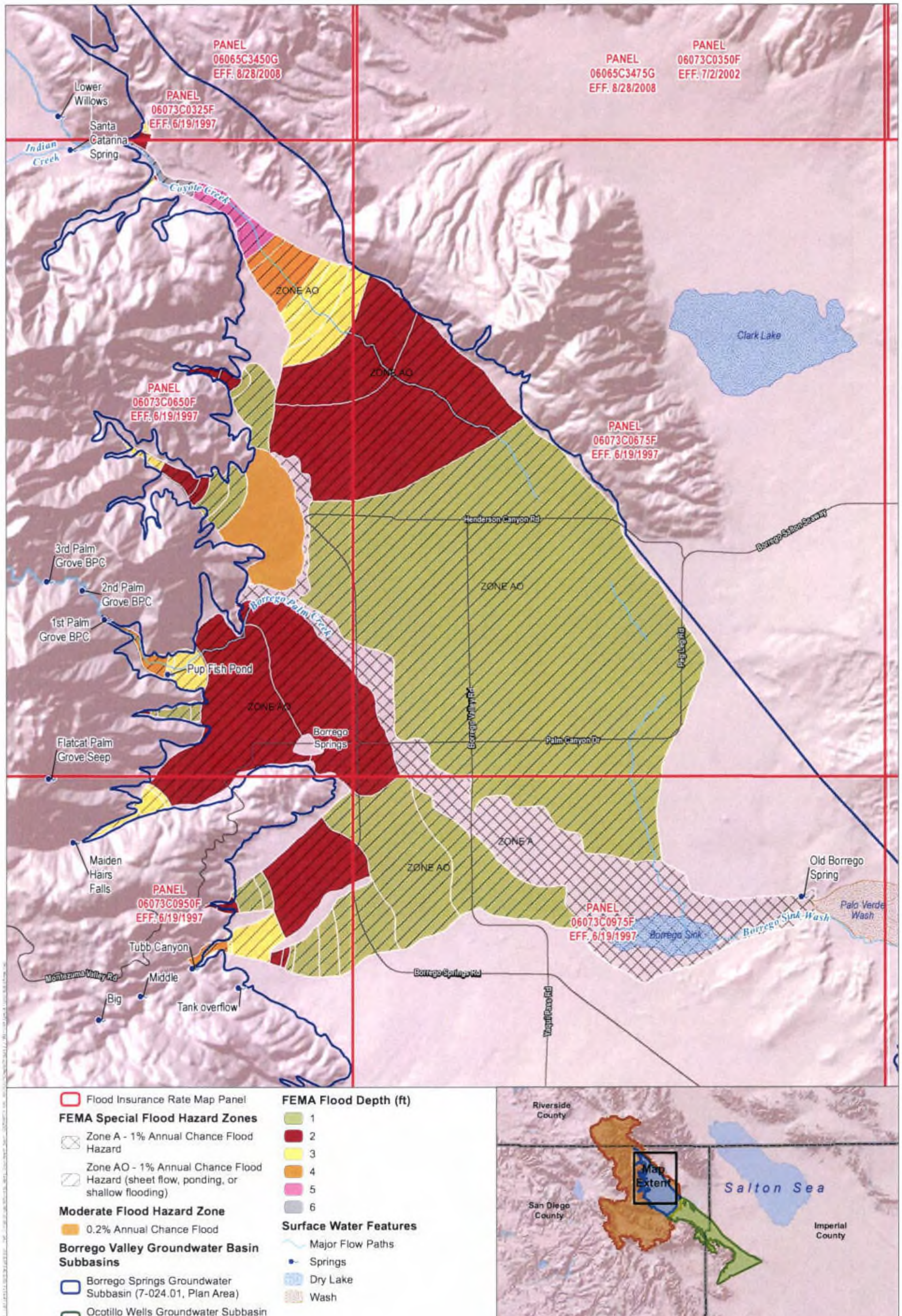

DATUM: NAD 1983 DATA SOURCE: FEMA 2017

DUDEK January 2020

Figure 2.2-19
FEMA Special Flood Hazard Areas
Groundwater Sustainability Plan for the Borrego Springs Groundwater Subbasin

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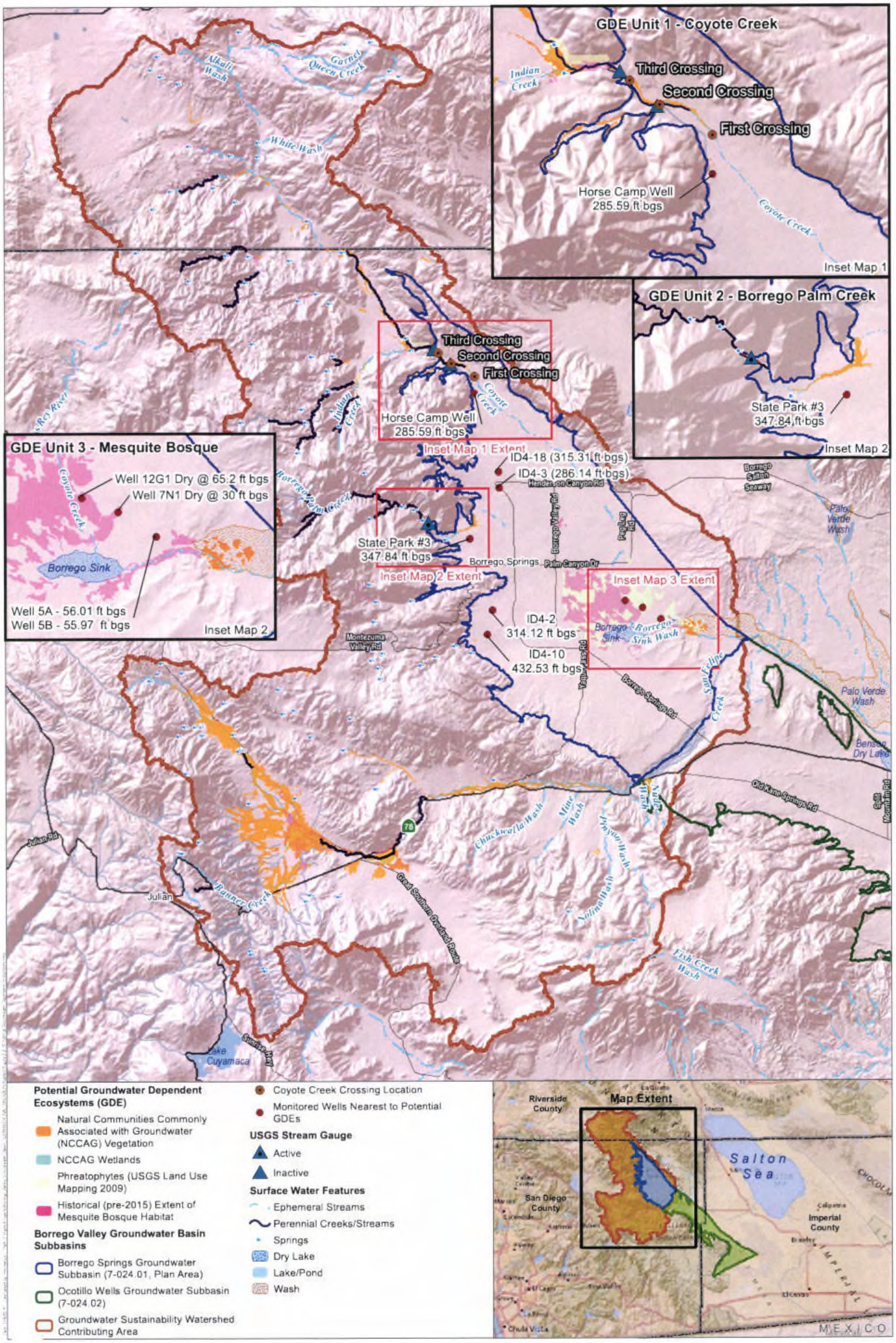

DATUM: NAD 1983 DATA SOURCE: DWR 2018, USGS NHD 2017, State Parks 2017, SanGIS 2017

DUDEK January 2020

Figure 2.2-20
Potential Groundwater Dependent Ecosystems
Groundwater Sustainability Plan for the Borrego Springs Groundwater Subbasin

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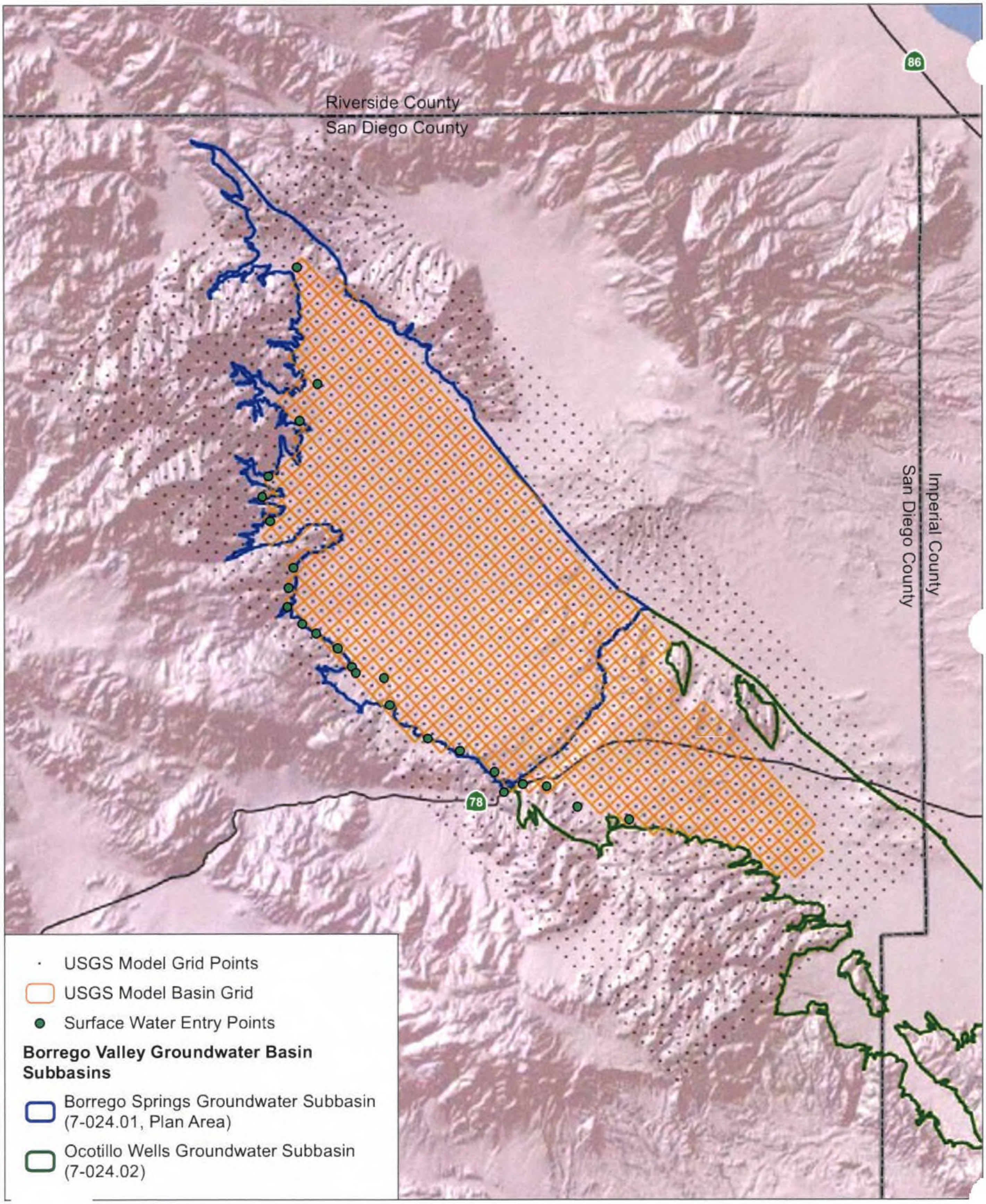

DATUM: NAD 1983. DATA SOURCE: DWR 2015, USGS 2015

DUDEK January 2020

Figure 2.2-21
Model Grid

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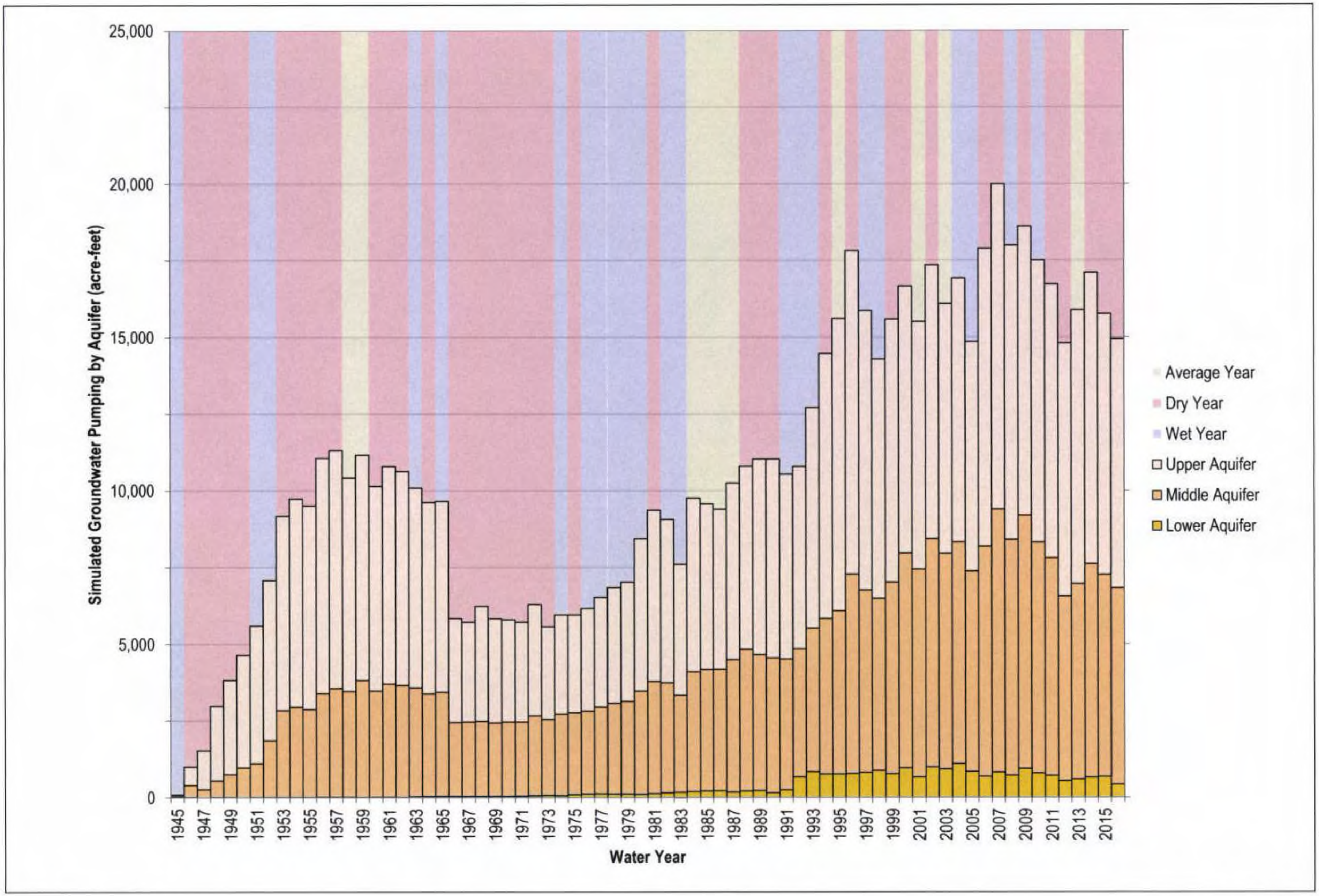

SOURCE: Modified from USGS 2015

FIGURE 2.2-22A

Simulated Groundwater Pumpage by Aquifer (1945-2016)

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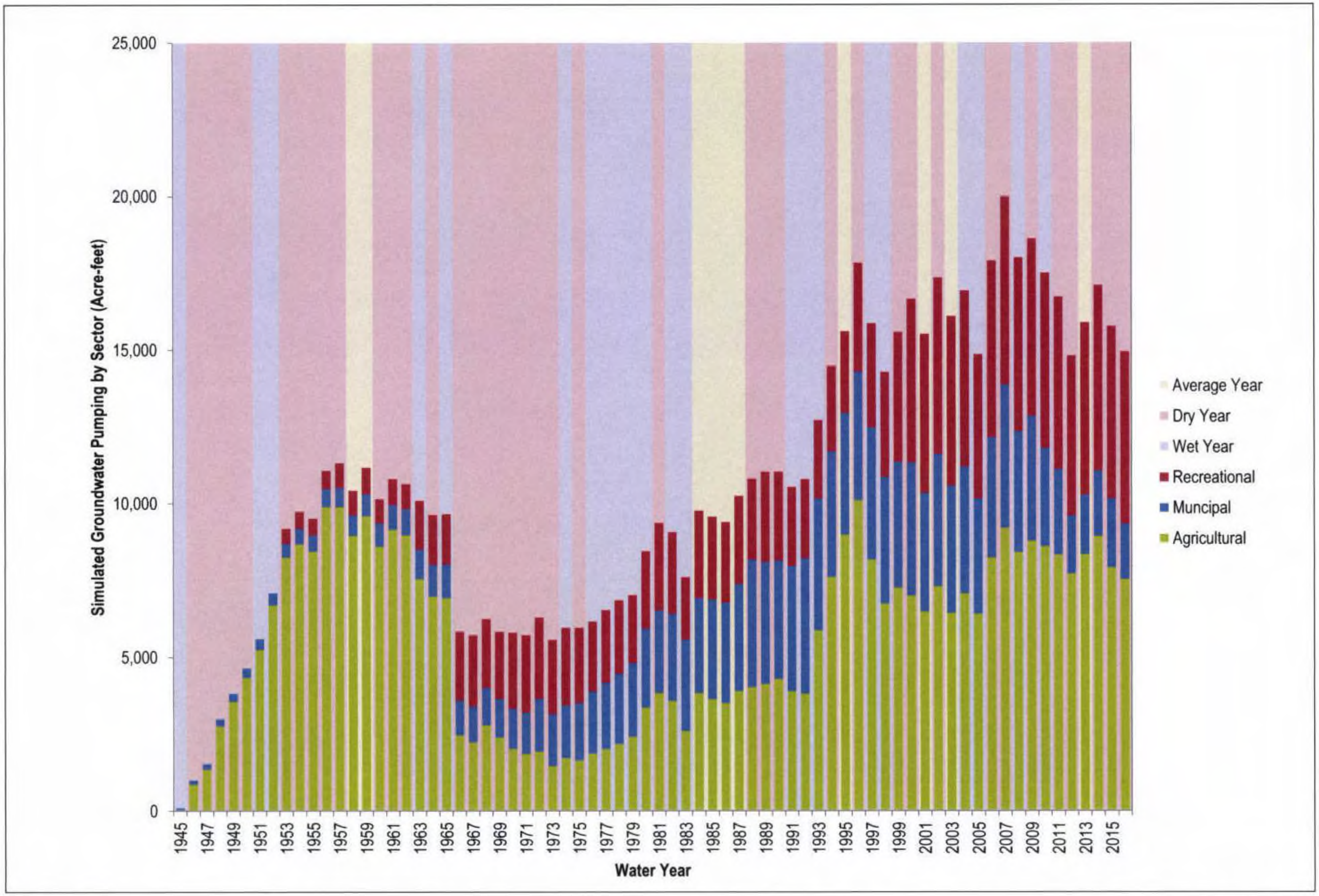

SOURCE: USGS 2015

FIGURE 2.2-22B

Estimated Water Use by Sector (1945 - 2016)

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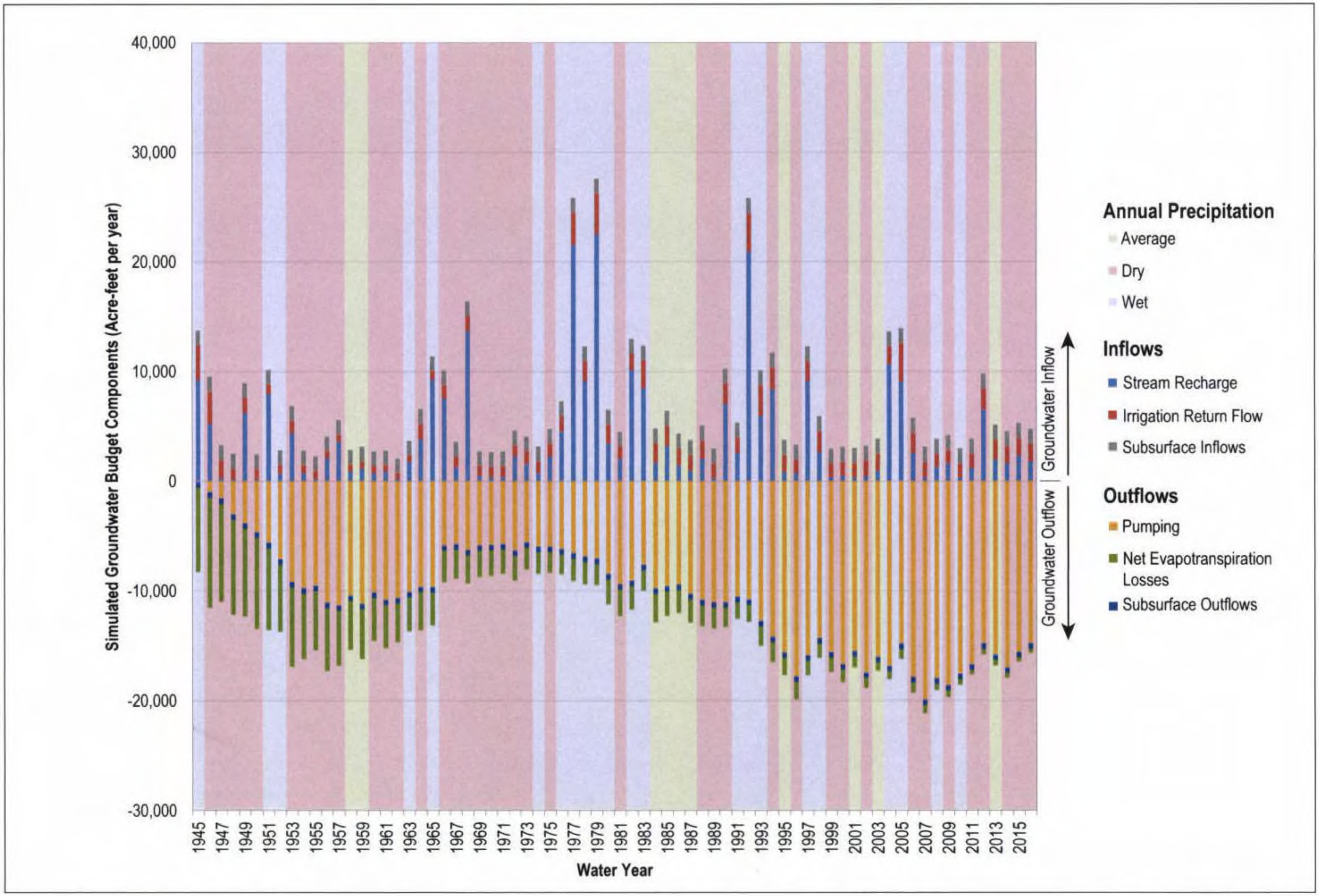

SOURCE: USGS 2015, Dudek 2017

FIGURE 2.2-23A

Groundwater Inflows and Outflows by Year (1945 - 2016)

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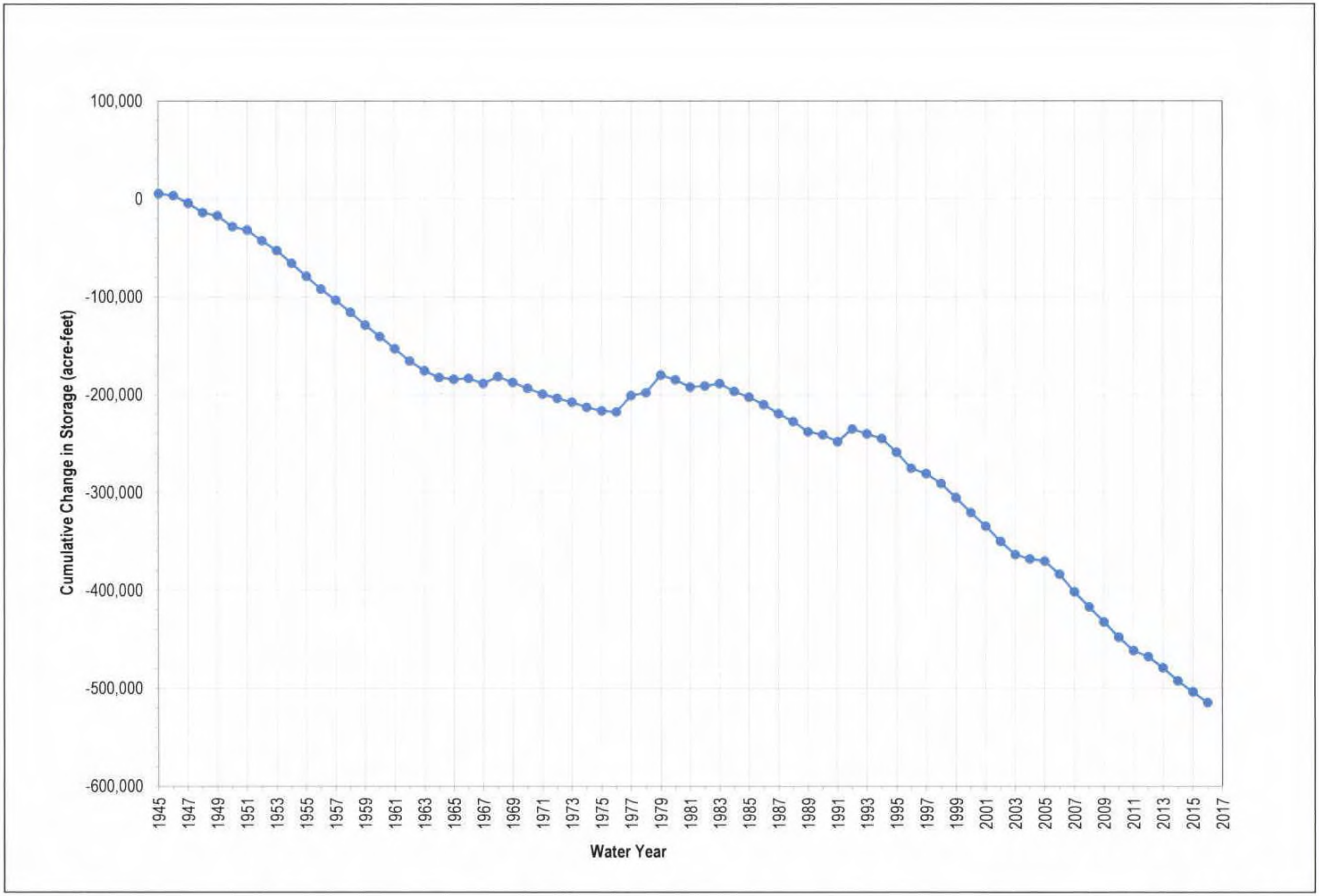

SOURCE: USGS 2015

FIGURE 2.2-23B

Cumulative Change in Storage by Year (1945 - 2016)

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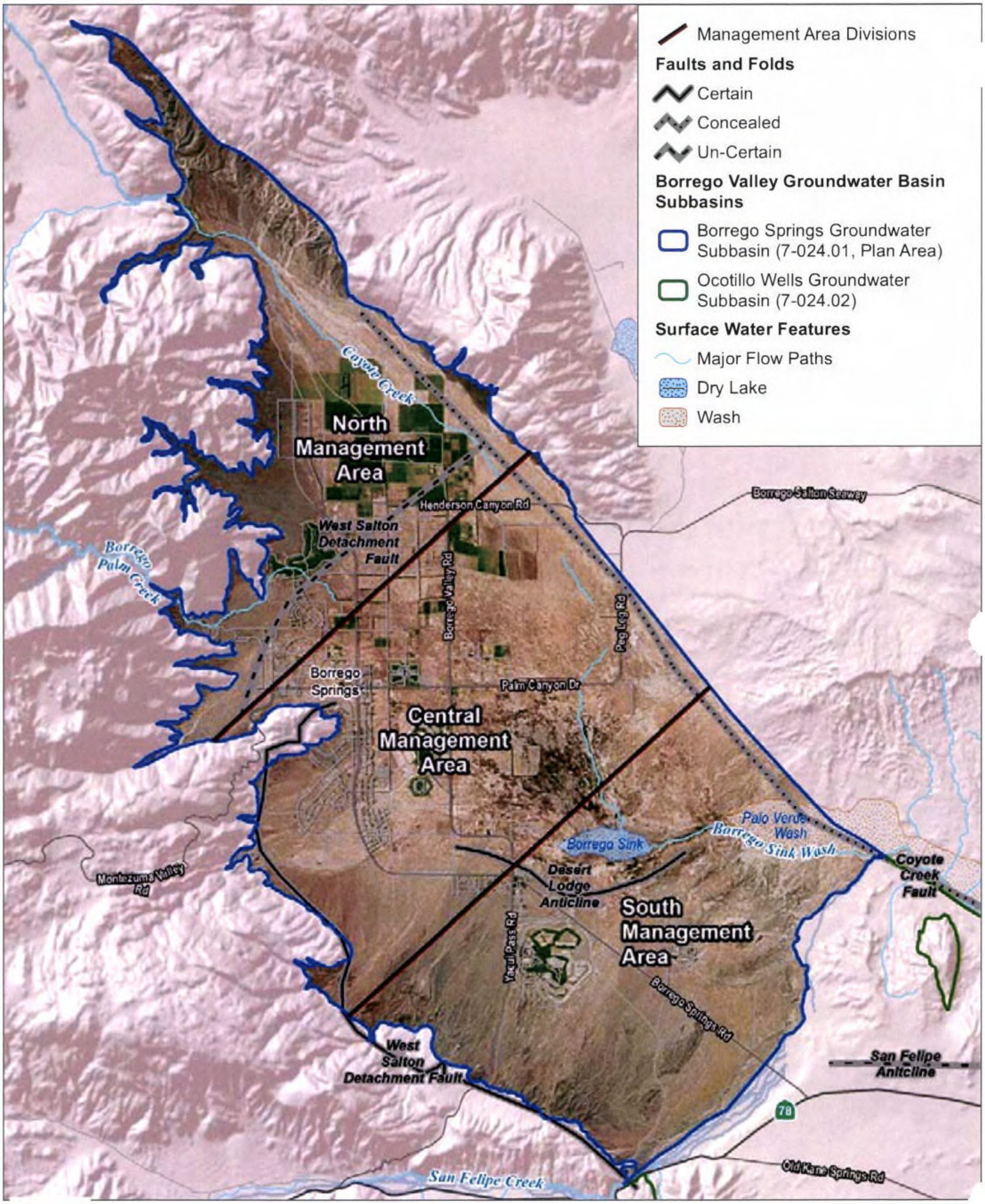

Figure 2.2-24

Groundwater Management Areas

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CHAPTER 3
SUSTAINABLE MANAGEMENT CRITERIA

This chapter of the Groundwater Management Plan (GMP, Plan) provides a discussion of the sustainability goal (Section 3.1), undesirable results (Section 3.2), minimum thresholds (Section 3.3), and the measurable objectives to avoid undesirable results (Section 3.4) applicable to the Borrego Springs Groundwater Subbasin (Subbasin, Plan Area).[1] Undesirable results occur when significant and unreasonable effects for any of the sustainability indicators[2] defined by the Sustainable Groundwater Management Act (SGMA) are caused by groundwater conditions occurring in one of the Subbasin's three management areas, or throughout the Subbasin. This chapter describes the criteria by which the GMP defines undesirable results within the Subbasin, and identifies what constitutes sustainable groundwater management for the Subbasin, including the process by which the GMP establishes minimum thresholds[3] and measurable objectives[4] for each applicable sustainability indicator (Title 23 California Code of Regulations [CCR] Section 354.22). Accordingly, the following Sections 3.2, 3.3, and 3.4 are subdivided to address each groundwater sustainability indicator. Undesirable results can vary for each management area of the Subbasin, and the beneficial uses and users supported by the Subbasin's aquifers. Section 3.5 provides a description of the monitoring network to measure each applicable sustainability indicator.

The Watermaster will periodically evaluate this GMP, assess changing conditions in the Subbasin that may warrant modification of the Plan or management objectives, and may adjust components accordingly. The Watermaster will focus its evaluation on determining whether the actions under the Physical Solution are meeting the Plan's management objectives and whether those objectives are meeting the sustainability goal in the Subbasin.

3.1 SUSTAINABILITY GOAL

3.1.1 Standards for Establishing the Sustainability Goal

A sustainability goal means the existence and implementation of one or more GSP's "that achieve sustainable groundwater management by identifying and causing the implementation of measures

1 A basin is a groundwater basin *or subbasin* [emphasis added] identified and defined in Bulletin 118 or as modified pursuant to a basin boundary modification approved by the Department of Water Resources (CWC Section 10721). In the context of this GSP, the word "basin" means the Borrego Springs Subbasin, unless otherwise specified.

2 A sustainability indicator refers to "any of the effects caused by groundwater conditions occurring throughout the basin that, when significant and unreasonable, cause undesirable results" (Title 23 CCR Section 351(ah)).

3 A minimum threshold means "a numeric value for each sustainability indicator used to define undesirable results" (Title 23 CCR Section 351(t)).

4 A measurable objective means "specific, quantifiable goals for the maintenance or improvement of specified groundwater conditions that have been included in an adopted Plan to achieve the sustainability goal for the basin" (Title 23 CCR Section 351(s)).

targeted to ensure the . . . basin is operated within its sustainable yield[5]" (California Water Code [CWC] Section 10721(u))." "Sustainable groundwater management" means the "management and use of groundwater in a manner that can be maintained during the planning and implementation horizon without causing undesirable results" (CWC Section 10721(v)). Undesirable results include chronic lowering of groundwater levels indicating a significant and unreasonable depletion of supply, significant and unreasonable reduction of groundwater storage, significant and unreasonable degraded water quality, and depletions of interconnected surface water that have significant and unreasonable adverse impacts on beneficial uses of the surface water (CWC Section 10721(x)).

The California Department of Water Resources (DWR) SGMA GSP regulations (Title 23 CCR Section 350, et seq.) provide supplemental information about the sustainability goal. For example, the regulations state: "Each Agency shall establish in its Plan a sustainability goal for the basin that culminates in the absence of undesirable results within 20 years of the applicable statutory deadline. The Plan shall include a description of the sustainability goal, including:

- information from the basin setting used to establish the sustainability goal,
- a discussion of the measures that will be implemented to ensure that the basin will be operated within its sustainable yield, and
- an explanation of how the sustainability goal is likely to be achieved within 20 years of Plan implementation and is likely to be maintained through the planning and implementation horizon" (Title 23 CCR Section 354.24).

3.1.2 Background

The Borrego Springs community overlying the Subbasin relies on local groundwater resources as the sole source of municipal drinking water, domestic supply, and agricultural irrigation. Recreational water use in the Subbasin is entirely supported by groundwater. Groundwater also supports other beneficial uses, as described in Chapter 2, Plan Area and Basin Setting, of this GMP, including those set forth in the *Water Quality Control Plan for the Colorado River Basin* (Basin Plan). The current rate of groundwater production from the Subbasin is not sustainable and, if not moderated, threatens to impact the beneficial uses and users of groundwater in the Plan Area. Impacts to beneficial uses and users may include decreased well production rate, increased pumping costs, dry wells, and/or increasingly poor water quality. Without action, groundwater could become much more challenging and expensive to access and potentially

5 "Sustainable yield" means the maximum quantity of water, calculated over a base period representative of long-term conditions in the basin and including any temporary surplus, that can be withdrawn annually from a groundwater supply without causing an undesirable result [CWC Section 10721(w)].

insufficient in quantity and quality to support beneficial uses. The community of Borrego Springs is a small and severely disadvantaged community (DWR 2018a).[6] The continued overdraft of the basin at its present rate of pumping could cause severe economic hardship for the community.

Annual natural recharge to the Subbasin is small compared to the volume of groundwater available in storage. Since inception of large-scale pumping in the Subbasin in the 1940s, an imbalance of groundwater extraction exceeding recharge has occurred. In other words, annual groundwater extraction from the Subbasin has exceeded recharge over multiple decades resulting in a depletion or "mining" of the groundwater resource. According to the results of the Borrego Valley Hydrologic Model (BVHM) described in Section 2.2.3, Water Budget, the cumulative volume of storage lost from the Subbasin between 1945 and 2016 is approximately 520,000 acre-feet (AF), which is a sum of the annual differences between Subbasin inflows and outflows. The storage capacity of the Borrego Valley Groundwater Basin (which includes the Ocotillo Wells Subbasin), based on stable groundwater levels before groundwater development began, is estimated to have been about 5,500,000 AF (USGS 1982). Based upon subsequent study by Dr. David Huntley, the majority of readily available water to existing well users in the Borrego Valley exists in the upper and middle aquifers. The amount of groundwater within these two aquifers within the Subbasin was estimated to be approximately 2,131,000 AF in 1945 and 1,900,500 AF in 1979 (Huntley 1993). The remaining water located within the lower aquifer is more difficult and costly to extract due to its low specific yield (estimated to be approximately 3%), its depth, and low specific capacity (estimated to be 5 gallons per minute/foot of drawdown or less) (County of San Diego 2010). Furthermore, as groundwater levels continue to drop in the Subbasin, an increasing percentage of water will be pumped from the lower aquifer, which has a lower yield, but is also likely to yield lower quality water (elevated total dissolved solids (TDS), sulfates, and arsenic), as discussed in Section 2.2.2.4. The BVHM estimates that total storage loss from water year 1980 through water year 2016 is 334,293 AF. Therefore, as of 2016, the volume of groundwater in storage within the upper and middle aquifers of the Subbasin is approximately 1,566,207 AF.

Outright depletion (dewatering) of a groundwater resource is a serious condition for a community that is totally reliant on groundwater supply. Depletion also means that the groundwater resource has been effectively permanently removed, from storage without the ability to recover under current climate conditions and pumping volumes. In order to begin to bring the Subbasin back into balance, it is estimated that approximately 75% of the maximum baseline pumping in the Subbasin, on average, will

6 Severely disadvantaged communities are those census geographies with an annual median household income that is less than 60 percent of the Statewide annual median household income. The statewide median household income for 2012–2016 (the current dataset) is $63,783; therefore, the calculated severely disadvantaged community threshold is $38,270.

need to be reduced over the GMP implementation period and through the planning an implementation horizon.

3.1.3 Sustainability Goal

The Physical Solution's sustainability goal is to ensure that by 2040, and thereafter within the planning and implementation horizon of this GMP (50 years), the Subbasin is operated within its sustainable yield and does not exhibit undesirable results.

Meeting this goal requires achieving a balance of water demand with available water supply, while protecting water quality, by the end of the GMP implementation timeframe, carrying through the SGMA planning and implementation horizon. A good analogy is a prudent financial routine of "balancing the books" whereby the totals of debit (groundwater withdrawal) and credits (recharge) are brought into agreement to determine the profit or loss (change in groundwater storage) made during a period of time (annually or over a longer period of time such as a hydrologic cycle). Central to achieving this goal is a strong understanding of the local setting of the Subbasin described in Chapter 2. The Subbasin is totally groundwater dependent with no immediately viable alternative sources of water supply such as imported water, recycled water or groundwater from adjacent basins/subbasins (USBR 2015; Dudek 2018; BWD 2000, 2002).

Conditions within the Subbasin will be considered sustainable when the following sustainability goals are met:

- Long-term, aggregate groundwater use is less than or equal to the Subbasin's estimated sustainable yield, as defined by SGMA (Section 2.2.3.6, Sustainable Yield Estimate);
- The rate of groundwater level change within the Subbasin, averaged across indicator wells in the previous reporting period, is generally stable or increasing when compared to the contemporary groundwater level trend (i.e., 10-year trend 2010–2020 or trend based on available data) (Section 2.2.2.1, Groundwater Elevation Data);
- Groundwater levels are maintained at elevations necessary to avoid undesirable results. Lowering of groundwater levels potentially leading to significant and unreasonable depletions of available water supply for beneficial use could occur if groundwater levels fall below the top of screened intervals for key municipal water wells, or result in the loss of water availability for domestic well users (Section 2.2.2.1, Groundwater Elevation Data);
- Groundwater quality, as measured in municipal and domestic water wells, generally exhibits a stable and/or improving trend for identified contaminants of concern: arsenic, nitrate, sulfate, and TDS (Section 2.2.2.4, Groundwater Quality); and

- Groundwater quality is suitable for existing and future beneficial uses (Section 2.2.2.4, Groundwater Quality).

3.1.4 Sustainability Strategy

To ensure the Subbasin meets its sustainability goal by 2040, the Physical Solution includes several projects and management actions (PMAs) detailed in Chapter 4, Projects and Management Actions, to address undesirable results. The PMAs expected to be implemented are: (1) Water Trading Program, (2) Water Conservation Program, (3) Pumping Reduction Program, (4) Voluntary Fallowing of Agricultural Land, (5) Water Quality Optimization, and (6) Intra-Subbasin Water Transfers. The overarching sustainability goal as well as the absence of undesirable results are expected to be achieved by 2040 through implementation of the PMAs. The sustainability goals will be maintained through proactive monitoring and management by the Watermaster as described in this and the following chapters.

Table 3-1 summarizes whether each of the six undesirable results has occurred, is occurring, or is expected to occur in the future in the Subbasin without GMP implementation, and shows the PMAs that have been developed to address each of the undesirable results presently occurring. The community of Borrego Springs has been acutely aware of its water problems for over 25 years, and the major drought period from 2012 through 2016 led to further heightened public awareness. Because supply augmentation through local and/or imported surface water is not a feasible option for the Subbasin at this time, the only tool available to the Watermaster to achieve groundwater sustainability is through demand reduction. The Borrego Water District (BWD) already implements a water conservation (shortage) policy, some golf courses have already implemented technologies and landscape practices that save water, and agricultural users have implemented increasingly efficient irrigation systems over the years. It is important to continue to implement and strengthen water conservation practices, as proposed in the water conservation PMA, because opportunity remains for further water savings, particularly with regard to the outdoor water use of BWD customers.

Considering the water conservation already achieved, and the diminishing returns in the volume of water that can be saved through conservation alone, the most critical PMAs to realize the pumping/water use reductions needed to achieve the Physical Solution's sustainability goal are the voluntary fallowing of agricultural land, and the pumping reduction program. The pumping reduction program caps water use at the beginning of the implementation period (a total pumping allowance of 22,600 acre-feet per year (AFY)) and gradually reduces the cap to a level that matches the sustainable yield of the Subbasin (initially 5,700 AFY) by 2040. Because agriculture accounts for approximately 70% of groundwater used in the Subbasin, such a drastic reduction cannot be achieved without continuing the permanent fallowing of agricultural land or conversion to substantially lower water demand uses on agricultural land. The Water Trading

Program is a PMA expected to replace the existing water credit program that assigned a water allocation for fallowing of primarily agricultural land based on crop or turf type and allowed for water credits to be transferred to new development to offset water demand. The water trading PMA ties into the pumping reduction program and voluntary fallowing of agricultural land by preserving the economic value of water as its availability is capped and reduced over time, and by providing for flexibility in the types of economic development or redevelopment that can occur, where consistent with water availability, general plan and zoning designations, and land use regulations.

