Comments and suggestions on the Stetson Engineers Report on IWV Basin pumping Scenario 6, agenda item 3.b., Sustainable Management Criteria item 3.c. and Land Subsidence Conditions item 3.d.ii) - all presented at the August 1, 2019 TAC meeting

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Preliminary notes: This Comment Document follows other similar reports by this author on the previous Stetson Engineers pumping scenarios. These reports appear to not have been posted appropriately on the GSA website. **All of these report comments have been offered in an attempt to provide guidance and insight into the creation of a functional sustainability plan**.

A. Items 1) through 7), pumping scenario 6

1) **Missing elements of the GSP** **None of the pumping scenarios performed to date have assumed a set of conditions that meet the basic SGMA requirements as the basis of a functional and legal GSP as has been pointed out by this author in previous scenario reports.** This is not to criticize the preliminary, dedicated and high quality professional work done by Stetson Engineers and their associates including the Desert Research Institute. **These scenarios do clearly expose the extreme circumstances of the Basin overdraft and its continuing cause**. **The scenario reports also do acknowledge the essential need for and do incorporate imported water in most of the scenarios**. We look forward to Capital Core's presentation at the August GA Board meeting. Hopefully, we will hear a positive story.

The exploration of pumping scenarios without at least a plan outline already in place runs the clear risk of misinterpretation. **"What if", unsupported allocations are appropriate for the purposes of pumping scenario exploration but unacceptable for a plan. This "what if" distinction has been made repeatedly by Stetson Engineers but has been lost in the emotional turmoil of public confusion that has followed. I**f **the fundamental assumptions of a realistic plan had been in place from the start this would have been moderated and perhaps not have happened**.

Key missing elements in these existing scenarios are 1) proper recognition of the existing water rights of the Basin claimants and 2) a full recognition of the GA responsibility to stabilize and maintain usable water levels in the affected basin wells in a time frame short enough to prevent further serious damage. Both of these missing elements are discussed in the following sections.

2) **Ignored groundwater rights** **As the GSP is being constructed, a serious and missing component comes from the limitations that the existing groundwater rights of at least some of the Basin pumpers will impose on a Sustainability Plan**. The US Navy has belatedly brought forth its Federal Reserved Water Right and is recognized as such in all of the scenarios. However, in spite of many of us repeatedly pointing out the historic rights of the present Searles Valley Minerals, these rights have also been virtually ignored as have the overlying historical rights of some of the farm community. It is acknowledged that the overlying rights of the rural domestic well owners is indirectly recognized in the de minimis category. It is also recognized that only by adjudication will these water rights be firmly established. **However, it is proper to recognize these rights even as the GSP is being written.** The water allocations in all of the scenarios to date have favored the City of Ridgecrest and the Indian Wells Valley Water District. **With the specific aim to avoid litigation, these additional water rights must not be ignored.**

Having identified this omission it is clear that not all present pumping can be continued even if the Basin were to obtain supplemental outside water. **Part of the GSP needs to be devoted to a buyout plan for some of the major pumpers to be implemented immediately**. **Farm irrigation is based on low cost water and this distinction in itself identifies the likely buyout candidates**. This statement is key to the farm irrigation water vulnerability as described in the next section.

3) **Allocation vs market force** **All of the pumping scenarios to date are based on allocations defined by the GA itself not on any suggestions or advice from the advisory committees or the public**. The Domestic Well Owners Association has devised and made available a sustainability plan dated January 2019 which is based on market force economics. **Our plan has been criticized as having elements that are not legal. However, the basic market force economics of the plan most certainly are legal and are the centerpiece of virtually all modern commerce.** The Domestic Well Owners Association has described this plan numerous times in public and to the GA Board and it has been apparently ignored. No one from the GA staff or Board has offered any comments, suggestions or objections to it.

