

**Critique of the Borrego Water District's
Integrated Water Resources Management Plan
Draft No. 4
October 2008**

The Borrego Water District's Integrated Water Resources Management Plan (IWRMP) has as its expressed purpose qualifying the district for Proposition 50 and Proposition 84 funds, but it will inevitably serve another equally important purpose as well; i.e., it will become a part of the historical record of scientific research on the Borrego Valley aquifer. For that reason it must be as accurate a representation of current science on the aquifer as possible.

Progress on groundwater management in the valley has historically been frustrated by special interests distorting data to achieve their own ends. In so doing, these interests have nullified the self-corrective nature of scientific inquiry as it applies to the Borrego basin. It is important, therefore, that the IWRMP be based on and contribute to sound science about the aquifer and furthering knowledge thereof; and the BWD has a special duty to see that it does. Its stated purpose should not lead to the corruption of data about the basin in the interest of achieving narrow, short-term, and selfish ends. It appears, however, that the author has, from time to time, sacrificed scientific ends to others.

The BWD's IWRMP presents a fair summary of recent data regarding the Borrego Basin. When it goes beyond a mere recitation of findings, however, it ceases to be objective and becomes a polemic. As a result, it is analytically flawed, empirically misleading, and, at times, verges on junk science; i.e.,

“...extensively corrupted science, science corrupted in objectivity and/or method, the corruption either deliberate or involving sloppy methods or due to ignorance of what science is about, the outcome useless conclusions that make false statements about the natural world...”¹

“...what seems clear about junk science in America is that one usually finds a conflict between special interest and group interest, where... group interest is public interest, the interest of the group at large...”²

“As always, the primary enemies of science will be any institution or group whose power is threatened by knowledge of the real world.”³

¹ . Agin, Dan. Junk Science: How Politicians, Corporations, and Other Hucksters Betray Us, 2006, Thomas Dunne Books, St. Martins Press, New York, p. 4.

² Agin, p. 277

³ Agin, p. 291

A part of the IWRMP's manifest lack of objectivity is surely traceable to the recent employment history of its principal author, Bill Mills. Mills worked for a number of years as a consultant to and lobbyist for AAWARE, the local farmers mutual benefit corporation, and represented local agriculturalists views and interests. It appears that he continues to do so, whether or not he is still retained as a consultant.

Nowhere in the document, however, is the identity of the principal author disclosed, let alone his possible conflict of interest arising from long-standing affiliation with an interest group that is responsible for more than 70% of the water pumped annually from the Borrego Valley aquifer and has a financial interest in continuing to do so. That, quite simply, is intellectually dishonest.

The principal author's identity and, because of its prejudicial potential, relevant occupational history should be disclosed up-front and in detail; and he should be required to disclose his present relationship with joint and several agricultural interests in the valley, if any, or when and how his previous professional relationship(s) were terminated if they have been. In the interest of full disclosure, information about the author's possible conflicts of interest should as well be made a proper part of all drafts of this document distributed locally for information and comment.

Quoted below are specific passages from the IWRMP that are especially problematic. Comments on each of the passages appear immediately below the quoted material in Arial 12 point Italic type. The quoted material itself is presented in the New Times Roman 12 point type of the original and surrounded by a text box.

The purpose of this Integrated Water Resources Management Plan is to provide an update on the District's efforts to mitigate the aquifer overdraft problem, and to present alternatives for the District to further evaluate as it strives to provide a sustainable water supply for its customers. (p. 1)

Rewrite the above as:

"The purpose of this Integrated Water Resources Management Plan (IRWMP) is to update the District's Ground Water Management Plan (GMP), report on efforts to mitigate the aquifer overdraft since the GMP was adopted in 2002, and provide a plan that can be integrated with the plans of other agencies having responsibility for water management to create an IRWMP."

The IRWMP does not "present alternatives for the District to further evaluate," as claimed, but rather is an argument for one general solution – importing water –

and a specific instantiation of that solution, i.e., the “Phased Dr. Nel – Allegrati Farms Import.” It dismisses all other options; most specifically sustained use of groundwater in the basin.

The State has initiated the funding of projects as a result of Proposition 50 (and subsequently Proposition 84), such as the proposed importation pipeline, but require that the agency participate in an Integrated Regional Water Resources Management Plan (IRWMP). This plan requires that an agency develop a water management plan for incorporation in a regional process to integrate its plan with other agencies having responsibilities for water management, creating an IRWMP. In addition to the other purposes of this document, this plan serves also as the initial step in that process. (p.2)

Rewrite the above as:

“The State provides funding for projects such as an importation pipeline (Propositions 50 and 84), but requires that, to be eligible, an agency develop a water management plan that can be integrated with the plans of other agencies having responsibilities for water management to form an IRWMP.”

Conservation Management Plan is attached hereto as Appendix “A”, and also includes the provision of best management practices implementation for irrigation and commercial users, (p.2)

There is no list of BMP included. If that is not what the above means, then it is badly phrased.