Table 3-1
Summary of Undesirable Results Applicable to the Plan Area

Sustainability Indicator	Historical (Pre-2015)	Existing Conditions	Future Conditions Without GMP Implementation	PMAs Implemented to Meet the GMP's Sustainability Goal
Chronic Lowering of Groundwater Levels	Significant and Unreasonable	Significant and Unreasonable	Significant and Unreasonable	Water Trading Program, Water Conservation, Pumping Reduction Program, Voluntary Fallowing of Agricultural Land, Intra-Subbasin Water Transfers
Reduction of Groundwater Storage	Significant and Unreasonable	Significant and Unreasonable	Significant and Unreasonable	
Seawater Intrusion	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Degraded Water Quality	Not Significant	Not Significant	Significant and Unreasonable	Pumping Reduction Program, Voluntary Fallowing of Agricultural Land, Water Quality Optimization, Intra-Subbasin Water Transfers
Land Subsidence	Not Significant	Not Significant	Not Significant	Not Applicable
Interconnected Surface Water	Significant and Unreasonable	Not Applicable*	Not Applicable*	Not Applicable

Notes: GMP = Groundwater Management Plan; PMA = Projects and Management Action
* See following Sections 3.2 6 and 3 2 7

3.2 UNDESIRABLE RESULTS

Standards for the Description of Undesirable Results

According to GSP Regulations, the GSP's description of undesirable results is to include the following:

1. The cause of groundwater conditions occurring throughout the basin that would lead to or has led to undesirable results based on information described in the basin setting, and other data or models as appropriate.
2. The criteria used to define when and where the effects of the groundwater conditions cause undesirable results for each applicable sustainability indicator. The criteria shall be

based on a quantitative description of the combination of minimum threshold exceedances that cause significant and unreasonable effects in the basin.

3. Potential effects on the beneficial uses and users of groundwater, on land uses and property interests, and other potential effects that may occur or are occurring from undesirable results (Title 23 CCR Section 354.26(b)).

Under SGMA, undesirable results occur when the effects caused by groundwater conditions occurring throughout the basin cause significant and unreasonable impacts to any of the six sustainability indicators. That is, the "significant and unreasonable occurrence of any of the six sustainability indicators constitutes an undesirable result" (DWR, Draft Sustainable Management Criteria, Best Management Practice, Section 4, p. 5). These sustainability indicators are:

- Chronic lowering of groundwater levels
- Reduction of groundwater storage
- Seawater intrusion
- Degraded water quality
- Land subsidence
- Depletions of interconnected surface water

Application of Standards in the Borrego Subbasin

Each of the sustainability indicators for the Subbasin is discussed as follows, in the context of undesirable results.

3.2.1 Chronic Lowering of Groundwater Levels – Undesirable Results

Chronic lowering of groundwater levels in the Subbasin's aquifers has historically occurred and is ongoing due to groundwater production for agricultural, municipal, recreational and domestic use that exceeds the long-term sustainable yield of the Subbasin and the absence of any viable alternative source of water supply. The existing beneficial uses and users of Subbasin water are described in Section 2.1.4, Beneficial Uses and Users. The beneficial uses for groundwater for the Anza Borrego Hydrologic Unit are defined in the Basin Plan as Municipal and Domestic Supply (MUN), Industrial Service Supply (IND), and Agriculture Supply (AGR) as described in Section 2.1.2,Water Resources Monitoring and Management Programs. SGMA requires that all beneficial uses and users of groundwater, including groundwater dependent ecosystems (GDEs), be considered in GSPs (CWC Section 10723.2). The honey mesquite in the vicinity of the Borrego

Sink is the primary GDE identified within the Plan Area that has historically been affected by pumping as described in Section 2.2.2.7, Identification of Groundwater Dependent Ecosystems.

Undesirable results associated with chronic (i.e., persistent and long-term) lowering of groundwater levels are most directly indicated by loss of access to adequate water resources for support of current and/or potential future beneficial uses and users. As discussed in Section 2.2.2.1, Groundwater Elevation Data, the rate of groundwater level decline within the Subbasin is variable across the Plan Area, generally decreasing in magnitude from north to south. The North Management Area (NMA) exhibits the steepest groundwater level declines since 1945 (average rate of 1.95 feet per year) due to pumping for primarily agricultural uses; the Central Management Area (CMA) exhibits substantial but somewhat less severe declines (average rate of 1.33 feet per year) due to pumping for primarily municipal, domestic and recreational uses; and the South Management Area (SMA) has up until 2014 exhibited minimal if any decline, though the resumption of groundwater pumping to support recreation at Rams Hill Golf Club resulted in a localized decline in groundwater levels, as shown by MW-3 in Figure 2.2-13F. Domestic users of groundwater, including customers of the BWD, are predominantly supplied groundwater produced from wells located within CMA, and to a lesser degree the SMA and NMA. Failure to address and reverse the current rate of groundwater level decline could put domestic, agricultural, recreational and water supply availability for other beneficial uses at risk.

Groundwater level declines indicating a significant and unreasonable depletion of supply, if continued over the SGMA planning and implementation horizon, can occur in several ways in the Subbasin. Depletions leading to a complete dewatering of the Subbasin's upper aquifer in the CMA would be considered significant and unreasonable because beneficial users rely on this aquifer for water supply. Groundwater level declines would be significant and unreasonable if they are sufficient in magnitude to lower the rate of production of pre-existing groundwater extraction wells below that needed to meet the minimum required to support the overlying beneficial use(s), and that alternative means of obtaining sufficient groundwater resources are not technically or financially feasible. To the extent lowering groundwater levels impact *de minimis*[7] pumpers, significant and unreasonable impacts to those pumpers could be avoided. For example, alternative means of obtaining water for *de minimis* and domestic pumpers who can no longer pump may include connection to the municipal water system (i.e., BWD), groundwater well maintenance or rehabilitation (e.g., well pump lowering), or for some beneficial users, well redevelopment or deepening. However, use of these alternative means of supply, by themselves, do not necessarily offset undesirable results for lowering groundwater levels in the context of the Subbasin as a whole (as opposed to individual uses or users),

7 SGMA defines a de minimis extractor as "a person who extracts, for domestic purposes, two acre-feet or less (of groundwater) per year."

because the ultimate source of supply remains groundwater pumped from the Subbasin, even if from another location.

Undertaking an evaluation for one particular use or user depends on the overlying beneficial use(s), the location within the Subbasin, and the characteristics of the well(s) currently in use. Should a groundwater level decline cause the production rate of pre-existing groundwater wells to be insufficient for the applicable beneficial use, an undesirable result may be avoided for that particular user through the alternative means shown in Table 3-2. Table 3-2 acknowledges that certain beneficial users have greater flexibility and financial capacity to address lowering groundwater levels than others. For example, the BWD, as the municipal water system, has the ability to manage production from multiple extraction wells across its service area, normally distributes the cost for well maintenance and development to its pool of customers, and can obtain grants for such work, if available. In contrast, domestic and *de minimis* users can have geographic and financial constraints that may make well redevelopment and/or new well construction infeasible. Given the considerations previously outlined, domestic well users who are not in close proximity to existing BWD water service lines have the greatest sensitivity to and are consequently the most likely to experience the adverse effects of continued declining groundwater levels.

Table 3-2
Means of Addressing Decreasing Well Production by Use

	Municipal Uses	Agricultural Uses	Recreational Uses	Domestic/*De Minimis* Uses
Connection to Municipal Water System	N/A		✓	*
Well Maintenance (e.g., brushing and bailing, pump lowering, repair or replacement)	✓	✓	✓	✓
Well Redevelopment/Deepening	✓	✓	✓	*
Well Abandonment/New Well Development	✓	✓	✓	*

Notes: N/A = not applicable.
* Domestic and *de minimis* users may have geographic, financial, and technical constraints that limit the ability to modify or deepen wells Furthermore, based on Borrego Water District's (BWD's) water supply pipeline distribution system, some – but not all – domestic and *de minimis* users can be hooked into the BWD system.

The upper aquifer currently hosts the most accessible (i.e., shallowest) and highest-yielding wells within the Subbasin as a whole. Figure 3.2-1 shows the extent of the upper aquifer, and a representation of the percentage of the aquifer that remains saturated, based on the update of the BVHM discussed in Section 2.2.3, Water Budget. Also shown is the saturated thickness, in feet of the aquifer. The upper aquifer does not occur in the southern fringe of the CMA, nor in the southwestern portion of the SMA; in these areas, the middle or lower aquifers begin near the ground surface. The water table has dropped below the base of this aquifer in some parts of the Subbasin, particularly within the southwestern half of the CMA, which overlies the more developed portion of Borrego Springs that is served by the BWD with wells located in the CMA (Figure 3.2-1).

Up to 200 feet of the upper aquifer remains saturated in the east central part of the CMA, and roughly 50 feet, on average, of the upper aquifer remains saturated within portions of the SMA and CMA. Figure 3.2-2 and Figure 3.2-3 show the same information for the middle, and lower aquifers, respectively. Groundwater level declines, based on the percentage of the aquifer thickness that is saturated, have begun to drop below the top of the middle aquifer in the southwestern part of the NMA, and the western part of the CMA. Groundwater levels have also dropped below the top of the lower aquifer along the western fringes of the CMA, and SMA, where the upper aquifer boundary is much closer to the ground surface.

Because many of the domestic groundwater users not connected to BWD rely on continued access to the upper aquifer or upper portions of the middle aquifer, an important objective in this GSP is that access to the upper aquifer or upper middle aquifer be maintained, as much is practicable, in areas with *de minimis* and other domestic wells not currently served by municipal supply (Figure 3.2-1 and Figure 3.2-2). The lower aquifer is an important source of water supply to irrigation wells, municipal wells and some domestic wells mostly in the SMA. The lower aquifer is the thickest aquifer underlying the Plan Area (Figure 3.2-3). Figure 3.2-4 shows a map of township and range sections where well completion reports indicate domestic wells occur, along with an estimate of the average remaining water column, based on statistics gathered by DWR on well depths, and the results of the BVHM regarding depth to water as of September 2016.

The groundwater levels simulated by the BVHM were attached to township and range sections by averaging the groundwater levels of the overlapping model grid cells. Also shown in Figure 3.2-4 is BWD's water distribution system, because the feasibility of connecting domestic well users to the municipal water system, if needed, is related to the distance from BWD's existing infrastructure. Overall, there are 77 domestic wells in DWR's well completion report database. As shown Figure 3.2-4, four of the township and range sections have water levels estimated to be below the bottom of the well in the section. Furthermore, the difference between the average well depth and the average groundwater level is less than 50 feet in seven township and range sections, representing 20 domestic wells, which indicates a high likelihood that some may lack access to adequate water in existing wells. With groundwater levels expected to continue to decline early in the Physical Solution implementation, domestic users are currently experiencing undesirable results, which will be alleviated by 2040. The majority of the wells in this situation are close to the BWD water distribution system.

The undesirable results of chronic lowering of groundwater levels is expected to continue to occur absent management action to counteract the current trend, until the Subbasin water budget is brought into balance. BWD has had to abandon and re-drill wells in the past and expects to continue to do so during the Physical Solution's implementation to continue to provide adequate groundwater access. For example, BWD well ID1-10 is being replaced and relocated in 2019 due to declining groundwater levels and production rate loss. The exact number of agricultural and domestic wells that have been abandoned and re-drilled deeper and/or relocated due to production rate loss from declining groundwater levels is not known. However, anecdotal information and field observations have confirmed that inactive wells exist throughout the Plan Area.

As discussed in Section 3.3, Minimum Thresholds, this GMP establishes thresholds for each Subbasin management area that would generally indicate the occurrence (or absence) of an undesirable result. These thresholds relate to known elevations that current and future groundwater levels can be compared against, such as the subsurface boundaries between the upper, middle and lower aquifers, and the prevailing elevations of the perforated intervals of groundwater wells in use, where known. The pumping reduction plan, the voluntary fallowing of agricultural land, and other PMAs described in this GMP are intended to limit production to meet all present beneficial uses and users of groundwater including the existing footprint of water intensive agriculture in the Subbasin. The proposed PMAs to mitigate potential effects to beneficial use and users are discussed in Chapter 4, Projects and Management Actions.

3.2.2 Reduction of Groundwater Storage – Undesirable Results

Reduction of groundwater storage in the Plan Area has the potential to impact the beneficial uses and users of groundwater in the Subbasin by limiting the volume of groundwater available for agricultural, municipal, recreational, industrial, and domestic use. In essence, the undesirable results of reductions in groundwater in storage are the same as those previously described for chronic lowering of groundwater levels, because within this Subbasin, these impacts go hand-in-hand. Continuing the current rate of loss of groundwater in storage could also impact other sustainability indicators, namely groundwater quality.

The primary cause of groundwater conditions in the Plan Area that would lead to reduction in groundwater storage is the ongoing groundwater production in excess of the estimated long-term sustainable yield of the Subbasin. Significant and unreasonable impacts with respect to groundwater in storage are indicated by a long-term deficit in the groundwater budget, which is described in Section 2.2.3, Water Budget. The usable quantity of groundwater in storage is large compared to average annual natural recharge to the Subbasin. On average, the Subbasin lost approximately 7,300 AFY from storage for the period between 1945 and 2015. Over the last 10 years, the Subbasin lost 13,137 AFY, based on the BVHM model results as described in Section 2.2.3. It is estimated from the BVHM that the cumulative volume of stored water lost from the Subbasin between 1945 and 2016 was approximately 520,000 AF. This volume is the cumulative difference between Subbasin inflows (e.g., natural recharge) and outflows (e.g., pumping) calculated by the BVHM over the 71-year timeframe.

An important concept relevant to the Subbasin is the high variability and the decadal periodicity of wet versus dry periods in the climatic record. A clear example of the variability inherent in the recharge values is that the 20-year period from 1955 to 1974 was one of the 'driest' on record and it immediately preceded one of the 'wettest' periods from 1975 to 1994 (ENSI 2018). The average annual recharge rates for these two periods of 'dry' and 'wet' precipitation were 3,975 and 11,907 AFY, respectively (ENSI 2018). The long-term groundwater supply highly depends on 'wet' years with high recharge rates; however, these occur on a decadal scale and may not coincide with the 20-year initial sustainability period.

Reduction in groundwater storage is significant and unreasonable if it is sufficient in magnitude to lower the rate of production of pre-existing groundwater wells below that needed to meet the minimum required to support the overlying beneficial use(s), and where means of obtaining sufficient groundwater or imported resources are not technically or financially feasible for the well owner to absorb, either independently or with assistance from the Watermaster, or other available assistance/grant program(s). Additionally, historical reductions in groundwater storage have desiccated GDEs (honey mesquite) in the Subbasin prior to the effective date of SGMA, January 1, 2015 (USGS 1982, 2015; County of San Diego 2009). GDEs are discussed in more detail in Section 3.2.6, Depletions of Interconnected Surface Water.

Under the fixed pumping reduction plan described in Chapter 4 of this GMP, which would ramp down existing levels of pumping to meet the sustainable yield by 2040, it is estimated that an additional 72,000 AF of water would be removed from storage for the period 2020 through 2040. This estimate assumes that the historical climate from 1960 through 2010 repeats for the 50-year planning horizon from 2020 to 2070. Depending on the actual timing and magnitude of pumping reductions and the location and magnitude of future groundwater recharge, the amount of groundwater removed from storage will vary. The implementation of pumping reductions will limit water supply availability such that the present extent of water-intensive agriculture in the Subbasin will be substantially reduced (i.e., the existing trend of agricultural land fallowing will need to be maintained and likely accelerated). The proposed PMAs to mitigate potential effects to beneficial use and users are discussed in Chapter 4.

3.2.3 Seawater Intrusion – Undesirable Results

Undesirable results from seawater intrusion are not considered to be applicable to the Subbasin due to geographic isolation from the ocean. The Subbasin is more than 50 miles from the Pacific Ocean and more than 130 miles from the Gulf of California. As a result, this GMP does not establish criteria for seawater intrusion (Title 23 CCR Section 354.26(d)).

3.2.4 Degraded Water Quality – Undesirable Results

In general, the groundwater quality in the Subbasin meets California drinking water maximum contaminant levels (MCLs) without the need for treatment. As documented in Section 2.2.2.4, Groundwater Quality, naturally occurring poor water quality has been identified in specific areas: near the margins of the Subbasin where unconsolidated sediments are in contact with fractured bedrock; in parts of the SMA where certain wells that tap the lower aquifer have concentrations of arsenic above the drinking water MCL; and near the Borrego Sink where elevated sulfate and TDS are likely associated with dissolution of evaporites from the dry lake. Historical groundwater quality impairment for nitrates is noted for select portions of the Plan Area predominantly in the upper aquifer of the NMA underling the agricultural areas and near high density septic point sources. The source of nitrates is likely associated with either fertilizer applications or septic return flows. In desert environments artificial irrigation of the previously undisturbed desert floor can result in leaching of built up soil nitrate deposits (Walvoord et al. 2003). As discussed in Section 2.2.2.4, several potable wells in the Plan Area have been abandoned because of elevated nitrate above the drinking water MCL.

Degradation of groundwater quality in the upper aquifer has occurred as recharge to the aquifer has mobilized natural and anthropogenic sources of nitrate. The groundwater impacted by nitrate has the potential to migrate laterally as a result of pumping. One strategy successfully implemented to produce potable water in several areas of the Subbasin is to only screen the deeper sediments of the middle and lower aquifer to avoid nitrate that is likely concentrated in the upper aquifer. It should be noted that abandoned wells have the potential to provide a migration pathway of nitrate contaminants from the upper aquifer to the middle and lower aquifers. Hence, the Watermaster's proactive cooperation with San Diego County in the enforcement of the County's ordinance governing abandonment of inactive wells will be considered by the Watermaster in order to preserve the existing potable water quality, especially where poor water quality has been identified.

Naturally occurring arsenic above the drinking water MCL has been detected in a subset of wells primarily screened in the lower aquifer of the SMA. Arsenic has not been detected at elevated concentrations in the NMA or CMA; however, semi-annual monitoring will track arsenic trends over time.

Degraded water quality is significant and unreasonable if the magnitude of degradation at pre-existing groundwater wells precludes the use of groundwater for existing beneficial use(s), including through migration of contaminant plumes that impair water supplies, where alternative means of treating or otherwise obtaining sufficient alternative groundwater resources are not technically or financially feasible. At a minimum, for municipal and domestic wells, water quality must meet potable drinking water standards specified in Title 17 and Title 22 of the CCR. For irrigation wells, water quality should generally be suitable for agriculture use. The majority of groundwater pumped in the Plan Area is used for recreational and agricultural irrigation and thus does not have to meet potable drinking water standards to be put to beneficial use. The Basin Plan has not established numerical objectives for groundwater quality in the Plan Area but recognizes that in most cases irrigation return flows return to the aquifer with an increase in mineral concentrations such as TDS and nitrate (Colorado River RWQCB 2017). The Basin Plan objective is to minimize quantities of contaminants reaching the aquifer by establishing stormwater and irrigation/fertilizer use best management practices.

Alternative means of obtaining water may consist of connection to the municipal water system (i.e., BWD), wellhead treatment, or for some beneficial users, well abandonment and new well development. Table 3-3 evaluates potential alternative means for addressing degraded water quality for each beneficial user type.

In summary, degradation of groundwater quality in the Plan Area has occurred for certain constituents (e.g., nitrate, sulfate, arsenic) and locally within the certain aquifers. However, groundwater quality has continued to be suitable for beneficial use throughout the Plan Area, when considering reasonable adaptation strategies such as screening wells in the lower and/or middle aquifer or selective well abandonment. However, undesirable results related to groundwater quality may become significant and unreasonable if conditions worsen to the point where beneficial uses are impaired (e.g., if adaptation strategies or required treatment methods becomes technically and/or financially infeasible). Continued reduction of groundwater in storage and chronic lowering of groundwater levels are intricately linked to undesirable effects on groundwater quality because these conditions increasingly limit the effectiveness of existing mitigation strategies. Therefore, significant and unreasonable impacts on groundwater quality are a potential outcome in the future if groundwater overdraft is not halted.

The proposed PMAs, including the Groundwater Quality Optimization Program are discussed in Chapter 4.

Table 3-3
Means of Addressing Degraded Water Quality

	Municipal Uses	Agricultural Uses	Recreational Uses	Domestic/*De Minimis* Uses
Connection to Municipal Water System	N/A		✓	✓
Wellhead Treatment	✓	✓	✓	*
Blending Sources	✓	✓	✓	*
Well Abandonment/New Well Construction	✓	✓	✓	*

Notes: N/A = not applicable.
* Depending on water quality degradation, wellhead treatment for domestic/*de minimis* uses may not be financially feasible in a severely disadvantaged community. Furthermore, domestic and *de minimis* users may not have the flexibility, nor the technical or financial means to blend sources or drill new wells

3.2.5 Land Subsidence – Undesirable Results

The undesirable result of land subsidence includes an irreversible reduction in groundwater storage, and differential settlement of the land surface that substantially interferes with surface land uses. As discussed in Section 2.2.2.5, Land Subsidence, the degree of land subsidence occurring in the Plan Area is minimal, has not substantially interfered with surface land uses in the past, and is not anticipated to substantially interfere with surface land uses in the foreseeable future, including within the GMP's planning and implementation horizon. Therefore, this GMP does not propose minimum thresholds or measurable objectives specific to this sustainability indicator. If during the GMP implementation timeline, it becomes evident that minimum thresholds and measurable objectives for lowering of groundwater levels and groundwater in storage are not being met, the degree to which land subsidence may become an undesirable result will be re-evaluated.

3.2.6 Depletions of Interconnected Surface Water – Undesirable Results

Under SGMA, depletions of surface waters interconnected with water in the Subbasin that have significant and adverse impacts on beneficial uses of surface waters constitute an undesirable result (CWC Section 10721(x)(6)). As described in Section 2.2.2.6, Identification of Interconnected Surface Water, surface waters have been disconnected from the underlying Subbasin aquifer for many decades. Though pre-development groundwater conditions supported a flowing spring east of the Borrego Sink (Old Borrego Spring), the spring became dry early in the Subbasin's history due to groundwater decline that cannot be feasibly reversed under current or expected future conditions. Furthermore, for the reasons described in Section 2.2.2.6 and Appendix D4, pumping within the Subbasin has no significant nexus to the seeps and/or springs that contribute flow to mapped creeks that enter the margins of the Subbasin such as Coyote Creek and Borrego Palm Creek. Therefore, there are no undesirable results as defined in SGMA currently occurring, or expected to occur, as a result of depletion of interconnected surface water. Therefore, this GMP does not propose minimum thresholds or measurable objectives related to this sustainability indicator.

3.2.7 Groundwater Dependent Ecosystems – Undesirable Results

Appendix D4 provides a complete review of available pertinent spatial datasets, historical data (e.g., stream flow and groundwater levels), satellite-derived vegetation metrics, and geology to develop a robust hydrogeological conceptual model to evaluate nexus of mapped GDEs with regional groundwater levels within the Subbasin. As described in Section 2.2.2.7, Identification of Groundwater Dependent Ecosystems, and Appendix D4, because of the long-term imbalance of pumping with available natural recharge, an irreversible impact has likely occurred on the honey mesquite community from a decline in groundwater levels, an impact which, based on the best available science, was completed and likely became permanent sometime prior to 1985. The comprehensive assessment revealed potential GDEs identified within the Subbasin no longer have direct reliance on groundwater emerging from aquifers or on groundwater occurring near the ground surface, and instead are sustained by periodic stormwater flows, soil moisture, and potentially perched groundwater where present. These findings indicate that based on best available data, undesirable results on GDEs occurred prior to 1985 and are not presently occurring or anticipated to occur in the future. Therefore, this GMP does not propose minimum thresholds or measurable objectives related to this sustainability indicator.

3.3 MINIMUM THRESHOLDS

A minimum threshold refers to a numeric value for each sustainability indicator used to define undesirable results (Title 23 CCR Section 351(t)). A GSP must establish minimum thresholds that quantify groundwater conditions for each applicable sustainability indicator at each monitoring site or representative monitoring site. The numeric value used to define minimum thresholds shall represent a point in the basin that, if exceeded, may cause undesirable results (Title 23 CCR Section 354.28(a)).

A GSA may establish a representative minimum threshold for groundwater elevation (GWE) to serve as the value for multiple sustainability indicators, where the GSA can demonstrate the representative value is a reasonable proxy for multiple individual minimum thresholds as supported by adequate evidence (Title 23 CCR Section 354.28(d)). Minimum thresholds are not required for sustainability indicators that are not present and not likely to occur in the Subbasin (Title 23 CCR Section 354.28(e)).

Per Title 23 CCR Section 354.28(b), the description of minimum thresholds shall include the following:

4. The information and criteria relied upon to establish and justify the minimum thresholds for each sustainability indicator. The justification for the minimum threshold shall be supported by information provided in the basin setting, and other data or models as appropriate, and qualified by uncertainty in the understanding of the basin setting.
5. The relationship between the minimum thresholds for each sustainability indicator, including an explanation of how the Agency has determined that basin conditions at each minimum threshold will avoid undesirable results for each of the sustainability indicators.

6. How minimum thresholds have been selected to avoid causing undesirable results in adjacent basins or affecting the ability of adjacent basins to achieve sustainability goals.
7. How minimum thresholds may affect the interests of beneficial uses and users of groundwater or land uses and property interests.
8. How state, federal, or local standards relate to the relevant sustainability indicator. If the minimum threshold differs from other regulatory standards, the Agency shall explain the nature of and basis for the difference.
9. How each minimum threshold will be quantitatively measured, consistent with the monitoring network requirements described in [the GSP Regulations].

The following sections address minimum thresholds for each of SGMA's sustainability indicators.

3.3.1 Chronic Lowering of Groundwater Levels – Minimum Thresholds

3.3.1.1 Minimum Threshold Justification

The GSP regulations provide that the "minimum threshold for chronic lowering of groundwater levels shall be the groundwater level indicating a depletion of supply at a given location that may lead to undesirable results" (Title 23 CCR Section 354.28(c)(2)).

Chronic lowering of groundwater levels in the Subbasin, as discussed in Section 3.2.1, Chronic Lowering of Groundwater Levels – Undesirable Results, cause significant and unreasonable declines if they are sufficient in magnitude to lower the rate of production of pre-existing groundwater wells below that necessary to meet the minimum required to support the overlying beneficial use(s), where alternative means of obtaining sufficient groundwater resources are not technically or financially feasible. In addition, GWEs will be managed under the minimum thresholds to ensure the several aquifers in the Subbasin are not depleted in a manner to cause significant and unreasonable impacts to other sustainability indicators. At the same time, the Physical Solution acknowledges that groundwater levels are anticipated to fall below 2015 levels before they are stabilized by 2040. Thus, the minimum thresholds have been designed with that circumstance in mind.

Maintaining groundwater levels above saturated screen intervals for pre-existing municipal wells during an anticipated multi-year drought circumstance was selected as the minimum desired threshold for GWEs that would be protective of beneficial uses in the Subbasin. This minimum threshold in most cases would also be protective of non-potable irrigation beneficial uses.

Explained as follows, these minimum thresholds are also intended to protect against significant and unreasonable impacts to groundwater storage volumes and water quality. The development of the minimum thresholds for chronic lowering of groundwater levels included review of the hydrogeologic conceptual model, climate, current and historical groundwater conditions including groundwater level trends and groundwater quality, land subsidence data, interconnected surface water and the water budget as discussed in various sections of Chapter 2.

The minimum thresholds for chronic lowering of groundwater levels are based principally on the documented screen intervals of key municipal water wells and domestic/*de minimis* wells located in the Subbasin. Municipal wells are listed in Table 3-4 along with minimum thresholds corresponding to the top screened interval. Key indicator wells are also shown in Figure 3.3-1. Minimum thresholds are not considered applicable for BWD wells that require replacement, or are not relied upon for a significant source of supply. These wells are as follows: (1) Well ID1-10 well is planned for replacement in 2019; (2) the Wilcox well is an emergency back-up well with no power supply (diesel generator only); (3) ID1-16 will continue to be used but is planned to be replaced during the 20-year SGMA initial sustainability period; (4) ID4-18 is proposed for replacement in the future; and (5) ID1-8 is seldom used by BWD, and is not anticipated to continue to serve BWD customers over the SGMA initial sustainability period. Although the aforementioned wells are not key municipal wells and thus do not have an accompanying minimum threshold, they are included in Table 3-4 for informational purposes. Table 3-4 also lists the year drilled, well depth, recent static depth to groundwater, surface elevation, GWE, aquifers screened, and management area for the BWD wells.

Table 3-4
Borrego Water District Well Screened Intervals and Key Municipal Well Minimum Thresholds

Well	Year Drilled	Well Depth (feet)	Screen Intervals (feet; bgs)	Minimum Threshold / Top of Well Screen (feet; bgs)	Depth to Groundwater (feet; bgs)*	Surface Elevation / Groundwater Elevation (feet MSL)*	Aquifer	Management Area	Existing Minimum Threshold Exceedance
Improvement District (ID) No. 1									
ID1-8	1972	830	72–240 260–830	72	77.76	526.69 / 448.93	Middle/ Lower	SMA	N/A
ID1-10	1972	392	162–372	N/A	204.2	595.14 / 390.94	Middle	CMA	N/A
ID1-12	1984	580	248–568	248	146.14	533.2 / 387.06	Middle/ Lower	CMA	No
ID1-16	1989	550	160–540	N/A	231.77	620.15 / 388.38	Middle/ Lower	CMA	N/A
Wilcox	1981	502	252–502	N/A	309.78	702.13 / 392.35	Lower	CMA	N/A
Improvement District (ID) No. 4									
ID4-4	1979	802	470–500 532–570 586–786	470	290.88	598.11 / 307.23	Middle/ Lower	NMA	No
ID4-11	1995	770	450–750	450	223.2	613.72 / 390.52	Middle/ Lower	NMA/CMA	No
ID4-18	1982	570	240–300 310–385 395–405 425–440 460–475 490–560	N/A	315.31	690.96 / 375.65	Upper/ Middle	NMA	N/A
Improvement District (ID) No. 5									
ID5-5	2000	700	400–700	400	182.1	576.8 / 394.7	Middle/ Lower	CMA	No

Notes: bgs = below ground surface; MSL = above mean sea level; SMA = South Management Area, N/A = not applicable; CMA = Central Management Area; NMA = North Management Area.

* Fall 2018 measured value, except ID4-11 and Wilcox, which are Spring 2018 measurements (due to active pumping or lack of access at time of Fall 2018 visit)

In Section 3.4, Measurable Objectives, this GMP establishes measurable objectives and interim milestones at the same locations as the minimum thresholds as required by the GSP Regulations (Title 23 CCR Sections 351(g) and 354.30) based on the assumption that the historical climate from 1960 through 2010 repeats for the period 2020 through 2070. A linear reduction in pumping from current levels to an initial target of 5,700 AFY between 2020 and 2040 was applied in the BVHM to forecast change in Subbasin groundwater storage (Figure 3.3-2). Figure 3.3-2 shows the cumulative change in storage for the entire Borrego Basin for several model runs including the cumulative change in storage from the original USGS model run (1945 through 2010) and the cumulative change in storage for the model update (2011 through 2016). In addition, the model was run to address six different future scenarios. Future scenarios can be divided into two groups:

10. Pumping remains the same as current levels, and
11. A linear reduction in pumping from current levels to an initial target of 5,700 AFY between 2020 and 2040. Three potential climate scenarios were run for each of the scenarios:
    a. Historical climate from 1960 through 2010 was repeated for the period 2020 through 2070,
    b. California DWR change factors for projected climate conditions in 2030 were applied to the historical period from 1960 through 2010 following the procedures outlined in the DWR climate guidance for GSPs, and
    c. DWR change factors for projected climate conditions in 2070 were applied to the historical period from 1960 through 2010 following the procedures outlined in the DWR climate guidance for GSPs (DWR 2018c).

Applying DWR climate change factors for projected climate conditions in 2030 and 2070 result in an estimated 79,000 AF and 87,000 AF of groundwater removed from storage or an increase of 9.7% and 20.8%, respectively as compared to assuming a repeat of the historical climate scenario. The results indicate that 5,700 AFY of sustainable yield appears to be an acceptable initial target for sustainable annual withdrawals from the Subbasin, and that changes in future climate conditions are just as likely as not to produce a small impact on storage in the Subbasin when compared to changes in pumping and historical climate variability.

Because water years in which significant natural recharge occurs are infrequent and unpredictable, identifying the degree of climate variability in the Subbasin is a more informative and consequential factor in understanding future conditions than the application of DWR climate change factors to a repeat of historical climate. Although Figure 3.3-2 shows that the difference between a repeat of past climate and the application of DWR climate change factors is notable, the range in future outcomes produced by climate variability is much more significant.

Therefore, the GSA evaluated the potential future variability in recharge to the Subbasin over the 20-year SGMA initial sustainability period based on the effect of time-varying recharge using a Monte Carlo Simulation (MCS) uncertainty analysis (ENSI 2018). The BVHM recharge values produced over the model period from 1945 to 2010 served as the basis of the analysis. All of the simulations are based on the initial target pumping rate of 5,700 AFY being achieved in year 20 of GSP implementation. The MCS uncertainty analysis selected 20-year periods at random from the historical time series from 1945 to 2010. Alternatively, annual data could be randomly selected based on the distribution of values, but this was not done because review of the recharge values shows that there is periodicity within the time series (i.e., decadal dry, wet, and normal climatic periods).

The MCS uncertainty analysis provides for a series of 'what if' analyses where a 20-year SGMA attainment period could occur for any historical 20-year period modeled by the BVHM and thus examine the potential variability in the water balance as exhibited by the model. A total of 53 20-year periods from 1945 to 2016 are evaluated using the MCS uncertainty analysis. Figure 3.3-3 shows the MCS uncertainty analysis simulations in terms of the average and percentiles. Shown are the 20th through 80th percentiles. The 20th percentile line on Figure 3.3-3 indicates the value of the cumulative change in storage. The 20th percentile line represents a result which is higher than 20% of the simulations and lower than 80% of the simulations.

Since the simulations are looking at different time periods, the values translate to rate of occurrence. For example, values below the 20th percentile occur 20% of the time. The change in groundwater in storage, and corresponding change in groundwater level, associated with the 20th percentile was selected as the proposed minimum threshold for the Subbasin meaning that based on 53 20-year periods evaluated, values below the minimum threshold occur 20% of the time and values above the threshold occur 80% of the time. The uncertainty analysis demonstrates that variability in the historical climate and associated recharge is a critical factor to establish minimum thresholds.

In addition to minimum thresholds for BWD key indicator wells, the GMP has minimum thresholds for key indicator wells throughout the Subbasin which are intended to be protective of beneficial uses and users of groundwater (Table 3-5). As previously mentioned, the climate in the Subbasin is both highly variable and has a decadal periodicity (ENSI 2018). A MCS uncertainty analysis was performed to estimate the effects of reaching a pumping target of 5,700 AFY through incremental reductions by 2040 under a wide range of potential climate scenarios (ENSI 2018). The minimum threshold is based on the estimated degree of groundwater level decline that would occur in each indicator well if the 20th percentile scenario for groundwater recharge were to be realized. It should be noted that the minimum thresholds in Table 3-5 were determined based on groundwater reductions occurring uniformly across all production wells in the BVHM and do not account for differential reductions that may be possible between and across different sectors and/or groundwater management areas.

The Watermaster will evaluate the minimum thresholds, interim milestones, and measurable objectives at least every 5 years based on the BVHM as revised to include additional data such as the preceding GMP implementation period climate and actual realized pumping reductions to determine the likelihood that the Plan will attain sustainability goals. The Watermaster will adjust the rate of pumping reduction, revisit minimum thresholds, and/or evaluate additional PMAs if the minimum thresholds in Table 3-4 or Table 3-5, as updated are exceeded or if the interim milestones in Table 3-7, as updated are not being achieved. Furthermore, key wells could be added or replaced for the purpose of minimum threshold compliance monitoring as new data become available.

As described in Section 3.5, the GMP establishes a monitoring network in the Subbasin of 50 monitoring sites; however, only those representative sites listed in Table 3-4, Key Municipal Well Minimum Thresholds, and Table 3-5, Key Indicator Wells in Each Management Area, will be used to monitor compliance with the sustainability indicators for each management area, per Title 23 CCR Section 354.36(a). The thresholds in Table 3-4 are intended to establish groundwater level thresholds for municipal water system, whereas those in Table 3-5 are intended to be representative of Subbasin management areas, and reflect domestic, recreational and agricultural beneficial users not connected to the BWD system.

Table 3-5
Minimum Thresholds for Key Indicator Wells in Each Management Area

Management Area	Representative Monitoring Point Well ID	2018 Observed Groundwater Elevation (feet MSL)	Minimum Threshold Maximum allowable decline in groundwater levels as measured at the beginning of GMP implementation through 2040
NMA	MW-1	377.91	-39
	ID4-3	381.4	-42
	SWID 010S006E09N001S	375.05	-46
	ID4-18	377 94	-44
CMA	ID4-1	393.88	-33
	Airport 2	407.51	-25
	ID1-16	389.75	-33
SMA	MW-5A	409 61	-14
	MW-5B	409.6	
	MW-3	454.38	-12
	Air Ranch	465.47	-9
	RH-1	468.13	-9

Notes: MSL = above mean sea level; GMP = Groundwater Management Plan; NMA = North Management Area; CMA = Central Management Area; SMA = South Management Area.

3.3.1.2 Relationship between the Established Minimum Thresholds and Sustainability Indicator(s)

d. Relationship between the established minimum thresholds and the Chronic Lowering of Groundwater Sustainability Indicator

The wells described in Table 3-4 and Table 3-5 are in locations that reflect a wide cross section of Subbasin conditions. These locations are representative of overall Subbasin conditions and conditions in each management area because they are spatially distributed throughout the Subbasin both vertically (across aquifers), and laterally. The GSA determined that use of the minimum elevation thresholds at each of the listed monitoring site locations will help avoid the undesirable results of chronic lowering of groundwater levels because it will minimize the chance that access to adequate water resources for beneficial users within the Subbasin will be compromised.

e. Relationship between the established minimum thresholds and the three other sustainability indicators applicable to the Borrego Subbasin

In addition, and as described more fully as follows, use of GWEs at the cross section of wells outlined in Table 3-4 and Table 3-5, are also appropriate minimum thresholds for the following sustainability indicators: groundwater storage, and groundwater quality degradation. As established in Chapter 2, there are no regionally extensive aquitards, so lowering groundwater levels can reasonably be considered a proxy for decreases in groundwater in storage. Furthermore, the mechanism by which the Physical Solution intends to address undesirable results is an incremental pumping reduction plan to reach the sustainable yield (initially 5,700 AFY) by 2040. This measure would also minimize the degree of overdraft. The relationship between the chronic lowering of groundwater levels and water quality is not direct, but deeper groundwater may be the source of elevated arsenic concentrations in the SMA. Chronic lowering of groundwater levels may, therefore, result in the need to treat groundwater for municipal and domestic uses.

3.3.1.3 Minimum Threshold Impacts to Adjacent Basins

As described in the hydrogeologic conceptual model in Section 2.2.1, Hydrogeologic Conceptual Model, subsurface outflow from the Subbasin is minor (estimated at 511 AFY in the southern end of the BVHM model domain). The Coyote Creek fault is interpreted to act as a boundary to groundwater flow between the Subbasin and the Ocotillo-Clark Valley Groundwater Basin (USGS 2015). The adjacent Ocotillo-Clark Valley Groundwater Basin and Ocotillo Wells Subbasin are both "very low" priority basins not required to prepare GSPs. As such, they are not expected to develop descriptive undesirable results or quantitative minimum thresholds and measurable objectives. Thus, the minimum threshold of GWE selected to prevent chronic lowering of groundwater levels and to avoid triggering the other two applicable sustainability indicators in the Subbasin are not expected to cause undesirable results in adjacent basins or adversely affect the ability of adjacent basins to achieve sustainability goals.

3.3.1.4 Minimum Threshold Impact on Beneficial Uses

Beneficial uses and users of groundwater in the Subbasin are discussed in Section 2.1.4, Beneficial Uses and Users, and generally include three primary sets of pumpers: agriculture, municipal and recreation. Other Subbasin pumpers include small water systems and *de minimis* users. The minimum thresholds developed represent points in the Subbasin that, if exceeded, may cause undesirable results (Title 23 CCR Section 354.28(a)). It is expected that, if GWEs fall below the established minimum thresholds, water supplies available to beneficial uses and users in the Subbasin will be limited or challenging to produce, and significant and unreasonable water quality and other adverse impacts to sustainability indicators may occur.

As a result, the PMA Section of the GMP (Chapter 4) describes the plan to establish: (1) Baseline Pumping Allocations for each non-*de minimis* pumper of groundwater in the Subbasin, and (2) a ramp down schedule using a linear reduction in pumping to reach the planning sustainability target (initially 5,700 AFY). Once implemented, the latter is expected to require an approximate 19% reduction in pumping every 5 years from the Baseline Pumping Allocation of 24,215 AFY for a total estimated reduction of about 76% under the initial sustainable yield. Baseline Pumping Allocations were determined based on the maximum water use by individual (non-*de minimis*) pumpers over the 5-year baseline period of January 1, 2010, to January 1, 2015. The Baseline Pumping Allocation also includes municipal water use previously reduced through end use efficiency and conservation efforts, and recreation use curtailed prior to GMP adoption. The estimated water use by sector is 70% for agriculture, 18% for recreation, 12% for municipal, and less than 1% for other users based on the total Baseline Pumping Allocation.[8] Agricultural water use occurs over approximately 2,624 acres (according to updated estimates by the GSA in 2018), municipal water use includes 2,059 residential and commercial connections, and recreational water use includes six golf courses with approximately over 400 acres of irrigated turf.

As described in Chapter 4, the Physical Solution includes water transfers , water conservation and efficiency, land fallowing, and pumping reduction programs to mitigate the impacts of mandated pumping reductions. These programs will be designed to maximize beneficial uses while recognizing the finite availability of groundwater resources in the Subbasin. The Physical Solution's currently contemplated aggregate pumping allowance at each 5-year milestone and for achieving the initial Subbasin sustainability is presented in Table 3-6.

8 Water credits are included in the Baseline Pumping Allocation.

Table 3-6
Potential Aggregate Pumping Assuming Initial Sustainable Yield Target of 5,700 AFY

Year	Baseline Pumping Allocation (AFY)	Percent Reduced	Pumping Allowance (Percent)	Pumping Allowance (AFY)
0	[24,215]	0.0%	100%	[24,215]
5		25%	75%	[18,616]
10		50%	50%	[12,108]
15		64%	36%	[8,717]
20		76.5%	23.5%	[5,700]

Notes: AFY = acre-feet per year Baseline Pumping Allocation and Pumping Allowances must be updated to represent numbers in the Judgment. Aggregate Pumping amounts and percentages may change based on adaptive management updates to BVHM. [AFY amounts are in brackets until finalized]

3.3.1.5 Comparison between Minimum Threshold and Relevant State, Federal, or Local Standards

The GSA was not aware at the time it prepared the Plan of any other state, federal, or local standards specific to addressing the lowering of groundwater levels in the Subbasin. As part of the implementation of PMAs, additional biological analysis may be required in some circumstances and may have relevance to future iterations of the minimum thresholds.

With regard to local standards, there are no quantitative standards that define or limit specific GWEs or amount of allowable groundwater level decline. As further described in Chapter 2, when the County prepares a general plan (including community plan) update process, the Physical Solution will be a key consideration with respect to related goals and policies. The implementation of the Physical Solution and the County's general plan update process are separate but related processes. Future general plan and community plan updates should consider the sustainability goals of the Physical Solution. The Physical Solution may be referred to by reference within future general plan and community plan updates.

