May 21, 2019

County of San DiegoMay 14, 2019
Planning & Development Services
C/O: Jim Bennett
5510 Overland Avenue, Suite 310
San Diego, CA 92123

Ref: Groundwater Sustainability Plan
Borrego Valley Groundwater Basin
Borrego Springs Sub-

Re: Suggested changes to the Groundwater Sustainability Plan Draft for the Borrego Valley Groundwater Basin (SGMA Draft): Promote Bioretention Basins and Greywater Systems

Dear Mr. Bennett

I have several suggested changes and additions to the Groundwater Sustainability Plan Draft for the Borrego Valley Groundwater Basin (SGMA Draft).

The SGMA Draft states that "There are currently no managed stormwater recharge facilities in the Plan Area." Thus, recharge is limited to natural infiltration of stormwater, and to a lesser degree, return flows of applied irrigation water and septic recharge." (2.45) Additionally, poor water quality associated with irrigation return flow and septic recharge has percolated to the aquifer and has the potential to migrate laterally as a result of pumping. (3.29) Septic systems have polluted several BWD wells and resulted in the need to drill expensive new wells.

"The source of nitrates is likely associated with either fertilizer applications or septic return flows." (4.30) "Home septic tanks, when used in high concentrations and built to poor or outdated standards" (2.46) and agriculture petrochemical fertilizers, herbicides and pesticides are contributors to groundwater quality degradation.

Since recharge is often polluted by septic and agriculture return flows, infiltration of stormwater in bioretention basins could dilute these toxic return flows. The use of existing natural and extensive man-made stormwater drainage channels could substantially reduce construction costs, increase the basin recharge, mitigate pollution from septic and agriculture return flows and the runoff to the Borrego Sink that could results in higher TDS levels.

Runoff in the Borrego Sink could also damage the middle and upper aquifers so stormwater should be captured and allowed to percolate into the aquifer before it

reaches the Sink. “The Borrego Sink, similar to dry lake beds that occur in the desert, is a location where water evaporates and minerals will accumulate and can form evaporite deposits. Historically similar conditions occurred as sediments were deposited. Thus, the middle and upper aquifers have the potential to include evaporite deposits that can re-dissolve and lead to elevated concentrations of sulfates and carbonates that result in corresponding increase in TDS.” ENSI: DRAFT 12/7/2018, page 9.

There is plenty of evidence that stormwater runoff exists and can be captured on a cost effective basis:

- There are years in which the frequency, intensity and/or duration of runoff events were sufficient to initiate substantial stream recharge (e.g., water years 1967, 1977, 1979, and 1992).” (2.79)
- “The runoff into the Subbasin from the 24 entry points was as much as 44,000 AFY with an average annual rate of 3,600 AFY.” (2.75)
- “Storm flows may occasionally be adequate in intensity and duration for recharge to be initiated through deep percolation of storm runoff.” (2.66)
- The runoff that is not recaptured is lost to evaporation in the Borrego Sink or leaks out of the aquifer in the southern basin.
- “The contributory watersheds are approximately 400 square miles (mi2) and much larger in area than the approximately 98mi2 Subbasin as illustrated in Figure 1.” (p. 532)
- “Stream and flood flows from the adjacent watersheds provide the bulk of the water that enters the Subbasin.” (p. 532)
- There are existing infrastructure improvements (drainage channels) that can be utilized to increase runoff into bioretention basins and reduce construction costs. (See the attached Rams Hill example)

The Summary of General Plan and Community Plan Land Use Policies Relevant to Groundwater Sustainability in the Plan Area also encourages stormwater infiltration. It specifies the following:

> COS-4.3 Maximize stormwater filtration and/or infiltration in areas that are not subject to high groundwater by maximizing the natural drainage patterns and the retention of natural vegetation and other pervious surfaces.
>
> COS-5.2 Require development to minimize the use of directly connected impervious surfaces and to retain stormwater runoff caused from the development footprint at or near the site of generation.

Furthermore, Rick Alexander recently wrote a California Water Board Grant Application request for a Coyote Creek grant to research the capture groundwater in ponds. His requests should be expanded to include the Rams Hill, and de Anza areas.