The Save Our Aquifer Coalition (SOAC) was formed in the early 2000s to draw public awareness of the Borrego Valley. The non-profit group has sponsored water conservation programs with the local school children and distributes water awareness bumper stickers that were designed by school contest winners. (p. 7)

*The original language purposely distorts SOAC’S mission and trivializes its efforts on behalf of the aquifer which consisted mainly of more direct and assertive attempts to provoke action on groundwater management in the basin.
Rewrite as:*

“The Save Our Aquifer Coalition (SOAC), a California public interest association, was formed in the early 2000s to draw public attention to and lobby for correction of the aquifer overdraft situation in the Borrego Valley.”

This is a measure of the amount of water, as a percentage, that can be withdrawn from a **unit-less** cube of aquifer material.. (p. 15)

“Unit-less” needs to be explained or changed to something more easily understood. It probably could just be deleted.

It should be noted that this study [Netto’s thesis] was conducted under the review of an academic review committee. This review process is aimed at ensuring that scientific methodologies were employed and differs than from that of a ‘peer’ review process which is concerned with both the methodology and the reasonableness of the values derived from any estimation process. (p. 26)

The above statement is patently false, as anyone who has ever been through a Master’s degree or Ph.D. thesis defense knows full well. It implies that all the academic examining committee is interested in is the logic of the argument and completely disregards the truth/falsity of the conclusions drawn. That is preposterous. The only possible purpose for its inclusion here is to create an unwarranted bias in favor of the farmers figures (AAWARE 2003) to help justify the “conclusion” on p. 28 that the results of the AAWARE study and Netto’s thesis “are compatible” (sic) (see below). It should be deleted.

Considering the differences in methodology used in developing these estimates [Netto’s and AAWARE’s], it is concluded that the results are compatible (sic). (p. 28)

The BWD Groundwater Management Plan (2002) used nominal values for delivered water and ignored return flow. The AAWARE 2003 study determined the amount of delivered water from electrical power records for pumping and well production information supplied by the farmers to arrive at 14,700 af of delivered water. Netto did not have access actual figures such as these and so estimated applied water based on nominal values to arrive at 11,878 af of delivered water, a difference of 2,822 af.

Delivered Water/Acre for each study

<u>Study</u>	<u>Irrigated Acreage</u>	<u>Delivered Water</u>	<u>Delivered Water/Acre</u>
Netto	4,310	11,878.00	2.76
AAWARE	3,400	14,650.00	4.31

Netto on the other hand, relied on a “field investigation,” i.e., empirical tests conducted in the Borrego Valley, “to determine the amount of applied water consumptively used” the results of which showed a return rate of 22% for citrus and 14% for all other crops, or an overall return rate of 19.67%. The AAWARE study used purported nominal values of 32.2% for citrus and a 25.7% average

return rate for all other crops or an overall return rate of 28.67% - nine points higher than Netto's.

Values from table on page 29, IWMRP 2008 (Return Flow % added)

<u>Study</u>	<u>Irrigated Acreage</u>	<u>Delivered Water</u>	<u>Net Water Use</u>	<u>Return Flow</u>	<u>Return Flow %</u>
Netto	4,310	11,878	9,541	2,337	19.68%
AAWARE	3,400	14,650	10,450	4,200	28.67%

Thus the AAWARE study offers the most reliable estimate of applied water while the Netto study offers the most reliable value for return flow since both are empirically determined values specific to the Borrego Valley. It follows, therefore that the most reliable method of determining the Net Water Use is to use AAWARE's value for applied water (14,650 af) and Netto's value for return flow (22% for citrus and 14% for all other crops). Doing so yields a different, but more scientifically sound and reliable, result than the one Mill's methodology offers.

Using Netto's Return Flow rate and AAWARE's estimate of Delivered Water/Acre

<u>Study</u>	<u>Irrigated Acreage</u>	<u>Delivered Water/Acre</u>	<u>Delivered Water</u>	<u>Return Flow %</u>	<u>Return Flow</u>	<u>Net Water Use</u>	<u>Net Water Use/Acre</u>
Netto	4,310	4.31	18,571	19.68%	3,654	14,917	3.46
AAWARE	3,400	4.31	14,650	19.68%	2,882	11,768	3.46
Difference	910		3,921		771	3,150	

Moreover, Mill's analysis ignores a significant difference in the size of the two areas on which the respective studies were based to conclude that the results of the two studies are "compatible". Netto's calculations are based on a test area of 4,310 acres vice AAWARE's which are based on a test of area of only 3,400 acres; a difference of 910 acres. To eliminate this disparity and arrive at values that are comparable, it is necessary to compare Net Water Use per acre rather than gross Net Water Use as Mills did. Calculation of the Net Water Use per acre using AAWARE's more robust estimate of delivered water and Netto's empirically established local return flow rate yields a Delivered Water rate of 4.31 af/acre and a Net Water Use of 3.46 af/acre. Applying the latter to the 3,400 acres on which the AAWARE study is based yields a Net Water Use of 11,768 af, or 1,318 af more than the value published in the AAWARE study (10,450 af), a difference of 12.6%. Using this method, the two studies are now comparable or "compatible" to use Mills terminology, but show that agriculture's consumptive water use is significantly higher than the AAWARE (2003) study would lead one to believe.