3.3.1.6 Minimum Threshold Measurement Method

The static groundwater level will be provided to the Watermaster (for wells with radio/cellular transmit flow meters) or measured (for wells with manual read meters) at each identified minimum threshold well (key indicator wells) at least two times per year to evaluate groundwater level elevation trends at anticipated seasonal low and seasonal high groundwater conditions. All measurements will comply with the Sampling and Analysis Plan and Quality Assurance Project Plan (Appendix E1) and will be entered in to the Watermaster's data management system. The monitoring network is described in further detail in Section 3.5, Monitoring Network.

3.3.2 Reduction of Groundwater Storage – Minimum Thresholds

3.3.2.1 Minimum Threshold Justification

Reduction of groundwater in storage in the Subbasin as discussed in Section 3.2.2, Reduction of Groundwater Storage – Undesirable Results, is significant and unreasonable if it is sufficient in magnitude to lower the rate of production of active groundwater wells below the minimum required to support the overlying beneficial use(s), where an alternative means of obtaining sufficient groundwater resources is not technically or financially feasible. As discussed in Section 3.3.1, Chronic Lowering of Groundwater Levels – Minimum Thresholds, domestic wells are generally located in areas that have a groundwater level substantially above the average depth of wells, with some exceptions shown in Figure 3.2-4. Furthermore, in most cases it would be technically and financially feasible to connect domestic and *de minimis* users to the municipal water system, should they experience a significant loss in production rate attributable to groundwater level declines.

As discussed in Section 2.2.3.8, Surface Water Available for Groundwater Recharge or In-Lieu Use, neither imported nor recycled water is economically viable for alternative water supply. Stormwater capture and infiltration has limited potential in the Subbasin due to the arid environment and infrequent availability of stormwater runoff. The usable quantity of groundwater in storage is large compared to average annual natural recharge to the Subbasin. On average, the Subbasin lost approximately 7,300 AFY from storage for the period between 1945 and 2015. Over the last 10 years, the Subbasin lost approximately 13,137 AFY, based on the BVHM model results as described in Section 2.2.3, Water Budget. The long-term deficits in the groundwater budget resulted in an estimated 520,000 AF of water removed from storage from 1945 to 2016.

In order to reach the initial target sustainability of 5,700 AFY, a non-linear pumping reduction is proposed to bring the basin into sustainability by 2040. The estimated pumping reduction over the applicable period is 76% from the Baseline Pumping Allocation. The Baseline Pumping Allocation is based on maximum annual groundwater extraction by each non-*de minimis* pumper in the Subbasin during the period from January 1, 2010, to January 1, 2015. Hence, some pumping reductions, such as those for municipal end-use efficiency and water credits sites, have already been realized.

BVHM simulations that include an initial target pumping rate of 5,700 AFY in 2040, non-linear reduction in pumping, and an assumption that the historical climate from 1960 through 2010 was repeated for the period 2020 through 2070 to simulate future conditions, indicate a net deficit of 72,000 AF for groundwater in storage over the 20-year Plan implementation period. As discussed in Section 3.3.1.1, the change in groundwater in storage associated with the 20th percentile was selected as the proposed minimum threshold for the Subbasin meaning that based on fifty-three 20-year periods evaluated, values below the minimum threshold occur 20% of the time and values above the threshold occur 80% of the time (Figure 3.3-3).

The overdraft 'curve' that assumes a 5,700 AFY average annual recharge is approximately equal to the 55th percentile of the MCS analysis, meaning target sustainability occurs in 45% of the simulations. The GSA will evaluate the interim milestones and measurable objective at least every 5 years based on the BVHM as revised to include additional data such as the preceding GSP implementation period climate and realized pumping reductions to determine the likelihood that the Plan will attain sustainability goals. If necessary, the Watermaster will adjust the rate of pumping reduction or evaluate additional PMAs if the minimum threshold is exceeded or the interim milestone is not being achieved.

3.3.2.2 Relationship between Minimum Threshold and Sustainability Indicator(s)

The minimum threshold for reduction of groundwater storage is related to the other applicable sustainability indicators, including chronic lowering of groundwater levels and degraded groundwater quality. The minimum threshold for reduction in groundwater storage, which will be directly correlated with the minimum threshold for chronic lowering of groundwater levels, will protect against losses of groundwater in storage sufficient to lower the rate of production of pre-existing groundwater wells below the minimum required to support the overlying beneficial use(s), as further described in Section 3.2.2.1, Minimum Threshold Justification.

3.3.2.3 Minimum Threshold Impacts to Adjacent Basins

As described in Section 3.3.1.3, Chronic Lowering of Groundwater Levels – Minimum Threshold, the minimum threshold selected for reduction of storage avoids causing undesirable results in adjacent basins or affecting the ability of adjacent basins to achieve sustainability goals.

3.3.2.4 Minimum Threshold Impact on Beneficial Uses

The minimum thresholds developed will limit the availability of water supply to beneficial uses and users in the Subbasin as discussed in Section 3.3.1.4, Chronic Lowering of Groundwater Levels – Minimum Threshold. The minimum threshold impact on beneficial uses for both chronic lowering of groundwater level and reduction of groundwater storage is the same.

3.3.2.5 Comparison between Minimum Threshold and Relevant State, Federal, or Local Standards

The comparison between minimum threshold and relevant state, federal, or local standards is generally the same as previously discussed for Section 3.3.1.4, Chronic Lowering of Groundwater Levels – Minimum Threshold. The only difference is that San Diego County currently has cumulative analysis and mitigation standards for permitting discretionary projects with water demands in the Borrego Valley Exemption area, in which adequate water availability must be determined in consideration of surrounding uses and users. It is anticipated these standards will be updated to ensure consistency with the Physical Solution.

3.3.2.6 Minimum Threshold Measurement Method

Reduction in groundwater storage is not a parameter that can be directly measured; rather, change in storage will be regularly estimated based on either the Subbasin water budget or monitoring results derived from analysis of GWEs and aquifer properties as discussed in Section 3.5.2, Monitoring Protocols for Data Collection and Monitoring. To monitor the changes in storage to the Subbasin, the generalized water budget equation is as follows:

Sum of inflows – Sum of outflows = Change in storage

The water budget is an accounting framework used to quantify all inflows and outflows from the Subbasin over a given period of time, with the difference equating to the change in storage. The BVHM is used to estimate the water budget. The simulated water budget included water inputs from underflow, infiltrating rainfall, applied irrigation, and infiltrating surface water flows in creeks (i.e., losing streams); the water outputs included evapotranspiration, pumping, and subsurface flow out of the Subbasin. The water budget developed using the USGS model is an important tool to manage water resources and will be updated at least every 5 years to document progress toward achieving Subbasin sustainability.

On at least an annual basis, change in groundwater storage will be estimated based on change in GWEs. This involves documenting change in measured GWEs at all monitoring program wells in the Subbasin over a given period of time. The GWE change is then multiplied by the overlying Subbasin area and estimated specific yield of the aquifer sediments to determine the change in groundwater storage. Changes in storage in the Subbasin are determined from the generalized GWE and aquifer properties equation:

Overlying Area x (GWE_{t0} – GWE_{t1}) x Specific Yield = Change in Storage

Groundwater elevation surfaces will be created from measured GWE data using a geographic information system (GIS) for specific time periods (e.g., Spring 2020 and Spring 2021). Each surface represents a specific elevation of the groundwater table. The difference between the two surfaces multiplied by the surface area of the Subbasin represents the change in saturated volume of aquifer material between the two periods. This difference will be calculated using GIS and multiplied by the specific yield to estimate the change in groundwater storage. The reduction in groundwater storage will be calculated annually and reported by Watermaster to document progress toward the sustainability goal.

Monitoring parameters for this sustainability indicator/minimum threshold include routine groundwater level measurements. Additionally, the hydrogeologic properties of the aquifer will be updated as additional pump test data becomes available.

3.3.3 Seawater Intrusion – Minimum Thresholds

As described in Section 3.2.3, Seawater Intrusion – Undesirable Results, seawater intrusion is not an applicable undesirable result in the Subbasin and a minimum threshold is not warranted.

3.3.4 Degraded Water Quality – Minimum Thresholds

Degraded water quality in the Subbasin, as discussed in Section 3.2.4, Degraded Water Quality – Undesirable Results, is significant and unreasonable if it is sufficient in magnitude to affect use of pre-existing groundwater wells such that the water quality precludes the use of groundwater to support the overlying beneficial use(s), and that alternative means of obtaining sufficient groundwater resources are not technically or financially feasible. For municipal and domestic wells, this means water quality that meets potable drinking water standards specified in Title 22 of the CCR. For irrigation wells, water quality should generally be suitable for agriculture use. As indicated in the Basin Plan, irrigation return flows and septic recharge returns to the aquifer with an increase in mineral concentrations such as TDS and nitrate. The Basin Plan objective is to minimize quantities of contaminants reaching the aquifer by establishing stormwater best management practices. A PMA to optimize water quality is discussed in Chapter 4.

3.3.4.1 Minimum Threshold Justification

The minimum threshold for degraded water quality is protective of existing and potential beneficial uses and users in the Subbasin. Alternative means of addressing degraded water quality such as wellhead treatment may also be technically and financially achievable.

3.3.4.2 Relationship between Minimum Threshold and Sustainability Indicator(s)

Degraded water quality is related to the sustainability indicators: chronic lowering of groundwater levels and reduction in groundwater storage. As groundwater levels decline and storage decreases there exists the potential for increased concentration of constituents of concern (COCs) as a result of poorer water quality identified in parts of the lower aquifer. Additionally, poor water quality associated with irrigation return flow and septic recharge that has percolated to the aquifer has the potential to migrate laterally as a result of pumping. Degraded water quality is not a predictor of other sustainability indicators. Rather, it is a potential response. As such, it is sufficient to establish the minimum threshold for degraded water quality in isolation from the other sustainability indicators.

3.3.4.3 Minimum Threshold Impacts to Adjacent Basins

As described in Section 3.3.1.3, Chronic Lowering of Groundwater Levels – Minimum Threshold, the minimum threshold selected for degraded water quality is protective of causing undesirable results in adjacent basins or affecting the ability of adjacent basins to achieve sustainability goals.

3.3.4.4 Minimum Threshold Impact on Beneficial Uses

The minimum threshold for degraded water quality maintains existing and potential future beneficial uses.

3.3.4.5 Comparison between Minimum Threshold and Relevant State, Federal, or Local Standards

The minimum threshold for degraded water quality is compliant with potable drinking water standards specified in Title 22 of the CCR and water quality objectives established in the Basin Plan.

Section 13241, Division 7 of the CWC, specifies that, "[e]ach regional board shall establish such water quality objectives in water quality control plans as in its judgement will ensure the reasonable protection of beneficial uses and the prevention of nuisance; however, it is recognized that it may be possible for the quality of water to be changed to some degree without unreasonably affecting beneficial uses..." The Watermaster is mindful that the Basin Plan indicates that investigative studies will be conducted to develop groundwater objectives and implementation plans for the Borrego Subarea.

3.3.4.6 Minimum Threshold Measurement Method

Groundwater quality will be monitored on a semi-annual basis at key, representative monitoring and extraction wells (shown in Table 3-4 and Table 3-5) located in each of the three management areas: NMA, CMA, and SMA. All measurements will comply with the *Sampling and Analysis Plan and Quality Assurance Project Plan* (Appendix E1) and be recorded in the Watermaster's data management system. The monitoring network and monitoring protocols are described in Section 3.5, Monitoring Network, and Section 3.5.2, Monitoring Protocols for Data Collection and Monitoring. Groundwater quality trends will be evaluated semi-annually using the Mann-

Kendall test to assess whether or not the historical dataset exhibits a trend with a selected significance level of 0.05 or confidence interval of 95%. Water quality results will be compared to background water quality objectives discussed in Section 3.4.4, Degraded Water Quality – Measurable Objectives, and potable drinking water standards specified in Title 22 of the CCR.

3.3.5 Land Subsidence – Minimum Thresholds

As explained in Section 3.2.5, Land Subsidence – Undesirable Results, land subsidence is not presently an applicable undesirable result in the Subbasin and a minimum threshold is not presently warranted.

3.3.6 Depletions of Interconnected Surface Water – Minimum Thresholds

As described in Section 3.2.6, Depletions of Interconnected Surface Water, there are no undesirable results occurring within the Subbasin associated with depletion of interconnected surface water, and thus a minimum threshold is not being proposed.

3.3.7 Groundwater Dependent Ecosystems – Minimum Thresholds

As described in Section 3.2.7, Groundwater Dependent Ecosystems, the impact of groundwater pumping within the Subbasin to GDEs occurred prior to 2015, and thus, a minimum threshold is not being proposed.

3.4 MEASURABLE OBJECTIVES

Standards for Establishing Measurable Objectives

Under Chapter 6 of SGMA, a GSP is to include "measurable objectives, as well as interim milestones in increments of 5 years, to achieve the sustainability goal in the basin within 20 years of implementation of the plan" (CWC Section 10727.2(b)(1)). In addition, the plan is to describe "how the Plan helps meet each objective and how each objective is intended to achieve the sustainability goal for the basin for the long-term beneficial uses" (CWC Section 10727.2(b)(2)). The GSP Regulations define "measurable objectives" as "specific, quantifiable goals for the maintenance or improvement of specified groundwater conditions that have been included in an adopted Plan to achieve the sustainability goal for the basin" (Title 23 CCR Section 351(s)).

Per GSP Regulations (Title 23 CCR Section 354.30):

a. Each Agency shall establish measurable objectives, including interim milestones in increments of five years, to achieve the sustainability goal for the basin within 20 years of Plan implementation and to continue to sustainably manage the groundwater basin over the planning and implementation horizon.

b. Measurable objectives shall be established for each sustainability indicator, based on quantitative values using the same metrics and monitoring sites as are used to define the minimum thresholds.

c. Measurable objectives shall provide a reasonable margin of operational flexibility under adverse conditions which shall take into consideration components such as historical water budgets, seasonal and long-term trends, and periods of drought, and be commensurate with levels of uncertainty.

d. An Agency may establish a representative measurable objective for groundwater elevation to serve as the value for multiple sustainability indicators where the Agency can demonstrate that the representative value is a reasonable proxy for multiple individual measurable objectives as supported by adequate evidence. Each Plan shall describe a reasonable path to achieve the sustainability goal for the basin within 20 years of Plan implementation, including a description of interim milestones for each relevant sustainability indicator, using the same metric as the measurable objective, in increments of five years. The description shall explain how the Plan is likely to maintain sustainable groundwater management over the planning and implementation horizon.

The measurable objectives developed for each of the applicable sustainability indicators in this GMP are based on the current understanding of the Plan Area and basin setting as discussed in detail in Chapter 2. In particular, evaluation of the water budget as described in Section 2.2.3, Water Budget, concluded that the initial sustainable yield of the Subbasin is approximately 5,700 AFY and a 76% curtailment of pumping from the Baseline Pumping Allocation would be required to achieve the initial sustainability goal. As discussed in Section 3.3.1, Chronic Lowering of Groundwater Levels – Minimum Threshold, a linear reduction in pumping from current levels to an initial target of 5,700 AFY between 2020 and 2040 was applied in the BVHM to forecast change in Subbasin groundwater storage and groundwater levels at each of the BWD wells and for key indicator wells in the Subbasin. Use of the BVHM to develop measurable objectives for chronic lowering of groundwater levels and reduction of groundwater in storage is discussed in the following sections. Additionally, the basis for establishing the measurable objective for degraded water quality and depletions of interconnected surface water are also described.

3.4.1 Chronic Lowering of Groundwater Levels – Measurable Objectives

A reasonable margin of operational flexibility under adverse conditions was factored in when developing minimum thresholds and measurable objectives for chronic lowering of groundwater levels. The minimum threshold is based on a statistical evaluation of historical climate and the probability of reoccurrence as discussed in Section 3.3.1, Chronic Lowering of Groundwater Levels – Minimum Threshold. The minimum threshold for chronic lowering of groundwater levels is based on the 20th percentile, meaning 20% of the time groundwater recharge is greater than the 53 20-year historical periods evaluated. For municipal wells, the minimum threshold is equivalent to the top of the well screen.

The reduction of groundwater in storage 'curve' that assumes a 5,700 AFY average annual recharge is approximately equal to the 55th percentile meaning target sustainability occurs for 45% of the simulations using historical climate.

The measurable objective for chronic lowering of groundwater levels is based on the average annual recharge. Table 3-7 presents observed groundwater levels, observed groundwater level trends, interim milestones and measurable objectives by Subbasin management area for key indicator wells, as well as key municipal wells. The difference between minimum thresholds, measurable objectives, and the current groundwater table level is visually depicted in Figure 3.4-1 for the key municipal wells. The methodology used to establish interim milestones assumes a consistent pumping reduction applied uniformly across all pumping wells in the Subbasin, and approximates average conditions based on the BVHM. Therefore, the Watermaster will use the BVHM, including the model improvements as new data become available, to evaluate progress toward meeting interim milestones based on average conditions by management area.

Table 3-7
Measurable Objectives for Groundwater Levels

Representative Monitoring Point Well ID	2018 Observed Groundwater Elevation (feet MSL)	Observed Groundwater Level Trend (feet per year)	2020 Interim Milestone (feet MSL)	2025 Interim Milestone (feet MSL)	2030 Interim Milestone (feet MSL)	2035 Interim Milestone (feet MSL)	Measurable Objective Value (feet MSL)
North Management Area							
MW-1	377.91	-2.14	373	367	364	363	363
ID4-3	381.4	-2.09	377	371	369	368	368
SWID 010S006E09N001S	375.05	-2.48	370	367	366	365	365
ID4-18	377.94	-2.31	373	369	367	367	367
Central Management Area							
ID4-1	393.88	-1.39	391	381	375	370	370

Table 3-7
Measurable Objectives for Groundwater Levels

Representative Monitoring Point Well ID	2018 Observed Groundwater Elevation (feet MSL)	Observed Groundwater Level Trend (feet per year)	2020 Interim Milestone (feet MSL)	2025 Interim Milestone (feet MSL)	2030 Interim Milestone (feet MSL)	2035 Interim Milestone (feet MSL)	Measurable Objective Value (feet MSL)
Airport 2	407.51	-1.67	404	394	387	382	382
ID1-16	389.75	-0.95	388	384	376	370	370
South Management Area							
MW-5A	409.61	-0.74	408	400	393	387	384
MW-5B	409.6	-0.74	408	400	393	387	384
MW-3	454.38	-5.84	443	440	437	434	433
Air Ranch	465.47	-0.50	464	462	460	458	458
RH-1	468.13	-0.94	466	463	460	457	456
BWD Key Municipal Indicator Wells							
ID4-4	305.33	-2.73	300	291	285	284	284
ID4-11	390 52	-2.29	386	366	358	355	355
ID1-12	386.81	-1.51	384	377	370	369	368
ID5-5	394.7	-0.85	393	384	378	377	377

Notes: MSL = above mean sea level; BWD = Borrego Water District.
Methodologies The 2020 interim milestone is based on the spring 2018 observed groundwater elevation subtracted from the absolute value of the contemporary observed groundwater level trend multiplied by 2 years The 2025, 2030, 2035 and measurable objective are based on the results of the BVHM estimates of change in groundwater in storage and corresponding change in groundwater head at each model node with linear fixed reduction to the initial estimated sustainable yield target of 5,700 acre-feet per year and the applied 2030 DWR climate change factors. In cases where there was a groundwater level increase between 2035 and 2040, the measurable objective was held at 2035 levels. Note SWID 010S006E09N001S has a limited groundwater level record and was determined by subtracting Spring 2018 measurement from the Spring 2017 measurement.

The interim milestones define the planned pathway to sustainability and are meant to track progress toward achieving sustainability.

The Physical Soluion recognizes that climate change enhances the probability, magnitude, and periodicity of extreme precipitation events and that recharge over the 20-year GMP implementation period is an estimation. As such, the interim milestones for chronic lowering of groundwater levels will be closely monitored to determine whether the Subbasin is on track to achieve its sustainability goals. The Watermaster will annually review actual Subbasin groundwater extraction, historical and contemporary groundwater level trends, changes in groundwater storage, and climatic condition (i.e., dry, normal, wet year/period) to determine whether metrics indicate the Subbasin is on track to achieve its sustainability goals.

The Watermaster will provide at a minimum a 5-year outlook for proposed pumping reductions and annually review the pumping allowance in terms of achieving sustainability goals. The Watermaster may amend the pumping allowance to achieve and maintain the sustainability goals. The intent of the 5-year outlook is to provide clear direction to the groundwater extractors regarding the availability of water supply over the next 5-year period. The Watermaster will provide 5-year outlooks for the start of the Physical Solution implementation and for each of the 5-year milestones. If the Watermaster amends the pumping allowance in any given year, it will provide a minimum 5-year outlook that will be reevaluated at the next 5-year milestone.

3.4.2 Reduction of Groundwater in Storage – Measurable Objectives

The reduction of groundwater in storage measurable objective was developed using the same methodology as chronic lowering of groundwater levels. The estimated reduction of groundwater in storage simulated using the BVHM was used to establish the interim milestones and measurable objective, as described in Section 3.4.1, Chronic Lowering of Groundwater Levels – Measurable Objective. The reduction of groundwater in storage measurable objectives are listed in Table 3-8 for the BVHM model domain.

Table 3-8
Reduction of Groundwater in Storage Interim Milestones and Measurable Objectives

Year	Percent Pumping Reduced	Pumping Allowance (percent)	Pumping Allowance (acre-feet per year)	Cumulative Reduction of Groundwater in Storage (acre-feet)
0 (Baseline)	0.0%	100%	22,600[a]	0
5 (Interim Milestone)	19%	81%	18,376	43,500
10 (Interim Milestone)	37%	63%	14,151	73,000
15 (Interim Milestone)	56%	44%	9,925	76,600
20 (Measurable Objective)	75%	25%	5,700	72,000

Notes:
[a] The Baseline Pumping Allocation currently does not include Water Credits that may be converted to Baseline Pumping Allocation during GSP implementation

3.4.3 Seawater Intrusion

As explained in Section 3.2.3, Seawater Intrusion – Undesirable Results, seawater intrusion is not an applicable undesirable result in the Subbasin and a measurable objective is not warranted.

3.4.4 Degraded Water Quality – Measurable Objectives

Extraction wells in the Subbasin are generally screened in the upper, middle, or lower aquifers or cross-screened in multiple aquifers. These principal aquifers are discussed in Section 2.2.1.3, Principal Aquifers and Aquitards. Many extraction wells have long well screens intercepting multiple aquifers. Wellhead concentrations represent the average water quality of the formations producing flow to the well and in most cases do not represent the water quality of a specific aquifer or zone. As discussed Section 2.2.2.4, Groundwater Quality, the primary COCs identified in the Subbasin include arsenic, fluoride, nitrate, sulfate, and TDS.

As discussed in Section 3.3.4, Degraded Water Quality – Undesirable Results, the minimum threshold for degraded water quality is based on intended beneficial uses. For domestic or municipal supply (MUN), the minimum water quality means water quality that meets potable drinking water standards specified in Title 22 of the CCR. For irrigation wells, minimum water quality should generally be suitable for agriculture use. To develop a measurable objective for degraded water quality, the Basin Plan water quality objectives have been considered. The Regional Water Quality Control Board (RWQCB), Colorado River Region Basin Plan recognizes that, "[e]stablishment of numerical objectives for groundwater involves complex considerations since the quality of groundwater varies significantly with depth of well perforations, existing water levels, geology, hydrology and several other factors" (Colorado River RWQCB 2017). The Basin Plan does not have specific water quality objectives for groundwater. Groundwater quality suitability for agricultural use is industry and crop-specific, but can be gaged through conformance with generally accepted threshold limits for irrigation used by State Water Resources Control Board, and/or through continued engagement with growers within the Subbasin. If groundwater quality destined for irrigation is measured as meeting Title 22 standards, it would also be suitable for irrigation, as drinking water quality objectives are stricter than those that would make groundwater suitable for irrigation use.

Since the aforementioned standards are minimum thresholds, the GMP's measurable objective is for groundwater quality for the identified COCs within municipal and domestic wells exhibit stable or improving trend, as measured at each 5-year evaluation. For irrigation wells, the measurable objective is the same as the minimum threshold (i.e., that water quality be of suitable quality for agricultural use).

3.4.5 Land Subsidence Measurable Objectives

As explained in Section 3.2.5, Land Subsidence – Undesirable Results, land subsidence is not presently an applicable undesirable result in the Subbasin and a measurable objective is not warranted at this time.

3.4.6 Depletions of Interconnected Surface Water – Measurable Objectives

As discussed in Section 3.3.6, Depletions of Interconnected Surface Water – Minimum Thresholds, there is not sufficient information at this time to establish a minimum threshold or measurable objective for depletions of interconnected surface water. Based on information provided by the DWR and best available data, actions implemented by the Physical Solution such as pumping reductions and PMAs do not have a substantial nexus with mitigating depletions of interconnected surface water. Specifically, a pre-SGMA impacted GDE associated with the honey mesquite located in the vicinity of the Borrego Sink and potential GDEs located along the fringes of the Subbasin.

3.4.7 Groundwater Dependent Ecosystems – Measurable Objectives

As described in Section 3.2.7, the impact of groundwater pumping within the Subbasin to GDEs occurred prior to 2015, and thus, a minimum threshold is not being proposed.

3.5 MONITORING NETWORK

Standards for Establishment of Monitoring Networks

Under SGMA, a GSP is to contain information regarding:

1. The monitoring and management of groundwater levels within the basin;
2. The monitoring and management of groundwater quality, groundwater quality degradation;
3. The type of monitoring sites, type of measurements, and the frequency of monitoring for each location monitoring groundwater levels, groundwater quality, subsidence, streamflow, precipitation, and evaporation, including a summary of monitoring information such as well depth, screened intervals, and aquifer zones monitored, and a summary of the type of well relied on for the information, including public, irrigation, domestic, industrial, and monitoring wells; and
4. Monitoring protocols that are designed to detect changes in groundwater levels, groundwater quality, and quality of surface water that directly affect groundwater levels or quality or are caused by groundwater extraction in the basin (CWC Section 10727.2).

According to GSP Regulations, the GSP is also to include descriptions of:

- How the monitoring network is capable of collecting sufficient data to demonstrate short-term, seasonal, and long-term trends in groundwater and related surface conditions, and yield representative information about groundwater conditions as necessary to evaluate Plan implementation
- Monitoring network objectives including explanation of how the network will be developed and implemented to monitor:
    - Groundwater and related surface conditions
    - Interconnection of surface water and groundwater

- How implementation of the monitoring network objectives demonstrate progress toward achieving the measurable objectives, monitor impacts to beneficial uses or users of groundwater, monitor changes in groundwater conditions, and quantify annual changes in water budget components
- How the monitoring network is designed to accomplish the following for each sustainability indicator:
  - Chronic Lowering of Groundwater Levels. Demonstrate groundwater occurrence, flow directions, and hydraulic gradients between principal aquifers and surface water features
  - Reduction of Groundwater Storage. Estimate the change in annual groundwater in storage
  - Seawater Intrusion. Monitor seawater intrusion
  - Degraded Water Quality. Determine groundwater quality trends
  - Land Subsidence. Identify the rate and extent of land subsidence
  - Depletions of Interconnected Surface Water. Calculate depletions of surface water caused by groundwater extractions
- How the monitoring plan provides adequate coverage of the sustainability indicators
- The density of monitoring sites and frequency of measurements required to demonstrate short-term, seasonal, and long-term trends
- The scientific rational (or reason) for site selection
- Consistency with data and reporting standards
- For each well, the corresponding sustainability indicator, minimum threshold, measurable objective, and interim milestone
- The location and type of each monitoring site on a map (Title 23 CCR Section 354.34).

Monitoring Network

The overall objective of the monitoring network in the Borrego Springs Subbasin is to track and monitor parameters to demonstrate progress toward meeting the sustainability goals, including the minimum thresholds and measurable objectives defined in Section 3.3 and Section 3.4, respectively. In 2017, the GSA developed a *Sampling and Analysis Plan and Quality Assurance Project Plan* (SAP/QAPP), and in August 2018, the GSA developed a *Groundwater Extraction Metering Plan* (both included in Appendix E). The metering plan will be a mandatory component of the Physical Solution implementation for non-*de minimis* users. The monitoring network is described in Chapter 2, Section 2.2.2.2, and the monitoring plan is described below in terms of each applicable sustainability indicator, including monitoring protocols and monitoring plan assessment and improvement. The monitoring plan described below will be re-evaluated periodically to address findings of the data and compliance criteria presented in this GMP. It is expected that data collected throughout implementation of the Physical Solution may be used to validate and update the BVHM.

The monitoring plan was prepared pursuant to the DWR's *Best Management Practices for Sustainable Management of Groundwater, Monitoring Networks, and Identification of Data Gaps (BMP)* (DWR 2016), and considers relevant data and studies performed to date for the Subbasin. Consistent with the recommendations of the BMP, the monitoring plan includes monitoring objectives and recommendations for collecting data that demonstrate short- and long-term trends in groundwater, and progress toward achieving measurable objectives. The monitoring plan is also designed to monitor impacts to beneficial uses of groundwater, and to quantify annual changes in water budget components. Monitoring objectives, previous studies and ongoing monitoring programs, data quality objectives, and monitoring scope are described in detail below.

3.5.1 Description of Monitoring Network

The monitoring network is designed to collect sufficient data to demonstrate short-term, seasonal, and long-term trends in groundwater and related surface conditions, and provide representative information about Subbasin-wide groundwater conditions as necessary to evaluate Plan implementation. The most critical sustainability criteria to be monitored directly for the Subbasin are chronic lowering of groundwater levels and degraded water quality at the key indicator wells listed in Table 3-4 and Table 3-5 (Figure 3.3-1). Direct measurement of groundwater levels across the wider monitoring network described in Chapter 2 (Table 2.2-4) will be used to calculate and evaluate reductions in groundwater storage. No direct measurements of seawater intrusion, land subsidence, and depletions of interconnected surface water are proposed at this time.

The scope of monitoring is subdivided below consistent with the sustainability indicators.

3.5.1.1 Chronic Lowering of Groundwater Levels – Monitoring Network

As a critically overdrafted basin, groundwater levels in the Subbasin are the most obvious and important metric for basin sustainability, closely followed by water quality conditions. In addition, the effect of chronic lowering of groundwater levels will also be observed within each of the other sustainability indicators. The groundwater level-monitoring network currently consists of 50 wells, including 23 dedicated monitoring wells and 27 extraction wells. Of the 50 wells in the network, 46 are monitored for water levels, 30 are monitored for water quality, and 19 are monitored for production, as explained in Section 2.2.2, Current and Historical

Groundwater Conditions, and shown on Figure 2.2-12. The Subbasin monitoring density for GWE is currently approximately 48 wells per 100 square miles (Plan Area is approximately 98 square miles). While there is no definitive rule for the density of groundwater monitoring points needed in a basin, for comparison the monitoring well density recommended by CASGEM Groundwater Elevation Monitoring Guidelines ranges from 1 to 10 wells per 100 square miles (DWR 2010). Per GSP Regulation Section 354.2(a), the key indicator wells identified in Table 3-4 and Table 3-5 are proposed as the representative monitoring sites for the chronic lowering of groundwater sustainability indicator.

Wells were selected for monitoring based on a combination of factors, including geographic location, screen interval relative to the three principal aquifers, accessibility, well condition, and continuity of historical data. The groundwater level monitoring program incorporates all feasible wells in the Subbasin at this time; however, the network is expected to be further refined as access is gained to additional wells or new wells are drilled in the Subbasin. The GSA recently inspected several private wells to determine potential to include into the monitoring network and is working with private property owners to gain access or to install radio/cellular transmission meters capable of measuring well levels in monitoring wells for long-term monitoring, to be followed up by Watermaster. In addition to tracking groundwater levels at key indicator wells in the Subbasin, collected data will also be used to update groundwater level elevation contour and direction of groundwater flow maps.

Groundwater production is currently recorded monthly for 11 active BWD wells and 12 golf course wells. Additionally, many private pumpers record groundwater production at monthly or annual intervals. Upon Plan adoption, all non-*de minimis* groundwater extractors will be required to record monthly groundwater production and report to the Watermaster on an annual basis. The GSA secured Proposition 1 grant funding to install a limited number of flow meters at wells and is currently working with private well owners to get flow meters installed. The property owner (or third-party contractor acceptable to the GSA) would monitor/read the meter on a monthly basis. A manufacturer or qualified installer of such meters, or other third-party contractor acceptable to the GSA would inspect and read the meter on an annual basis to verify the accuracy of data including meter calibration. Under the Physical Solution, private well owners will install, at their own expense, Watermaster approved meters such as the SWIIM meter system that can radio transmit water production and other data to the Watermaster in real time on a schedule as determined by the Watermaster. On behalf of the property owner, the manufacturer, meter installer or third-party contractor would provide an annual statement to the Watermaster with verification of the total extraction in gallons from each well and verification that each flow meter is calibrated to within factory acceptable limits, as well as verification that there are no valves or other devices upstream of the meter that could lead to pumped water being diverted before being read by the meter. The Watermaster will keep data confidential to the maximum extent allowed by law (California Govt. Code 6254(e)). The mandatory requirements for well metering are detailed further in the *Groundwater Extraction Metering Plan* provided as Appendix E2.

The current groundwater level monitoring network is capable of collecting data of sufficient accuracy and quantity to demonstrate short-term, seasonal, and long-term trends in groundwater and related surface conditions.

The entire groundwater monitoring network is shown in Figure 2.2-12, whereas the key indicator wells used to track progress towards interim milestones and measurable objectives are shown in Figure 3.3-1 and Figure 3.4-1.

- Short-term trends are tracked by pressure transducers currently installed and maintained in 17 wells that record groundwater levels at intervals of 15 minutes to 1 hour (sub-daily).
- Seasonal trends are tracked by semi-annual GWE monitoring of 46 wells in the spring and fall.
- Long-term trends are tracked by analysis of data from key indicator wells monitored semi-annually in each of the management areas with historical data dating back to the mid-1950s.

The groundwater level network is sufficiently representative of groundwater conditions in the Subbasin necessary to update the BVHM and track sustainability metrics discussed in the previous sections. As discussed in Section 2.2.1.3, Principal Aquifers and Aquitards, the groundwater system has been subdivided into three principal aquifers consisting of the upper, middle and lower aquifers. Most wells are cross-screened in more than one aquifer and aquifer-specific groundwater levels are limited. As described in Section 2.2.2.1, Groundwater Elevation Data, review of existing GWE data within the Plan Area suggests that although three distinct aquifers are delineated in varying thickness across the Subbasin, the effect of well screen lengths and intervals is potentially negligible with respect to measured depths to groundwater (i.e., potentiometric surface).

Therefore, although the Watermaster may not be able to obtain data from groundwater monitoring wells screened solely in each of the three aquifer units in each of the three management areas, these data gaps are not considered significant with regard to groundwater levels, given all the other available data points. As such, for the purposes of the GMP, the need for wells screened solely in each vertical aquifer unit independently does not appear to be necessary to achieve adequate spatial representation of GWEs in the Subbasin.

3.5.1.2 Reduction of Groundwater in Storage Monitoring Network

Reduction in groundwater storage is not a parameter that can be directly measured; rather, change in storage will be estimated based on the Subbasin water budget every 5 years and monitoring results derived from analysis of GWE changes annually (aquifer properties will be refined if there are additional pump tests performed within the Subbasin). The wider monitoring network shown in Table 2.2-4 will be used to update groundwater level elevation contour and direction of groundwater flow maps. Based on the availability of sufficient aquifer properties and GWE data, monitoring of groundwater levels in the Subbasin is a sufficient surrogate for evaluating reduction of groundwater in storage (Title 23 CCR Section 354.36(b)). The method for measurement of estimating annual reduction of groundwater in storage is described in Section 3.3.2.6, Minimum Threshold Measurement Method.

3.5.1.3 Degraded Water Quality Monitoring Network

The monitoring network currently includes sampling of 30 wells on a semi-annual basis to determine and track groundwater quality trends. Wells are monitored for potential COCs that were previously identified in part by the USGS and DWR, and a review of the historical data by the GSA. The COCs include arsenic, fluoride, nitrate, sulfate and TDS. Additionally, in Fall 2017, general minerals were analyzed to establish baseline water quality and for comparison of water quality type for all wells monitored. Radionuclides were also analyzed to determine baseline conditions but are not currently considered a COC.

Additional wells are proposed to be added to the monitoring network to further evaluate both groundwater levels and groundwater quality in the CMA to better track trends in this more developed area of the Subbasin. Additionally, the Watermaster will continue to work with private landowners to expand the monitoring network.

3.5.1.4 Seawater Intrusion Monitoring Network

As explained in Section 3.2.3, Seawater Intrusion – Undesirable Results, seawater intrusion is not an applicable undesirable result in the Subbasin and monitoring is not warranted.

3.5.1.5 Land Subsidence Monitoring Network

As explained in Section 3.2.5, Land Subsidence – Undesirable Results, land subsidence is not an applicable undesirable result in the Subbasin and monitoring is not warranted. If during the Physical Solution implementation, it becomes evident that minimum thresholds and measurable objectives for lowering of groundwater levels and groundwater in storage are not being met, the degree to which land subsidence may become an undesirable result will be re-evaluated.

3.5.1.6 Depletions of Interconnected Surface Water Monitoring Network

As explained in Section 3.2.6, Depletions of Interconnected Surface Waters – Undesirable Results, the impact of groundwater pumping within the Subbasin to GDEs occurred prior to

2015, is neither currently nor expected to become an undesirable result, and thus monitoring is not warranted.

3.5.2 Monitoring Protocols for Data Collection and Monitoring

Standards for Establishing Monitoring Protocols

"Under SGMA, the GSP must contain monitoring protocols that are designed to detect changes in groundwater levels, groundwater quality, inelastic surface subsidence for basins for which subsidence has been identified as a potential problem, and flow and quality of surface water that directly affect groundwater levels or quality or are caused by groundwater extraction in the basin. The CWC Section 10727.2(f). According to GSP Regulations, "Each Plan shall include monitoring protocols adopted by the Agency for data collection and management, as follows:

a. Monitoring protocols shall be developed according to best management practices.

b. The Agency may rely on monitoring protocols included as part of the best management practices developed by the Department, or may adopt similar monitoring protocols that will yield comparable data.

c. Monitoring protocols shall be reviewed at least every five years as part of the periodic evaluation of the Plan, and modified as necessary" (Title 23 CCR Section 352.2).

Protocols in the Borrego Subbasin

The protocols for data collection and monitoring are detailed in the SAP/QAPP (Appendix E1). The SAP/QAPP will be updated periodically to address findings of the data and compliance criteria presented in the Physical Solution. The SAP provides a sampling and analysis plan that includes sampling objectives, potential COCs, monitoring frequency, methods for GWE and quality monitoring, and sample handling. The QAPP defines roles and responsibilities, quality objectives and criteria, special training, documentation and records, field and laboratory analytical methods, field and laboratory quality control, assessments and response actions, data reduction, review, verification and validation, data evaluation roles and responsibilities, and data reporting. Technical standards, data collection methods and quality assurance are described in detail in the SAP/QAPP to ensure comparable data and methodologies (Appendix E1).

3.5.3 Representative Monitoring

Standards for Representative Monitoring

The GSP Regulations provide that a GSA may designate a subset of monitoring sites as representative of conditions in the basin as follows:

1. Representative monitoring sites may be designated by the Agency as the point at which sustainability indicators are monitored, and for which quantitative values for minimum thresholds, measurable objectives, and interim milestones are defined.
2. Groundwater elevations may be used as a proxy for monitoring other sustainability indicators if the Agency demonstrates the following:
   a. (1) Significant correlation exists between groundwater elevations and the sustainability indicators for which groundwater elevation measurements serve as a proxy.
   b. (2) Measurable objectives established for groundwater elevation shall include a reasonable margin of operational flexibility taking into consideration the basin setting to avoid undesirable results for the sustainability indicators for which groundwater elevation measurements serve as a proxy.
3. The designation of a representative monitoring site shall be supported by adequate evidence demonstrating that the site reflects general conditions in the area (Title 23 CCR Section 354.36).

GWEs and water quality are the primary indicators to be directly measured and are the only sustainability indicators for which representative monitoring points are warranted at this time. GWEs are also a proxy for evaluation of storage as previously described in Section 3.5.1.2. Measurement of other sustainability indicators (i.e., seawater intrusion, subsidence, and depletion of interconnected surface water) is not currently warranted as described in Section 3.5.1.

Representative monitoring points have been selected in each of the three management areas. Multiple representative monitoring points are warranted within each management area to address the diversity of land uses, proximity to pumping centers and recharge areas, elevation differences, etc. As such, selected representative monitoring points are anticipated to be updated as the Subbasin pumping centers evolve or other pertinent data are obtained over the Physical Solution implementation. Representative monitoring points are presented in Table 3-9 and plotted on Figure 3.3-1.

Table 3-9
Representative Monitoring Points

Management Area	Well ID	Rationale
North Management Area	MW-1	Dedicated monitoring well downgradient of agricultural pumping center, screened in the lower-middle/lower aquifers
	ID4-3	Proximal and cross-gradient of agricultural pumping center and golf course (De Anza). No log or well completion information is available.

Table 3-9
Representative Monitoring Points

Management Area	Well ID	Rationale
	SWID 010S006E09 N001S	Proximal to agricultural pumping center and suspected nitrate source areas, screened in the middle and lower aquifer
	ID4-18	Proximal and cross-gradient of agricultural pumping center and screened in the upper/upper-middle aquifers
	ID4-4	Key Municipal Water Well
Central Management Area	ID4-1	Located in central portion of community of Borrego Springs with predominantly drinking water beneficial use. No log or well completion information is available.
	Airport 2	Representative of eastern portion of CMA, screened in the middle and lower aquifer
	ID1-16	Representative of southwestern portion of CMA, screened in the middle and lower aquifers
	ID4-11	Key Municipal Water Well
	ID1-12	Key Municipal Water Well
	ID5-5	Key Municipal Water Well
South Management Area	MW-5A	Effective well pair to evaluate vertical differences (groundwater levels and water quality), located near Borrego Sink, screened in the middle/lower aquifers
	MW-5B	Effective well pair to evaluate vertical differences (groundwater levels and water quality), located near Borrego Sink, screened in the upper/middle aquifers
	MW-3	Dedicated monitoring well representative of pumping effects near golf course (Rams Hill) screened in the middle/upper-lower aquifers.
	Air Ranch Well 4	Representative of conditions in southeast SMA, screened in the lower aquifer

Notes: CMA = Central Management Area; SMA = South Management Area.

3.5.4 Assessment and Improvement of Monitoring Network

Standards for Assessment and Improvement of Monitoring Network

Section 354.38 of the GSP Regulations provide that a GSA should continue to assess and improve the monitoring network throughout the planning and implementation horizon, as follows:

1. Each Agency shall review the monitoring network and include an evaluation in the Plan and each 5-year assessment, including a determination of uncertainty and whether there are data gaps that could affect the ability of the Plan to achieve the sustainability goal for the basin.
2. Each Agency shall identify data gaps wherever the basin does not contain a sufficient number of monitoring sites, does not monitor sites at a sufficient frequency, or utilizes monitoring sites that are unreliable, including those that do not satisfy minimum standards of the monitoring network adopted by the Agency.

3. If the monitoring network contains data gaps, the Plan shall include a description of the following:
   a. The location and reason for data gaps in the monitoring network.
   b. Local issues and circumstances that limit or prevent monitoring.
4. Each Agency shall describe steps that will be taken to fill data gaps before the next 5-year assessment, including the location and purpose of newly added or installed monitoring sites.
5. Each Agency shall adjust the monitoring frequency and density of monitoring sites to provide an adequate level of detail about site-specific surface water and groundwater conditions and to assess the effectiveness of management actions under circumstances that include the following:
   a. Minimum threshold exceedances.
   b. Highly variable spatial or temporal conditions.
   c. Adverse impacts to beneficial uses and users of groundwater.