The principal advantage of this approach is that it primarily depends on market prices of water to control use. Obviously, those activities that depend on the lowest cost water will likely cease at some point. Making our water supply function like a commodity market is not a novel idea at all and completely avoids almost all of the turmoil and legal fighting since allocations can then play a minor and non-controversial role. The only water right involved would be the Federal Reserved Right. We strongly recommend that our plan be reexamined carefully and modified to satisfy whatever legal issues are present. **We submit that a market force approach is likely the only approach which will satisfy all of the conflicting claims and requirements in this complex Basin.**

4) **Critical importance of the vulnerability of shallow wells** **It is estimated that about 95% of the total number of wells in the IWV Basin are domestic private wells.** These wells serve a primarily rural community. These wells are relatively shallow by design and have overall produced a very small fraction of the groundwater pumped over the years. **Even though the pumping fraction for these wells is small the value of these wells to the rural community is very high and danger of individual well failure due to ever decreasing groundwater levels is a critical concern. The shallow well community has absorbed this cost to repair or replace wells for decades.** This ongoing well failure is primarily the consequence of water mining by the major pumpers. Stetson Engineers has developed a quantitative model that can predict well failure rates for the present or any future pumping plan including the scenarios under discussion. **This model can provide very valuable guidance to the development of sustainability pumping plans.**

It is easy to develop a pumping plan that will result in a sustainable **overall** condition. No elaborate pumping or flow model is required. What is a lot harder is to devise a plan that works properly in all of the varied areas of the Basin, some with significantly higher pumping rates and some with more complicated hydrology. **To protect the shallow wells in the Basin into the future it is essential to reduce local and overall Basin pumping immediately**.

The notion of a grace period of perhaps two years where major pumping is allowed to continue as-is, simply continues the existing unacceptable condition of over- pumping. **The short term benefits to commercial entities are clear but no one else benefits at all.** A ramp down similarly does not benefit the great majority of Basin pumpers. **Allowing continued pumping at current rates for a "grace period" of even 2 years followed by a 5 year ramp down is in effect just allowing the overdraft to continue.**

The idea that these extensions would give the farmers an opportunity to recoup their investments is nonsense. Farming works on a long term basis. The groundwater shortfall issue has been widely known for decades (actually a hundred years) and has simply been ignored. One can have a certain level of sympathy for the farmers now caught up in this water supply squeeze, except that much of the current farm activity has occurred in the last 10 years - even as the County funded and published the Todd Report and followed up by a huge reduction in the A1 zoned land in the IWV. The Todd Report summarizes decades of IWV groundwater research which clearly identifies the critical nature of the Valley overdraft. **A far better approach element to reduce farm irrigation is to implement a limited buyout immediately upon acceptance by the State of the GSP. Again a market force approach is appropriate.**

5**) Incomplete entries in Tables 1 and 2** Regardless of the GSP basic approach, it is essential that all major producers be identified with defendable accurate pumping numbers. **Since SGMA has significantly changed the former prescriptive right law, it is especially important to determine the pumping quantities for the years 2010 to 2014 for every major pumper**. **Many of both the older and newer farmers in the Basin expanded their irrigated acreage during and after this time**. The existing Tables 1 and 2 summarizing acreage and water production by the major pumpers is not accurate or complete. There are many small acreages not accounted for. The attempt to force well registration may result in some new water users coming forward but it should not be expected to be very useful. An examination of Google Earth imagery during this time period could be useful to verify the actual irrigated acreages. It is unfortunate to resort to spy techniques to obtain this information.

6) **Inappropriate questions to the PAC** The PAC has been asked to comment on the correctness of the 63,836 ac-ft number in the scenario 6 ramp down. Why this was directed to them is not clear as any useful answer depends on the impact of this water increment on the total water in storage which is a TAC question. There has never been a public discussion of Basin storage at a TAC meeting except for that brief opportunity right after the Stetson presentation of the topic some months ago. One can observe that there is a range of estimates in the literature but the average is about 2 M ac-ft in the top 200ft of the aquifer. **None of the values tabulated take into account the substantial volumes of additional poor quality water that were discovered during the Bureau of Reclamation study – not even the Bureau number. The value of about 2M ac-ft is not conservative.**

7) **Need to recognize value of maintaining some groundwater flow to the sink** All of the flow model calculations for the scenarios demonstrate a continuation of the declines in groundwater levels NE of the Little Lake fault. This trend is observed in the actual water levels that have been recorded in this area. The declines are a result of the lower hydraulic conductivity of the disturbed fault zone and the predominate pumping to the SE of the fault. Why is any of this important? As the residents of the Valley can attest there have been many severe dust events (very characteristic white dust) occurring primarily at the now dry playa and vicinity that have been more and more frequent in recent years. There is ample evidence that the shallow water phreatophyte zone nw of the playa is slowly drying out also.