Through Title XVI Reclamation Research Grant Program:

1. Stormwater Capture/Groundwater Infiltration Opportunity/Feasibility Study

   Specifically, BU Rec is interested in funding a Research Grant to explore feasibility of groundwater capture in ponds during vernal, or storm events, from the Coyote Creek Watershed. Captured water would percolate into the aquifer providing recharge rather than running-off and evaporating as now occurs. Coordination/cooperation of planning with ABDSP would be a critical component of such a study. Taking advantage of potentially fallowed agricultural lands could provide opportunities for location of stormwater capture basins.

3. Watershed Management Programs
   The Cooperative Watershed Management Program (CWMP) provides funding to watershed groups to encourage diverse stakeholders to form local solutions to address their water management needs. By providing this funding Reclamation promotes water reliability and cooperation between stakeholders to reduce conflict, facilitate solutions to complex water issues, and stretch limited water supplies. Funding is provided on a competitive basis for development of watershed groups and implementation of watershed management projects.

Therefore, the SGMA Draft Stormwater Capture and Infiltration sections should be rewritten with the emphasis on the positive rather than the negative. Grants and bond funding should be pursued and incentives offered to homeowners and large property owners who have the ability to build bioretention basins.

"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)" (4.17). Those who capture filtered household greywater and collect stormwater from roofs, driveways and yards by contouring their property so the water flows into underground tanks, would also experience lower water bills and the satisfaction of helping the community.

Although experts have made rough stormwater runoff estimates, accurate Borrego runoff data does not exist. Specifically, the annual precipitation data doesn't accurately indicate the amount of runoff and its potential recapture. The SGMA draft states "Winter and summer rain storms produce different amounts of runoff. For example, in a year of unusually high precipitation from extended periods of winter drizzle, there may be high amounts of precipitation but very little runoff. In other years, although the annual precipitation may be low, a single August storm could dumped a huge amount of rain in a few hours and create flooding. This type of storm would produce a huge runoff that could be captured and allowed to percolate into the aquifer. Precipitation patterns in the Plan Area are influenced by two distinct sources. The first source is

Pacific frontal systems that bring regional rain bands to Southern California, typically between October and April.

The second source is isolated and scattered thunderstorms that occur when moisture from the Gulf of California advects from south to north through the Plan Area. This phenomenon, commonly referred to as the "monsoon" season, is strongest in the summer months, but is not a regular or consistent occurrence. Occasionally, the decaying remnants of former tropical storms or hurricanes can pass through the area and in some years these further enhance the precipitation totals during the monsoon season. As a consequence of these disparate influences, the precipitation record is highly variable both seasonally and annually (Figure 2.2-3 and Figure 2.2-4). This makes defining the parameters of "wet" or "dry" years difficult **(e.g., one thunderstorm may drop half of the yearly total in an otherwise dry season)**." (2.36)

There are existing areas with extensive drainage systems that enhance their ability to capture stormwater at substantially lower construction costs (e.g. Viking Ranch and Rams Hill). Property owners could contribute the use of their land to Bioretention Projects and receive some form of compensation.

The Draft currently negatively states:

> "The infrequent occurrence of rainfall in the region results in extended periods of zero-recharge. Additionally, design criteria for capturing and infiltrating desert flood events, as well as removal and disposition of accumulated sediment from large storm events, is costly (USBR 2015). **Therefore, while this potential supplyside project requires additional analysis, the costs to construct this as a stand-alone project outweigh the benefits at this time.** Stormwater retention will be evaluated on a case-by case basis in conjunction with future development in the Subbasin "

This section should be rewritten as follows:

> There are a number of reasons bioretention basins should be built in Borrego.
>
> 1. Stormwater runoff that reaches the Borrego Sink doesn't recharge the aquifer, it is lost to evaporation.
> 2. "The Borrego Sink, similar to dry lake beds that occur in the desert, is a location where water evaporates and minerals will accumulate and can form evaporite deposits. Historically similar conditions occurred as sediments were deposited. The middle and upper aquifers have the potential to include evaporite deposits that can re-dissolve and lead to elevated concentrations of sulfates and carbonates that result in corresponding increase in TDS." ENSI: DRAFT 12/7/2018, page 9.
> 3. Bioretention basins would reduce flood damage.
> 4. Bioretention basins would support endangered ecosystems.
> 5. Experts lack accurate data on Borrego's rainfall intensity and duration, so their predictions are flawed.
> 6. Experts lact accurate data on streamflows. "The highest levels of uncertainty in the model were from agricultural pumping, specific yield, and streamflow entering the valley." (2.80) In the fall of 2017, there was a precipitation event in the Coyote Creek watershed that produced runoff in Coyote Creek; however, no stream flow measurements are available for this event. Dudek 10329.001 Feb. 2019.
> 7. Septic system and fertilizer pollution, that threatens water quality, can be diluted with the addition of natural recharge from bioretention basins.
> 8. The existing costly flood channel infrastructure, such as the extensive natural and man made drainage channels in the Rams Hill area, will reduce bioretention basin construction costs.
> 9. There are government programs that encourage bioretention basins construction in areas such as the Viking Ranch.
> 10. "There is runoff into the Subbasin from 24 entry points with as much as 44,000 AFY (2.75)."
> 11. Since grants and bond financing for the capture and infiltration of stormwater are available, they should be aggressively pursued.
> 12. Incentives can be offered to encourage the construction of multiple bioretention basins.
>
> Therefore, bioretention basin construction costs may be quite reasonable and the benefits to Borrego's critical water problems substantial.

The draft should also be strengthened with these three provisions:

1. Prohibit the concentration of septic tanks that are threatening our water quality.
2. Wherever possible, eliminate home septic systems by connecting homes to the BWD sewer system.
3. All homes should be obligated to install greywater systems and capture stormwater from roofs, driveways, and direct flows from contoured land to bioretention basins and/or in underground tanks for landscape irrigation.

Everyone agrees that Borrego needs every drop of water it can save whether it's through changing to drip irrigation and native landscaping, installing home and commercial greywater systems, initiating turf reduction programs, or constructing large and small bioretention basins.

For these reasons, the SGMA draft should encourage, not discourage, the capture of stormwater runoff in bioretention basins.

Regards,

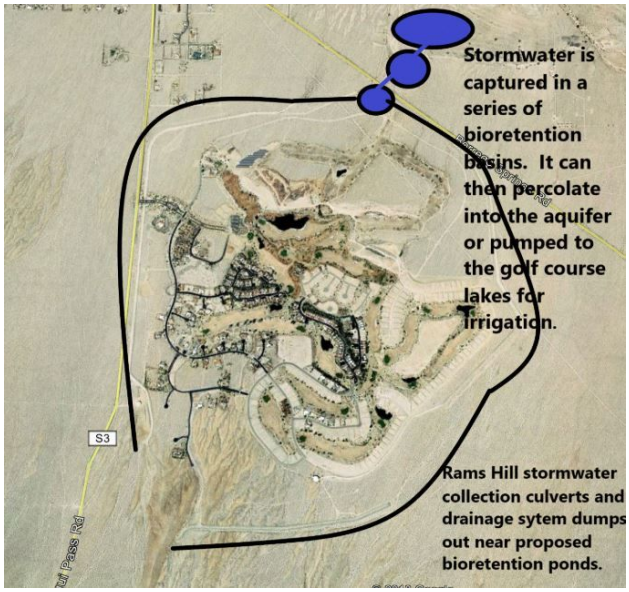
Bill Berkley
SGMA Advisory Committee representing Borrego recreation

The Rams Hill Drainage Channels:

In the Rams Hill area extensive existing drainage channels collect runoff from thousands of acres and direct it to a small central collection point at the bottom of the hill where a series of bioretention basins can be built. This system could save thousands of acre feet over a decade. Therefore, the cost to build a series of bioretention basins would be relatively small when weighed against the benefits and Borrego's critical water situation.

The world has been experiencing climate change, particularly in precipitation extremes that generate peak runoff flows which if captured and saved, would increase water supplies.

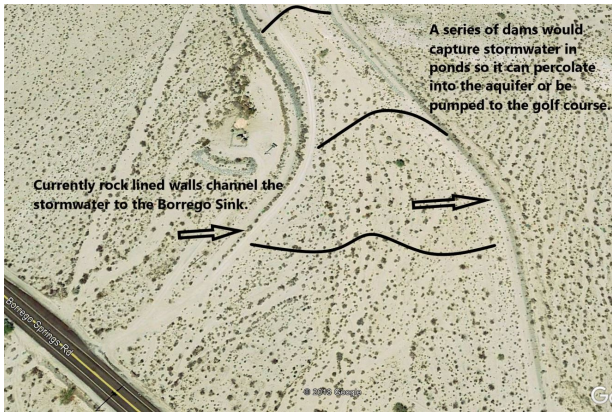
Rams Hill's 3,200 acres and the thousands of park acres drain into the extensive natural and manmade drainage systems that collect stormwater and funnels it down to a central location that's perfect for the construction of a number of cascading bioretention ponds. The water can then percolate into the aquifer or be pumped immediately into Rams Hill's lakes where it can then irrigate the course.