3.5.4.1 Review and Evaluation of the Monitoring Network

The Subbasin monitoring network will be reviewed and evaluated for effectiveness annually and for each 5-year assessment. The review and evaluation will address uncertainty and data gaps that could affect the ability of the Plan to achieve the sustainability goal for the basin, and will consider localized effects that may not be represented throughout the respective management area. The evaluation is described in more detail in Section 5.4.5, Monitoring Network, of the GMP.

3.5.4.2 Identification of Data Gaps

Groundwater Elevation

Identification of data gaps for GWEs must consider vertical and lateral representation of the Subbasin and management areas. For vertical control, as discussed in Section 2.2.2, Current and Historical Groundwater Conditions, review of existing GWE data within the Plan Area suggests that although three distinct aquifers are delineated in varying thickness across the Subbasin, the effect of well screen lengths and intervals is potentially negligible with respect to measured depths to groundwater (i.e., potentiometric surface). Multicompletion wells or well clusters screened at discrete intervals in the upper, middle and lower aquifers would be required to determine potentiometric surface by aquifer unit. However, the average potentiometric surface measured at wells that are screened over one or more aquifer units appears to sufficiently represent groundwater conditions in the Subbasin with respect to monitoring the applicable sustainability indicators.

Laterally, the pattern of existing overlying land uses and beneficial uses of groundwater are well represented by the management areas, which the monitoring network covers. As conditions may change throughout the Physical Solution implementation, representation of overlying land uses and beneficial groundwater uses will be evaluated annually along with the network's reliability (i.e., access). Each monitoring well will be tracked and the need for alternative or additional monitoring wells will be evaluated as part of the annual and 5-year review processes, as described in Section 5.4.5, Monitoring Network, of the GMP.

As described in Section 3.5.1.1, based on the nature of the Subbasin and review of historical data, semi-annual monitoring is an appropriate monitoring frequency to continue to track seasonal trends and addresses the minimum standards of the monitoring network.

Groundwater Quality

As discussed in Section 2.2.2.4, Groundwater Quality, there are both anthropogenic and natural sources of the COCs in the Subbasin. All COCs are found in differing concentrations in the upper, middle, and lower aquifers. Extraction wells in the Subbasin are generally screened in the upper, middle, or lower aquifers or cross-screened in multiple aquifers. As such, water quality samples collected at the wellhead represent an average concentration of the formations screened and do not represent depth-discrete or aquifer specific conditions. Multicompletion wells or depth discrete water quality samples would be required to better characterize water quality by aquifer zone and depth in the Subbasin. For example, water quality results indicate that there is elevated arsenic detected at concentrations above drinking water standards in the lower aquifer of the SMA. As the occurrence of wells screened in discrete aquifer zones is limited, especially for the lower aquifer in the NMA and CMA, it is uncertain if elevated arsenic occurs at depth in these areas of the Subbasin. Additionally, there is limited contemporary data available for private wells located in the NMA and CMA to laterally and vertically delineate nitrate and TDS concentrations in the upper aquifer.

Regulatory Data Gaps

SGMA requires that the Plan consider relevant state, federal, and local standards. As such, pertinent regulatory agencies are considered stakeholders. Summaries of data gaps associated with relevant agencies are provided below:

- RWQCB – The Colorado River RWQCB has not established water quality objectives for the Region, and acknowledges that "[e]stablishment of numerical objectives for groundwater involves complex considerations since the quality of groundwater varies significantly with depth of well perforations, existing water levels, geology, hydrology and several other factors" (Colorado River RWQCB 2017).

Borrego Valley Hydrologic Model

SGMA requires that the GSA identify data gaps and uncertainty associated with key water budget components and model forecasts, and develop an understanding of how these gaps and uncertainty may affect implementation of proposed projects and water management actions.

As explained in the *Update to U.S. Geological Survey Borrego Valley Hydrologic Model for the Borrego Valley Sustainability Agency* (contained in Appendix D1), the sensitivity analysis conducted by the USGS indicated the greatest uncertainty in the numerical model was in agricultural pumping, streamflow leakage, and storage. As new data are collected and an improved understanding of the basin is developed over time, through either additional characterization, monitoring efforts, or both, the predictive accuracy of the BVHM could be improved, as needed, at annual updates and the 5-year review process. This is because new data could allow for a refinement of the underlying model assumptions (aquifer properties, stratigraphy, boundary conditions, etc.) and/or a more robust calibration due to a larger database of calibration targets (groundwater levels, surface water flows, a more robust climatic dataset, etc.).

To improve the accuracy of the BVHM in simulating actual conditions and provide greater confidence in predictive simulations, the Watermaster intends to obtain additional data and further study the hydrogeology of the basin:

- Collect actual agricultural pumping data via existing or installation of new flow meters at farm wells. The pumping data may be incorporated in the numerical model to calibrate the Farm Process Package to more accurately estimate the water demands for the various crops and golf courses being irrigated.
- Collect periodic manual streamflow measurements at major drainages that convey most of the surface water runoff to the valley, either from perennial flows or flash flows from major precipitation events. Collection of this information can be used to further verify the accuracy of the Basin Characterization Model used in the BVHM, and ultimately to provide a more accurate estimate of stream leakage.

Additional data gaps noted within this GMP, which would improve the accuracy of the BVHM, but may not be necessary to adequately apply sustainable management criteria include:

- Conduct aquifer tests at wells with screen intervals isolated to only the upper aquifer or the middle aquifer to obtain site-specific estimates of hydraulic conductivity and specific yield for each aquifer unit. This information may be used to enhance the calibration of the model to these hydraulic properties and our understanding of storage in the Subbasin.

- Evaluate subsurface inflow and outflow along the Coyote Creek fault. Currently, the Coyote Creek fault is interpreted to act as a boundary to groundwater flow between the Subbasin and the Ocotillo-Clark Valley Groundwater Basin. However, supplemental analysis of boundary conditions may be warranted to estimate a value of underflow to substantiate the working assumption regarding the negligible effect on the Subbasin water balance across this portion of the Subbasin boundary.

3.5.4.3 Description of Steps to Fill Data Gaps

The process for addressing identified data gaps is for the Watermaster to evaluate the potential significance of the data gaps, anticipated duration, costs, and overall benefit to the effectiveness of the GMP. Initial tasks to address existing data gaps include the following:

- If the Colorado River RWQCB develops interim water quality measurable objectives, the Watermaster will coordinate for determination of defensible water quality objectives.
- The Watermaster will evaluate opportunities for gathering additional data on existing or new monitoring wells screened in the upper aquifer of the NMA to determine the nature and extent of nitrate concentrations in the upper aquifer underlying areas of historical agricultural fertilizer application.
- The Watermaster will evaluate opportunities for gathering additional data on existing or new monitoring wells screened in the lower aquifer of the NMA and CMA to determine if poor water quality occurs with depth in the Subbasin, such as the elevated arsenic detected in the lower aquifer of the SMA.

3.5.4.4 Description of Monitoring Frequency and Density of Sites

Based on Subbasin conditions, as described in GMP Chapter 2; Section 3.5.1.1, Chronic Lowering of Groundwater Levels Monitoring Network; and the monitoring plan (described above), semi-annual monitoring of water quality and water elevations is considered adequate to demonstrate short-term, seasonal, and long-term trends in groundwater and related surface conditions, and yield representative data to compare to measurable objectives and minimum thresholds.

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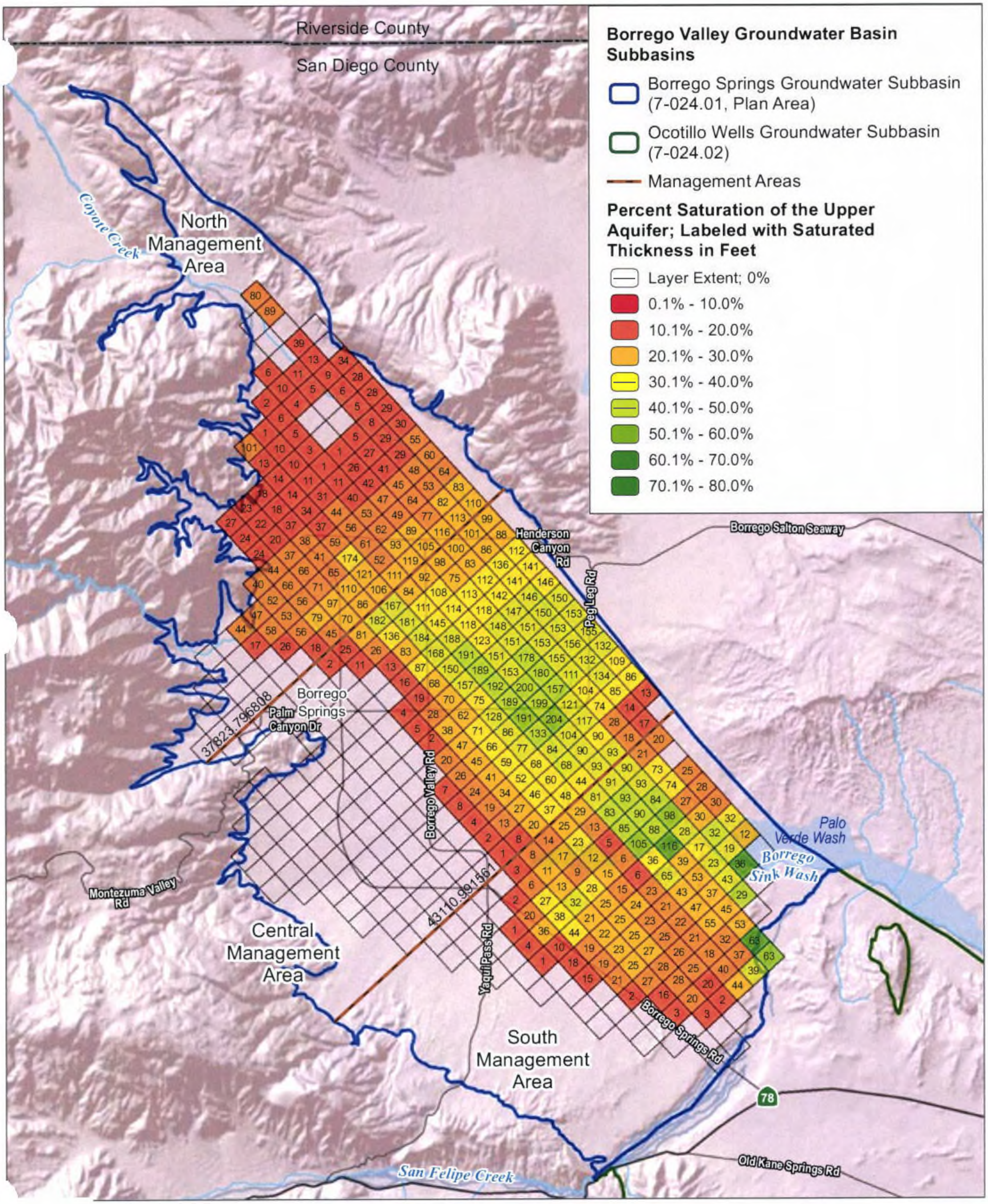

DATUM: NAD 1983. DATA SOURCE: DWR 2015, USGS 2015

DUDEK January 2020

0 1 2 Miles

Figure 3.2-1
Model Upper Aquifer Saturated Thickness - September 2016

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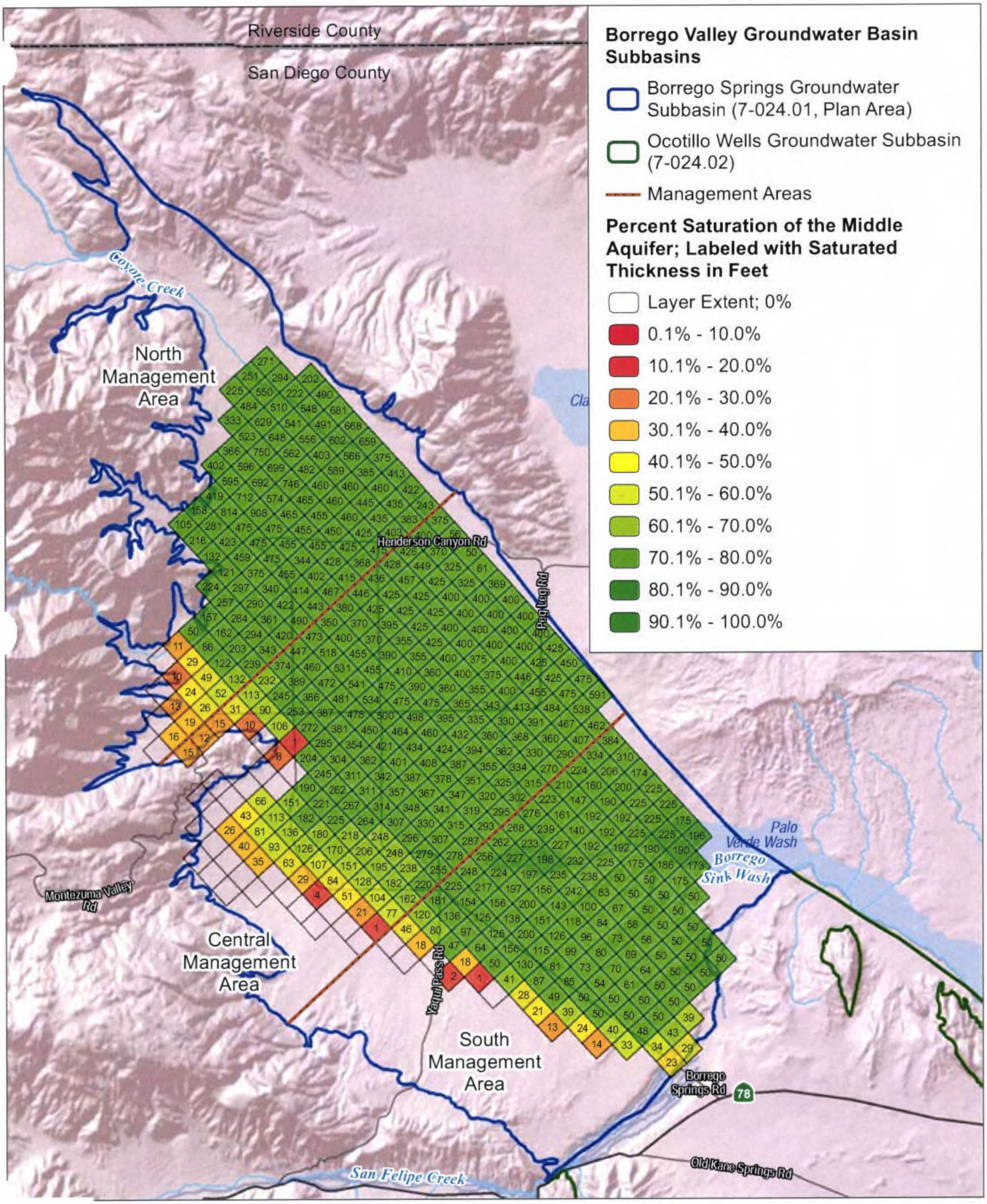

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Figure 3.2-2
Model Middle Aquifer Saturated Thickness - September 2016

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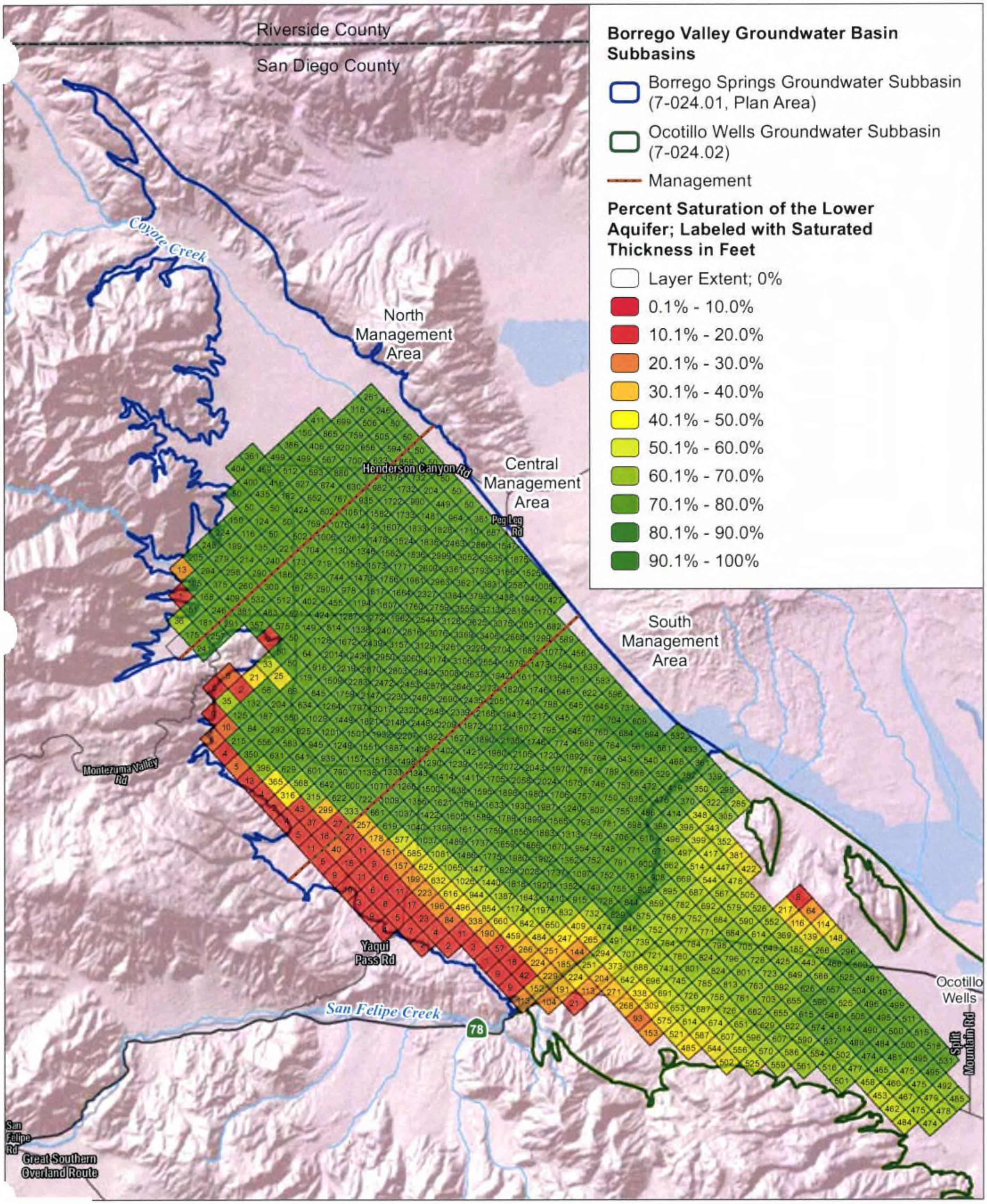

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0 1.25 2.5 Miles

Figure 3.2-3

Model Lower Aquifer Saturated Thickness - September 2016

Groundwater Management Plan for the Borrego Springs Groundwater Subbasin

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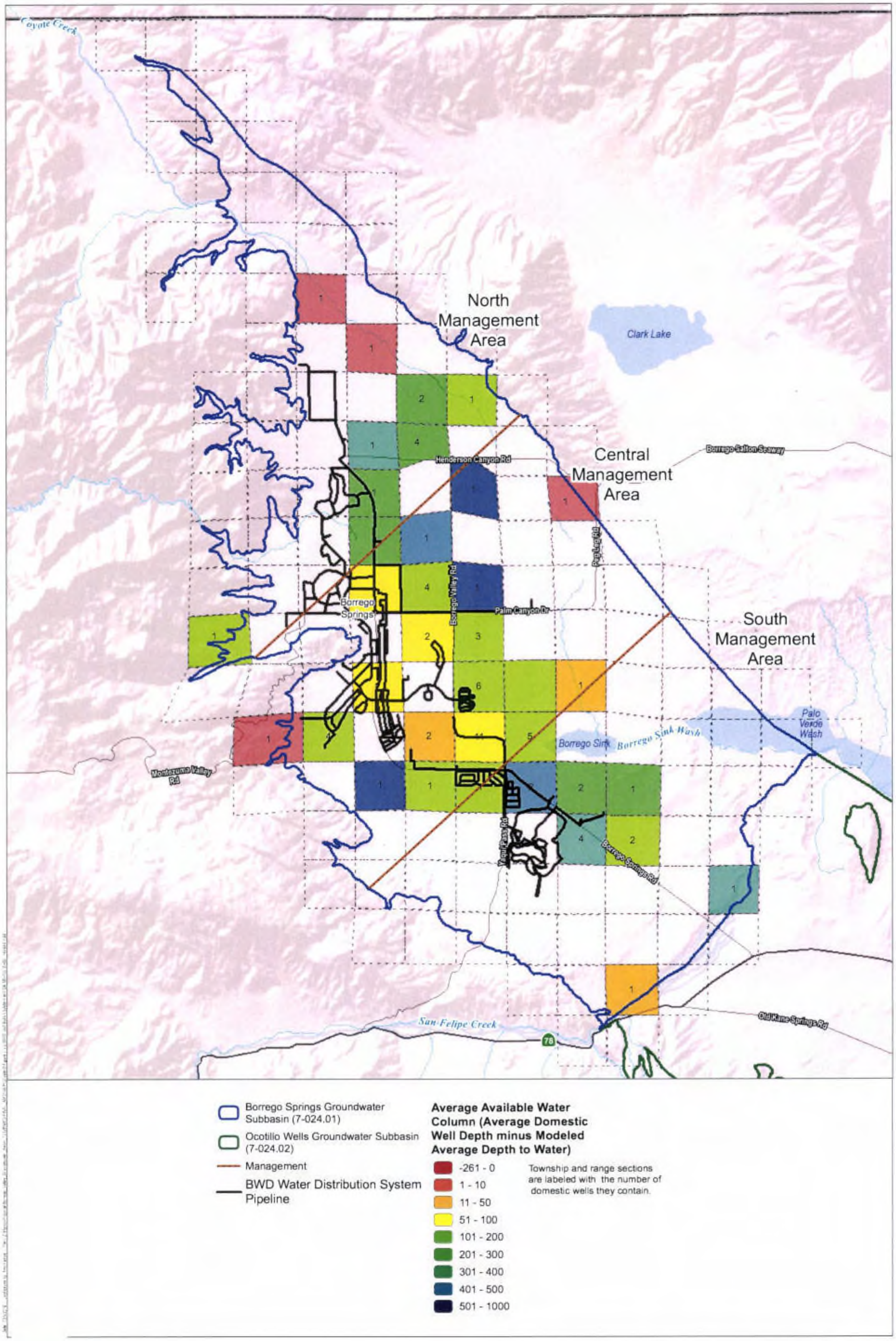

DATUM: NAD 1983 DATA SOURCE: SanGIS 2017, BWD, DWR 2018

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Figure 3.2-4

BWD Distribution System and De Minimis Users

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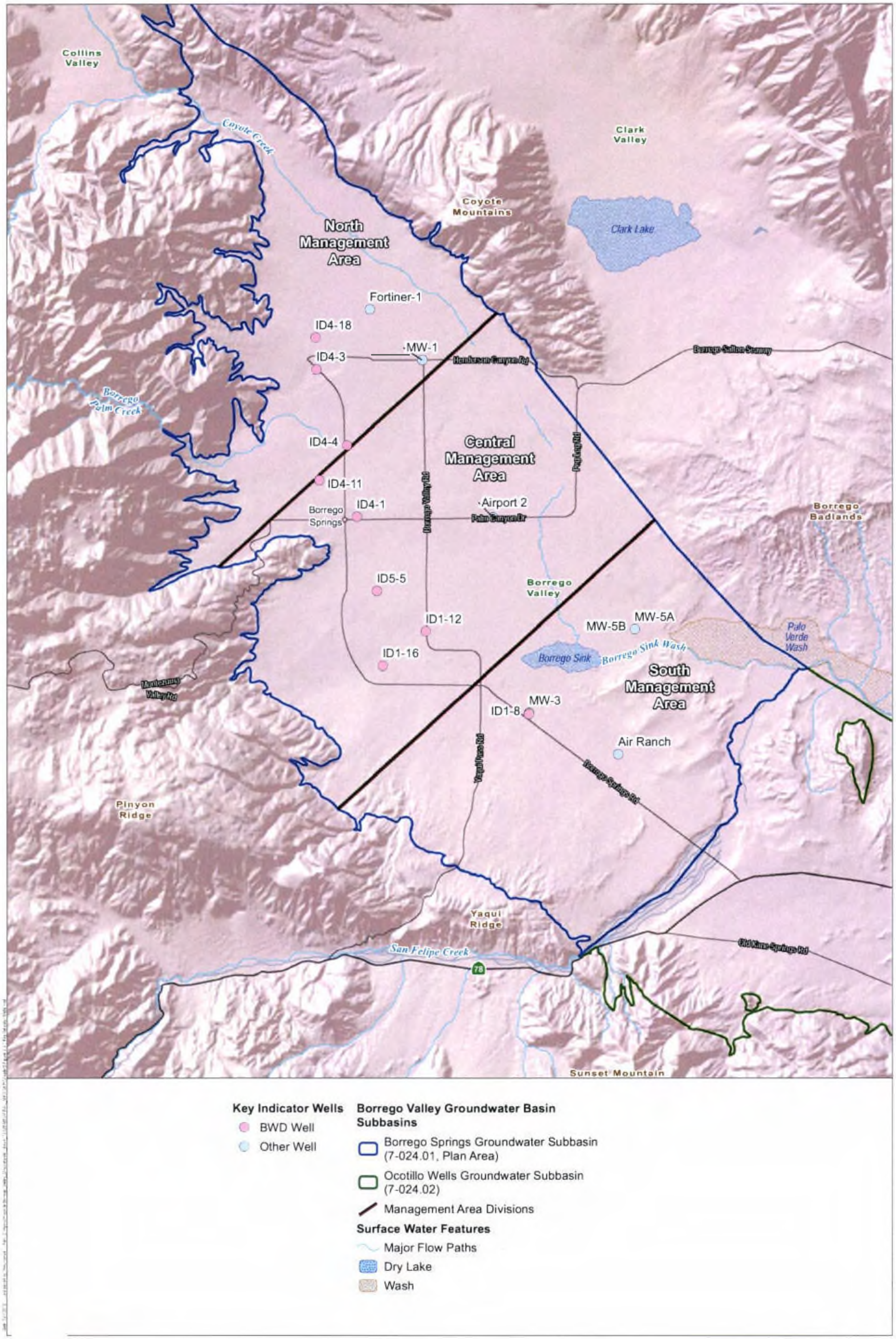

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0 0.75 1.5 Miles

Figure 3.3-1

Key Indicator Wells

Groundwater Management Plan for the Borrego Springs Groundwater Subbasin

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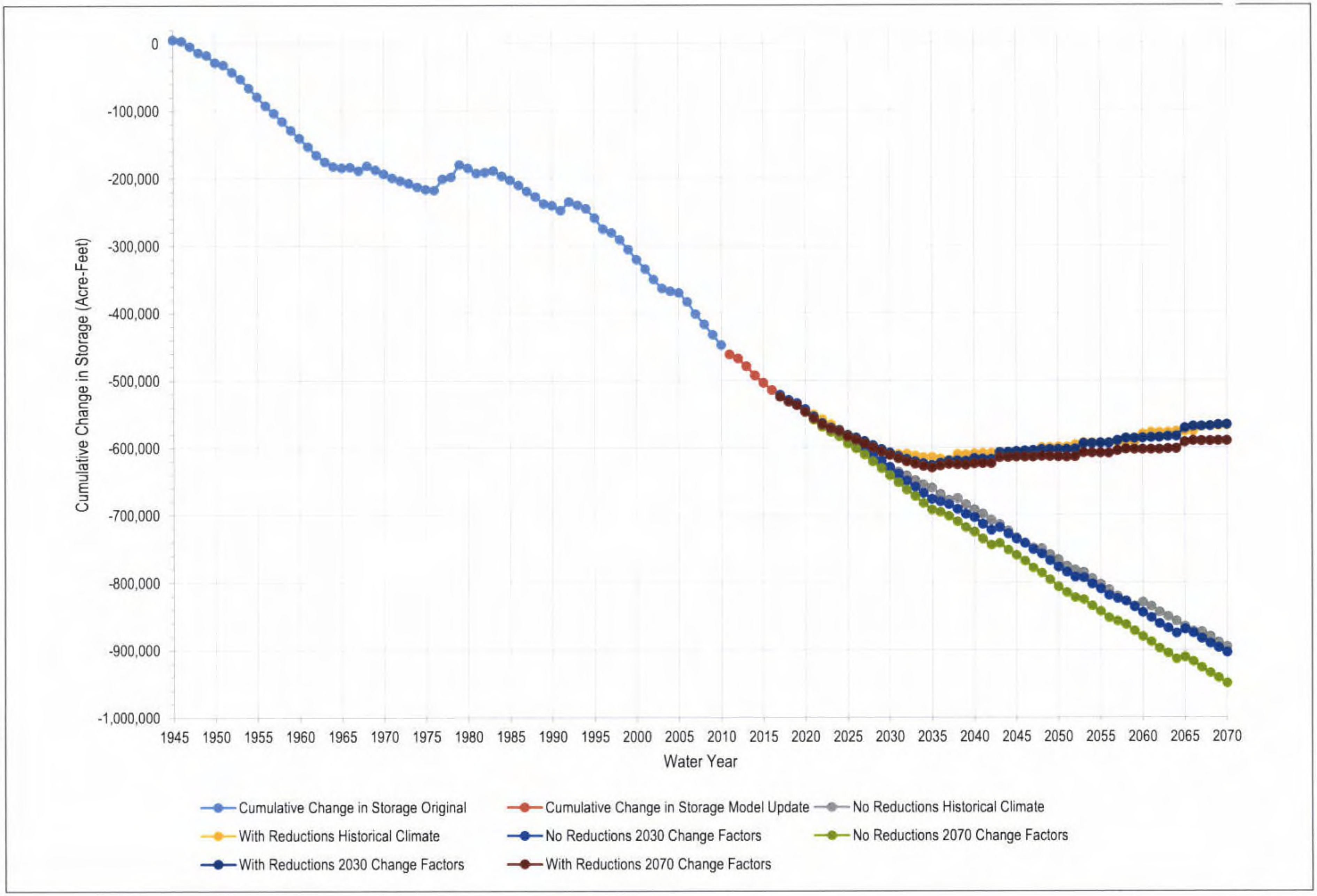

FIGURE 3.3-2

BVHM Model Runs Addressing Future Climate and Pumping Reductions

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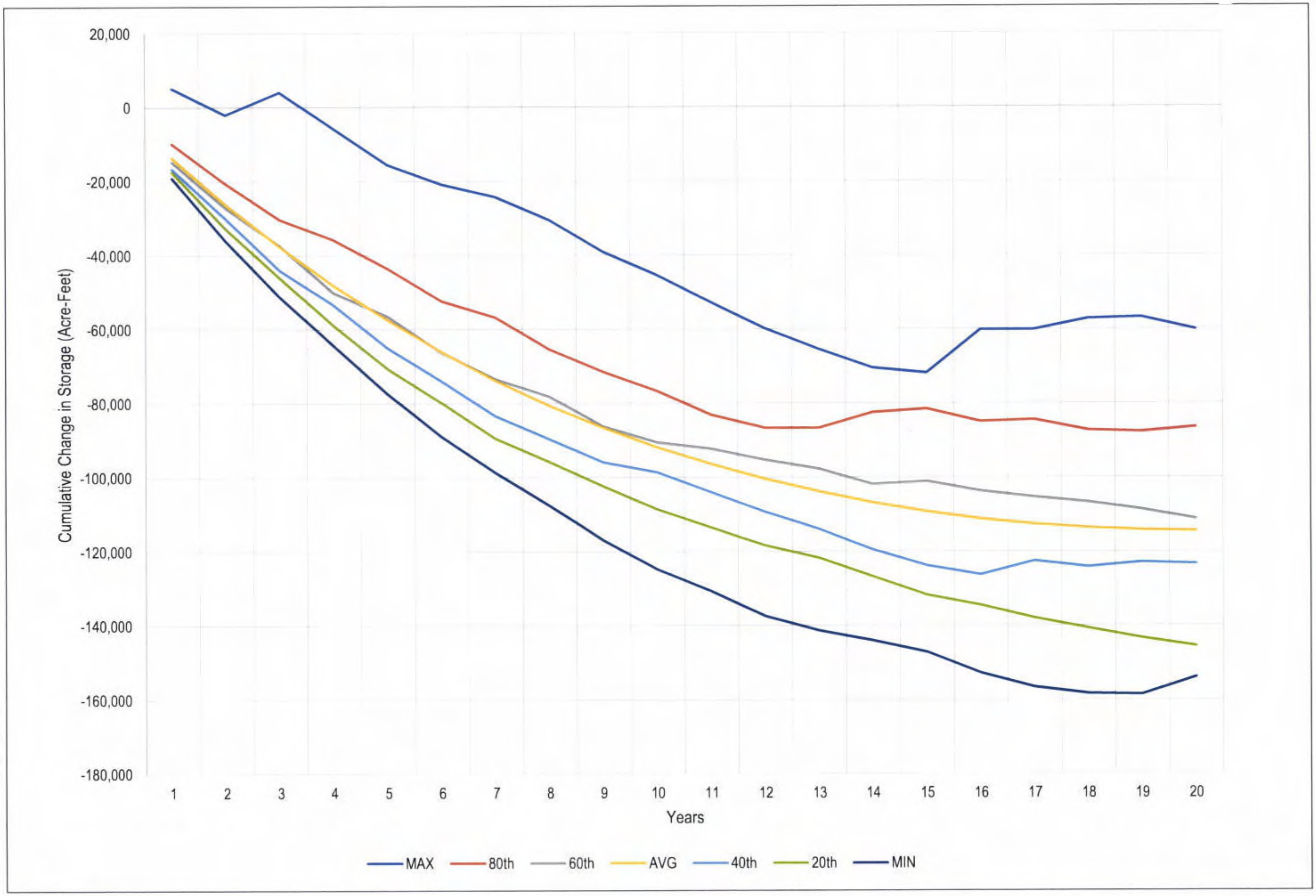

SOURCE: ENSI 2018

FIGURE 3.3-3

Monte Carlo Simulation Time Varying Recharge 1945 to 2010 and Forcasted Cumulative Overdraft

Groundwater Management Plan for the Borrego Springs Groundwater Subbasin

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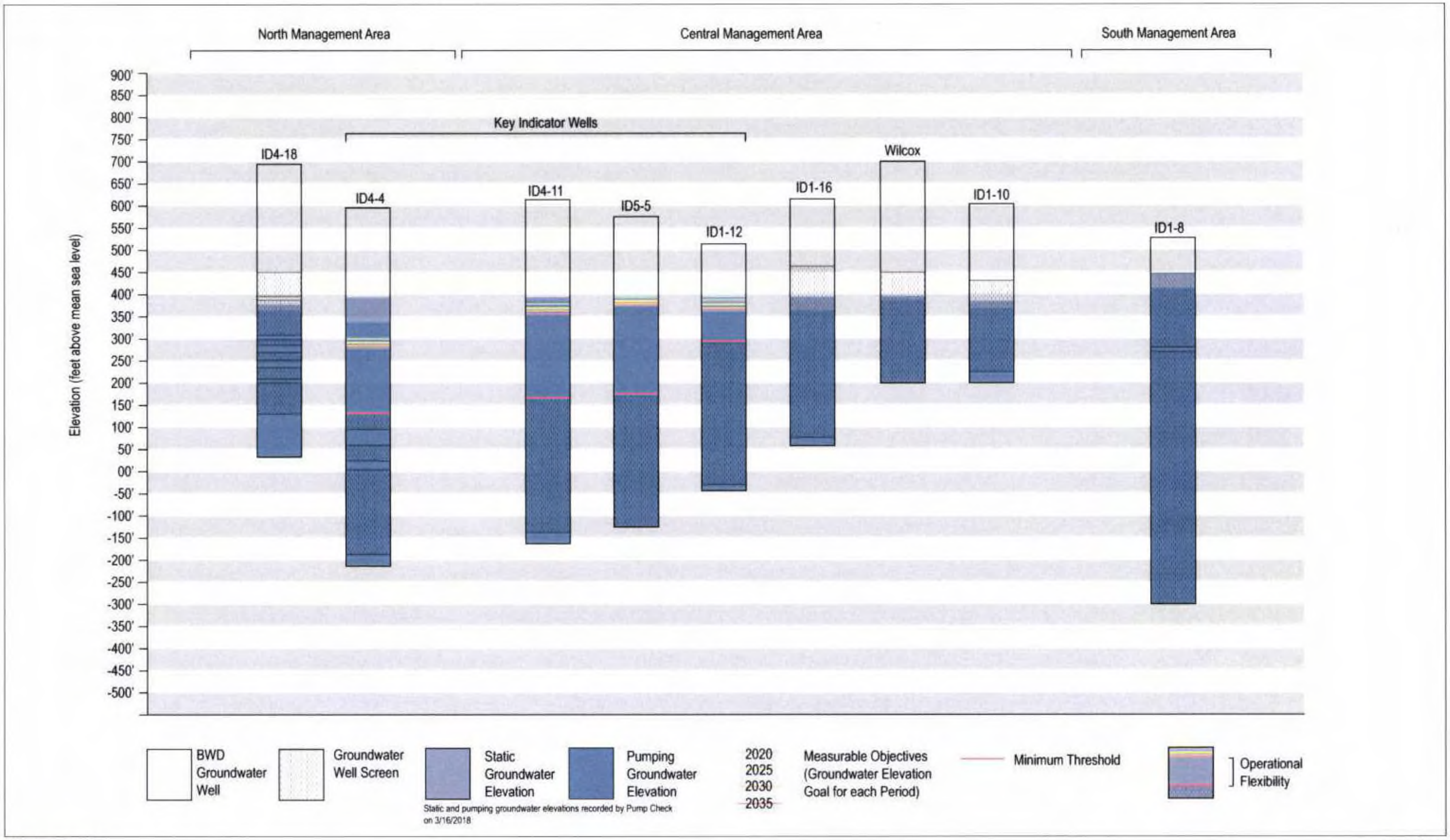

SOURCE: Pump Check 2018

FIGURE 3.4-1

BWD Municipal Well Screens Relative to 2018 Groundwater Elevations

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CHAPTER 4
PROJECTS AND MANAGEMENT ACTIONS

4.0 PROJECTS AND MANAGEMENT ACTIONS TO ACHIEVE SUSTAINABILITY GOAL

Standards for Projects and Management Actions

Under the Regulations, the Groundwater Sustainability Plan (GSP, Plan) is to include the following:

1. "Each Plan shall include a description of the projects and management actions the Agency [Groundwater Sustainability Agency (GSA)] has determined will achieve the sustainability goal for the basin, including projects and management actions to respond to changing conditions in the basin.
2. Each Plan shall include a description of the projects and management actions that include the following:
   a. A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent. The Plan shall include the following:
      i. A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management actions, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.
      ii. The process by which the Agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken.
   b. If overdraft conditions are identified through the analysis required by California Code of Regulations (CCR) Section 354.18 [Water Budget], the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.
   c. A summary of the permitting and regulatory process required for each project and management action.

d. The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.

e. An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.

f. An explanation of how the project or management action will be accomplished. If the projects or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.

g. A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.

h. A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.

i. A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.

3. Projects and management actions shall be supported by best available information and best available science.

4. An Agency shall take into account the level of uncertainty associated with the basin setting when developing projects or management actions" (CCR Section 354.44).

Further, a GSA "has and may use the powers [in the Sustainable Groundwater Management Act (SGMA)] to provide the maximum degree of local control and flexibility consistent with the sustainability goals of [SGMA]" (California Water Code (CWC), Section 10725(b)). "A groundwater sustainability agency may perform any act necessary or proper to carry out the purposes of [SGMA]" (CWC, Section 10725.2(a)). The Watermaster takes the place of the GSA and may exercise the authority of a GSA consistent with the Judgment and subject to the restrictions on such authority in SGMA and under the continuing jurisdiction of the Court.

4.1 INTRODUCTION TO PROJECTS AND MANAGEMENT ACTIONS

Projects and management actions (PMAs) have been developed to address sustainability goals, measurable objectives, and undesirable results identified for the Borrego Springs Subbasin (Subbasin), with a view towards reducing the potential socioeconomic impacts associated with actions required to sustainably manage the Subbasin. The applicable undesirable results are chronic lowering of groundwater levels, reduction of groundwater storage, and degradation of water quality as explained in Section 3.2, Undesirable Results. In addition, groundwater dependent ecosystems (GDEs), which suffered significant and unreasonable adverse impacts well before January 1, 2015 (CWC, Section 10727.2(b)(4), were also evaluated, quantified, and considered.

The PMAs have been selected and developed with consideration of the arid climate that affords few opportunities for capture of excess precipitation. The Subbasin is remote to potential sources of imported water and totally dependent on groundwater for its water supply as described in Section 2.2.3.8, Surface Water Available for Groundwater Recharge or In-Lieu Use. In addition, water uses by volume within the Subbasin are primarily for agriculture and recreation with lesser amounts for municipal, domestic and industrial uses as described in Section 2.1.4, Beneficial Uses and Users. Water quality degradation is attributable to overlying land uses and the mobilization of naturally occurring contaminants from the underlying geologic formations as described in Section 3.2.4, Degraded Water Quality – Undesirable Results. Finally, the magnitude of the overdraft, estimated to be almost 400% above sustainable yield, is a primary factor in the selection of PMAs and the degree to which they will need to be implemented to achieve Subbasin sustainability.

The PMAs determined to achieve the sustainability goals for the Subbasin are: (1) Water Trading Program, (2) Water Conservation, (3) Pumping Reduction Program, (4) Voluntary Fallowing of Agricultural Land, (5) Water Quality Optimization, and (6) Intra-Subbasin Water Transfers. These proposed PMAs have been developed using preexisting basin studies and vetted through a public outreach and agency collaboration process as described in Section 2.1.5, Notice and Communication.

The identified PMAs are interrelated in many respects and the benefits of each may be augmented by co-implementation. The following are prospective examples of interrelated PMA benefits:

- PMA No. 1 – Water Trading Program incentivizes PMA No. 2 – Water Conservation.
- Water use reductions from PMA No. 3 – Pumping Reduction Program and PMA No. 4 – Voluntary Fallowing of Agricultural Land may mitigate groundwater quality as part of PMA No. 5 – Water Quality Optimization.
- PMA No. 6 – Intra-Subbasin Water Transfers may be used to match water quality to its potable and non-potable beneficial uses in accordance with PMA No. 5 – Water Quality Optimization.

4.2 PROJECTS AND MANAGEMENT ACTION NO. 1 – WATER TRADING PROGRAM

In 2005, the Borrego Water District (BWD) implemented a water credits program as described in Section 2.1.2, Water Resources Monitoring and Management Programs, that assigned a water allocation for fallowing of primarily agricultural land based on crop or turf type and allowed for water credits to be transferred to new development to offset water demand. The program was initiated in response to overdraft conditions within the groundwater basin and was designed to encourage water conservation and reduce high water consumptive land uses.