If this Valley is to avoid an Owens Lake dust condition attention needs to be made to this problem. In the design of sustainability scenarios it is important to not entirely ignore the 2500 ac-ft of estimated discharge even if the model seems relatively insensitive to it. We cannot afford to assume we can productively use all of the 7650 ac-ft of natural recharge and simply continue to dry out this area. This is primarily a Navy issue now but it will become a Valley issue at some point that will be potentially a lot more expensive and difficult to solve.

B. **Sustainable Management Criteria item 3.c.**

1) **Groundwater level as a proxy** There is unnecessary confusion over use of groundwater levels as a proxy for groundwater quantity and possibly groundwater quality. Care needs to be placed on the wording in the GSP sections that introduce and use these concepts. I suspect that there was actually some confusion at DWR over this since both lowering of groundwater levels and reduction of groundwater in storage are both listed as management criteria. There is no doubt that a water level proxy will be used extensively in the IWV GSP for both descriptions of monitoring and for minimum thresholds. Except for some areas along N Brown Rd, water level proxy for water quality will not likely be useful. It is probably not appropriate to attempt to even bring up the water quality proxy use for this Basin. There is no reason to create more confusion.

2) **Groundwater level minimum threshold** Since the Basin has substantially different static water levels at different locations, largely as a result of local water mining, it will be impossible to have only a few water levels to be set as minimum level metrics. It would be possible to use a section by section approach like Jean M has already done for shallow well impact analysis. This suggestion of course leads directly to a next step which is to use her analysis to establish the section minimum threshold based on shallow well impacts. There probably is not enough actual well data to do this but her well construction model could be used instead. **The advantage of using a shallow well impact as a minimum water level threshold is that it does not involve any more or less arbitrary selection of minimum levels.**

C. **Land Subsidence Conditions item 3.d.ii**) This section is very well written and is quite thorough and professional in its content and approach. There are two areas that this author has brought up before that should be added/modified. 1) Even though early day IWV subsidence caused by local pumping is not documented in the literature there is substantial physical evidence from the subsidence depressions that are still quite evident. The most obvious area is at the old Bowman Ranch which was centered at the present day Walmart. The depression is about 15ft and is nearly ½ mi in diameter. It is a very evident feature even today. Up into the 70's there were several water well motors that were perched on their casings above the original ground level in the area by about the same 15 ft. 2) The other area is located on the very early day IWV farm pumping which was more or less centered on N Brown Rd and extends from about Leliter Rd to north of Neal Ranch Rd. This depression is also quite evident even today. There were also water well motors still mounted on casing perched in the air scattered around in this area into the 70's and some no doubt still remain. Neither of these subsidence features are subtle. **It would seem to be proper to mention these depressions related to early pumping even though there is no professional documentation. The rationale for doing such is to illustrate that water extraction subsidence in the IWV Basin has occurred and is not a theoretical issue.**

The second area of omission relates to the extensive and thick (1600 ft) organic clay zone underlying N Brown Rd which is not shown at all on Figure 2. This clay is the western portion of the lacustrine feature which is shown stopping at the Little lake Fault. There is ample evidence for this continuity in wells across the 5 miles more or less separating Brown Rd and the Little Lake Fault. This author strongly suspects that this clay zone is the origin of the subsidence that is described in C.2) above. With further pumping along N Brown Rd further subsidence would be expected and in fact, is likely the most subsidence prone area associated with current or likely future pumping in the Valley.