The entire 200 acre Rams Hill Golf Course is a bioretention basin that currently captures water from hillsides, roads, parking lots, and roofs so that it can percolate into the aquifer. Some of the stormwater flows into the golf course lakes and is reused for irrigation which eliminates the need to pump water from the aquifer.

This picture of the sixth hole at Rams Hill was taken in February 2019. It demonstrates that the golf course is a large bioretention basin that has captured hundreds of acre feet of stormwater runoff that has recharged the aquifer over the years.

This picture shows the existing rock lined channels (east of Borrego Springs Road and near the BWD Reclamation Plant) that direct stormwater to the Sink. If the 4 acres between the rock lined channel walls were excavated to an average depth of 10 feet, they could capture 40 acre feet from one storm. While these storms may be infrequent, climate change may result in more storm events in the future.



Why miss an opportunity to capture stormwater before it is lost to evaporation in the Borrego Sink?

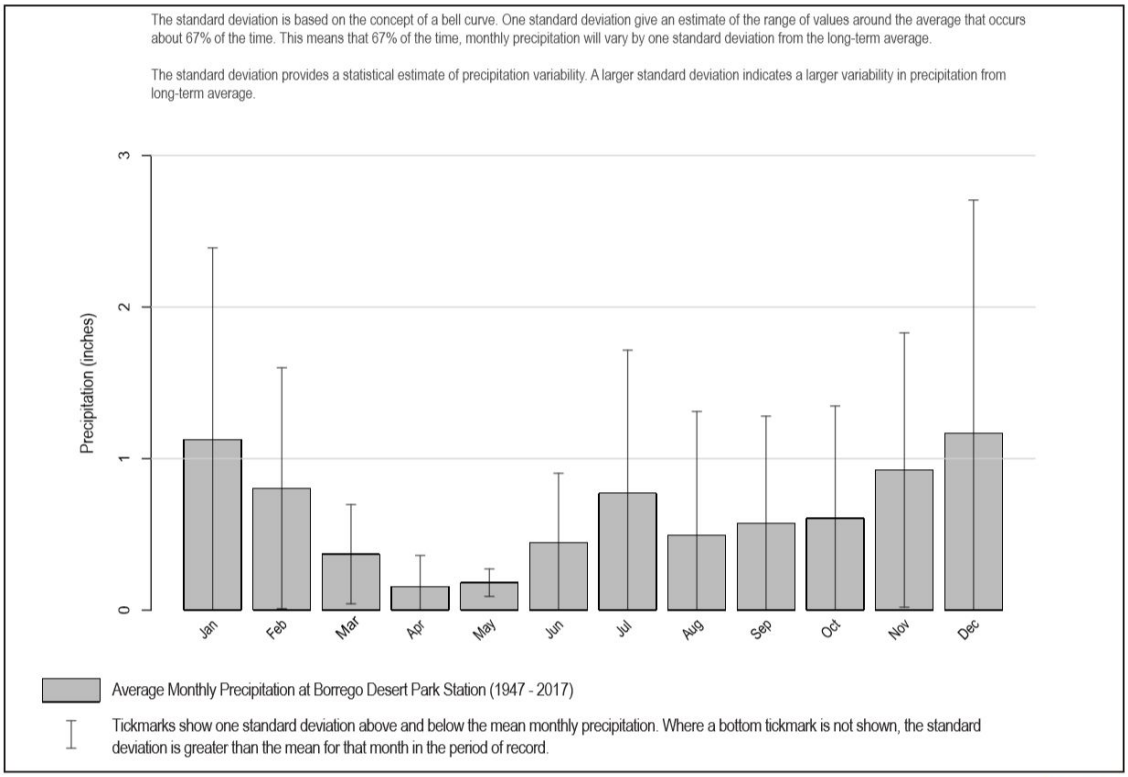


FIGURE 2.2-4
Average Monthly Precipitation at Borrego Desert Park Station (1947 - 2017)
Groundwater Sustainability Plan for the Borrego Valley Groundwater Basin

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