4.2.1 Water Trading Program Description

The Water Trading Program will have a similar intent as the existing Water Credit Program but be informed by the pumping allocations developed in conjunction with the Physical Solution, and the estimated sustainable yield of the Subbasin, and be administered by the Watermaster. The program will enable permanent transfer and potentially long-term or short-term lease of baseline pumping allocations (BPA) (as reduced over time per PMA No. 3) and replace the existing Water Credits Program. The program is intended to allow groundwater users or new development to purchase needed groundwater allocation from others to maintain economic activities in the Subbasin, encourage and incentivize water conservation, and facilitate adjustment of pumping allocations as water demands and basin conditions fluctuate during the 20-year GMP implementation period. The Water Trading Program will be implemented as set forth in the Judgment.

The Physical Solution will allocate a specific amount of allowable groundwater use (pumping allowance) to non-*de minimis* pumpers consistent with the finalized BPA (see PMA No. 3 – Pumping Reduction Program). Each year during the Physical Solution implementation, the Watermaster will publish the annual pumping allowance as a percentage of the BPA (e.g., in year five of the GMP implementation period, the pumping allowance is to be set at 75% of the BPA with annual reductions through 2040 to reach the target sustainability, initially set at 5,700 acre-feet per year (AFY), for the Subbasin as a whole). Every 5 years, the Watermaster is required to report progress toward achieving the Subbasin's sustainability goals to Department of Water Resources (DWR). Non-*de minimis* pumpers may be able to privately negotiate the sale of all or a portion of their pumping allowance with willing purchasers, within the confines of the Water Trading Program and Watermaster rules. Upon agreement, a proposed trade would be submitted to the Watermaster for review and approval. If approved, the shareholder parties would be notified, the trade certified, and the Watermaster would update the official, publicly accessible register to notate the trade and the updated annual pumping allowances.

The Water Trading Program will include either temporary or permanent water transfers, or both. Each user's pumping allowance will represent and entitle the user to extract a specific volume of groundwater over time, adjusted commensurate with the pumping reduction schedule developed by the Watermaster and where applicable, water trading between non-*de minimis* pumpers. The water trade review process by the Watermaster is intended to be structured to prevent unintended consequences, such as hoarding, collusion, or speculation. For example, to prevent hoarding, the Watermaster could cap the BPA held by an individual at a maximum percentage of the total BPA allocated to all users in the Subbasin. If warranted, the Water Trading Program Policy and/or rules will be reviewed annually, and updated as needed to address unintended consequences or other unanticipated program deficiencies.

Summary of Process to Adopt Program and How Program Will be Accomplished

The Water Trading Program implementing regulations are incorporated into the Physical Solution pertaining to transfers of BPA. The Technical Advisor retained by the Watermaster will develop and test an accounting/register system to track BPA, pumping allowance, water trades and compliance though metering of groundwater production.

Finalize the details of the initial Water Trading Program into a comprehensive Water Trading Program Policy document to be developed through the Technical Advisory Committee process and approved by the Watermaster.

Legal Authority and Regulatory Process

It is the established policy of the State of California "to facilitate the voluntary transfer of water and water rights where consistent with the public welfare" (CWC, Section 109(a)). "The Legislature hereby finds and declares that voluntary water transfers between water users can result in a more efficient use of water, benefitting both the buyer and the seller" (CWC, Section 475). To these ends, BWD has previously duly adopted and implemented a Demand Offset Mitigation Water Credits Policy. That policy has been implemented under the umbrella of a 2013 Memorandum of Agreement between the BWD and the County of San Diego Regarding Water Credits and Section 67.720 (Chapter 7) of the County Groundwater Ordinances. Thus, in addition to the authority described as follows, each of the members of the GSA has independent legal authority to implement water transfer programs in their respective jurisdictions under existing law and they have done so.

Under SGMA, a GSA has authority to "authorize temporary and permanent transfers of groundwater extraction allocations within the [GSA's] boundaries, if the total quantity of groundwater extracted in any water year is consistent with the provisions of the [GSP]" CWC, Section 10726.4(a)(3). a GSA also has authority to "provide for a program of voluntary fallowing of agricultural lands or validate an existing program" (CWC, Section 10726.2(c)). Under the California Constitution, Article X, Section 2, a Physical Solution pursuant to a Stipulation for Judgment may allow for transfers of pumping allocations.

The Water Trading Program identified in this chapter carries forward the policy of the state and satisfies SGMA requirements by establishing a voluntary program that encourages water within the Subbasin to be transferred to beneficial uses of water in a manner designed to achieve the sustainability goals and to protect against undesirable results. The Water Trading Program is expected to operate in parallel with the Voluntary Fallowing of Agricultural Land Program described in Section 4.5, Projects and Management Action No. 4 – Voluntary Fallowing of Agricultural Land.

4.2.2 Water Trading Program Relationship to Sustainability Criteria

The Water Trading Program is intended to avoid undesirable results in the Subbasin by providing incentives for water conservation, the transfer of water to other beneficial uses and the reduction of water intensive land uses. The Water Trading Program will be implemented in a manner consistent with the baseline production allocations and the schedule of ramp downs necessary to achieve the sustainability objectives developed for the Physical Solution. This program will help achieve stabilization of groundwater levels and groundwater in storage, and potentially limit water quality degradation.

Relationship to Measurable Objectives

The Water Trading Program primarily provides for the potential voluntary reallocation of available water supplies to other beneficial uses of water. Reallocation of available water supplies may result in changes to the existing distribution of pumping in the Subbasin that could result in direct effects primarily to the chronic lowering of groundwater levels and reduction of groundwater in storage measurable objectives. The Water Trading Policy will explicitly consider the direct effects to measurable objectives when evaluating proposed water trades. For instance, an area of origin of pumping requirement (i.e., North Management Area) may be required for trades. PMA No. 6 – Intra-Subbasin Transfers is being evaluated to address and optimize the distribution of pumping in the Subbasin as a result of implementation of PMAs.

Relationship to Minimum Thresholds

Consistent with the measurable objective, the Water Trading Program may result in direct, positive effects primarily to the chronic lowering of groundwater levels and reduction of groundwater in storage minimum thresholds. The Water Trading Policy will explicitly consider the direct effects to minimum thresholds when evaluating proposed water trades.

4.2.3 Expected Benefits of the Water Trading Program

The Water Trading Program will provide an economic incentive for conserving water and promoting beneficial uses of water and land uses by providing for the potential to monetize voluntary water conservation or the elimination of water intensive uses. For example, the Water Trading Program provides the ability for replacement of water intensive crop types with other land uses such as residential development, lower water use hydroponics, or solar projects. It may also encourage restoration of land for use as open or recreational space in accordance with the Voluntary Fallowing of Agricultural Land Program (see Section 4.5). It may also serve to shift pumping from areas and aquifers of depressed groundwater levels or poorer quality groundwater to those more favorable for additional pumping. PMA No. 5 – Water Quality Optimization and PMA No. 6 – Intra-Subbasin Water Transfers have been selected to evaluate and mitigate the potential effects of shifting pumping in the Subbasin (see Sections 4.6 and 4.7).

4.2.4 Timetable for Implementation of the Water Trading Program

The Water Trading Program will commence immediately under interim authority of the Watermaster that will be established by the Court.

4.2.5 Metrics for Evaluation of Water Trading Program Effectiveness

The Water Trading Program will include both direct and indirect metrics to evaluate its effectiveness. Program effectiveness is primarily related to Subbasin sustainability goals that are quantified through the development of measurable objectives and minimum thresholds in this Plan. As such, groundwater levels and corresponding changes in Subbasin groundwater storage are potentially the most representative metric to evaluate Program effectiveness. Additionally, comparison of metered or estimated historical water use versus metered water use after the Physical Solution adoption is integral to implement the program. Pursuant to the Metering Plan, all non-*de minimis* groundwater extractors will be required to register their wells during Physical Solution implementation and report metered production data. In addition, BPA, pumping reduction, temporary or permanent water trades, voluntary fallowing of agricultural land and other land use changes will be documented. Water budget components, when combined with water quality, demographic information, and project costs may be used as an indirect measure of the effectiveness of the Water Trading Program as shown in Table 4-1.

Table 4-1
Metrics for Evaluating Water Trading Program Effectiveness

PMA No.	PMA Name	Direct Metrics	Indirect Metrics
No. 1	Water Trading Program	1. Groundwater levels 2. Groundwater storage 3. Metered groundwater extraction 4. Baseline pumping allocation (BPA) 5. Pumping reduction (ramp down) 6. Water trades 7. Area of irrigated land and crop type 8. Used and unused BPA	1. Water budget components 2. Water quality 3. Subbasin demographics 4. Cost

Notes: PMA = Projects and Management Action

4.2.6 Economic Factors and Funding Sources for Water Trading Program

The costs of the Water Trading Program will be borne solely by the parties to the transfer and as such may be allocated between the parties as they deem acceptable.

4.2.7 Water Trading Program Uncertainty

Elements of uncertainty associated with the Water Trading Program include the impact of voluntary fallowing of agricultural land and changing land use to the overall economy of the Subbasin, the relationship of the program to existing property and water rights, and how program compliance will be enforced. It is anticipated that program design and stakeholder outreach will reduce this level of uncertainty.

4.3 PROJECTS AND MANAGEMENT ACTION NO. 2 – WATER CONSERVATION

The BWD has historically implemented measures to encourage efficient water use. These include a tiered water rate structure and other incentive programs (BWD 2009). In the past, rebate programs were established for purchase of low flow toilets, low water use washing machines, and high water use turf removal. Additionally, the BWD provided rate payer irrigation system audits and may pay a portion of recommended irrigation system improvements as described in Section 2.1.2, Water Resource Monitoring and Management Programs. The Borrego Springs Community Plan (County 2013) includes a policy requiring the continuation of "...aggressive, multi-faceted water conservation programs to reduce existing agricultural, golf course, commercial and residential [water] use."

The agricultural sector has made significant investment in end use efficiency technologies such as drip irrigation. Some golf courses have invested in control technologies to optimize the timing and application of irrigation. Use of lower water demand native plants has also been incorporated into non-turf areas for some of the golf courses. BWD has also adopted a water conservation (shortage) policy (BWD 2018). In addition, the County of San Diego adopted and enforces an ordinance containing groundwater use reduction measures for new development. San Diego County Code of Regulatory Ordinances (County Code) Section 67.720.

4.3.1 Water Conservation Program Description

The Water Conservation Program would consist of separate components for the three primary sectors: agricultural, municipal, and recreation. Programs for each sector would follow a similar approach consisting of reviewing historical programs and projects, identifying areas and methods for greatest potential water savings, outreach and coordination with potential participants, developing project cost estimates, competitively evaluating project alternatives implementing projects, and acquiring follow-up metrics.

Legal Authority and Regulatory Process

California Constitution Article X, Section 2 and CWC Section 100 provide that because of conditions prevailing in the state, it is the declared policy of the state that the general welfare requires that the water resources of the state shall be put to beneficial use to the fullest extent of which they are capable, the waste or unreasonable use of water shall be prevented, and the conservation of such waters is to be exercised with a view to the reasonable and beneficial use thereof in the interest of the people and the public welfare.

Additionally, in May 2016, Governor Brown signed Executive Order B-37-16 that set a policy of making water conservation a California way of life and ordered state agencies to establish permanent changes so Californians use water more efficiently. It set a framework for moving the state from temporary, emergency water conservation measures to a more permanent approach customized to the unique local conditions. In April 2017, DWR, the State Water Resources Control Board, the California Public Utilities Commission, the California Department of Food and Agriculture, and the California Energy Commission issued a report entitled "Making Water Conservation a California Way of Life, Implementing Executive Order B-37-16" to establish a long-term framework for water conservation and drought planning (DWR et al. 2017).

In May 2018, Governor Brown signed Senate Bill 606 and Assembly Bill 1668, which stem from the Governor's Executive Order and report to implement it. The legislation establishes a foundation for long-term improvements in water conservation and drought planning to adapt to climate change and the resulting longer and more intense droughts. Most of the legislation applies to conservation measures for urban water suppliers, but the legislation recognizes that small water suppliers and rural communities require guidance from the state to improve drought and conservation planning (CWC, Section 10609.40.) Accordingly, DWR and the State Water Resources Control Board must propose to the Governor and Legislature by January 1, 2020, recommendations and guidance relating to the development and implementation of countywide drought and water shortage contingency plans to address the planning needs of small water suppliers and rural communities (CWC, Section 10609.42). The County may be able to adopt additional conservation measures that result from the forthcoming recommendations.

The State of California has set standards for water efficiency in landscaping since 1990. These requirements are currently set forth in the Water Conservation in Landscaping Act, Government Code Sections 65591 et seq. The DWR adopted and periodically amended a Model Water Efficient Landscape Ordinance (MWELO). The MWELO is currently codified in Title 23 CCR Sections 490 et seq. The County is at all times required to adopt an ordinance as effective as the

MWELO at conserving water or apply the MWELO. The County adopted and has enforced its own water efficient landscape regulations since the first MWELO became effective on January l, 1993. In response to prolonged drought conditions in the state, Governor Brown, by Executive Order B-29-15 issued April l, 2015, directed the DWR to amend the MWELO to increase water efficiency standards for new and existing landscapes and to limit the use of turf. The DWR revised the MWELO in accordance with the Executive Order and the California Water Commission approved the revised MWELO on July 15, 2015. Consistent with the requirements of the Water Conservation in Landscaping Act, the County amended its water efficient landscape requirements set forth at Sections 86.701 et seq. of the County Code to ensure that the County's requirements are as effective as the current MWELO at conserving water.

Public noticing will be an integral part of the conservation program implementation. To be most effective, the availability of optional water conservation program services such as water audits and rebate programs will be widely advertised through billing inserts, websites, or mailings to BWD customers and other members of the public. In addition, water conservation outreach will be discussed at public meetings conducted by the Watermaster.

Agricultural Sector

Agricultural extractions from the Subbasin are estimated to be about 15,749 AFY based on the BPA making agriculture the largest potential sector for water savings in the Subbasin. Potential agricultural water savings are from reduction of applied water to crops, planting lower water use crops and/or increased efficiency of irrigation systems. Efficiencies in fertilizer or pesticide use can serve to limit degradation of groundwater quality potentially caused by agricultural return flows. The primary element of the agricultural conservation program will be voluntary water audits to be performed by third-party contractors such as the Resource Conservation District of Greater San Diego County, which may have the following components:

- Pre-audit analysis of historical water use, topography, climate data, and land use
- Analysis of distribution uniformity (amount of water supplied by irrigation system to each plant), crop density, and crop types
- Analysis of irrigation efficiency (amount of water used beneficially by crop compared to the total water applied)
- Analysis of soil grain size and texture, agronomic soil suitability including salinity, drainage, and water retention properties
- Analysis of irrigation system water use efficiency, pressure, and maintenance
- Pesticide and fertilizer application and use
- A report containing recommendations for improving efficiency and crop yield

- Follow up analysis of measures implemented actions/practices and savings obtained

The steps to implement the audit program will consist of the following:

1. Historical project analysis – Compile and analyze information from previously conducted audit programs and estimate cost and water savings achieved
2. Analysis of potential acreage, land use, and water savings – Geographic information systems (GIS) analysis of Subbasin agriculture, land use, and property ownership in order to determine scope and design of program and to target appropriate landowners for outreach efforts
3. Program design – Design and select program components based on crop types, program cost, and potential water savings; may include irrigation audits, equipment rebates, and cost sharing
4. Program Outreach – Contact, inform, and coordinate with potential program participants to determine needs and constraints
5. Conduct Audits – Each audit will include a report documenting "pre" conditions, recommendations for implementing water savings measures, and potential quantified benefits
6. Follow up on Audit Results – Return to each audit location after a suitable amount of time to document recommendations implemented and other metrics

Municipal Sector

Approximately 1,700 AFY of water is currently supplied for municipal purposes within the Subbasin and about 75% of that is used out of doors. Therefore, outdoor water use has great potential for municipal water savings. There is potential for water savings associated with turf removal or replacement and irrigation system upgrades for homeowner associations (HOAs). However, indoor conservation measures will be implemented to raise awareness of the value of the resource as well as for the water savings they provide.

Potential programs to be included in the municipal water conservation sector include landscape irrigation audits, rebates for turf replacement, efficient landscape irrigation equipment and indoor water fixtures. Smart irrigation controllers may be encouraged in order to automatically adjust landscape irrigation based on real-time, local weather conditions. A BWD-dedicated water conservation website would give water users voluntary access to free water conservation information such as a landscape watering calculator, a watering index, and a water efficient plant database. See the San Diego County Water Authority conservation website for example projects and programs (https://www.watersmartsd.org/tools).

The BWD may sponsor an accreditation program for gardeners and landscapers that complete a training program that may include water efficiency, green waste reduction, pesticide reduction, and fertilizer management. The individuals and companies that receive certification may be included in a conservation website list, to be contacted by those interested in hiring "environmentally responsible" landscaping professionals. Professionals could include those primarily employed in the agricultural sector as part of a job retraining program.

The following steps will be conducted as part of implementation of the Municipal water conservation program:

- A conservation and efficiency analysis will be performed to identify Best Management Practices for water conservation for residential and commercial stakeholders.
- The scope, feasibility, and impact of a landscape restrictive ordinance for existing development will be evaluated in addition to water efficient landscape requirements set forth at Section 86.701 et seq. of the County Code for new development.
- Determination of the applicability of conservation requirements for existing water users (BWD Conservation Program) versus new development (i.e., County water efficient landscape requirements).
- The nature of a potential conservation incentive program will be evaluated, which may include incentives for turf removal, installation of efficient water fixtures, etc.
- Development of an updated program to provide voluntary home inspections to assist residents with identifying water conservation and efficiency opportunities.
- Preparation of a Municipal Water Conservation and Efficiency Plan to convey the findings of the previously referenced assessments, present resources to be made available to stakeholders, and document requirements of the plan, if any.

Recreation Sector

Opportunities for water savings in the recreational sector are primarily from golf courses. Changes in golf course irrigation practices, turf types, irrigated area, and adjacent landscaping afford opportunities for significant water savings. The physical and operational improvements to golf course irrigation systems may include modification of irrigation types and schedules, and the installation of soil moisture and evapotranspiration sensors (Mann 2014).

The following tasks will be implemented for the development of a Recreation Water Conservation and Efficiency Plan:

- Identify stakeholders/participants and conduct interviews to receive input and identify concerns to be addressed in the program development. Additionally, the interviews would be used to solicit suggestions for specific resources that will assist the recreational sector with improving efficiency.

- Assessment of each golf course's irrigation practices and irrigated acreage to identify areas where more efficient irrigation practices could be applied, and the potential cost/benefit of the action for the operator.
- Independent of specific property evaluations, a variety of irrigation practices, alternative turf types or management actions should be evaluated to recommend the best methods for increasing irrigation efficiency and groundwater conservation in the Subbasin.
- Preparation of a Recreational Water Conservation and Efficiency Plan to convey the findings of the previously referenced assessments, present resources to be made available to stakeholders, and document requirements of the plan, if any.

4.3.2 Water Conservation Program Relationship to Sustainability Criteria

The specific components of a water conservation program to be implemented within the Subbasin will be developed through a process of outreach, data compilation, and program design for each sector. By reducing the amount of water consumed within each sector, the program will reduce the water produced, thereby directly addressing the requirement to ramp down groundwater production to meet the sustainability goals. Chronic lowering of groundwater levels and reduction of groundwater in storage will be addressed by a reduction of pumping from the Subbasin. In addition, agriculture and landscape audits may result in a reduction in fertilizer and pesticide use needed for crops and turf, thereby limiting the amount of primarily nitrate and total dissolved solids (TDS) infiltrating to the aquifer.

Relationship to Measurable Objectives

The Water Conservation Program will incrementally reduce water demand in the Subbasin and is an option worth considering to achieve measurable objectives during Plan implementation and throughout the planning period. The Water Conservation Program is directly related to the chronic lowering of groundwater levels and reduction of groundwater in storage measurable objectives.

Relationship to Minimum Thresholds

Consistent with the measurable objective, the program serves as an incremental, direct physical action to maintain sustainability indicators, including groundwater levels and groundwater storage, above minimum thresholds to avoid undesirable results. The Water Conservation

Program also has the potential to improve water quality by augmenting the quantity and quality of return flows.

4.3.3 Expected Benefits of the Water Conservation Program

In addition to the potential for incremental water savings estimated at 1,455 AFY for all sectors, the conservation program will raise awareness of the value of water as a resource and help modify the culture of water use. Therefore, the benefits of the program will accumulate as a larger segment of the local population becomes more educated about water conservation and modifies behavior over time. By taking a proactive role in water efficiency issues, the BWD and the Watermaster will lead by example.

Agricultural audits are commonly performed by agencies throughout California. They are generally recognized as beneficial for increasing efficiency, reducing water use, and increasing crop yields. Audits are often conducted by Resource Conservation Districts with funding provided by counties or state grant programs. A previous study of the Subbasin completed by Roger Mann for DWR and BWD identified several individual actions and estimated costs for reducing water use (Mann 2014). This study estimated potential water savings of 365 AFY by maximizing agricultural irrigation efficiency. Potential water conservation savings for the municipal sector of 255 AFY assumes 20% water savings on BWD outdoor water use. An updated recreation sector water conservation estimate of 835 AFY was developed based on the assumptions made by Mann and interviews with several golf course landscape professionals with experience in Borrego Springs. Estimated water savings by sector as a result of implementing water conservation programs are listed in Table 4-2.

Table 4-2
Estimated Potential Water Savings by Sector for Water Conservation Programs

Water Sector/Crop	Potential Water Savings Acre-Feet Per Year
Agriculture	365[a]
Municipal	255[b]
Recreation	835[c]
Total	**1,455**

Source: Mann 2014.
Notes:
[a] Potential water savings for agriculture is based on an estimate of current irrigation efficiency of 79%, rising to 85% with implementation of irrigation system improvements. There may be potential for additional savings.
[b] Assumes 20% savings of outdoor water use that is about 75% of total BWD demand.
[c] Based on 2018 interviews and/or previous assumptions by Mann

Recreation Sector

Potential water savings for golf courses are achievable by two primary activities: 1) converting turf to desert landscaping or low water use xeriscaping, and 2) optimizing golf course irrigation system management. Estimated potential water savings for golf courses by implementing turf conversion is provided in Tables 4-3.

Table 4-3
Estimated Potential Water Savings by Sector for Water Conservation Programs

Golf Course	Estimated Turf Acres[a]	Estimated Convertible Acres[b]	Potential Water Savings Acre-Feet Per Year
Borrego Springs Resort	106.00	32.0[c]	192.6
Club Circle	23.00	3.9	23.5
De Anza	146.76	24.9	149.9
Ram's Hill[d]	96.75	0.0	—
Road Runner Golf and Country Club	46.23	7.9	
The Springs	42.45	7 2	43.3
Total	**461.19**	**75.9**	**456.9**

Notes:
[a] Turf area based on aerial analysis of GIS.
[b] Assumes 17% of irrigated turf is convertible and 90 irrigated turf acres per 18-hole golf course, except where golf course specific information was provided. Water savings assume average water demand of 6.02 acre-feet per year per acre of turf.
[c] Borrego Springs Resort has indicated that up to 32 acres of turf is potentially convertible to desert landscaping based on their preliminary evaluation (Bambach, pers comm 2018)
[d] Rams Hill Golf Course has indicated that it is unlikely that they have any convertible turf. However, they have implemented irrigation system improvements and conversion of non-turf areas to native landscaping and are working with irrigation professionals to identify future water savings projects (Smith, pers. comm 2018).

The average cost of turf conversion per acre for golf courses is $20,000. Conversion cost assumes turf removal and fine grading with sand or decomposed granite to match grade of adjacent turf. No irrigation replacement or plant material is included. Conversion to desert landscaping from turf would be approximately $2.86 per square foot or $125,000 per acre (Smith, pers. comm. 2018).

Optimizing golf course irrigation system management is another management strategy that may result in water savings. This involves installation of new controllers and sprinkler heads, soil moisture sensors, and weather stations to improve irrigation efficiency. For instance some golf courses are required to turn on multiple sprinklers covering a large area even when only a small portion of the golf course requires irrigation. Estimated potential water savings for golf courses by optimizing golf course irrigation system management is provided in Table 4-4.

Table 4-4
Golf Course Irrigation System Management

Golf Course	Estimated Managed Acres of Irrigated Turf[a]	Potential Water Savings Acre-Feet Per Year at 0.82 AF/ acre/year[b]
Borrego Springs Resort	106.00	86.92
Club Circle	23.00	18.86
De Anza	146.76	120.34
Ram's Hill	96.75	79.34
Road Runner Golf and Country Club	46 23	37.91
The Springs	42 45	34.81
Total	**461.19**	**378.18**

Notes: AFY = acre-feet per year; AF = acre-feet.
[a] Turf area based on aerial analysis of geographic information system (GIS)
[b] Mann 2014.

The average cost of optimizing a golf course irrigation system is approximately $400 per acre per year (Mann 2014). For 100 acres of turf that works out to $40,000 per year; however, it should be noted that there are substantial upfront capital costs to install irrigation system infrastructure and train staff to use software and maintain equipment. Actual costs and potential water savings will vary, and require detailed evaluation and study of each golf course's existing irrigation system.

Municipal Sector

The Borrego Springs HOA implemented turf replacement projects in the last 5 years, which indicate the potential costs and benefits that may be achieved through additional turf replacement programs. Approximate data for historical turf replacement projects are presented in Table 4-5.

Table 4-5
Historical Turf Replacement Projects, Borrego Springs

Year	Area Replaced (square feet)	Total Cost	Cost/Square Foot	Estimated Outdoor HOA Water Savings (%)
Club Circle West, Borrego Springs HOA				
2013	38,800	$125,250	$3.23	37
2017	3,438	$8,695	$2.53	7
2018	2,770	$7,756	$2.80	7
2018	6,700	$15,000	$2.24	NA
Total	**51,708**	**$156,701**	**$3.03[a]**	**51**

Source: Duncan, pers. comm. 2018a, 2018b.
Notes: HOA = homeowner association; NA = not applicable
[a] Average cost per square foot

Based on the Borrego Springs HOA turf replacement projects, the average cost is approximately $3.00 per square foot or $131,000 per acre. Actual costs and water savings will be determined by specific program configuration and funding sources. Previous estimates indicate that HOA turf replacement and irrigation efficiency projects, if implemented throughout the Subbasin, have the potential to save approximately 90 AFY (Mann 2014).

Graywater Guidance Programs

In recent years, state regulations for the use of graywater have been relaxed, making it easier to utilize wastewater from showers, clothes washers, and wash basins for irrigation of certain types of landscaping (CWC, Chapter 15). "Laundry to Landscape" systems conforming to certain requirements do not currently require a state permit. The County Department of Environmental Health (DEH) administers graywater systems in unincorporated areas of the County. No construction permit is required for clothes washer systems provided the system is installed in accordance with the Graywater System Requirements for a Single Clothes Washer (County 2015). Larger graywater systems, which require more extensive plumbing modifications, require a permit. The County DEH has developed guidance for the design, installation, operation and maintenance of graywater systems to ensure subsurface irrigation systems discharging graywater will not contaminate surface water or groundwater or create public health hazards (County 2015b). The guidance also explains the permitting procedures and inspection of graywater systems. The DEH graywater systems webpage can be found at: https://www.sandiegocounty.gov/content/ sdc/deh/lwqd/lu_graywater_systems.html

Installation of an individual graywater system in Borrego Springs is feasible provided a graywater system meets the requirements outlined in the guidance. There is an average of about 40 gallons per person per day available for graywater recycling and the average family can reduce their freshwater use by as much as 30% by using graywater for irrigation (SOW 2019).

4.3.4 Timetable for Implementation of Water Conservation Program

Because water conservation is a beneficial component of sustainable water supply planning, it is intended that the water conservation program will be enacted within the first few years of Physical Solution implementation subject to the availability of grant funding, and continue indefinitely recognizing that all of the sectors have historically implemented or are in the process of evaluating water conservation and efficiency projects.

4.3.5 Metrics for Evaluation of Water Conservation Program

The Water Conservation Program will include both direct and indirect metrics to evaluate the effectiveness of the program. Program effectiveness is primarily related to Subbasin sustainability goals that are quantified through the development of measurable objectives and minimum thresholds is this Plan. As such, groundwater levels and corresponding changes in Subbasin groundwater storage are potentially the most representative metrics to evaluate Program effectiveness. Additionally, the metrics available for evaluation of the Water Conservation Program are dependent on the water use sector and specific programs to be evaluated. Direct metrics will include groundwater levels and corresponding groundwater storage, and metered pumping records, effective after adoption of the Physical Solution.

BWD water supply records will be used to directly evaluate water supply reduction for specific water accounts that have implemented water conservation program components. The number and types of water conservation projects implemented with quantification of water saved will also be documented. Indirect metrics may also include follow up evaluation of water users having received water audits to see which recommended measures were implemented and the associated estimated water savings. For water efficient fixture give-away or rebate programs, records of the number and type of fixtures will be used to approximate water savings. Similarly, follow up evaluation of turf replacement projects will allow for an approximation of water savings related to irrigation reduction. Water budget components, when combined with water quality, demographic information, and project costs may be used as an indirect measure of the effectiveness of the Water Trading Program as shown in Table 4-6.

Table 4-6
Metrics for Evaluating Water Conservation Program Effectiveness

PMA No.	PMA Name	Direct Metrics	Indirect Metrics
No. 2	Water Conservation	1. Groundwater levels 2. Groundwater storage 3. Metered groundwater extraction 4. Number/type of projects implemented 5. Quantification of water saved	1. Water budget components 2. Water quality 3. Subbasin demographics 4. Cost 5. Audits

Notes: PMA = Projects and Management Action.

4.3.6 Economic Factors and Funding Sources for Water Conservation Program

Planning-level development cost for establishing the Water Conservation Program is estimated to be approximately $130,000.

Potential sources of funding for the Water Conservation Program components include state grants.

4.3.7 Water Conservation Program Uncertainty

Only high level estimates of the cost and benefits of the water conservation program are possible until there is a detailed plan for project components, stakeholder interest, and quantification of benefits for each sector. Some benefits such as stakeholder awareness and level of participation in voluntary programs are difficult to predict or quantify. Other components of uncertainty are the extent to which conservation measures have already been implemented and how to incentivize or require participation in specific components of the conservation programs.

4.4 Projects and Management Action No. 3 – Pumping Reduction Program

The Pumping Reduction Program is the central tool to implement the Physical Solution and achieve the sustainability goal for the Subbasin. The pumping reduction program is based on the establishment of each respective user's BPA. To establish the program, the GSA worked with the groundwater extractors in the Subbasin to determine individual BPAs. Once the program is implemented, BPAs will be ramped down over time to bring pumping in the Subbasin within its sustainable yield by 2040. As described in SGMA, any limitation on extractions by the GSA "shall not be construed to be a final determination of rights to extract groundwater from the basin or any portion of the basin" (CWC, Section 10726.4(a)(2)). The Physical Solution resolves uncertainty over water rights by incorporating the pumping reduction program into the Judgment in a groundwater rights adjudication.

Adoption and implementation of the ramp down component of the pumping reduction program in the Subbasin is accomplished by means of the Judgment. Ramp down will begin immediately upon Court approval of an interim Watermaster.

4.4.1 Pumping Reduction Program Description

It is anticipated that the Pumping Reduction Program will consist of the following general components: (1) estimation of the Subbasin sustainable yield through the Technical Advisory Committee process based on a future projection scenario analyzed using the BVHM, and (2) pumping allocation reduction recommendations to reach the estimated sustainable yield by 2040. In summary, each non-*de minimis* groundwater user within the Subbasin has been assigned an allocation based on their historical groundwater use. That allocation will be reduced incrementally as necessary until 2040 such that the total extraction from the Subbasin will be equal to the estimated sustainable yield at the end of that period. Non-*de minimis* groundwater users will be able to trade their pumping allowances in accordance with PMA No. 1, but the total volume of pumping allowances within the Subbasin will decrease over time. Each component of the program is discussed in greater detail as follows.

Estimation of the Subbasin Sustainable Yield

A water budget approach has been used to establish the estimated sustainable yield for the Subbasin as explained in Section 2.2.3, Water Budget, and Section 2.2.3.6, Sustainable Yield Estimate. Based on existing data, the initial estimated sustainable yield of the Subbasin is 5,700 AFY, which is an approximately 76% reduction from historical water use of up to 24,215 AFY as established by the BPA. The estimated sustainable yield is the target amount to which groundwater is to be reduced over the implementation period. As described in Section 3.5.4, Assessment and Improvement of Monitoring Network, data gaps may be filled and improvements to the Borrego Valley Hydrologic Model may occur as implementation of the Physical Solution proceeds. It should be noted that the 5,700 AFY sustainable yield value is an estimate that depends on a number of climate and hydrological factors that will be re-evaluated based on a future projection scenario of pumping and recharge within the Subbasin using the BVHM model runs concurrent with the Physical Solution 5-year updates. If the sustainable yield changes as a result of significant new data, the pumping reduction schedule will be modified accordingly.

Determination of Baseline Pumping Allocation

BPAs have been determined for pumpers in each of the three sectors: recreational, municipal, and agricultural. The "baseline pumping allocation" is defined as the amount of groundwater each pumper in the Subbasin is allocated prior to SGMA-mandated reductions and is determined by the maximum annual production[1], in AFY, for each well owner over the baseline pumping period. The baseline pumping period is the 5-year period from January 1, 2010, to January 1, 2015. In addition to the three water use sectors, there are two small water use systems and two non-potable irrigators, the baseline allocations for which were considered separately. These are the Anza-Borrego Desert State Park (ABDSP) and the Borrego Air Ranch Water Co. The two

[1] This is an estimate based on metered data from BWD, small water systems, and other pumpers, as well as estimated pumping based on the evapotranspiration method described in Appendix F.

non-potable irrigators are the Borrego Springs Unified School District (Elementary School) and La Casa Del Zorro Resort and Spa (La Casa Del Zorro).

The BPA is determined to be the maximum annual groundwater extraction during the baseline pumping period. Metered historical data is the most accurate method of determining maximum historical use. Therefore, metered data has been used when available. Metered data was available for the ABDSP, a limited number of private pumpers and for all of BWD's production. Where metered data was unavailable, including for golf courses and a large proportion of agriculture, water use is estimated using plant-specific evapotranspiration rates during the baseline period.

The evapotranspiration method requires the determination of irrigated areas and plant types and the application of a water use factor. Irrigated area and plant types have been determined from aerial photographs, limited field reconnaissance, GIS analysis tools and correspondence with pumpers. The water use factor is an annual estimate of water use in feet of water that includes plant type, climate, irrigation system efficiency, and for some crops such as citrus, the leaching of salts from the soils. The BPA methodology developed for the Subbasin is detailed in Appendix F, and the baseline pumping allocated by sector is provided in Chapter 2, Table 2.1-3.

Pumping Allocation Reduction

As described in Section 2.2.3.6, the initial estimated sustainable yield for the Subbasin is 5,700 AFY. This is approximately 24% of the historical extraction levels of about 24215 AFY resulting in a required reduction in pumping of 76%.

Because many of the parameters used to determine water use and sustainable yield estimate are modeled or estimated, it is anticipated that adjustments will be required to achieve the sustainability goals. Therefore, the reduction of allocation will be reviewed at least every 5 years using the BVHM in relation to groundwater levels, groundwater in storage and other sustainability criteria. Adjustments to the program will be made when necessary in the future by Watermaster.

Pumping Overage Charges

The SGMA legislation allows for charging fees for pumping in excess of allocations or non-compliance with other GSA regulations (CWC Section 10732 (a)). The Physical Solution requires the Watermaster to establish an Overproduction Penalty Assessment for violations of pumping allowance and/or reporting during the Physical Solution implementation as set forth in the Judgment.

4.4.2 Pumping Reduction Program Relationship to Sustainability Criteria

Permanent reduction in pumping directly relates to all of the applicable sustainability criteria. Pumping reductions will serve to stabilize declining groundwater levels and prevent loss of groundwater storage. Degradation of water quality may be limited as a result of a reduction in fertilizer use needed for crops and turf, thereby limiting the amount of primarily nitrate and TDS infiltrating to the aquifer.

Relationship to Measurable Objectives

The pumping reduction program will serve as a significant, direct physical action to meet the measurable objectives of chronic lowering of groundwater levels and the reduction in groundwater storage. Further, it is anticipated to support certain measurable objectives to protect against degradation of water quality.

Relationship to Minimum Thresholds

Consistent with the measurable objectives, the program serves as a significant, direct physical action to maintain sustainability indicators, including groundwater levels and groundwater storage, above minimum thresholds to avoid undesirable results. Additionally, improvements to water quality are expected as a result of reduction of fertilizer use and return flows to the aquifer.

4.4.3 Expected Benefits of the Pumping Reduction Program

As the central component to achieving sustainability within the Subbasin, the Pumping Reduction Program will result in the avoidance of undesirable results including chronic lowering of groundwater levels, reduction of groundwater in storage, and potentially degraded water quality. Peripheral benefits may include potential investment in alternate land uses or taking advantage of the water trading or land fallowing management programs. To achieve the required reductions, the sectors may implement conservation measures resulting in more efficient use of water and greater resiliency to long-term climate variability.

4.4.4 Timetable for Implementation of the Pumping Reduction Program

Individual allocations have been provided by the Judgment to each existing user. Metering will be required by March 31, 2020. As the central component of the Physical Solution, the Pumping Reduction Program is anticipated to be implemented upon interim approval of the Judgment. The program will be ongoing throughout the Physical Solution implementation as annual adjustments to the pumping allocations are made. It is anticipated that the ramp down schedule will be revisited during the 5-year Physical Solution updates.

4.4.5 Metrics for Evaluation of Effectiveness of Pumping Reduction Program

The Pumping Reduction Program will include both direct and indirect metrics to evaluate the effectiveness of the program. Program effectiveness is primarily related to Subbasin sustainability goals that are quantified through the development of measurable objectives and minimum thresholds in this Plan. As such, groundwater levels and corresponding changes in Subbasin groundwater storage are probably the most representative metrics to evaluate effectiveness. Water metering will be required to implement the Physical Solution, so that extractions from wells will be directly measured as specified in the Metering Plan (Appendix E2). Establishment of the BPA and pumping reduction or ramp down rates is required to be developed to implement the Pumping Reduction Program. Water budget components, when combined with water quality, demographic information, and project costs may be used as an indirect measure of the effectiveness of the Pumping Reduction Program as shown in Table 4-7.

Table 4-7
Metrics for Evaluating Pumping Reduction Program Effectiveness

PMA No.	PMA Name	Direct Metrics	Indirect Metrics
No. 3	Pumping Reduction Program	1. Groundwater levels 2. Groundwater storage 3. Metered groundwater extraction 4. Baseline pumping allocation (BPA) 5. Pumping reduction (ramp down) 6. Area of irrigated land and crop types 7. Used and unused BPA	1. Water budget components 2. Water quality 3. Subbasin demographics 4. Cost

Notes: PMA = Projects and Management Action.

4.4.6 Economic Factors and Funding Sources for Pumping Reduction Program

Private parties will be installing their own meters and radio/cellular data transmitting systems. Watermaster costs to determine and enforce compliance will be funded through pumping fees.

Concerns regarding this PMA specific to the SDAC community include water affordability (BWD rate impacts), loss of jobs/local economy, impacts to infrastructure, and/or quality of life. In response, the BWD commissioned an SDAC Impact/Vulnerability Assessment to understand the implications that the implementation of SGMA will have on the SDAC population of Borrego Springs. The report remarks that the 20-year SGMA compliance period does provide time for the community to adapt. The BWD's tiered rate structure (maintenance of low water rates for baseline water use) and seeking state funding to support the SDAC are strategies that consider the needs of the SDAC during Physical Solution implementation.

BWD continues to actively work to assess water use and to evaluate how to best structure water costs for the SDAC. SGMA- and SDAC-related grants and other publicly funded support is expected to continue to be available and pursued by BWD to assist in subsidizing future water costs. Borrego Springs is a key part of the utilization experience for the ABDSP.

4.4.7 Pumping Reduction Program Uncertainty

Uncertainty associated with the Pumping Reduction Program is related to the method of establishing the estimated sustainable yield. As described in Section 2.2.3, Water Budget, and previously in Section 4.4.1, it has been necessary to estimate historical groundwater use where direct measurement was unavailable. Therefore, evaluation and as-needed adjustment to the Program parameters will be conducted every 5 years, at a minimum.

Legal authority and Regulatory Process

SGMA provides the GSA with authority to: "control groundwater extractions by regulating, limiting, or suspending extractions from individual groundwater wells or extractions from groundwater wells in the aggregate, . . . or otherwise establishing groundwater extraction allocations" (CWC, Section 10726.4(a)). Also,

> in addition to any other authority granted to a groundwater sustainability agency by this part or other law, a groundwater sustainability agency may enter into written agreements and funding with a private party to assist in, or facilitate the implementation of, a groundwater sustainability plan or any elements of the plan (CWC, Section 10726.5).

Further, the powers outlined in SGMA are in addition to, and not a limitation on the authority granted to local agencies under any other law (CWC, Section 10725(a), 10726.8(a)). And, counties have independent authority under their police powers to act to protect groundwater and other related resources (Envt'l Law Foundation v. State Water Resources Control Board (Aug. 29, 2018), 3rd District Court of Appeal case no. C083239; Allegretti & Co. v. County of Imperial (2006) 138 Cal.App.4th 1261; Baldwin v. County of Tehama (1994) 31 Cal.App.4th 166). Courts have power to adopt pumping restrictions in situations of overdraft as part of a Physical Solution under the California Constitution Article X, Section 2. Ramp down provisions have been approved by California Courts as acceptable means of implementing physical solutions.

In addition, under SGMA, "no extraction of groundwater between January 1, 2015, and the date of adoption of the plan pursuant to this part . . . may be used as evidence of, or to establish or defend against, any claim of prescription" (CWC, Section 10720.5(a)). The protection of the Subbasin and the achievement of the sustainability goals could be put at significant and unreasonable risk were the establishment of BPA's delayed until a later date. Failure to approve the BPA's at the time of Physical Solution adoption could encourage pumpers to pump more groundwater in order to establish or defend against prescription. The Watermaster takes the place of the GSA and may exercise the authority of a GSA consistent with the Judgment and subject to the restrictions on such authority in SGMA and under the continuing jurisdiction of the Court. Accordingly, adopting the BPA's and ramp down immediately, as part of the Physical Solution, is the most protective of the Subbasin and in compliance with SGMA and other laws.

4.5 PROJECTS AND MANAGEMENT ACTION NO. 4 – VOLUNTARY FALLOWING OF AGRICULTURAL LAND

4.5.1 Program Description of Voluntary Fallowing of Agricultural Land

The voluntary Fallowing Program will constitute a mechanism to facilitate the conversion of high water use irrigated agriculture to low water use open space, public land, or other development on a voluntary basis. Due to the extent of the overdraft within the Subbasin and the infeasibility of increasing water production or tapping imported supplies, land fallowing is a necessary and principal management action to achieve sustainability. Although some fallowing programs in California are short term to address a specific drought or shortage, the program proposed for the Subbasin is primarily for long-term or permanent fallowing or conversion to other land uses. Approximately 2,480 acres of land in the Subbasin have been fallowed in the last several decades and another 600 acres were recently fallowed as part of the water credit program as described in Section 2.1.2, Water Resources Monitoring and Management Program.

Currently, there are about 2,624 acres of active agriculture within the Subbasin. It is anticipated that each of these lands/landowners with water demands during 2010–2014 will receive freely transferable BPAs as part of the Physical Solution that, in turn, will encourage cultivated lands to be fallowed. Factors that will be considered for the fallowing program include the current extent of agriculture land and water use, the intended land and water use after fallowing, and the potential environmental impacts associated with fallowing. These include airborne emissions through wind-blown dust, the introduction or spreading of invasive plant species, and changes to the landscape that could adversely affect visual quality. The land uses proximal to the fallowing projects will affect the processes utilized and best management practices associated with fallowing proposals will be developed as part of this management action. For example, there could be differing levels of site stabilization or restoration needed or required based on the land use intended post- fallowing. Temporary stabilization will be less expensive and may be appropriate for properties to be developed for other use in the near term. A passive restoration approach may be applied if the goal is for the property to eventually return to native habitat, and active restoration may be applied for relatively near-term restoration to native habitat with the goal of providing open space, parks, or public trails.