It is important to note that as residential development occurs in the Valley that the current agricultural net water usage after fallowing is insufficient to mitigate the new demands... current net water use by a complete fallowing of agriculture using the county offset program and BWD mitigation fees would fall short of offsetting the potential new municipal water demands by about 3,000 afy. (p. 34)

...if all of the dwelling units currently in the general plan are developed, a new demand on the aquifer of about 3,000 afy could result. However, the likelihood that all agricultural water use will be eliminated is not reasonable to project; and thus the total amount of overdraft will be significantly greater, and further diminish the ability to depend upon the local aquifer as a sustainable water supply for the Borrego Valley. (p. 39)

In the first instance, the county's current General Plan population projections have been acknowledged to be unrealistic even by DPLU planners. They are driven by esoteric formulae which originally projected a terminal population of more than 35,000

"The past application of single-use 'Eudidean' zoning techniques to the Borrego Springs area [resulted in] an outdated view of the area's future development, in which prior planners envisioned 35,000+ residents...rather than the likely population of 8,000 envisioned in this Plan." ("Borrego Springs Updated Community Plan," 2008, p. 31)

That number was reduced only after members of the Borrego Springs Community Sponsor Group vigorously protested the reasonableness of the values derived from the county's estimation process. Given the growth rate of Borrego Springs to date, projecting an increase such as the county projects any time in the foreseeable future is not only unreasonable; it is ridiculous.

"While current county land use regulations would permit a potential full-time population of 13,000, we are far from the growth curve that would yield such demographics. A more realistic maximum full-time population would be 8,000." ("Borrego Springs Updated Community Plan," 2008, p, 14)

As an indication of the extremely slow pace of development in Borrego, "Many residential parcels were first created over 50 years ago and remain undeveloped." ("Borrego Springs Updated Community Plan," 2008, p. 30)

In addition to grossly over estimating Borrego's growth potential, Mills relies on his low-ball estimate of Net Water Use by agriculture in the valley to support the above statements. Moreover, his entire discussion of "Ultimate Water Requirements from New Development" (p. 34 – 37) is biased in favor of importing water by focusing entirely on the end-state itself and ignoring the amount of time

and complex, interactive processes involved in getting to that end-state. In so doing, he assumes a much compressed, essentially durationless, process that has no intermediate states; a totally fantastic assumption.

The process of phasing out agriculture and other inappropriate, water intensive enterprises in the valley would likely involve a transition over an indefinitely long period of time; although the Desert Area Initiative committee believes it can be accomplished in as little as 11 years:

"Convert existing agricultural uses to other, less-consumptive uses by 2020 consistent with a Plan population of 8,000." ("Borrego Springs Updated Community Plan," 2008, p. 32)

Given Borrego's historically slow rate of residential growth, it would be a relatively simple matter to encourage reduced water use through following by institution of a pump tax and issuance of "durable mitigation entitlements" and conservation measures such as tiered water rates, conservation incentives, development of a wastewater recycling program, artificial recharge, etc. Such measures would or could bring significant reductions in pumping that would far exceed demands coming from residential growth over the same period and thereby slow draw-down of the aquifer and provide additional time to define the reliability of the groundwater supply in the basin, allow legislative action by the state and county to regulate groundwater pumping in some reasonable way, and develop other strategies to obviate the need for or reduce the scale of exorbitantly expensive public works projects to import water into this small and sparsely populated valley.

Finally, Mills is unnecessarily pessimistic about the possibility of reducing residential water use. (p. 36) If communities in Arizona can limit residential use to 1/3 af/du, then, given proper incentives, there is obviously no reason to believe that Borrego cannot.

In a word, this whole section should be completely reworked to be less dogmatic, more realistic, and flexible enough to accommodate alternate strategies that rely, at least in part, on sustainable use of groundwater.

<p>Additionally, the growers in the valley were increasingly identified as the adversarial. (sic) The growers responded by forming the Agricultural Alliance for Water Resources Education (AAWARE). (p. 66)</p>
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The above is both false and gratuitous. The farmers formed AWARE for the sole purpose of defending their rights to continue mining the aquifer. It had nothing to do with defending their honor, as implied above. This language again betrays Mill's bias toward the farmers, adds nothing to the discussion, and should be deleted.

In addition to the above discrepancies, the entire document would profit from rigorous copy editing to eliminate numerous typographical, spelling, grammatical and diction errors, and, in places, deflate bloated prose (see the first two items above).

12/30/08