The Physical Solution includes mandatory minimum fallowing requirements for permanent BPA transfers.

Legal Authority and Regulatory Process

Establishment of a voluntary land fallowing program is expressly authorized under SGMA (CWC, Section 10726.2(c)).

4.5.2 Voluntary Fallowing of Agricultural Land Program Relationship to Sustainability Criteria

The Fallowing Program will address each of the undesirable results that have been identified for the Subbasin by reducing the amount of groundwater consumed from existing uses and reduced application of fertilizers or other agrichemicals. Reduced pumping will help to stabilize groundwater levels and increase groundwater in storage. Degradation of water quality may be limited to the extent that land fallowing or changes in land use reduces the amount of fertilizers applied for the former land uses.

Relationship to Measurable Objectives

The land fallowing program will serve as a significant, direct physical action to meet the measurable objectives of chronic lowering of groundwater levels and the reduction in groundwater storage. Further, it is anticipated to support certain measurable objectives for degradation of water quality, most notably for nitrate and TDS associated with agricultural return flows.

Relationship to Minimum Thresholds

Consistent with the measurable objective, the program serves as a significant, direct physical action to maintain sustainability indicators, including groundwater levels, groundwater storage, and water quality above minimum thresholds to avoid undesirable results. Additionally, improvements to water quality are expected as a result of reduction of fertilizer use and return flows to the aquifer.

4.5.3 Expected Benefits from Voluntary Fallowing of Agricultural Land Program

In addition to the benefits derived directly from reduced pumping, the program will allow for a level of land use and community planning for converted properties not otherwise available. Depending on the nature of land uses implemented, the program could result in increased recreational space or potential economic benefits from conversion of land use types. For example, the conversion of previously fallowed land to a land restoration project that is expected to improve infiltration of stormwater runoff along the Coyote Creek wash is currently being evaluated.

4.5.4 Timetable for Implementation of Voluntary Fallowing of Agricultural Land Program

The program will result in immediate groundwater savings, which may increase with addition of fallowed lands and fluctuate depending on the nature and timing of converted land use.

4.5.5 Metrics for Evaluation of Voluntary Fallowing of Agricultural Land Program

The Voluntary Fallowing of Agricultural Land Program will include both direct and indirect metrics to evaluate the effectiveness of the program. Program effectiveness is primarily related to Subbasin sustainability goals that are quantified through the development of measurable objectives and minimum thresholds in this Plan. As such, groundwater levels and corresponding changes in Subbasin groundwater storage are the ultimate metrics to evaluate effectiveness. Direct metrics by which to evaluate the success of the fallowing program include comparison of pre- and post- pumping records for fallowed or converted properties, to the extent available. The area of irrigated land and crop types should also be directly tracked to monitor program effectiveness. Additionally, the number of fallowing projects implemented, active and or planned are to be tracked. Water budget components, when combined with water quality, demographic information, and project costs may be used as an indirect measure of the effectiveness of the Voluntary Fallowing of Agricultural Land Program as shown in Table 4-8.

Table 4-8
Metrics for Evaluating Voluntary Fallowing of Agricultural Land Program Effectiveness

PMA No.	PMA Name	Direct Metrics	Indirect Metrics
No. 4	Voluntary Fallowing of Agricultural Land	1. Groundwater levels 2. Groundwater storage 3. Metered groundwater extraction 4. Area of irrigated land and crop type	1 Water budget components 2. Water quality 3. Subbasin demographics 4. End-use of fallowed land

Table 4-8
Metrics for Evaluating Voluntary Fallowing of Agricultural Land Program Effectiveness

PMA No.	PMA Name	Direct Metrics	Indirect Metrics
		5. Area of fallowed land 6. Number of implemented/active/planned projects	5. Stabilization of site soils 6. Cost

Notes: PMA = Projects and Management Action

4.5.6 Economic Factors and Funding Sources for Voluntary Fallowing of Agricultural Land Program

The Voluntary Fallowing of Agriculture Program will be self-funded by the parties to any permanent transfer of agricultural BPA.

Additionally, wells that will no longer be used will have costs to be properly destroyed. Such costs will be self-funded by the parties to any permanent transfer of agricultural BPA..

4.5.7 Voluntary Fallowing of Agricultural Land Program Uncertainty

Compliance with the minimum fallowing standards is required for permanent transfers of BPA. Program uncertainty is related to the willingness of property owners to participate in the program and the water consumption of future, post fallowing, post transfer land uses. These parameters will be evaluated during the first phase of the implementation.

4.6 PROJECTS AND MANAGEMENT ACTION NO. 5 – WATER QUALITY OPTIMIZATION

Groundwater is extracted for multiple beneficial uses in the Subbasin including municipal and domestic use, and for irrigation. At a minimum, for municipal and domestic wells, the water quality must meet potable drinking water standards specified in Title 22 of the CCR. For irrigation wells, water quality should generally be suitable for agriculture and recreational use. Water quality optimization is primarily focused on ensuring potable water quality for municipal and domestic use. Additionally, water quality optimization will evaluate the potential to match water quality for intended uses such as the potential to use groundwater with elevated nitrate concentrations or other constituents of concern for irrigation. In general, the groundwater quality in the Subbasin is good and meets California drinking water maximum contaminant levels without the need for treatment.

As documented in Section 2.2.2.4, Groundwater Quality, naturally occurring poor water quality has been identified in specific areas: near the margins of the Subbasin where unconsolidated sediments are in contact with fractured bedrock; for select wells screened predominantly in the lower aquifer of the South Management Area that have concentrations of arsenic above the drinking water maximum contaminant level; and near the Borrego Sink where elevated sulfate and TDS are likely associated with dissolution of evaporites from the dry lake. Historical groundwater quality impairment for nitrates is noted for select portions of the Subbasin predominantly in the upper aquifer of the North Management Area underlying the agricultural areas and near high density of septic point sources. The source of nitrates is likely associated with either fertilizer applications or septic return flows. It should be noted that BWD does not have wells in the Borrego Sink area, and utilizes wells that produce water meeting Title 22 requirements without further treatment.

A robust groundwater quality monitoring program is essential to the implementation of the "Water Quality Optimization Program." Analysis of the existing monitoring program and data gaps has revealed lateral, vertical, and temporal limitations to water quality data availability. These data gaps will be addressed with collection and analysis of additional data and implementation of this GMP as described in Section 3.5, Monitoring Network.

4.6.1 Water Quality Optimization Program Description

Implementation of the Water Quality Optimization Program is to be initially conducted at the planning level. However, preliminary evaluations have already been conducted for several water quality optimization options. These are presented briefly following the section on planning considerations as follows.

Water Quality Optimization Planning

Development of the Groundwater Quality Optimization Program is anticipated to include three general phases: (1) investigation to identify the sources, nature, and extent of existing and potential future water quality impairments; (2) as needed, development of work plans to implement mitigation strategies; and (3) implementation of water quality mitigation projects.

The initial program phase will be to evaluate key issues associated with program development as follows:

- Evaluate existing data for gaps related to identification of contaminant sources (e.g., well construction information in areas with suspected surficial contaminant sources) through the Technical Advisory Committee process.
- Perform outreach with applicable stakeholders to obtain input regarding pertinent practices or anticipated future activities and vulnerabilities (e.g., meeting with farmers regarding fertilizer application practices).
- Scope investigations to fill data gaps or refine preliminary findings.
- Evaluate proactive abandonment of inactive wells to minimize migration pathways.

- As needed, prepare recommended mitigation alternatives for Watermaster consideration, with associated cost-benefit analyses.
- Identify potential funding sources.
- Consider costs and benefits for combined treatment projects and methods.
- As needed, scope a feasibility study for outlining the procedures for characterizing and mitigating degraded groundwater quality in the Subbasin.
- Prepare a Groundwater Quality Optimization Plan.

BWD Water Quality Optimization Options

Both direct treatment and indirect options have been considered to optimize groundwater quality and its use. Direct treatment of some types of groundwater contaminants may not be cost effective. There are indirect methods that may be more cost effective such as blending of poor quality water with better quality water, the construction of new wells in areas or aquifers with better quality water, transfer of water to areas where water use is better suited to a particular water quality as described in Section 4.7, PMA No. 6 – Intra-Subbasin Water Transfers, and reallocation of pumping production between wells.

Direct Treatment Options

The BWD has investigated the treatment of arsenic and nitrates on a preliminary basis. Treatment and cost considerations are presented *in Water Replacement and Treatment Cost Analysis for the Borrego Valley Groundwater Basin* (Dudek 2015). The feasibility of treatment is dependent on several factors including the contaminant concentration, quantity of water to be treated, the type of treatment facilities, and the operation and maintenance cost associated with particular treatment methods. Wellhead treatment systems yielded a wide range of total costs based on the level of uncertainty. The costs have been estimated to be between $227 and $548 per acre-foot for municipal production wells (Dudek 2015). Treatment system costs have not been evaluated for domestic wells because there have been no known detections of arsenic above drinking water standards reported for domestic wells. If private wells were to become impacted by water quality degradation, the feasibility of direct treatment would be evaluated.

Indirect Treatment Methods

Indirect treatment methods considered include various blending scenarios, the construction of new wells and delivery facilities, and re-allocation of pumping among existing wells.

Blending

Arsenic levels above the maximum contaminant level have historically been documented in one active BWD well and several private irrigation wells in the South Management Area; however, all BWD wells currently meet drinking water standards. There is a potential that continued decline in groundwater levels may result in increased arsenic concentrations. If increased arsenic concentrations do occur in BWD wells in the future, blending of water from these wells with BWD wells that do not have elevated arsenic is potentially a low-cost alternative to direct treatment. The cost associated with blending is highly variable and will depend on proximity of wells and the water quality of the blending source well. Additionally, the Division of Drinking Water would need to review and approve any potential blending plan, and it may not be possible to meet Division of Drinking Water standards because blending is not a preferred permanent alternative due to the potential for variability in the concentration of arsenic at the well-head over time.

New Well and Pipeline

This option would require the construction of new extraction wells in a part of the basin with acceptable water quality (potentially the North Management Area or Central Management Area). In addition to well construction costs associated with this alternative, costs to be evaluated include the cost of distribution pipelines, ongoing maintenance costs, and project power. The BWD is currently locating, designing and constructing up to three new potable extraction wells as part of its current Capital Improvement Plan.

Reallocation of Pumping from Existing Wells

Another option in the future is to re-allocate production from wells with higher levels of constituents of concern and potential for future water quality degradation, with production from more reliable wells with better water quality. The feasibility of this mitigation measure would be based on availability of water resources from wells in other parts of the Subbasin. If private wells were to become impacted by water quality degradation, the feasibility of drilling new wells or connecting to the BWD distribution system would be evaluated.

4.6.2 Water Quality Optimization Relationship to Sustainability Criteria

The Water Quality Optimization Program will address the undesirable result of water quality degradation. Avoiding undesirable results to water quality benefits the whole Subbasin to the benefit of all pumpers. Depending on the methods selected to optimize water quality, the Water Quality Optimization Program could potentially help to alleviate declining groundwater levels in particular areas of the basin by relocating pumping to other parts or management areas.

Relationship to Measurable Objectives

The Water Quality Optimization Program will be implemented to meet the measurable objectives for water quality.

Relationship to Minimum Thresholds

Consistent with the measurable objectives, the program serves as a direct physical action to maintain water quality above minimum thresholds to avoid undesirable results.

4.6.3 Expected Benefits of Water Quality Optimization

The primary benefit of the Water Quality Optimization Program is the existing and future maintenance of high quality water produced by groundwater extractors. Associated benefits may include lower long-term water costs to customers and reduction of future degradation of water quality.

4.6.4 Timetable for Implementation of the Water Quality Optimization

It is anticipated that the Water Quality Optimization Program will require a significant analysis and planning component prior to the implementation of specific water quality projects. Such planning has already started and the entire planning component is expected to take from 18 to 24 months after adoption of the Physical Solution. The need for specific water quality optimization projects will be evaluated annually through the Technical Advisory Committee process based on the results of the monitoring network described in Section 3.5, Monitoring Network.

4.6.5 Metrics for Evaluation of Water Quality Optimization

Water Quality Optimization will include both direct and indirect metrics to evaluate the effectiveness of the program. Effectiveness is primarily related to Subbasin sustainability goals that are quantified through the development of measurable objectives and minimum thresholds in this Plan. As such, groundwater quality in the Subbasin is the ultimate metric to evaluate effectiveness. Water quality evaluation has been included in the data gaps analysis and groundwater monitoring plan as described in Section 3.5, Monitoring Network. Specific metrics will include monitoring for the constituents most likely to be of concern in the basin, including arsenic, nitrate, sulfate, fluoride, and TDS. Metered groundwater extraction, groundwater levels and corresponding changes in groundwater storage will be monitored as they potentially relate to the potential for leaching of contaminants from subsurface geology. Active and implemented optimization projects will be tracked, and the need for new projects will be identified. Water budget components, when combined with demographic information and project costs may be used as an indirect measure of the effectiveness of the Water Quality Optimization as shown in Table 4-9.

Table 4-9
Metrics for Evaluating Water Quality Optimization Effectiveness

PMA No.	PMA Name	Direct Metrics	Indirect Metrics
No. 5	Water Quality Optimization	1. Groundwater levels 2. Groundwater storage 3. Metered groundwater extraction 4. Water quality 5. Active projects/identification of need for projects 6. List of implemented projects	1. Water budget components 2. Subbasin demographics 3. Cost

Notes: PMA = Projects and Management Action.

4.6.6 Economic Factors and Funding Sources for Water Quality Optimization Program

Planning-level development cost for establishing the Water Quality Optimization Program is estimated to be approximately $124,000.

Potential sources of funding for the Water Quality Optimization program components include state grants, pumping fees, water rates, parcel taxes, and other mechanisms as described in Section 5.1.6.

4.6.7 Water Quality Optimization Program Uncertainty

Program uncertainty includes unknown existing and future water quality, and the costs and efficacy associated with projects selected to address water quality degradation. These costs are dependent on a more thorough characterization of the severity and location of existing and potential future water quality impairments. Additionally, there is uncertainty regarding the availability of funding to implement the Water Quality Optimization Program.

4.7 PROJECTS AND MANAGEMENT ACTION NO. 6 – INTRA-SUBBASIN WATER TRANSFERS

4.7.1 Intra-Subbasin Water Transfers Program Description

The purpose of Intra-Subbasin Transfer Program is to mitigate existing and future reductions in groundwater storage and groundwater quality impairment by establishing conveyance of water from higher to lower production alternative areas in the Subbasin. This PMA will evaluate the feasibility and effectiveness of utilizing new or existing well sites in the Subbasin where groundwater conditions are more favorable for continued groundwater extraction. Currently, the BWD is the only entity in the Subbasin with a large water distribution system. The BWD distribution system supplies only potable water. All other water users in the Subbasin only have small, private conveyance restricted to limited areas of land. These include both potable and non-potable systems for domestic and irrigation use.

The GMP has designated three Subbasin management areas as described in Section 2.2.4, Management Areas. The management areas are based primarily for the purpose of groundwater quality management since the end uses of groundwater differs substantially across the three management areas. Wells in the North Management Area (NMA) serve primarily agricultural use whereas wells in the Central Management Area (CMA) primarily serve municipal and recreational uses, and wells in the South Management Area (SMA) primarily serve recreational use which means there may be different thresholds for undesirable results for potable versus non-potable uses. For example, groundwater pumped in the NMA, with potentially elevated nitrate levels from irrigation return flow, might be beneficially used to irrigate golf course turf in the CMA or SMA. Conveyance of non-potable water in the Subbasin would require construction of a new non-potable distribution system. A non-potable distribution system could benefit all pumpers in the Subbasin because it would preserve areas of the Subbasin where water meets drinking water standards. Additionally, because the Desert Lodge anticline effectively compartmentalizes the SMA from the CMA, it may be necessary to convey water between management areas to achieve location specific measurable objectives for groundwater levels and groundwater in storage. The need for transfer of pumped groundwater may be of benefit to other areas of the Subbasin depending on the timing and location of pumping reductions. For instance, if a sizable area of land were fallowed in the NMA, there is the potential to use existing wells to supply water to the CMA or SMA.

This PMA would only be implemented after the Watermaster evaluates the feasibility and effectiveness of utilizing new or existing well sites in the Subbasin where groundwater conditions are more favorable for continued groundwater extraction. As part of this PMA, current system infrastructure, condition, and needs as well as identify potential siting for new wells and conveyance facilities will be evaluated.

Development of the Intra-Subbasin transfer program will include the following steps:

- Inventory of existing infrastructure with considerations for capacity, condition, and vulnerabilities.
- Identification and prioritization of specific extraction wells that warrant mitigation/replacement.
- Preliminary opportunities and constraints analysis.

- Identification of current and potential future water blending opportunities and limitations.
- Estimated costs for anticipated future water treatment requirements (i.e., arsenic, nitrate, TDS) for the existing well network.
- Cost-benefit analysis for various selected project alternatives.
- Development of a more specific Intra-Subbasin Water Transfer Plan.

Legal Authority and Regulatory Process

A GSA has the power to "perform any act necessary or proper to carry out the purposes of [SGMA]" (CWC Section 10725.2(a)). A GSA may also "authorize temporary and permanent transfers of groundwater extraction allocations within the agency's boundaries, if the total quantity of groundwater extracted in any water year is consistent with the provisions of the groundwater sustainability plan." A GSA also has the power to "(e) Transport, reclaim, purify, desalinate, treat, or otherwise manage and control polluted water, wastewater, or other waters for subsequent use in a manner that is necessary or proper to carry out the purposes of this part" (CWC, Section 10726.2(e)).

4.7.2 Intra-Subbasin Water Transfers Program Relationship to Sustainability Criteria

The Intra-Subbasin Transfer Program will potentially address multiple undesirable results identified for the Subbasin. Groundwater level declines may be addressed by the transfer of water from parts of the Subbasin with stable groundwater levels to those with pumping depressions or groundwater level declines. Water transfers may also allow for selective pumping of the middle or lower aquifers as opposed to the upper aquifer, which is likely more susceptible to water quality impacts as a result of septic and irrigation return flows. Use of groundwater resources may be optimized by the transport of water for uses to which the water quality is compatible, thereby potentially preserving good water quality for potable use. For example, transfer of high nitrate groundwater for irrigation may reduce the reliance on potable water.

Relationship to Measurable Objectives

The Intra-Subbasin Transfer Program is intended to optimize water supply and demand for beneficial users in the Subbasin. This program will evaluate the distribution of pumping in the Subbasin that could result in direct effects to the chronic lowering of groundwater levels and reduction of groundwater in storage measurable objectives.

Relationship to Minimum Thresholds

Consistent with the measurable objective, the program serves as a direct physical action to manage groundwater levels, groundwater in storage and water quality above minimum thresholds to avoid undesirable results.

4.7.3 Expected benefits of the Intra-Subbasin Water Transfers Program

The primary benefit of the Intra-Subbasin Transfer Program is that it will provide flexibility in regard to where groundwater is produced and consumed. In particular, it provides a potential mechanism to convey both potable and non-potable water to end users. This would allow for conveyance of groundwater of specific water quality for purposes to which its use is compatible. Additionally, it could provide an additional tool to reduce groundwater extraction from areas of declining groundwater levels. It is expected that Intra-Subbasin Transfer Program would help achieve measurable objectives for groundwater levels, groundwater in storage and water quality.

4.7.4 Timetable for Implementation of the Intra-Subbasin Water Transfers Program

It is anticipated that the planning part of the Intra-Subbasin Transfer and analysis plan will require approximately 9–12 months but potentially be required to be initiated through the Technical Advisory Process during Physical Solution implementation based on the results of the monitoring network as described in Section 3.5, Monitoring Network.

4.7.5 Metrics for Evaluation of the Intra-Subbasin Water Transfers Program

The Intra-Subbasin Water Transfer Program will include both direct and indirect metrics to evaluate the effectiveness of the program. Program effectiveness is primarily related to Subbasin sustainability goals that are quantified through the development of measurable objectives and minimum thresholds. As such, groundwater levels, corresponding changes in Subbasin groundwater storage, and water quality are probably the most representative metrics to evaluate effectiveness. Direct metrics by which to evaluate the success of the metrics for the evaluation of the Intra-Subbasin Transfer Program include area and aquifer-specific measurement of groundwater levels and corresponding changes in groundwater storage, metering of groundwater production and monitoring water quality. Active and implemented projects will be tracked, and the need for new projects will be identified. Water budget components, when combined with demographic information and project costs, may be used as an indirect measure of the effectiveness of the Intra-Subbasin Water Transfers as shown in Table 4-10.

Table 4-10
Metrics for Evaluating Intra-Subbasin Water Transfers Effectiveness

PMA No.	PMA Name	Direct Metrics	Indirect Metrics
No. 6	Intra-Subbasin Water Transfers	1. Groundwater levels 2. Groundwater storage 3. Metered groundwater production 4. Water quality 5. Active projects/identification of need for projects 6. List of implemented projects	1. Water budget components 2. Subbasin demographics

Notes: PMA = Projects and Management Action

4.7.6 Economic Factors and Funding Sources for Intra-Subbasin Water Transfers Program

Planning-level development cost for establishing the Intra-Subbasin Water Transfers Program is estimated to be approximately $90,000.

Potential sources of funding for the Intra-Subbasin Water Transfers Program components include state grants, pumping fees, water rates, parcel taxes, and other mechanisms as described in Section 5.1.6.

4.7.7 Intra-Subbasin Water Transfers Program Uncertainty

Program uncertainty associated with intra-subbasin water transfers includes the cost and availability of land for infrastructure and facilities construction, level of participation of water users, and water quality suitability for contributing and receiving uses, some of which activities may require CEQA compliance. Intra-subbasin water transfers may require construction of new pipeline conveyance systems, siting and construction of new extraction wells, and additional analysis of water quality.

4.8 GROUNDWATER SUSTAINABILITY PLAN COORDINATION WITH GENERAL PLAN UPDATE

SGMA (CWC, Sections 10727.2(g), 10726.9) requires coordination of GSPs with General Plan Updates in order to promote consistency within the planning documents. In this case, the County will have a representative on the Watermaster Board and, thus, this task of coordination is more streamlined than it may be with the development of GSPs.

The sustainability goals of the Physical Solution are anticipated to play a central role in the County's next General Plan update process, which encompasses updates to the Borrego Springs Community Plan (see Chapter 2, Basin Setting). The GSA prepared a *Planning, Permitting and Ordinance Review Technical Report* attached as Appendix __ that identifies key issues of current County plans and policies that may need to be changed or updated to ensure consistency with the

Physical Solution's long-term sustainability goal and sustainable management criteria of the GMP.

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CHAPTER 5
PLAN IMPLEMENTATION

5.1 GROUNDWATER MANAGEMENT PLAN IMPLEMENTATION AND ESTIMATED COSTS

The Physical Solution (Plan) will be implemented by the Watermaster under the Judgment. The following sections include cost estimates previously developed by the GSA for Plan implementation including annual reporting, periodic updates, monitoring protocols, and projects and management actions (PMAs). The Watermaster's costs for Physical Solution implementation are likely less than those GSP implementation costs estimated by the GSA due to anticipated efficiencies entailed by the negotiated terms of the Physical Solution that have been agreed to by participating pumpers.

As a potential worst case cost assessment, the following sections include potential Physical Solution implementations costs, as developed for the GSA/GSP process. Potential funding sources and mechanisms are presented along with a tentative schedule for implementing the Plan's primary components. In addition, annual reporting and 5-year update procedures for the Borrego Springs Groundwater Subbasin (Subbasin, Plan Area) are described.

Standards for Plan Implementation

Under the GSP Regulations (23 California Code of Regulations (CCR) Section 350, et seq.), a GSP is to include the following:

- An estimate of the cost of implementing the Plan and a general description of how the Agency plans to meet those costs (23 CCR Section 354.6(e)).
- Schedule for Implementation (23 CCR Sections 352.4(c)(2) and 355.4(b)(2)).

Annual Reporting

The Watermaster shall submit an annual report to the Court and Department of Water Resources (DWR) by April 1 of each year following the adoption of the Plan. The annual report shall include the following components for the preceding water year:

1. General information, including an executive summary and a location map depicting the basin covered by the report.
2. A detailed description and graphical representation of the following conditions of the basin managed in the Plan:
    a. Groundwater elevation data from monitoring wells identified in the monitoring network shall be analyzed and displayed as follows:

   i. Groundwater elevation contour maps for each principal aquifer in the basin illustrating, at a minimum, the seasonal high and seasonal low groundwater conditions.

   ii. Hydrographs of groundwater elevations and water year type using historical data to the greatest extent available, including from January 1, 2015, to current reporting year.

b. Groundwater extraction for the preceding water year. Data shall be collected using the best available measurement methods and shall be presented in a table that summarizes groundwater extractions by water use sector, and identifies the method of measurement (direct or estimate) and accuracy of measurements, and a map that illustrates the general location and volume of groundwater extractions.

c. Surface water supply used or available for use, for groundwater recharge or in-lieu use shall be reported based on quantitative data that describes the annual volume and sources for the preceding water year.

d. Total water use shall be collected using the best available measurement methods and shall be reported in a table that summarizes total water use by water use sector, water source type, and identifies the method of measurement (direct or estimate) and accuracy of measurements.

e. Change in groundwater in storage shall include the following:

   i. Change in groundwater in storage maps for each principal aquifer in the basin.

   ii. A graph depicting water year type, groundwater use, the annual change in groundwater in storage, and the cumulative change in groundwater in storage for the basin based on historical data to the greatest extent available, including from January 1, 2015, to the current reporting year.

3. A description of progress towards implementing the Plan, including achieving interim milestones, and implementation of projects or management actions since the previous annual report (CCR Section 356.2).

5-Year Evaluation

The Watermaster shall evaluate its Plan at least every 5 years and whenever the Plan implementation is amended, and provide a written assessment to DWR as part of its Annual Report. The assessment shall describe whether the Plan implementation, including implementation of PMAs, are meeting the sustainability goal in the Subbasin, and shall include the following:

1. A description of current groundwater conditions for each applicable sustainability indicator relative to measurable objectives, interim milestones and minimum thresholds.

2. A description of the implementation of any projects or management actions, and the effect on groundwater conditions resulting from those projects or management actions.
3. Elements of the Plan, including the basin setting, management areas, or the identification of undesirable results and the setting of minimum thresholds and measurable objectives, shall be reconsidered and revisions proposed, if necessary.
4. An evaluation of the basin setting in light of significant new information or changes in water use, and an explanation of any significant changes. If the Agency's evaluation shows that the basin is experiencing overdraft conditions, the Agency shall include an assessment of measures to mitigate that overdraft.
5. A description of the monitoring network within the basin, including whether data gaps exist, or any areas within the basin are represented by data that does not satisfy the requirements of the GSP Regulations (23 CCR Sections 352.4 and 354.34(c)). The description shall include the following:
   a. An assessment of monitoring network function with an analysis of data collected to date, identification of data gaps, and the actions necessary to improve the monitoring network, consistent with the requirements of Section 354.38.
   b. If the Agency identifies data gaps, the Plan shall describe a program for the acquisition of additional data sources, including an estimate of the timing of that acquisition, and for incorporation of newly obtained information into the Plan.
   c. The Plan shall prioritize the installation of new data collection facilities and analysis of new data based on the needs of the basin.
6. A description of significant new information that has been made available since Plan adoption or amendment of the Plan's implementation, or the last 5-year assessment. The description shall also include whether new information warrants changes to any aspect of the Plan's implementation, including the evaluation of the basin setting, measurable objectives, minimum thresholds, or the criteria defining undesirable results.
7. A description of relevant actions taken by the Watermaster, including a summary of Rules and Regulations related to the Plan.
8. Information describing any enforcement or legal actions taken by the Agency in furtherance of the sustainability goal for the basin.
9. A description of completed or proposed Plan amendments.
10. Where appropriate, a summary of coordination that occurred between multiple Agencies in a single basin, Agencies in hydrologically connected basins, and land use agencies.
11. Other information the Agency deems appropriate, along with any information required by DWR to conduct a periodic review as required by California Water Code (CWC) Section 10733 (CCR Section 356.4).

5.1.1 Groundwater Sustainability Agency Annual Budget

The GSA previously performed substantial work toward estimating the cost of contemplated GSP implementation. Summaries of the tasks and costs previously estimated by the GSA to undertake the draft GSP are provided in the following subsections. The cost estimates below do not reflect the cost of Watermaster implementation of the Physical Solution. The Initial Watermaster Budget is attached to the Judgment and subsequent year projected costs will be developed as part of the Watermaster Annual Budget process.

5.1.1.1 Operations and Monitoring Costs

Annual operations include semi-annual monitoring of groundwater levels, water quality, and streamflow monitoring, and annual review of land subsidence data, if necessary, in accordance with the monitoring plan (described in Chapter 3, Section 3.5). Other tasks include data management system maintenance, update of the groundwater model, and monitoring equipment maintenance. The required annual report will be produced in accordance with Section 356.2 of the GSP Regulations. The total annual cost of these tasks is estimated to be $303,261 per year starting in fiscal year (FY) 2020; however, some tasks such as the Borrego Valley Hydrologic Model update or land subsidence review may not occur annually throughout GMP implementation but have been included annually to provide a conservative estimate. A task list and related estimated annual costs are provided in Table 5-1.

Table 5-1
Operations and Monitoring Costs

Expense Item		Estimated Annual Costs (FY 2020)
Task 1:	Semi-Annual Groundwater Level Monitoring	$29,616 *
Task 2:	Semi-Annual Water Quality Monitoring	$69,131
Task 3:	Semi-Annual Stream Monitoring	$11,302
Task 4:	Pump Metering	$10,927 *
Task 5:	Land Subsidence Review	$9,168
Task 6:	Operation and Maintenance	$20,739
Task 7:	Data Management System	$19,508
Task 8:	Annual Groundwater Model Update	$79,375 *
Task 9:	Annual Comprehensive DWR Reporting	$16,444
Task 10:	Project Management and Coordination	$37,051
	Total	**$303,261**

Notes: FY = fiscal year; DWR = Department of Water Resources. * Task Costs above do not necessarily reflect Watermaster costs for implementing the Physical Solution

A summary of the scope of each task previously described by the GSA for implementation of the draft GSP is as follows. The following tasks do not necessarily describe Watermaster implementation costs for the Physical Solution:

12. **Semi-Annual Groundwater Level Monitoring** Monitoring of groundwater levels conducted semi-annually throughout the well network within the Subbasin. This may consist of multiple days of field monitoring annually in which trained professionals will manually measure depth to groundwater, or, collect data from transducer data loggers. Management of data, as well as annual preparation of groundwater level monitoring summary memorandum.
13. **Semi-Annual Water Quality Monitoring** Collection, testing, and analysis of groundwater samples from designated monitoring wells on a semi-annual basis. A trained professional will visit designated wells, perform field testing of select water quality parameters, collect samples, and send samples to laboratory for water quality testing. Test results will be tabulated and reported per the GSP guidelines. Management of data, as well as annual preparation of water quality monitoring summary.
14. **Semi-Annual Stream Monitoring** Inspection and monitoring of streams within basin on a semi-annual basis. Tasks may include measuring flow rates, visual inspection of streams, noting changes in geomorphology, and preparation of stream monitoring summary.
15. **Pump Metering** Quality assurance and quality control of supplied metering data of groundwater extraction, annual meter reads (non-self-reporting wells), meter calibration and validation, and new meter installations in accordance with the Metering Plan (Appendix E). Preparation of annual groundwater extraction summary.
16. **Land Subsidence Monitoring** Evaluation of existing monument survey to examine and estimate any changes in land subsidence. Management of data and preparation of periodic land subsidence summary, if necessary.
17. **Operation and Maintenance** Maintenance and minor repairs to various monitoring instruments including: transducers, dataloggers, well heads, etc. This task may also include inspections of fallowed lands.
18. **Data Management System** Maintenance and hosting of data management system. Updates and quality assurance of organization and viability of stored data.
19. **Annual Groundwater Model Update** Annual updates to groundwater model as a result of new and higher resolution data within the Subbasin. Preparation of periodic groundwater model summary, as necessary.
20. **Annual Comprehensive Department of Water Resources (DWR) Reporting** Preparation of draft DWR annual reports as outlined in the draft GSP. Review and edits of draft annual reports. Preparation and submittal of final DWR annual reports as outlined in the draft GSP.
21. **Project Management and Coordination** Correspondence between GSA and consultants, including GSA and Borrego Town Hall or GSP implementation update

meetings. Project management and as-needed correspondence to complete annual draft GSP requirements.

5.1.1.2 Management, Administration, and Other Costs

The GSA previously anticipated that it would incur additional costs for internal management and administration by Borrego Water District (BWD) and County staff. The following discussion does not reflect Watermaster administration and other costs. Initial Watermaster costs are included in the Initial Watermaster Budget attached to the Judgment and subsequent year projected costs will be developed as part of the Watermaster Annual Budget process. The level of effort in fulltime equivalent (FTE) employees and corresponding fully burdened rates is still being estimated, but at this state the GSA estimates it will require two FTEs at a fully burdened rate of $120,000 per FTE. The GSA may also incur costs related to repair and replacement of capital assets such as well meters, vehicles, equipment, and supplies, as well as potential legacy costs of well abandonment. It is assumed that the GSA will lease office and other space from BWD for operations and administration. Rent is roughly estimated at $500 per month or $6,000 per year. Legal fees are estimated at $30,000 per year based on legal fees currently paid to develop the draft GSP. Other expenses include audit services, insurance, office supplies, etc. and are roughly estimated based on comparable agency costs. Cost estimates for these items require additional evaluation; however, these other expenses are expected to be a fraction of personnel and legal expenses. Additional variable costs include engineering services, permits and fees, and land management/stewardship expenses that are expected to be incurred once PMAs are fully developed. Once PMAs are developed the GSA will update annual management, administration and other costs. Table 5-2 provides a comprehensive list of line item expense types that the GSA was expected to incur.

Table 5-2
Management, Administration, and Other Costs

Expense Item		Estimated Annual Costs (FY 2020)
1	Administrative Personnel (two FTE)	$240,000
2	Rent/Leases (BWD space)	$6,000
3	Utilities	$500
4	Consulting Services	$10,000
5	Audit and Professional Services	$5,000
6	Legal	$30,000
7	Insurance	$3,750
8	Public Outreach	$6,000
9	Repairs and Maintenance	$1,500
10	Supplies and Equipment	$750
11	Office Supplies	$500
12	Miscellaneous Expenses	$1,500

Table 5-2
Management, Administration, and Other Costs

Expense Item	Estimated Annual Costs (FY 2020)
Total	$305,500

Notes: FY = fiscal year; FTE = fulltime equivalent, BWD = Borrego Water District. * Costs above do not reflect Watermaster costs for implementing the Physical Solution

5.1.2 Reserves and Contingencies

In addition to covering the operations budget, the Watermaster budget includes a reserves policy which is expressly authorized by the Sustainable Groundwater Management Act (SGMA) (CWC Sections 10730(a) and 10730.2(a)(1)). Reasonable and achievable reserves are a prudent financial tool to aid in cash flow timing and unforeseen expenditures. Generally, a reserve for operations targets a specific percentage of annual operating costs or days of cash on hand. The reserve target is influenced by several factors including the frequency of billing and the recurrence of expenses. Comparable agencies use a reserve percentage of 50% of operating budget if billing semi-annually, less if more frequent. The bases and values for reserves are presented in the Initial Watermaster Budget attached to the Judgment. Subsequent years' reserves will be included in the Watermaster's Annual Budget process.

5.1.3 Periodic (5-Year) Groundwater Sustainability Plan Update Costs

Every fifth year of Physical Solution implementation and whenever the Physical Solution implementation is amended, the Watermaster will prepare and submit a Watermaster Evaluation and Assessment Report to the Court and DWR together with the annual report for that year. The assessment and report will be prepared as described in California Code of Regulations (CCR) Section 356.10. Table 5-3 provides a list of tasks and estimated cost that the GSA expected to incur to complete 5-year updates as part of the draft GSP.

Table 5-3
Groundwater Sustainability Plan 5-Year Update Costs

Expense Item		Estimated 5-Year Additional Costs
Task 1	Updated Water Budget, Groundwater Model and Sustainable Yield	$31,430
Task 2	Assessment of Pumping Allocations	$14,450
Task 3	5-Year Plan Evaluation and Assessment Report	$19,120
	Total	$65,000

. * Costs above do not necessarily reflect Watermaster costs for implementing the Physical Solution

5.1.4 Projects and Management Actions Development Costs

Details of the proposed PMAs are presented in Chapter 4, Projects and Management Actions. Task descriptions and estimated costs associated with the GSA's development of each PMA for the draft GSP are summarized in Table 5-4. Proposed PMAs are presented at the planning level and additional costs will be incurred with full implementation.

Table 5-4
Projects and Management Actions Development Costs

PMA Number	PMA	Estimated Cost	Level of Project Development
1	Water Trading Program	$122,065	Planning and trading system development*
2	Water Conservation Program (Demand Management)	$130,390	Planning, field surveys and cost development*
3	Pumping Reduction Program	$82,430	Planning and outreach*
4	Voluntary Fallowing of Agricultural Land	$103,175	Planning and outreach*
5	Water Quality Optimization	$124,060	Planning and preliminary engineering*
6	Intra-Basin Transfers	$89,545	Planning and preliminary engineering*

Notes: PMA = Projects and Management Action.. * Costs above do not necessarily reflect Watermaster costs for implementing the Physical Solution 5 1.5 Total Costs

Annual implementation costs may vary from year to year as a result of the status of PMAs, significance of new data, and increased milestone reporting requirements every fifth year of implementation. For planning purposes, the estimated annual budget for GSA operations and monitoring have been adjusted for annual inflation assumed at 2.8% per year to determine the total GSP implementation cost. The GSA's previously estimated draft GSP implementation cost for the anticipated 20-year implementation period for operations and monitoring, management, administration and other costs, 5-year annual reviews and 10% contingency is approximately $19,200,000 as summarized in Table 5-5.

Table 5-5
Groundwater Sustainability Plan Estimated Implementation Cost Through 2040

Fiscal Year	Operations and Monitoring Costs	Management, Administration and Other Costs	5-Year Annual Reviews	10% Contingency	Total
2020	$303,261	$305,500	$0	$60,876	$669,637
2021	$311,752	$314,054	$0	$62,581	$688,387
2022	$320,481	$322,848	$0	$64,333	$707,662
2023	$329,455	$331,887	$0	$66,134	$727,476
2024	$338,680	$341,180	$0	$67,986	$747,846
2025	$348,163	$350,733	$72,592	$77,149	$848,636
2026	$357,911	$360,554	$0	$71,846	$790,311
2027	$367,933	$370,649	$0	$73,858	$812,440
2028	$378,235	$381,027	$0	$75,926	$835,188
2029	$388,825	$391,696	$0	$78,052	$858,574

Table 5-5
Groundwater Sustainability Plan Estimated Implementation Cost Through 2040

Fiscal Year	Operations and Monitoring Costs	Management, Administration and Other Costs	5-Year Annual Reviews	10% Contingency	Total
2030	$399,712	$402,664	$83,340	$88,572	$974,287
2031	$410,904	$413,938	$0	$82,484	$907,327
2032	$422,410	$425,528	$0	$84,794	$932,732
2033	$434,237	$437,443	$0	$87,168	$958,849
2034	$446,396	$449,692	$0	$89,609	$985,696
2035	$458,895	$462,283	$95,679	$101,686	$1,118,543
2036	$471,744	$475,227	$0	$94,697	$1,041,668
2037	$484,953	$488,533	$0	$97,349	$1,070,835
2038	$498,532	$502,212	$0	$100,074	$1,100,818
2039	$512,490	$516,274	$0	$102,876	$1,131,641
2040	$526,840	$530,730	$109,846	$116,742	$1,284,157
	$8,511,809	**$8,574,653**	**$361,456**	**$1,744,792**	**$19,192,710**

Notes: Assumes inflation factor of 2.8% per year.* Costs above do not necessarily reflect Watermaster costs for implementing the Physical Solution

Estimated total draft final GSP implementation costs previously estimated by the GSA assumes the following general components:

- Data collection, management, and evaluation
- Annual reporting
- 5-year review assessment and reporting
- Data gap analysis and additional evaluation
- PMAs development and implementation of components as funding allows
- Management, administration, and other costs
- 10% contingency assumed over 20-year plan implementation period

In addition to the $19,200,000 required for 20-year draft final GSP implementation costs, an additional $652,000 was estimated to be required for PMAs development costs as previously provided in Table 5-4. In addition, $500,000 was budgeted for preparation of the Environmental Impact Report (EIR) for GSP implementation. Budget for the EIR has been secured though funding provided by Proposition 1 Severely Disadvantaged Community grant. Thus, the current total estimated draft final GSP implementation cost was approximately $20,352,000, including a contingency of $1,745,000. It is emphasized that this estimate does not include the implementation of all PMAs nor final costs incurred by BWD for internal management and administration. BWD intends to request reimbursement from the GSA for some of its GSA creation and GSP development related expenses and these costs are not included in the estimates.

Additional budget will be required to implement PMAs once they have been developed. Implementation of PMAs such as the water conservation program will be highly dependent upon securing funding such as through state or federal grants. Administrative costs to implement the primary water reduction programs that include the Water Trading Program, Pumping Reduction Program and Voluntary Fallowing of Agricultural Land was expected to be covered by the costs estimated in Table 5-5.

5.1.6 Funding Sources

In general, the GSA planned to fund draft final GSP implementation using a combination of groundwater extraction charges, including monthly fixed charges and variable pumping fees, assessments/parcel taxes, and grants. Because of Constitutional limitations imposed through California Propositions 13, 218, and 26, there are strict rules about what constitutes a fee versus a tax. Taxes and assessments require voter approval. Water rates passed under Proposition 218 are subject to mandatory noticing and a potential majority protest. Regulatory fees identified as an exemption from taxes under Proposition 26 can be passed by the vote of the governing body of the agency imposing the fee. An example is a $/AF pumping charge levied by a groundwater management agency. Assessments for special benefit are also governed by Proposition 218 and can be assessed to pay for a public improvement or service if it provides a special benefit to the properties. A benefit nexus is required to determine the amount of special benefit to each property. Grants from DWR have funded the majority of the GSP costs to date and it is expected that grants available from general obligation bonds such as Proposition 68 will be available to fund GSP implementation and development of PMAs. Potential funding sources specific to PMAs are presented in Chapter 4.

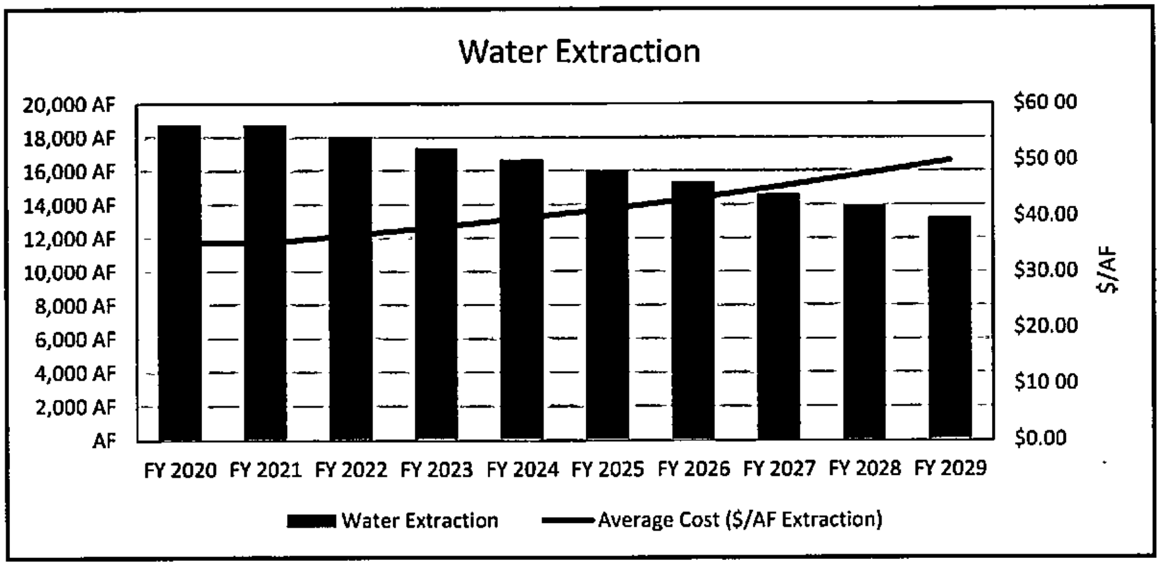
The GSA performed a preliminary financing plan options evaluation to determine a funding structure to fund the proposed GSA activities and expected financial commitments throughout GSP implementation. Development of the funding mechanism(s) is critical to facilitate successful implementation of the GSP consistent with the requirements of SGMA. A key success factor is preparing a cost allocation that is equitable to GSA members and stakeholders. Subsequent to the evaluation of financing plan options, a preliminary financing model was developed to determine revenue required to fund the operating plan, reserve balances and to evaluate required adjustments to the fee structure over time as pumping ramps down to the estimated sustainable yield.

The working draft Financing Plan identified the following proposed cost allocation structure:

- Monthly fixed charge based on well meter size (i.e., specific meter fee based on meter pipe diameter; 0–2 inches, 2–4 inches, 4–6 inches, 6–8 inches, and more than 8 inches; all non-*de minimis* extraction wells to be registered with the GSA)
- Variable pumping fee based on volume of groundwater extracted (all non *de minimis* wells to be metered)

It was expected that a portion of the pumping cost would be apportioned though the monthly meter fee and a portion applied at least semi-annually based on metered production. The intent of the meter fee was to provide regular cash flow to the GSA in order for it to meet its financial obligations. Monthly regular cash flow would also minimize the reserve target that would need to be greater if based solely on variable pumping revenues. Over the first 10 years of plan implementation, it was expected that up to $50/AF will be required to cover operations and monitoring costs, management, administration and other costs such as reserves (Exhibit 1). This cost did not include additional potential fees required to implement specific PMAs nor internal management and administration. Additional PMA planning, stakeholder outreach and detailed cost development is required to determine additional costs associated with PMAs implementation. Cost per acre-foot to cover GSA expenses was expected to continue to increase through 2040 as required revenue is spread over less groundwater extraction as a result of pumping ramp down. Exhibit 1 shows the estimated groundwater extracted and average cost per acre-foot.

Exhibit 1. Estimated Groundwater Extracted and Average Cost (dollar per acre-foot)



Notes: AF = acre-feet, FY = fiscal year. * Costs above do not necessarily reflect Watermaster costs for implementing the Physical Solution FY 2020 groundwater extraction is estimated based on recent agriculture, municipal, recreation, and other non-*de minimis* pumping. Pumping is assumed to ram down annually over time to the estimated sustainable yield The cost per acre-foot pumped increases as revenue is spread over less groundwater extraction.

5.2 IMPLEMENTATION SCHEDULE

The Physical Solution will be operated on an interim basis in connection with Court and DWR filing of the Judgment (including this GMP) no later than January 31, 2020. Figure 5.2-1 through 5.2-4 provides the GSA's preliminary schedule for implementation of the primary draft GSP components. The GMP schedule will be advanced by interim operation of the Physical Solution under Court supervision and continuing thereafter as the process proceeds. Each annual and periodic report will include a reevaluation and update of the schedule components based on progress toward the sustainability goal or other factors.

Routine annual and 5-year reporting of Physical Solution progress will be performed in accordance with SGMA requirements. Annual Reports will be prepared and submitted to the Court and DWR by April 1 of each year. Periodic Reports (5-Yearly or following substantial GSP amendments) will be submitted to the DWR by April 1 at least every 5 years (i.e., 2025, 2030, 2035, and 2040). The contents of Annual and Periodic Reports are described in the following Sections 5.3 and 5.4.

The six PMAs the GSA proposed and their implementation schedules are presented in Figure 5.2-3. The GSA anticipated that activities that might cause physical change to the environment requires California Environmental Quality Act (CEQA) review. There are CEQA exemptions that could apply for some of these activities. Regardless, the GSA would still have needed to go through the process of CEQA review to determine which exemptions would apply, and then file for the exemption. PMA No. 1 – Water Trading Program, PMA No. 3 – Pumping Reduction Program, and PMA No. 4 – Voluntary Fallowing of Agricultural Land, all were considered as activities to undergo CEQA. The GSA thought it was likely an Environmental Impact Report (EIR) will be required to be prepared and adopted. It was anticipated an EIR would take approximately two years to develop. PMA No. 5 – Water Quality Optimization and PMA No. 6 – Intra-Subbasin Water Transfer, have no definitive timeframe for implementation. The GSA would evaluate projects on a case-by-case basis to determine CEQA requirements. The Physical Solution is being undertaken by private pumpers and the Court-appointed Watermaster under the Judgment, and is not subject to CEQA.

5.3 ANNUAL REPORTING

The annual report will, at a minimum, include the components described as required pursuant to CCR Section 356.2. In addition to being available from DWR, the Watermaster will make annual reports available to the Court, the public and stakeholders through the methods described in Chapter 2 (Section 2.1.5, Notice and Communication), primarily through the Watermaster's website, but also through email announcements, newsletters/columns, and/or water bill inserts.

5.3.1 General Information

An executive summary will be prepared to summarize the findings of the Annual Report and include a location map similar to Figure 1-1. This section will include a description of significant progress and pertinent findings of the reporting period and key recommendations for going forward.

5.3.2 Description and Graphical Representations of Groundwater Information

Groundwater Elevation Data

Detailed descriptions and graphical representations will be included to demonstrate the following conditions of the Subbasin in accordance with the monitoring plan and monitoring network described in Section 3.5, and attached as Appendix E. Groundwater elevation data for each management area will be depicted and summarized using groundwater contour maps similar to those included as Figures 2.2-13A. The contour maps will include delineation of the primary aquifers (Figure 2.2-10) and groundwater contours for seasonal high and low conditions. Hydrographs depicting current and historical data for each management area will be included (Figure 2.2-13E). The written section will include a description and interpretation of the data shown in the figures and a discussion of observed data gaps and recommendations for modifications to the monitoring network, if warranted.

Groundwater Extraction

Groundwater extraction information for the preceding water year will be presented. Data sources will include BWD pumping records and metered extraction data from private agricultural, golf courses and other non-*de minimis* wells (i.e., pumpers extracting greater than 2 acre-feet per year). All non-*de minimis* groundwater users will be required to register their wells with the Watermaster upon initial GMP implementation in accordance with the Metering Plan (Appendix E). Data will be presented in a table that summarizes groundwater extractions by water use sector and management area, and identifies the measurement method (direct or estimated) and accuracy of measurements. A map of general location and volume of groundwater extractions will be provided. Groundwater extraction will be documented in conformance with the Metering Plan (Appendix E).

Surface Water Supply

Currently, there are only natural sources of groundwater recharge to the basin. The annual report will note developments or studies in regard to surface water supplies. The contribution from natural sources of recharge are presented in Section 2.2.3, Water Budget, and will be quantified as part of the water budget.

Sources of imported water and recycled water from wastewater treatment plant upgrades have been evaluated and determined to be infeasible at this time as explained in Section 2.2.3.8, Surface Water Available for Groundwater Recharge or In-Lieu Use.

Total Water Use

The total water use for the Basin will be reported in tabular format including water use by sector (agriculture, recreation, and municipal) and geographically by management area. Sources of data will include BWD production and delivery records and metered well use for the private sector. Where direct measurement is not possible, indirect methods will be used to estimate water use.

Changes in Groundwater Storage

Estimated changes in storage will be evaluated for each management area and each principal aquifer and this information will be depicted on maps. This section will include a graph of climate, groundwater use, and annual and cumulative change in storage for the period of available record through the reporting period.

5.3.3 Plan Implementation Progress

A description of progress toward implementing the Physical Solution will be included, including achieving interim milestones and implementation of PMAs since the previous report. Current progress will be compared to the planned schedule using the chart shown in Figures 5.2-1 through 5.2-4.

5.4 PERIODIC EVALUATION AND REPORTING

The Watermaster will evaluate its Plan implementation at least every 5 years and whenever the Plan implementation is amended and provide a written assessment to the DWR. The evaluation will include the elements of the annual reports and an assessment of the progress toward the sustainability goal as defined in Section 3.1.3, Sustainability Goal consistent with the Judgment. At a minimum, the Periodic Evaluations will include the elements required Pursuant to CCR Section 356.4. In addition to being available from DWR, the Watermaster will make periodic evaluations available to the public and stakeholders through the methods described in Chapter 2 (Section 2.1.5, Notice and Communication), primarily through the Watermaster's website, but also through the County's SGMA website, email announcements, newsletters/columns, and/or water bill inserts. In addition, the assessment will include the following components:

5.4.1 Current Groundwater Conditions

A description of current groundwater conditions will be included for each applicable sustainability indicator relative to measurable objectives, interim milestones, and minimum thresholds defined in Section 3.2, Undesirable Results. For example, hydrographs showing groundwater elevations for key wells in relation to the measurable objective and minimum threshold will be prepared.

5.4.2 Implementation of Projects or Management Actions

A description will be provided to summarize the implementation and status of PMAs, and the effect on groundwater conditions or other socioeconomic effects resulting from those PMAs. The success of PMAs will be evaluated in terms of whether implementation is achieving Subbasin sustainability goals. If not, PMAs would require re-evaluation or potentially accelerated implementation. Major deviations to the PMAs implementation schedule would be coordinated with the Subbasin stakeholders through an outreach process.

5.4.3 Plan Elements

Elements of this Plan, including the basin setting, management areas, or the identification of undesirable results and the setting of minimum thresholds and measurable objectives, will be reconsidered and revisions proposed, if necessary. Such considerations will include the extent to which this Plan is progressing toward achievement of the sustainability goal and meeting interim milestones.

5.4.4 Basin Evaluation

Each Periodic Evaluation will include an assessment of unanticipated changes that have occurred, or new information impacting water use, and how they may impact the plan implementation and achievement of the sustainability goal. Such changes may include unanticipated climate extremes. Changes will be evaluated in regard to impacts on overdraft conditions and adjustments made to mitigate overdraft and conditions contributing to undesirable effects.

Water Balance Review

The data collected to date will be reviewed to determine a revision in the estimated sustainable yield value by a future projection scenario analysis using the BVHM, as updated, on a schedule consistent with the Judgment.

The report will describe the impact of revised sustainable yield value on the following:

- Pumping allowances
- Measurable objectives/interim milestones
- Other pertinent components of the Physical Solution

5.4.5 Monitoring Network

The Watermaster's periodic evaluation will include a description of the monitoring network within the Basin, including whether data gaps exist, or whether areas within the Basin are represented by data that do not satisfy the Data and Reporting Standards. The descriptions shall include the following:

- An assessment of monitoring network function with an analysis of data collected to date, identification of data gaps, and the actions necessary to improve the monitoring network, consistent with the requirements of CWC Section 354.38.
  - The periodic evaluation will provide an update of data gaps. The evaluation shall include options for obtaining additional data sources, an estimate of timing to obtain new data sources, and for potential incorporation of newly obtained information into the GMP.
  - The evaluation will prioritize the installation of new data collection facilities and analysis of new data based on the needs of the Basin.
- An assessment of whether areas within the Basin are represented by data that does not satisfy the requirements of CCR Section 352.4 and Section 354.34(c), Data and Reporting Standards.

5.4.6 Pumping Allowance

The primary mechanism for achieving sustainability in the Basin is establishing Baseline Pumping Allocations and pumping ramp down (Basin-wide percentage reduction in cumulative pumping (from total BPA) effective in any particular Water Year, which when subtracted from 100 percent will determine the effective Pumping Percentage applicable to the BPAs that year). A summary will be provided to describe the status of pumping allocations and allowance in the Basin, including adjustments based on potential changes in the estimated sustainable yield of the Basin.

5.4.7 New Information

A description will be provided for significant new information that has been made available since Physical Solution adoption or implementation amendment, or the last 5-year assessment. The description will also include whether new information warrants changes to any aspect of the Physical Solution implementation, including the evaluation of the Basin setting, measurable objectives, minimum thresholds, or the specific criteria defining undesirable results.

5.4.8 Relevant Actions

A description will be provided for relevant actions taken by the Watermaster since the prior Periodic Report (or GMP adoption for the initial Periodic Report). Relevant actions may include rules and regulations related to the Physical Solution, development of additional PMAs, or other actions pertinent to the implementation of the Physical Solution.

5.4.9 Enforcement or Legal Actions

Information will be provided to describe enforcement or legal actions taken by Watermaster in furtherance of the sustainability goal for the Basin. Information will include a description of enforcement or legal actions, penalties, resolutions, or any other relevant information.

5.4.10 Plan Amendments

Descriptions will be provided for completed or proposed Physical Solution implementation amendments.

5.4.11 Summary of Coordination

Where appropriate, a summary will be provided to describe coordination activities that occurred during the reporting period with local agencies.

At the time of Physical Solution adoption, no other GSAs exist within the BVGB or adjoining basins. Therefore, if new GSAs are subsequently formed in these relevant areas a summary will be provided in the Periodic Report.

Coordination with the County of San Diego is anticipated throughout implementation of the Physical Solution, including any CEQA review and approval that may be required by the County or BWD as lead agency, and modification of land use designations, local ordinances, etc. This section will provide detailed summaries of relevant coordination with the County of San Diego as the land use agency.

5.4.12 Other Information

The Periodic Report should include other information the Watermaster deems appropriate and relevant, along with any information required by the DWR to conduct a periodic review as required by CWC Section 10733.

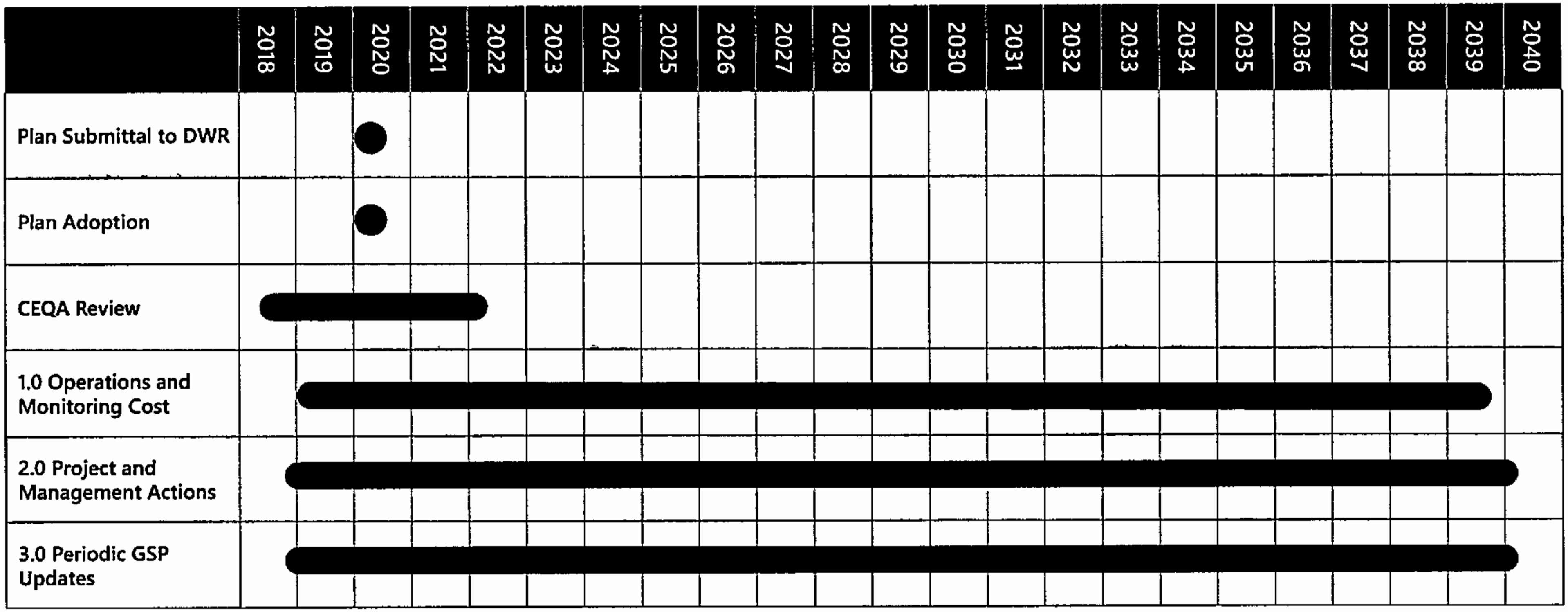


FIGURE 5.2-1
Schedule for Implementation - Overview

	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
1.0 Operations and Monitoring Cost	━	━	━	━	━	━	━	━	━	━	━	━	━	━	━	━	━	━	━	━	━	
1.1 Semi-Annual Groundwater Level Monitoring	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
1.2 Semi-Annual Groundwater Quality Monitoring	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
1.3 Semi-Annual Stream Monitoring	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
1.4 Pump Metering	12/1	12/1	12/1	12/1	12/1	12/1	12/1	12/1	12/1	12/1	12/1	12/1	12/1	12/1	12/1	12/1	12/1	12/1	12/1	12/1	12/1	12/1
1.5 Land Subsidence Review	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1.6 Operations and Maintenance		━	━	━	━	━	━	━	━	━	━	━	━	━	━	━	━	━	━	━	━	━
1.7 Data Management System	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
1.8 Groundwater Model Update	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1.9 Annual Comprehensive DWR Reporting	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1.10 Project and Management Coordination		━	━	━	━	━	━	━	━	━	━	━	━	━	━	━	━	━	━	━	━	━

2 Occurs twice a year in spring and fall — 12/1 Monthly recording with annual reporting — 1 Occurs once a year anytime of the year — ━ Ongoing

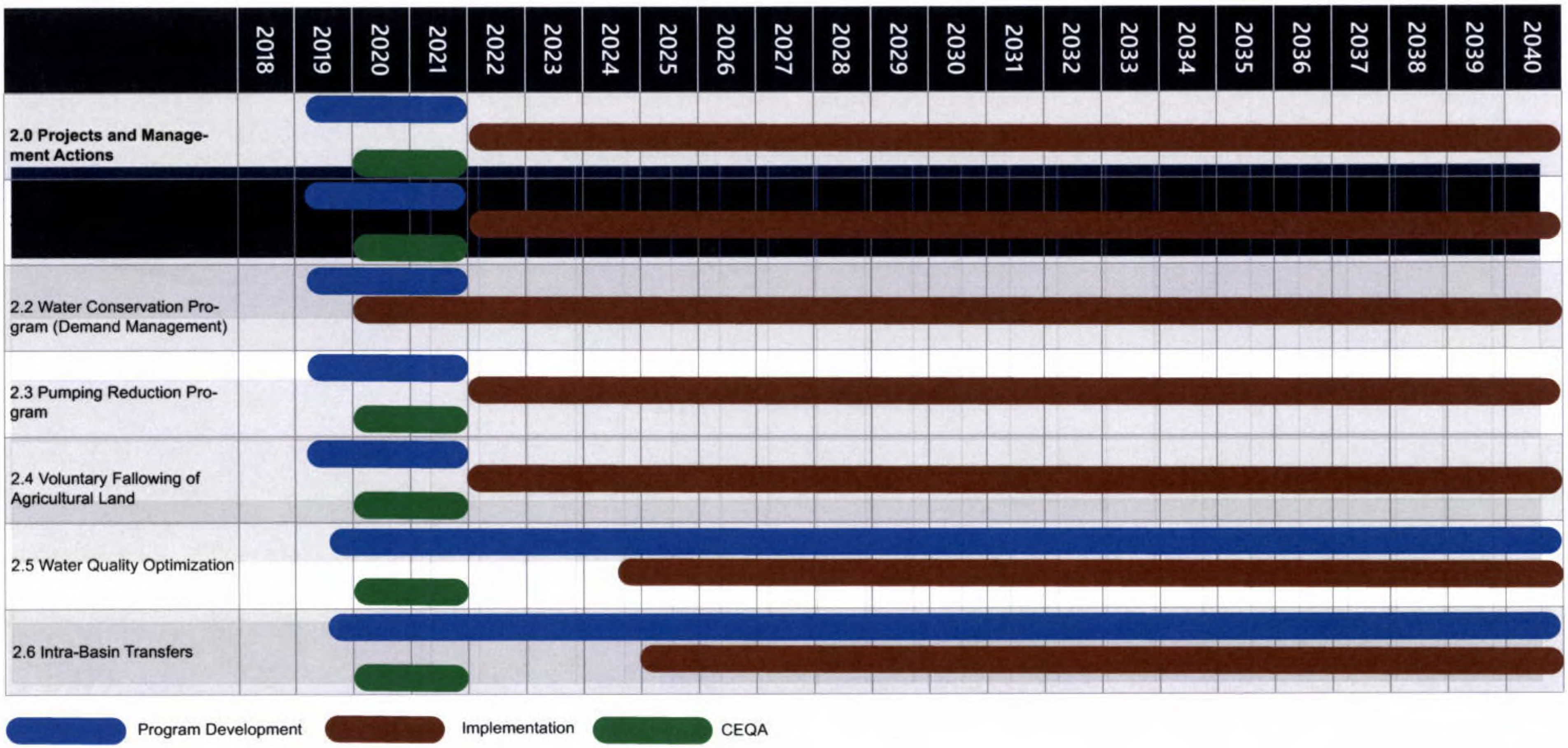
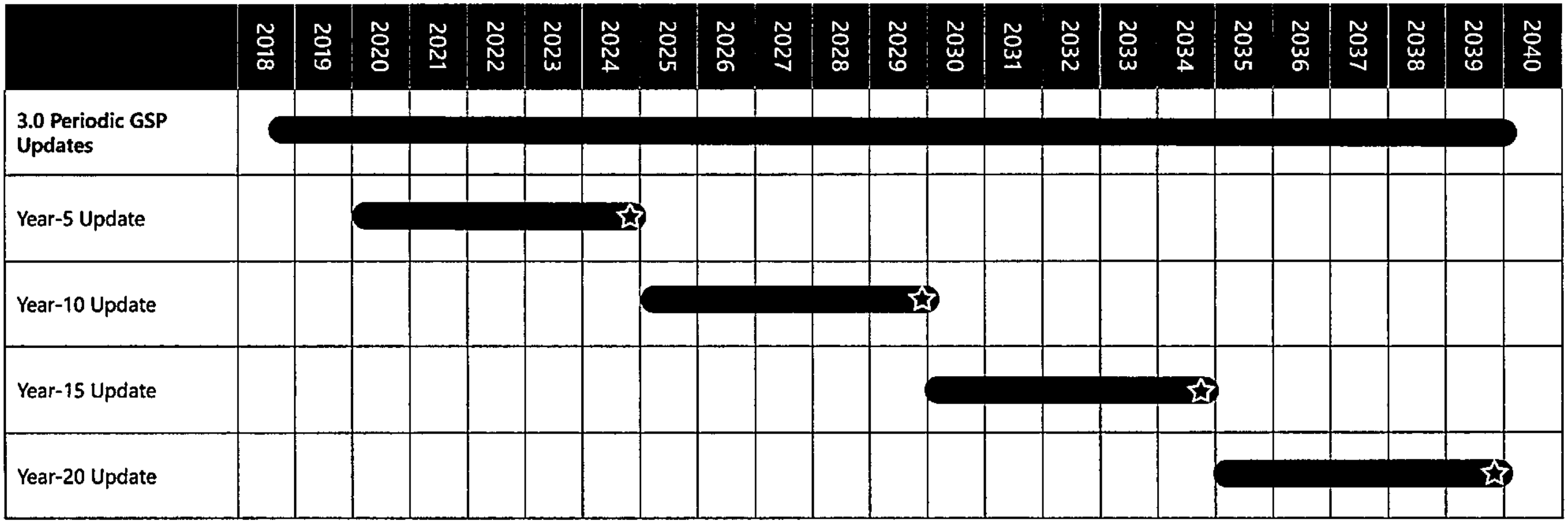


FIGURE 5.2-3

Schedule for Implementation - Project and Management Actions



* All updates will include the following: Update Budget, Groundwater Model, and Sustainable Yield; Assessment of Pumping Allocations; Five-year Plan Evaluation and Assessment

☆ Deliverable Milestone for Submittal of 5-year Updates

FIGURE 5.2-4

Schedule for Implementation - Periodic GSP Updates

APPENDIX A

DWR Preparation Checklist for GSP Submittal

A separate DWR preparation checklist will be submitted to DWR for the Stipulated Judgment and GMP as an alternative to a GSP pursuant to SGMA (Wat. Code, §§10733.6; 10737.4).

GSP Regulations Section	Water Code Section	Requirement	Description	Section(s) or Page Number(s) in the GSP
Article 3. Technical and Reporting Standards				
352.2		Monitoring Protocols	· Monitoring protocols adopted by the GSA for data collection and management · Monitoring protocols that are designed to detect changes in groundwater levels, groundwater quality, inelastic surface subsidence for basins for which subsidence has been identified as a potential problem, and flow and quality of surface water that directly affect groundwater levels or quality or are caused by groundwater extraction in the basin	Section 3.5, Section 5.4.5, and Appendix E
Article 5. Plan Contents, Subarticle 1. Administrative Information				
354.4		General Information	· Executive Summary · List of references and technical studies	Chapter ES, and "References Cited" section at end of each Chapter.
354.6		Agency Information	· GSA mailing address · Organization and management structure · Contact information of Plan Manager · Legal authority of GSA · Estimate of implementation costs	Section 1.3 and Appendix B
354.8(a)	10727.2(a)(4)	Map(s)	· Area covered by GSP · Adjudicated areas, other agencies within the basin, and areas covered by an Alternative · Jurisdictional boundaries of federal or State land · Existing land use designations · Density of wells per square mile	Figures 2.1-1 through 2.1-6
354.8(b)		Description of the Plan Area	· Summary of jurisdictional areas and other features	Section 2.1.1
354.8(c) 354.8(d)	10727.2(g)	Water Resource Monitoring and Management Programs	· Description of water resources monitoring and management programs · Description of how the monitoring networks of those plans will be incorporated into the GSP	Section 2.1.2

Appendix A - DWR Preparation Checklist for GSP Submittal

GSP Regulations Section	Water Code Section	Requirement	Description	Section(s) or Page Number(s) in the GSP
354.8(e)			· Description of how those plans may limit operational flexibility in the basin	
			· Description of conjunctive use programs	Section 2.1.6
354.8(f)	10727.2(g)	Land Use Elements or Topic Categories of Applicable General Plans	· Summary of general plans and other land use plans	Section 2.1.3
			· Description of how implementation of the GSP may change water demands or affect achievement of sustainability and how the GSP addresses those effects · Description of how implementation of the GSP may affect the water supply assumptions of relevant land use plans	Section 2.1.3
			· Summary of the process for permitting new or replacement wells in the basin	Section 2.1.2
			· Information regarding the implementation of land use plans outside the basin that could affect the ability of the Agency to achieve sustainable groundwater management	Section 2.1.2 and Section 2.1.3
354.8(g)	10727.4	Additional GSP Contents	Description of Actions related to:	
			· Control of saline water intrusion	Section 2.1.6 and Section 2.2.2.3
			· Wellhead protection	Section 2.1.6 and Section 2.2.2.4
			· Migration of contaminated groundwater	Section 2.1.6, 2.2.2.4, and 2.2.4.1
			· Well abandonment and well destruction program	Section 2.1.2 and 2.1.6
			· Replenishment of groundwater extractions	Section 2.1.6 and 2.2.3.7
			· Conjunctive use and underground storage	Section 2.1.6 and Chapter 4
			· Well construction policies	Section 2.1.2

GSP Regulations Section	Water Code Section	Requirement	Description	Section(s) or Page Number(s) in the GSP
			· Addressing groundwater contamination cleanup, recharge, diversions to storage, conservation, water recycling, conveyance, and extraction projects	Section 2.1.6 , 2.2.2.4, 2.2.3, and 4.7.5
			· Efficient water management practices	Section 2.1.6, and Section 4.3
			· Relationships with State and federal regulatory agencies	Section 2.1.2 and 2.1.6
			· Review of land use plans and efforts to coordinate with land use planning agencies to assess activities that potentially create risks to groundwater quality or quantity	Sections 2.1.2, 2.1.3, and 2.1.6
			· Impacts on groundwater dependent ecosystems	Sections 2.1.6, 2.2.2.6, and 2.2.2.7; and Appendix D4
354.1		Notice and Communication	· Description of beneficial uses and users	Section 2.1.4
			· List of public meetings	Appendix C
			· GSP comments and responses	Appendix G
			· Decision-making process · Public engagement · Encouraging active involvement	Section 2.1.5
			· Informing the public on GSP implementation progress	Section 2.1.5 and Section 5.4
Article 5. Plan Contents, Subarticle 2. Basin Setting				
354.14		Hydrogeologic Conceptual Model	· Description of the Hydrogeologic Conceptual Model	Section 2.2.1 and Figure 2.2-1
			· Two scaled cross-sections	Figure 2.2-10
			· Map(s) of physical characteristics: topographic information, surficial geology, soil characteristics, surface water bodies, source and point of delivery for imported water supplies	Figure 2.2-1 through Figure 2.2-9

Appendix A - DWR Preparation Checklist for GSP Submittal

GSP Regulations Section	Water Code Section	Requirement	Description	Section(s) or Page Number(s) in the GSP
354.14(c)(4)	10727.2(a)(5)	Map of Recharge Areas	· Map delineating existing recharge areas that substantially contribute to the replenishment of the basin, potential recharge areas, and discharge areas	Figure 2.2-11
	10727.2(d)(4)	Recharge Areas	· Description of how recharge areas identified in the plan substantially contribute to the replenishment of the basin	Sections 2.2.1.4, 2.2.2.6, and 2.2.3.1
354.16	10727.2(a)(1) 10727.2(a)(2)	Current and Historical Groundwater Conditions	· Groundwater elevation data · Estimate of groundwater storage · Seawater intrusion conditions · Groundwater quality issues · Land subsidence conditions · Identification of interconnected surface water systems · · Identification of groundwater-dependent ecosystems	Section 2.2.2
354.18	10727.2(a)(3)	Water Budget Information	· Description of inflows, outflows, and change in storage · Quantification of overdraft · Estimate of sustainable yield · Quantification of current, historical, and projected water budgets	Section 2.2.3
	10727.2(d)(5)	Surface Water Supply	· Description of surface water supply used or available for use for groundwater recharge or in-lieu use	Section 2.2.3.8
354.2		Management Areas	· Reason for creation of each management area · Minimum thresholds and measurable objectives for each management area · Level of monitoring and analysis · Explanation of how management of management areas will not cause undesirable results outside the management area	Section 2.2.4, and Sections 3.3.1.3, 3.3.2.3, and 3.3.4.3

GSP Regulations Section	Water Code Section	Requirement	Description	Section(s) or Page Number(s) in the GSP
			· Description of management areas	
Article 5. Plan Contents, Subarticle 3. Sustainable Management Criteria				
354.24		Sustainability Goal	· Description of the sustainability goal	Section 3.1.3
354.26		Undesirable Results	· Description of undesirable results · Cause of groundwater conditions that would lead to undesirable results · Criteria used to define undesirable results for each sustainability indicator · Potential effects of undesirable results on beneficial uses and users of groundwater	Section 3.2, Appendix D4
354.28	10727.2(d)(1)	Minimum Thresholds	· Description of each minimum threshold and how they were established for each sustainability indicator	Sections 3.3.1.1, 3.3.2.1, and 3.3.4.1
	10727.2(d)(2)		· Relationship for each sustainability indicator	Sections 3.3.1.2, 3.3.2.2, and 3.3.4.2
			· Description of how selection of the minimum threshold may affect beneficial uses and users of groundwater	Sections 3.3.1.4, 3.3.2.4, and 3.3.4.4
			· Standards related to sustainability indicators	Section 3.3
			· How each minimum threshold will be quantitatively measured	Sections 3.3.1.6, 3.3.2.6, and 3.3.4.6
354.3	10727.2(b)(1)	Measureable Objectives	· Description of establishment of the measureable objectives for each sustainability indicator	Sections 3.4.1, 3.4.2, and 3.4.4
	10727.2(b)(2)		· Description of how a reasonable margin of safety was established for each measureable objective	Sections 3.4.1, 3.4.2, and 3.4.4
	10727.2(d)(1) 10727.2(d)(2)		· Description of a reasonable path to achieve and maintain the sustainability goal, including a description of interim milestones	Sections 3.4.1, 3.4.2, and 3.4.4
Article 5. Plan Contents, Subarticle 4. Monitoring Networks				
354.34	10727.2(d)(1)	Monitoring Networks	· Description of monitoring network	Section 2.2.2, Section 3.5 and Appendix E

Appendix A - DWR Preparation Checklist for GSP Submittal

GSP Regulations Section	Water Code Section	Requirement	Description	Section(s) or Page Number(s) in the GSP
	10727.2(d)(2)		· Description of monitoring network objectives	Section 3.5 and Appendix E
	10727.2(e)		· Description of how the monitoring network is designed to: demonstrate groundwater occurrence, flow directions, and hydraulic gradients between principal aquifers and surface water features; estimate the change in annual groundwater in storage; monitor seawater intrusion; determine groundwater quality trends; identify the rate and extent of land subsidence; and calculate depletions of surface water caused by groundwater extractions	Section 3.5.1
	10727.2(f)		· Description of how the monitoring network provides adequate coverage of Sustainability Indicators	Section 3.5.1
			· Density of monitoring sites and frequency of measurements required to demonstrate short-term, seasonal, and long-term trends · Scientific rational (or reason) for site selection · Consistency with data and reporting standards	Section 3.5, Appendix E
			· Corresponding sustainability indicator, minimum threshold, measureable objective, and interim milestone	Section 3.3, 3.4, 3.5, and Appendix E
			· Location and type of each monitoring site within the basin displayed on a map, and reported in tabular format, including information regarding the monitoring site type, frequency of measurement, and the purposes for which the monitoring site is being used	Section 2.2.2, Table 2.2-4, Table 2.2-5, and Figure 2.2-12

GSP Regulations Section	Water Code Section	Requirement	Description	Section(s) or Page Number(s) in the GSP
			· Description of technical standards, data collection methods, and other procedures or protocols to ensure comparable data and methodologies	Section 3.5, Appendix E
354.36		Representative Monitoring	· Description of representative sites	Section 3.5.3 and Figure 3.3-1
			· Demonstration of adequacy of using groundwater elevations as proxy for other sustainability indicators	Section 3.5.3 and Figure 3.3-1
			· Adequate evidence demonstrating site reflects general conditions in the area	Section 3.5.3 and Figure 3.3-1
354.38		Assessment and Improvement of Monitoring Network	· Review and evaluation of the monitoring network · Identification and description of data gaps · Description of steps to fill data gaps · Description of monitoring frequency and density of sites	Section 3.5.4
Article 5. Plan Contents, Subarticle 5. Projects and Management Actions				
354.44		Projects and Management Actions	· Description of projects and management actions that will help achieve the basin's sustainability goal	Sections 4.2.1, 4.3.1, 4.4.1, 4.5.1, 4.6.1, and 4.7.1
			· Measureable objective that is expected to benefit from each project and management action	Sections 4.2.2, 4.3.2, 4.4.2, 4.5.2, 4.6.2, and 4.7.2
			· Circumstances for implementation	Sections 2.1.2 and 2.1.5; and Appendix C
			· Public noticing	
			· Permitting and regulatory process	
			· Time-table for initiation and completion, and the accrual of expected benefits	Sections 4.2.4, 4.3.4, 4.4.4, 4.5.4, 4.6.4, and 4.7.4
			· Expected benefits and how they will be evaluated	Sections 4.2.3, 4.3.3

GSP Regulations Section	Water Code Section	Requirement	Description	Section(s) or Page Number(s) in the GSP
			· How the project or management action will be accomplished. If the projects or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.	Sections 4.2.3, 4.3.3, 4.4.3, 4.5.3, 4.6.3, and 4.7.3; and Sections 4.2.5, 4.3.5, 4.4.5, 4.5.5, 4.6.5, and 4.7.5
			· Legal authority required	Section 1.3.2; and Appendix B
			· Estimated costs and plans to meet those costs	Section 5.1.4, and Sections 4.2.6, 4.3.6, 4.4.6, 4.5.6, 4.6.6, and 4.7.6
			· Management of groundwater extractions and recharge	Chapter 4
354.44(b)(2)	10727.2(d)(3)		· Overdraft mitigation projects and management actions	
Article 8. Interagency Agreements				
357.4	10727.6	Coordination Agreements - Shall be submitted to the Department together with the GSPs for the basin and, if approved, shall become part of the GSP for each participating Agency.	Coordination Agreements shall describe the following:	
			· A point of contact · Responsibilities of each Agency · Procedures for the timely exchange of information between Agencies · Procedures for resolving conflicts between Agencies · How the Agencies have used the same data and methodologies to coordinate GSPs · How the GSPs implemented together satisfy the requirements of SGMA · Process for submitting all Plans, Plan amendments, supporting information, all monitoring data and other pertinent information, along with annual reports and periodic evaluations	Cahpter 1, Appendix B, and Chapter 5. Organizational structure of the GSA (County and BWD) is simple, and there are no adjacent basins that are required to or expected to develop a GSP under SGMA

GSP Regulations Section	Water Code Section	Requirement	Description	Section(s) or Page Number(s) in the GSP
			· A coordinated data management system for the basin · Coordination agreements shall identify adjudicated areas within the basin, and any local agencies that have adopted an Alternative that has been accepted by the Department	GSP under SGMA.

APPENDIX B

GSA Formation and Interagency Agreement Documentation

B1: Advisory Commitee Bylaws

B2: Notice of Intent to Develop a Groundwater Sustainability Plan

B3: GSA Notification (Amended)

B4: Signed Memorandum of Understanding

B5: County of San Diego Notice of Election to Become a Groundwater Sustainability Agency

B6: Borrego Water District Notice of Election to Serve as Groundwater Sustainability Agency

Until a final judgment is entered by the Court in this action and all appeals are complete, the interim Watermaster shall assume all responsibility for the sustainable management of the Basin as set forth in the proposed Stipulated Judgment. During this time, the GSA (with only Borrego Water District as the remaining member) will be dormant, and thus the GSA will not perform any groundwater management actions or assess any fees or assessments. Upon entry of the Stipulated Judgment establishing the Watermaster, BWD is to withdraw as a GSA by notifying the Department under Water Code section 10723.8(e).

APPENDIX B1

Advisory Committee Bylaws

BORREGO VALLEY
GROUNDWATER SUSTAINABILITY PLAN
ADVISORY COMMITTEE
BY-LAWS

Adopted and approved at the June 29, 2017 Borrego Valley GSP Advisory Committee Meeting:

Article 1 PURPOSE AND FORMATION of the ADVISORY COMMITTEE

Section A – On September 20, 2016, the Board of Directors of the Borrego Water District (District) approved a Memorandum of Understanding (MOU) between the County of San Diego (County) and the District, which memorialized each agency's role and responsibilities for developing a Groundwater Sustainability Plan (GSP) for the Borrego Valley Groundwater Basin (Borrego Basin). On October 19, 2016, the Board of Supervisors of the County also approved the MOU, thereby establishing a multiple-agency Groundwater Sustainability Agency (GSA) responsible for developing and implementing a GSP for the Borrego Basin. The MOU establishes a Core Team comprised of County and District staff tasked with coordinating the activities of the Borrego Basin GSP Advisory Committee (AC).

Section B – In consideration of the interests of all beneficial uses and users of groundwater in the basin, stakeholder engagement and education of both stakeholders and the general public will be conducted in part via the deliberations of the AC pursuant to California Water Code Section 10723.2. The purpose of the AC is to provide input to aid in the development of the planning and policy recommendations contained in the GSP. As information supporting the GSP is prepared by the GSA, these items will be brought before the AC for discussion, analysis, and recommendations.

Section C – The AC is a non-partisan, non-sectarian, non-profit advisory organization. The AC is not empowered by ordinance, establishing authority, or policy to render a binding decision of any kind.

Section D – The AC is advisory to the Core Team. The Core Team will develop a GSP that meets the requirements of SGMA and is acceptable to the District and to the County. The GSP shall include, but not be limited to, groundwater use enforcement measures, a detailed breakdown of each GSA Party's responsibilities for Plan implementation, anticipated costs of implementing the Plan, and cost recovery mechanisms, if necessary.

Article 2 MEMBERSHIP AND TERM OF OFFICE

Section A – The AC shall consist of individuals with backgrounds in developing, deliberating, planning, and/or advocating for sustainable use of groundwater in the Borrego Basin, under the requirements of SGMA.

Section B – The AC is limited to nine (9) members as established in the MOU. Potential representatives shall be nominated by the following six (6) Stakeholder Organizations and shall be apportioned as follows:

(1) Four members nominated by the Borrego Water Coalition and filling the following representative roles- 1 agricultural member; 1 recreation member; 1 independent pumper; 1 at large member,
(2) One member nominated by the Borrego Springs Community Sponsor Group,
(3) One member nominated by the Borrego Valley Stewardship Council,
(4) One member nominated by the Borrego Water District Board of Directors who is not an employee or elected official –to represent ratepayers/property owners,
(5) One member nominated by the County of San Diego who is not an employee or elected official –to represent the Farm Bureau, and
(6) One member nominated by the California State Parks, Colorado Desert Region – to represent the Anza-Borrego Desert State Park.

Each person nominated to the AC by the above Stakeholder Organizations must be endorsed by the Board of Directors of the District and the Director of Planning & Development Services (PDS) of the County before serving on the AC. Substitution of an alternate for an endorsed AC Member is not permitted. Only endorsed Members may serve on the AC.

Section C – Each AC Member shall serve a term, which shall run concurrently with the development and completion of the GSP.

Section D - A vacancy shall be recognized for any AC Member who: (1) dies; (2) resigns; (3) has unexcused absences from more than three of the scheduled AC meetings within a single calendar year; (4) misses three meetings in a row; (5) regularly fails to abide by the discussion covenants of the AC; (6) violates the Ralph M. Brown Act; or (7) fails to exercise the purpose and authority of the AC as described in Article 1 above. The AC shall notify the Core Team if a position is deemed vacant pursuant to items 1-4 above, or if the AC recommends the removal of a member as related to items 5–7 above. If a vacancy occurs, the Stakeholder Organization may nominate another AC member appointee for that position that must then be endorsed by the District Board and County Director of PDS. The new appointee member shall serve through the development and completion of the GSP.

Article 3 DUTIES

The AC shall have the following duties and responsibilities:

(1) Serve as a resource to the Core Team on GSP development issues for the Borrego Basin;

(2) Advise in the formation of the planning and policy recommendations to be included in the GSP. This may include reviewing technical materials and providing comment, data, and relevant local information to the GSA related to Plan development; assisting in communicating concepts and requirements to the stakeholder constituents that they represent; providing comments on materials and reports prepared; assisting the Core Team to anticipate short- and long-term future events that may impact groundwater sustainability, trends and conditions that will impact groundwater management;

(3) Participate in AC and Core Team public decision-making meetings, expected to occur on an approximately quarterly basis or as needed during GSP development.

Article 4 STRUCTURE

Section A – AC meetings will be facilitated by a facilitator from the California State University, Sacramento, Center for Collaborative Policy ("CCP") or other such facilitator acceptable to the Core Team. The Facilitator shall convene the meeting, establish the existence of a quorum and oversee the meeting to insure the timely completion of the published agenda. If for any reason, the Facilitator cannot facilitate at a particular meeting, a Core Team member shall assume the facilitation responsibilities assigned above to the facilitator.

Section B – The Facilitator, in consultation with the AC, shall assign coordinating duties and/or specific tasks to subcommittees of the AC as necessary. The Facilitator will work with the Core Team to determine a meeting schedule, develop meeting materials, coordinate communications to the AC in advance of meetings, and other similar organizational responsibilities.

Section C – The District shall assign staff to record the minutes of all AC meetings, maintain a list of all active representatives, handle committee correspondence, and keep records of actions as they occur at each meeting. It is the responsibility of the Core Team staff assigned to the AC to assure that posting of meeting notices in a publicly accessible place for 72 hours prior to an AC meeting, to keep a record of such posting, and to reproduce and distribute the AC notices and minutes of all meetings.

Article 5 ORGANIZATIONAL PROCEDURES

Section A – Robert's Rules of Order govern the operation of the AC in all cases not covered by these by-laws, the AC may formulate specific procedural rules of order to govern the conduct of its meetings.

Section B – Any voting is on the basis of one vote per AC member. No proxy or absentee voting is permitted.

Section C – All AC recommendations regarding the GSP shall be made by consensus. Consensus is achieved when AC participants indicate that they are at Levels 1-4 (not Levels 5 or 6) as described below. If after multiple attempts, the AC deems consensus improbable among the AC members on a particular matter, the issue will be returned to the Core Team without a recommendation.

Levels of consensus are as follows:

1. I can say an **unqualified 'yes'** to the decision. I am satisfied that the decision is an expression of the wisdom of the group.
2. I find the decision **acceptable**. It is the best of the real options we have available to us.
3. I can **live with** the decision. However, I'm not enthusiastic about it.
4. I do not fully agree with the decision and need to register my view about it. However, I do not choose to block the decision and will **stand aside**. I am willing to support the decision because I trust the wisdom of the group.
5. We need to **do more work** before consensus can be achieved.

6. I do not agree with the decision and feel the need to **block** the decision being accepted as consensus.

Section D – AC meetings shall be held under the following discussion covenants:

- Focus on the future as much as possible.
- All perspectives are valued. You are not required to defend your perspective, but you are asked to share it and to provide supporting rationale.
- All ideas have value. If you believe another approach is better, offer it as a constructive alternative.
- Everyone will have an equal opportunity to participate.
- Everyone will be encouraged to talk.
- One person speaks at a time.
- No side conversations.
- View disagreements as problems to be solved rather than battles to be won.
- Avoid ascribing motives to or judging the actions of others. Please speak about your experiences, concerns, and suggestions. Treat each other with respect.
- Avoid right-wrong paradigms.
- When communicating outside of the AC, Members are asked to speak only for themselves when asked about AC progress unless there has been adoption of concepts or recommendations by the full body.

Section E – A majority of the AC members currently appointed shall constitute a quorum. A quorum is required for an Official Meeting to occur. No consensus vote of the AC shall be considered as reflecting an official recommendation by the AC unless a vote was taken at an Official Meeting.

Section F – All meetings of the AC and its subcommittees are open to the public to the extent required by the Ralph M. Brown Act. Meetings are to be held in accessible, public places in Borrego Springs, California. Notice of all AC meetings shall be posted in a publicly accessible place for a period of 72 hours prior to the meeting. A majority of the AC members shall not use a series of communications of any kind, directly or through intermediaries, to discuss, deliberate, or take action on any AC-related business outside of a public meeting in violation of the Ralph M. Brown Act.

Section G –All members of the AC must abide by these by-laws. The County and District reserve the right to remove members that do not abide by the by-laws.

Article 6 COMPENSATION

Members of the AC shall serve without compensation.

APPENDIX B2

Notice of Intent to Develop a Groundwater Sustainability Plan

County of San Diego

MARK WARDLAW
DIRECTOR

PLANNING & DEVELOPMENT SERVICES
5510 OVERLAND AVENUE, SUITE 310, SAN DIEGO, CA 92123
www.sdcounty.ca.gov/pds
PHONE (858) 694-2962 FAX (858) 694-2555

March 22, 2017

Trevor Joseph, SGM Section Chief
Department of Water Resources
901 P Street, Room 213
Post Office Box 942836
Sacramento, CA 94236

Delivery via E-Mail
(Trevor.Joseph@water.ca.gov)

NOTICE OF INTENT TO DEVELOP A GROUNDWATER SUSTAINABILITY PLAN FOR THE BORREGO VALLEY GROUNDWATER BASIN

Dear Mr. Joseph:

The purpose of this letter is to notify you that the Borrego Valley Groundwater Sustainability Agency (GSA), which comprises the County of San Diego (County) and Borrego Water District (District), intends to develop a Groundwater Sustainability Plan (GSP) for the Borrego Valley Groundwater Basin (BVGB) [Attachment 1] pursuant to California Water Code (Water Code) Section 10727.8. In November 2016, the Department of Water Resources (DWR) acknowledged resolution of the overlapping GSA status of the County and District through the adoption of a Memorandum of Understanding (MOU) between the two agencies, and approved the Borrego Valley GSA as the Exclusive Multi-Agency GSA for the BVGB (DWR Bulletin 118 Groundwater Basin Number 7-24).

To determine the best way to consider the interests of all beneficial uses and users of groundwater, pursuant to Water Code Sections 10723.2 and 10723.4, the Borrego Valley GSA established an ad-hoc advisory committee (AC) to aid in developing and implementing the GSP. The first meeting of the Borrego Valley Sustainable Groundwater Management Act (SGMA) AC occurred on March 6, 2017. In accordance with Water Code Section 10727.8(a), interested parties may participate in the development and implementation of the GSP by attending AC meetings in Borrego Valley and may sign up to receive information about AC meetings and GSP development at the County's SGMA webpage located at: http://www.sandiegocounty.gov/content/sdc/pds/SGMA/borrego-valley.html. AC meeting notices will also be posted at the Borrego Post Office, provided to the *Borrego Sun*, and posted to the District's website at: http://borregowd.org/.

The Borrego Valley GSA reviewed the Emergency Regulations for Groundwater Sustainability Plans and Alternatives that were adopted by the California Water

Commission on May 18, 2016 (California Code of Regulations Title 23. Division 2. Chapter 1.5. Subchapter 2. Groundwater Sustainability Plans) and developed a scope of work to comply with these regulations. The GSP will include, among other components, a groundwater model and projects/management actions that will be required to sustainably manage groundwater in the BVGB. The Borrego Valley GSA anticipates compiling and assessing existing data in the coming weeks and finalizing the GSP prior to the January 2020 SGMA-mandated deadline.

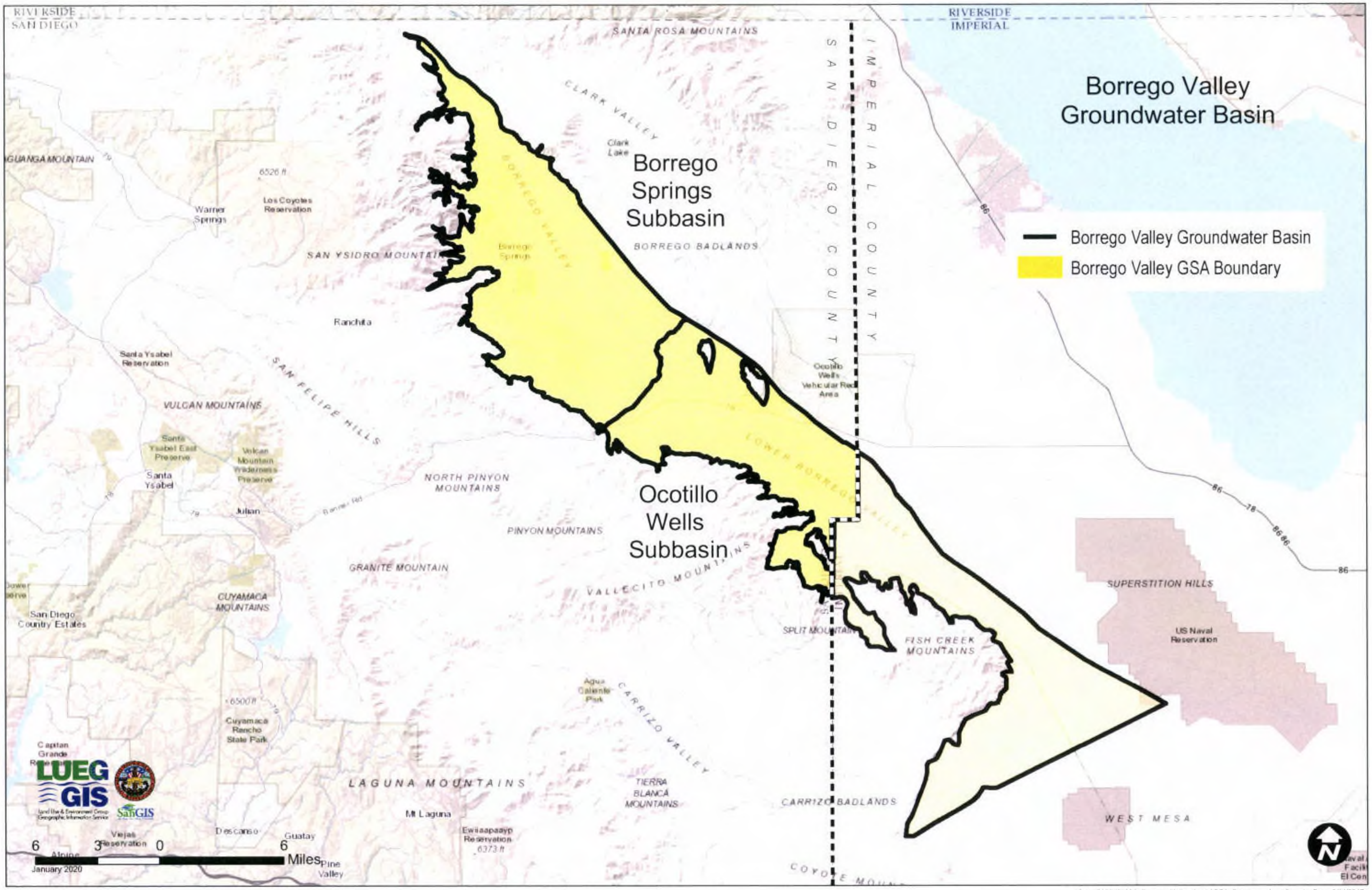
If you have any questions, or require additional information, please contact me at (858) 694-3820.

Sincerely,

JIM BENNETT, Groundwater Geologist
Planning & Development Services

Attachments:
Attachment 1 – Borrego Valley Groundwater Basin Map

cc.
Geoff Poole, General Manager, Borrego Water District
(geoff@borregowd.org)



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APPENDIX B3

GSA Notification (Amended)

County of San Diego

MARK WARDLAW
DIRECTOR

PLANNING & DEVELOPMENT SERVICES
5510 OVERLAND AVENUE, SUITE 310, SAN DIEGO, CA 92123
www sdcounty ca gov/pds
PHONE (858) 694-2962 FAX (858) 694-2555

March 22, 2017

Mark Nordberg, GSA Project Manager
Senior Engineering Geologist
Department of Water Resources
901 P Street, Room 213A
Post Office Box 942836
Sacramento, CA 94236

Delivery via E-Mail
(Mark.Nordberg@water.ca.gov)

GSA NOTIFICATION (AMENDED): MEMORANDUM OF UNDERSTANDING FOR THE BORREGO VALLEY GROUNDWATER SUSTAINABILITY AGENCY

Dear Mr. Nordberg:

Pursuant to California Water Code (Water Code) Section 10723.8, the County of San Diego (County) provided notice on January 13, 2016 to the California Department of Water Resources (DWR) of the County's decision to become a Groundwater Sustainability Agency (GSA) for the Borrego Valley Groundwater Basin (BVGB) [Attachment 1]. Since Borrego Water District (BWD) also provided notice to become a GSA for BVGB (DWR Basin No. 7-24), the County and BWD collaborated on a Memorandum of Understanding (MOU) to eliminate any overlap in the areas proposed to be managed. This MOU (Attachment 2) was approved by BWD on September 20, 2016 and by the County Board of Supervisors on October 19, 2016 and establishes the Borrego Valley GSA, which is a multi-agency GSA for the BVGB.

In October 2016, DWR released final 2016 modifications to California's basin boundaries (Bulletin 118 Basins [2016 Edits]), which included the subdivision of the BVGB into two separate subbasins (Borrego Springs and Ocotillo Wells). As such, this notification includes a map and GIS files of the proposed Borrego Valley GSA boundary within the limits of the revised basin in San Diego County (Attachment 1).

In addition to eliminating the overlap, the MOU serves to memorialize each agency's roles and responsibilities for developing a single Groundwater Sustainability Plan (GSP) that complies with the requirements of the Sustainable Groundwater Management Act (SGMA) to sustainably manage groundwater in the BVGB. As indicated in the initial notices, the County and BWD intend to work cooperatively to jointly manage groundwater in the basin.

Both agencies remain committed to considering the interests of all beneficial uses and users of groundwater, as well as those responsible for implementing a GSP. Each agency further anticipates working collaboratively with stakeholders to develop and implement the GSP for the Borrego Valley Groundwater Basin. To aid this effort, the County and BWD established an advisory committee in spring 2017. In accordance with Water Code Section 10727.8(a), interested parties may participate in the development and implementation of the GSP by attending advisory committee meetings in Borrego Valley and may sign up to receive information about GSP development at the County's SGMA webpage located at: http://www.sandiegocounty.gov/pds/SGMA.html.

The County and BWD concur that this agreement does not involve a material change from the information in the posted notices from BWD and the County, yet eliminates the overlap as required by California Water Code Section 10723.8(c).

If you have any questions, or require additional information, please contact the County Groundwater Geologist, Jim Bennett, at (858) 694-3820.

Sincerely,

MARK WARDLAW, Director
Planning & Development Services

Attachments:
Attachment 1 – Borrego Valley Groundwater Basin Map
Attachment 2 – MEMORANDUM OF UNDERSTANDING FOR THE BORREGO VALLEY GROUNDWATER SUSTABILITY AGENCY

cc.
Jim Bennett, Groundwater Geologist, County of San Diego
(jim.bennett@sdcounty.ca.gov)
Geoff Poole, General Manager, Borrego Water District
(geoff@borregowd.org)

APPENDIX B4

Signed Memorandum of Understanding

MEMORANDUM OF UNDERSTANDING
DEVELOPMENT OF A GROUNDWATER SUSTAINABILITY PLAN
FOR THE BORREGO VALLEY GROUNDWATER BASIN

This Memorandum of Understanding for the Development of a Groundwater Sustainability Plan ("Plan") for the Borrego Valley Groundwater Basin ("MOU") is entered into and effective this 29 day of October, 2016 by and between the Borrego Water District ("District") and the County of San Diego ("County"). The District and the County are each sometimes referred to herein as a "Party" and are collectively sometimes referred to herein as the "Parties."

RECITALS

WHEREAS, on September 16, 2014, Governor Jerry Brown signed into law Senate Bills 1168 and 1319 and Assembly Bill 1739, known collectively as the Sustainable Groundwater Management Act (Act);

WHEREAS, Act went into effect on January 1, 2015;

WHEREAS, Act seeks to provide sustainable management of groundwater basins, enhance local management of groundwater; establish minimum standards for sustainable groundwater management; and provide local groundwater agencies the authority and the technical and financial assistance necessary to sustainably manage groundwater;

WHEREAS, the Parties have each declared to be a Groundwater Sustainability Agency (GSA) overlying portions of Borrego Valley Groundwater Basin (Borrego Basin), identified as Basin Number 7.24, a Bulletin 118 designated (medium-priority) basin;

WHEREAS, each Party has statutory authorities that are essential to groundwater management and Act compliance;

WHEREAS, Section 10720.7 of Act requires all basins designated as high- or medium-priority basins designated in Bulletin 118 be managed under a Plan or coordinated Plans pursuant to Act;

WHEREAS, Section 10720.7 of Act requires all critically over drafted basins be managed under a Plan by January 31, 2020;

WHEREAS, the California Department of Water Resources (DWR) has identified the Borrego Basin as critically over drafted;

WHEREAS, the Parties intend to eliminate overlap of the Parties by collectively developing and implementing a single Plan to sustainably manage Borrego Basin pursuant to section 10727 et seq. of Act;

WHEREAS, the Parties wish to use the authorities granted to them pursuant to the Act and utilize this MOU to memorialize the roles and responsibilities for developing the Plan;

WHEREAS, it is the intent of the Parties to complete the Plan as expeditiously as possible in a manner consistent with Act and its implementing regulations;

WHEREAS, it is the intent of the Parties to cooperate in the successful implementation of the Plan not later than the date as required by the Act for the Borrego Basin;

WHEREAS, the Parties wish to memorialize their mutual understandings by means of this MOU; and

NOW, THEREFORE, in consideration of the promises, terms, conditions, and covenants contained herein, the Borrego Water District and the County of San Diego hereby agree as follows:

I. Purposes and Authorities.

This MOU is entered into by the Parties for the purpose of establishing a cooperative effort to develop and implement a single Plan to sustainably manage the Borrego Basin that complies with the requirements set forth in the Act and its associated implementing regulations. The Parties recognize that the authorities afforded to a GSA pursuant to Section 10725 of the Act are in addition to and separate from the statutory authorities afforded to each Party individually. The Parties intend to memorialize roles and responsibilities for Plan implementation during preparation of the Plan.

II. Definitions.

As used in this Agreement, unless context requires otherwise, the meanings of the terms set forth below shall be as follows:

1. "Act" refers to the Sustainable Groundwater Management Act.
2. "Advisory Committee" refers to the stakeholder group created in Section III of the MOU.
3. "Core Team" refers to the working group created in Section III of the MOU.
4. "County" refers to the County of San Diego, a Party to this MOU. The County has designated the Director, Planning & Development Services, or his designee(s), as the County department representative to carry out the terms of this MOU for the County.
5. "District" refers to the Borrego Water District, a Party to this MOU.
6. "DWR" refers to the California Department of Water Resources.
7. "Effective Date" means the date on which the last Party executes this Agreement.
8. "Governing Body" means the legislative body of each Party: the District Board of Directors and the County Board of Supervisors, respectively.
9. "Groundwater Sustainability Plan (Plan)" is the basin plan for the Borrego Basin that the parties to this MOU are seeking to develop and implement pursuant to the Act.
10. "Memorandum of Understanding (MOU)" refers to this agreement.
11. "Party" or "Parties" refer to the County of San Diego and Borrego Water District.

12. "Plan Funding" is the funding necessary for the preparation and implementation of the Plan.

13. "Plan Schedule" includes all the tasks necessary to complete the Plan and the date scheduled for completion.

14. "State" means the State of California.

15. "SWRCB" refers to the State Water Resources Control Board.

16. "Undesirable Result" shall be defined as in the Act Section 10721(x) 1-6

III. Agreement.

This section establishes the process for the Borrego Basin Plan Core Team and the Advisory Committee.

1. Establishment and Responsibilities of the Plan Core Team (Core Team).

   a. The Core Team shall jointly develop a coordinated Plan. The Plan shall include, but not be limited to, enforcement measures, a detailed breakdown of each Parties responsibilities for Plan implementation, anticipated costs of implementing the Plan, and cost recovery mechanisms (if necessary).

   b. The Core Team will consist of representatives from each Party to this MOU working cooperatively together to achieve the objectives of the Act. Core Team members serve at the pleasure of their appointing Party and may be removed/changed by their appointing Party at any time. A Party must notify all other Parties to this MOU in writing if that Party removes or replaces Core Team members.

   c. Each member of the Core Team shall be responsible for keeping his/her respective management and governing board informed of the progress towards the development of the Plan and for obtaining any necessary approvals from management/governing board. Each member of the Core Team shall keep the other member reasonably informed as to all material developments so as to allow for the efficient and timely completion of the Plan.

   d. Each Core Team member's compensation for their service on the Core Team is the responsibility of the appointing Party.

   e. The Core Team shall develop and implement a stakeholder participation plan that involves the public and area stakeholders in an Advisory Committee role to aid in developing and implementing the Plan.

   f. The Core Team will cooperatively work with the Advisory Committee to develop bylaws for the governance of the Advisory Committee. These bylaws are subject to approval by the Core team prior to adoption by the Advisory Committee. The Core Team may establish an appointment process and other administrative procedures for the Advisory Committee, in accordance with District and County policies intended to promote active participation in local government, and requirements to include stakeholders in the development of the Plan as established in the Act.

g. The Core Team will be the primary liaison with the Advisory Committee; and will guide Advisory Committee activities.

2. Core Team Meetings.

a. The Core Team will establish a meeting schedule and choice of locations for regular meetings to discuss Plan development and implementation activities, assignments, milestones and ongoing work progress.

b. The Core Team may establish and schedule meetings of the Advisory Committee to coordinate development and implementation of the Plan.

c. Attendance at all Core Team meetings may be augmented to include staff or consultants to ensure that the appropriate expertise is available.

3. Establishment and Role of the Advisory Committee

a. The Parties shall establish an Advisory Committee. The Advisory Committee will provide input to the Core Team on Plan development, including providing recommendations on basin sustainability measures, and the planning, financing, and implementation of the Plan. The Parties will agree on the composition of the Advisory Committee and acknowledge that the Advisory Committee must meet the requirements established in the Act.

b. Advisory Committee members will not be compensated for activities associated with the Advisory Committee, Plan development or any activity conducted under this agreement.

c. The Advisory Committee that is formed through this process shall be subject to and abide by the California open meeting laws under Government Code sections 54950 et seq., otherwise known as the "Brown Act," in order for the Parties to accept an Advisory Committee's recommendations.

d. Meetings of the Advisory Committee shall be held in Borrego Springs, CA.

IV. <u>Interagency Communication.</u>

1. To provide for consistent and effective communication between parties, each Party agrees that a single member from each Party's Core Team will be their central point of contact on matters relating to this MOU. Additional representatives may be appointed to serve as points of contact on specific actions or issues.

2. The Core Team shall appoint a single representative to communicate actions conducted under this agreement to DWR. The appointee shall not communicate formal actions or decisions without prior written approval from the Core Team. This is not intended to discourage informal communications between the Parties

and DWR.

V. Roles and Responsibilities of the Parties.

1. The Parties are responsible for developing a coordinated Plan that meets the requirements of the Act.

2. The Parties will jointly establish their roles and responsibilities for implementing a coordinated Plan for the Borrego Basin in accordance with the Act.

3. The Parties will jointly work in good faith and coordinate all activities to meet the objectives of this MOU. The Parties shall cooperate with one another and work as efficiently as possible in the pursuit of all activities and decisions described in the MOU.

4. Each of the Parties will provide expertise, guidance, and data on those matters for which it has specific expertise or statutory authority, as needed to carry out the objectives of this MOU. Further development of roles and responsibilities of each Party will occur during Plan development.

5. After execution of this MOU as soon as reasonably possible, the Core Team shall mutually develop a timeline that describes the anticipated tasks to be performed under this MOU and dates to complete each task (Plan Schedule); and scope(s) of work and estimated costs for Plan development. The Plan Schedule will allow for the preparation of a legally defensible Plan acceptable to the Parties and include allowances for public review and comment, and approval by governing boards prior to deadlines required in the Act. Due to the critical nature of the Borrego Basin overdraft, both Parties shall make every effort to complete the draft Plan as soon as possible but no later than July 1, 2019. The Plan Schedule shall become part of this MOU through reference. The Plan Schedule will be referred and amended as necessary to conform to developing information, permitting, and other requirements. Therefore, this Plan Schedule may be revised from time to time upon mutual agreement of the Core Team. Costs shall be funded and shared as outlined in Section VI.

6. The Parties recognize that they may disagree as to the composition of the Plan and/or the timelines/methods for implementing the Plan. In the event that the Parties have attempted, in good faith, to resolve the matter on their own and are unsuccessful, the Parties agree to jointly seek to use the non-binding mediation services provided by the DWR to address disputes arising under the Act, to the extent that such services are available. If non-binding mediation from the DWR is not available or if either Party believes it would be more useful to consult with the State Water Resources Control Board ("SWRCB"), the Parties agree to request non-binding mediation from the Chair of the SWRCB or another Member designated by the Chair who is acceptable to both Parties. The Parties recognize that the failure to timely complete a Plan or to achieve any of the other milestones in the Act may result in intervention by the SWRCB.

VI. Contracting and Funding for Plan Development.

1. The Parties shall mutually develop a scope of work, budget, cost sharing agreement and cost recovery plan ("Plan Funding") for the work to be undertaken pursuant to this MOU. The Plan Funding shall be included and adopted in the final Borrego Basin Plan. Both the budget and cost sharing agreement shall be determined prior to any substantial financial expenditures or incurrence of any financial obligations related to consultant costs.
2. Specifically, to fulfill the requirements of the Act, the Core Team will jointly prepare and agree upon a scope of work for the consultants needed to prepare the Plan. The Parties agree that any work contracted for the purpose of developing the Plan shall be a cooperative effort.
3. The County shall hire consultant(s) to complete required components of the Plan. The contracting shall be subject to the County's competitive bid process and be subject to auditing by the County's Auditor and Controller.
4. Within the parameters of the County's contracting regulations, policies and procedures, the Core Team will be cooperatively involved in the evaluation, selection and oversight of the consultant(s).
5. Each Party is free to retain other consultants for its own purposes and at its own cost, *provided that* each Party consults with the other Party before conducting such work. The scope of any such work may not conflict with or duplicate work performed under this MOU. Nothing in this agreement prohibits either Party from exercising its statutory authorities afforded to each Party individually.
6. The Parties agree that each Party will bear its own staff costs to develop the Plan.

VII. Approval.

1. The Parties agree to make best efforts to adhere to the required Plan Schedule and will forward a final Borrego Basin Plan to their respective governing boards for approval and subsequent submission to DWR for evaluation as provided for in Act.
2. Approval and amendments will be obtained from the District Board of Directors prior to submission to the County Board of Supervisors.
3. Each Governing Board retains full authority to approve, amend, or reject the proposed Plan, provided the other Governing Board subsequently confirms any amendments, but both Parties also recognize that the failure to adopt and submit a Plan for the Basin to DWR by January 31, 2020 risks allowing for state intervention in managing the Basin.
4. The Parties agree that they will use good-faith efforts to resolve any issues that one or both Governing Boards may have with the final proposed Plan for the Basin in a timely manner so as to avoid the possibility of state intervention. An amendment to this MOU is anticipated upon acceptance of the Borrego Basin Plan by both Governing Boards.

VIII. Staffing.

Each Party agrees that it will devote sufficient staff time and other resources to actively participate in the development of the Plan for the Basin, as set forth in this MOU.

IX. Indemnification.

1. Claims Arising From Sole Acts or Omissions of County.
The County of San Diego (County) hereby agrees to defend and indemnify the District, its agents, officers and employees (hereinafter collectively referred to in this paragraph as "District"), from any claim, action or proceeding against District, arising solely out of the acts or omissions of County in the performance of this MOU. At its sole discretion, District may participate at its own expense in the defense of any claim, action or proceeding, but such participation shall not relieve County of any obligation imposed by this MOU. The District shall notify County promptly of any claim, action or proceeding and cooperate fully in the defense.

2. Claims Arising From Sole Acts or Omissions of the District.
The District hereby agrees to defend and indemnify the County of San Diego, its agents, officers and employees (hereafter collectively referred to in this paragraph as 'County') from any claim, action or proceeding against County, arising solely out of the acts or omissions of District in the performance of this MOU. At its sole discretion, County may participate at its own expense in the defense of any such claim, action or proceeding, but such participation shall not relieve the District of any obligation imposed by this MOA. County shall notify District promptly of any claim, action or proceeding and cooperate fully in the defense.

3. Claims Arising From Concurrent Acts or Omissions.
The County of San Diego ("County") hereby agrees to defend itself, and the District hereby agrees to defend itself, from any claim, action or proceeding arising out of the concurrent acts or omissions of County and District. In such cases, County and District agree to retain their own legal counsel, bear their own defense costs, and waive their right to seek reimbursement of such costs, except as provided in paragraph 5 below.

4. Joint Defense.
Notwithstanding paragraph 3 above, in cases where County and District agree in writing to a joint defense, County and District may appoint joint defense counsel to defend the claim, action or proceeding arising out of the concurrent acts or omissions of District and County.. Joint defense counsel shall be selected by mutual agreement of County and District. County and District agree to share the costs of such joint defense and any agreed settlement in equal amounts, except as provided in paragraph 5 below. County and District further agree that neither party may bind the other to a settlement agreement without the written consent of both County and District.

5. Reimbursement and/or Reallocation.
Where a trial verdict or arbitration award allocates or determines the comparative fault of the parties, County and District may seek reimbursement and/or reallocation

of defense costs, settlement payments, judgments and awards, consistent with such comparative fault.

X. Litigation.

In the event that any lawsuit is brought against either Party based upon or arising out of the terms of this MOU by a third party, the Parties shall cooperate in the defense of the action. Each Party shall bear its own legal costs associated with such litigation.

XI. Books and Records.

Each Party shall have access to and the right to examine any of the other Party's pertinent books, documents, papers or other records (including, without limitation, records contained on electronic media) relating to the performance of that Party's obligations pursuant to this Agreement, *providing that* nothing in this paragraph shall be construed to operate as a waiver of any applicable privilege.

XII. Notice.

All notices required by this Agreement will be deemed to have been given when made in writing and delivered or mailed to the respective representatives of County and the District at their respective addresses as follows:

For the District:	For the County:
General Manager Borrego Water District PO Box 1870 806 Palm Canyon Drive Borrego Springs, CA 92004	San Diego County Administrative Officer San Diego County 1600 Pacific Highway San Diego, CA 92101
With a copy to:	With a copy to:
David Aladjem Downey Brand LLP 621 Capitol Mall, 18th Floor Sacramento, CA 95814	Justin Crumley, Senior Deputy Office of County Counsel 1600 Pacific Highway, Rm 355 San Diego, CA 92101

Any party may change the address or facsimile number to which such communications are to be given by providing the other parties with written notice of such change at least fifteen (15) calendar days prior to the effective date of the change.

All notices will be effective upon receipt and will be deemed received through delivery if personally served or served using facsimile machines, or on the fifth (5th) day following deposit in the mail if sent by first class mail.

XIII. Miscellaneous.

1. Term of Agreement. This MOU shall remain in full force and effect until the date upon which the Parties have both executed a document terminating the provisions of this MOU.
2. No Third Party Beneficiaries. This Agreement is not intended to, and will not be construed to, confer a benefit or create any right on a third party, or the power or right to bring an action to enforce any of its terms.
3. Amendments. This Agreement may be amended only by written instrument duly signed and executed by the County and the District.
4. Compliance with Law. In performing their respective obligations under this MOU, the Parties shall comply with and conform to all applicable laws, rules, regulations and ordinances.
5. Jurisdiction and Venue. This MOU shall be governed by and construed in accordance with the laws of the State of California, except for its conflicts of law rules. Any suit, action, or proceeding brought under the scope of this MOU shall be brought and maintained to the extent allowed by law in the County of San Diego, California.
6. Waiver. The waiver by either party or any of its officers, agents or employees, or

the failure of either party or its officers, agents or employees to take action with respect to any right conferred by, or any breach of any obligation or responsibility of this Agreement, will not be deemed to be a waiver of such obligation or responsibility, or subsequent breach of same, or of any terms, covenants or conditions of this Agreement, unless such waiver is expressly set forth in writing in a document signed and executed by the appropriate authority of the County and the District.

7. Authorized Representatives. The persons executing this Agreement on behalf of the parties hereto affirmatively represent that each has the requisite legal authority to enter into this Agreement on behalf of their respective party and to bind their respective party to the terms and conditions of this Agreement. The persons executing this Agreement on behalf of their respective party understand that both parties are relying on these representations in entering into this Agreement.

8. Successors in Interest. The terms of this Agreement will be binding on all successors in interest of each party.

9. Severability. The provisions of this Agreement are severable; and the adjudicated invalidity of any provision or portion of this Agreement shall not in and of itself affect the validity of any other provision or portion of this Agreement, and the remaining provisions of the Agreement shall remain in full force and effect, except to the extent that the invalidity of the severed provisions would result in a failure of consideration or would materially adversely affect either party's benefit of its bargain. If a court of competent jurisdiction were to determine that a provision of this Agreement is invalid or unenforceable and results in a failure of consideration or materially adversely affects either party's benefit of its bargain, the parties agree to promptly use good faith efforts to amend this Agreement to reflect the original intent of the parties in the changed circumstances.

10. Construction of Agreement. This Agreement shall be construed and enforced in accordance with the laws of the United States and the State of California.

11. Entire Agreement.

    a. This Agreement constitutes the entire agreement between the County and the District and supersedes all prior negotiations, representations, or other agreements, whether written or oral.

    b. In the event of a dispute between the parties as to the language of this Agreement or the construction or meaning of any term hereof, this Agreement will be deemed to have been drafted by the parties in equal parts so that no presumptions or inferences concerning its terms or interpretation may be construed against any party to this Agreement.

IN WITNESS WHEREOF, the parties hereto have set their hand on the date first above written.

BORREGO WATER DISTRICT

By: Beth A Hart
Beth A. Hart
President, Board of Directors

COUNTY OF SAN DIEGO,
a political subdivision of
the State of California

By: ____________________
Clerk of the Board of Supervisors

DATE: 10/24/16

APPROVED AS TO FORM AND LEGALITY
BY COUNTY COUNSEL

By: ____________________ 10/11/16
Senior Deputy

Approved and/or authorized by the
Board of Supervisors of the County of San Diego.
Meeting Date: 10/19/16 Minute Order No. 1
By: ____________________ Date: 10/24/16
Deputy Clerk of the Board Supervisors

APPENDIX B5

County of San Diego Notice of Election to Become a Groundwater Sustainability Agency

County of San Diego

MARK WARDLAW
DIRECTOR
PHONE (858) 694-2962
FAX (858) 694-2555

PLANNING & DEVELOPMENT SERVICES
5510 OVERLAND AVENUE SUITE 310 SAN DIEGO CA 92123
www.sdcounty.ca.gov/pds

DARREN GRETLER
ASSISTANT DIRECTOR
PHONE (858) 694-2962
FAX (858) 694-2555

January 13, 2016

Mark Nordberg, GSA Project Manager
Senior Engineering Geologist
Department of Water Resources
901 P Street, Room 213A
Post Office Box 942836
Sacramento, CA 94236

Delivery via E-Mail and US Mail
(MarkNordberg@water.ca.gov)

NOTICE OF ELECTION TO BECOME A GROUNDWATER SUSTAINABILITY AGENCY FOR THE BORREGO VALLEY GROUNDWATER BASIN

Dear Mr. Nordberg:

Pursuant to California Water Code Section 10723.8, the County of San Diego (County), a political subdivision of the State of California, gives notice to the California Department of Water Resources (DWR) of the County's decision to become a Groundwater Sustainability Agency (GSA) and to undertake sustainable groundwater management in the portion of the Borrego Valley Groundwater Basin (DWR Basin No. 7-24) within the boundary of San Diego County. The County overlies a portion of the basin as indicated on the attached map (Exhibit A of Attachment 1).

On January 6, 2016, the County Board of Supervisors held a public hearing in accordance with California Water Code Section 10723(b). The public hearing was noticed in the Daily Transcript in accordance with Government Code Section 6066 (Attachment 2).

After holding the public hearing, the County Board of Supervisors adopted Resolution Number 16-001 (Attachment 1) electing to become a GSA over the portion of the Borrego Valley Groundwater Basin within the boundary of San Diego County. No new bylaws, ordinances, or authorities were adopted by the County at that time.

The County is coordinating with Borrego Water District (BWD), which also submitted notice of election to DWR to become a GSA over the Borrego Valley Groundwater Basin within San Diego County. The County and BWD intend to work cooperatively to jointly manage groundwater in the basin. The County of Imperial and Imperial Irrigation District provided notice of election to DWR to become GSAs over the portion of the basin within

Imperial County. It should be noted that BWD and the County intend to submit a basin, boundary adjustment under separate cover which will request that DWR adjust the basin boundaries in Bulletin 118-2003.

The County Board of Supervisors authorized the Director of Planning & Development Services to negotiate inter-agency agreements with BWD, the County of Imperial, Imperial Irrigation District, and/or other agencies or entities utilizing groundwater in the Borrego Valley Groundwater Basin, as necessary for the purpose of implementing a cooperative and coordinated governance structure to sustainably manage the basin.

Pursuant to California Water Code Section 10723.2, the County will consider the interests of all beneficial uses and users of groundwater, as well as those responsible for implementing a Groundwater Sustainability Plan (GSP). An initial list of stakeholders and interested parties include, but are not limited to, the following:

a) Holders of overlying groundwater rights, including:
    1) Agricultural users – 17 property owners encompassing about 3,976 acres.
    2) Domestic well owners – About 275 wells within the GSA boundary.
b) Municipal well operators – No incorporated cities within the GSA boundary.
c) Public water systems – Borrego Water District.
d) Local land use planning agencies – County of San Diego and Borrego Springs Community Sponsor Group.
e) Environmental users of groundwater – Anza-Borrego Desert State Park.
f) Surface water users, if there is a hydrologic connection between surface and groundwater bodies – No hydrologic connection.
g) The federal government, including, but not limited to, the military and managers of federal lands – None.
h) California Native American tribes – None.
i) Disadvantaged communities, including, but not limited to, those served by private domestic wells or small community water systems – Borrego Water District ratepayers and domestic well owners.
j) Entities listed in Section 10927 that are monitoring and reporting groundwater elevations in all or a part of a groundwater basin managed by the groundwater sustainability agency – The BWD and County have filed and maintain California Statewide Groundwater Elevation Monitoring (CASGEM) monitoring data with the DWR.

The County intends to work cooperatively with stakeholders to develop and implement the GSP for the Borrego Valley Groundwater Basin and will maintain a list of interested parties to be included in the formation of the GSP. By this notification, the County has provided DWR with all applicable information in California Water Code Section

10723.8(a). If you have any questions, or require additional information, please contact the County Groundwater Geologist, Jim Bennett, at (858) 694-3820.

Sincerely,

MARK WARDLAW, Director
Planning & Development Services

Attachments:
Attachment 1 – Resolution No. 16-001 (with Exhibit A – Borrego Valley Groundwater Basin Map)
Attachment 2 – Proof of Publication

Attachment 1 – Resolution No. 16-001 (with Exhibit A – Borrego Valley Groundwater Basin Map)

Resolution No.:16-001
Meeting Date: 1/6/16 (1)

RESOLUTION OF THE BOARD OF SUPERVISORS OF THE COUNTY OF SAN DIEGO TO BECOME A GROUNDWATER SUSTAINABILITY AGENCY OVER BORREGO VALLEY GROUNDWATER BASIN.

WHEREAS, on September 16, 2014, the Sustainable Groundwater Management Act (SGMA) was signed into law and adopted into the California Water Code, commencing with Section 10720, and became effective on January 1, 2015;

WHEREAS, the legislative intent of the SGMA is to provide for sustainable management of groundwater basins and sub-basins defined by the California Department of Water Resources (DWR), to enhance local management of groundwater, to establish minimum standards for sustainable groundwater management, and to provide local groundwater agencies with the authority and the technical and financial assistance necessary to sustainably manage groundwater;

WHEREAS, Water Code Section 10723(a) authorizes local land use authorities, water suppliers, and certain other local agencies, or a combination of local agencies, overlying a groundwater basin to elect to become a Groundwater Sustainability Agency (GSA) for the basin;

WHEREAS, San Diego County (County) is a local agency qualified to become a GSA under SGMA;

WHEREAS, the County overlies a portion of Borrego Valley (DWR Basin No. 7-24), a DWR-designated medium-priority, non-adjudicated groundwater basin, as shown on the map at <u>Exhibit "A"</u> attached to this Resolution.

WHEREAS, California Water Code Section 10723.8 requires that a local agency electing to serve as a GSA notify DWR of its election to form the GSA and undertake sustainable groundwater management within a basin;

WHEREAS, California Water Code Section 10723.8 mandates that within 90 days of the posting of a notice by DWR of an entity's election to form a GSA, that entity shall be presumed to be the exclusive GSA for that area unless another entity provides notice to DWR of its intent to form a GSA, or notice that the entity has formed a GSA;

WHEREAS, on August 11, 2015 the County of Imperial provided notice to DWR of election to form a GSA within the portion of Borrego Valley that lies within their jurisdiction;

WHEREAS, on October 27, 2015 Borrego Water District (BWD) provided notice to DWR of its election to form a GSA within the portion of Borrego Valley that lies within its jurisdiction;

WHEREAS, California Water Code Section 10724(a) states that if there is an area within the basin that is not within the management area of another entity, the County will be presumed to be the GSA for that area;

WHEREAS, no other entities have jurisdiction over the Borrego Valley Groundwater Basin in its entirety within San Diego County;

WHEREAS, the County intends to work cooperatively with the BWD, the County of Imperial, and community interests to form a GSA over Borrego Valley Groundwater Basin;

WHEREAS, the County is uniquely qualified to become the GSA over that portion of Borrego Valley Groundwater Basin located within the County as a result of its;

- current jurisdiction over the entire extent of Borrego Valley Groundwater Basin within the County of San Diego (reference Exhibit "A");
- experience in regulating groundwater through the San Diego County Groundwater Ordinance (San Diego County Code Title 6, Division 7, Chapter 7 Groundwater), and groundwater monitoring via the County's role of administering and enforcing State standards and local ordinances pertaining to the construction or destruction of any well or boring within the County (Article 4, Section 67 of the San Diego County Code and the California Well Standards Bulletin 74-90); and
- experience regulating groundwater use by making land use decisions based on the availability of groundwater for project use and whether or not the project will negatively impact groundwater quantity or quality.

WHEREAS, establishing the County as a GSA will enable the County to coordinate well permitting and extraction allocations with Groundwater Sustainability Plan (GSP) requirements, apply uniform basin management requirements, and ensure diverse stakeholder interests are represented during GSP development;

WHEREAS, the County is committed to the management of its groundwater resources to create and promote sustainable groundwater use for the residents of the State of California, the County of San Diego, and Borrego Valley, in particular;

WHEREAS, the County held a public hearing on January 6, 2016 after publication of notice pursuant to Government Code Section 6066 to consider adoption of this Resolution; and

WHEREAS, no new bylaws were adopted in conjunction with this Resolution and the County's existing Board of Supervisors will serve for governance purposes of the GSA or until the County and BWD cooperatively adopt a governing structure for a unified GSA; and

WHEREAS, adoption of this Resolution does not constitute a "Project" under the California Environmental Quality Act (CEQA) pursuant to 15060(c)(3) and 15378(b)(5) of the State CEQA Guidelines because it is an administrative action that does not result in any direct or indirect physical change in the environment.

THEREFORE, BE IT RESOLVED that the Board of Supervisors of the County of San Diego does hereby elect to become a GSA for the portion of DWR Basin No. 7-24 within the jurisdiction of the County of San Diego, pursuant to California Water Code Section 10723, as shown on Exhibit "A" attached to this Resolution.

BE IT FURTHER RESOLVED that the County shall develop an outreach program to ensure that all beneficial uses and users of groundwater are considered.