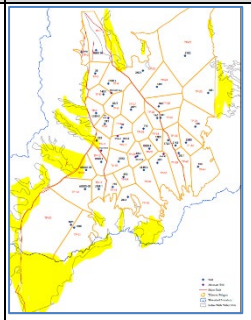
**RESPONSE TO COMMENTS**
**WY 2020 Annual Report**
**Indian Wells Valley Groundwater Sustainability Plan**
**February 2, 2022**

The following comments were compiled from phone calls, emails, and Technical Advisory Committee (TAC) review of the WY 2020 Annual Report. Based on these comments, the following recommendations are presented for improving the Annual Reports and the 2025 5-Year Report for the Groundwater Sustainability Plan (GSP):

1) Develop a comparison of the Thiessen Polygon Method and the Model for calculating change in storage for IWV groundwater basin. Review both methods with the TAC and develop recommendations for reporting this sustainability measurement to DWR in future Annual Reports and 2025 5-Year Report.
2) Reevaluate the distribution of monitoring wells with available data for use by the Thiessen Polygon Method and representative monitoring sites. Evaluate the need for designated management areas (El Paso and Main IWV basin) with the TAC. Address data gaps and well access constraints, review with TAC.
3) Spring 2020 groundwater levels were measured from March through June (State/KCWA covid protocols) for storage change analysis. Agricultural pumping had already started, influencing these calculated changes. Given the limited data for spring 2020, estimates of WY 2020 changes of groundwater in storage will not be included in future Annual Reports.
4) Local outreach to drillers and county well permit agencies to determine shallow well impacts, in addition to the current Shallow Well Mitigation Program reporting.
5) Review and address data gaps in the SW (Inyo well) and SE (Bucket well) areas of the basin with the TAC. Evaluate potential grant funding for monitoring well replacement.
6) Have the Configuration Management Plan (CMP) in place for reviewing new geologic data (i.e. SkyTEM, HCF, new wells, multi-level well data, aquifer continuity, pumping distribution etc.), and developing the Model for the 2025 5-Year Report.

Acronyms used in this response to comments matrix (alphabetical):
AFY: acre-feet/year; CMP: Configuration Management Plan (for Model development); dtw: depth to water; gwl: groundwater level (elevation); GWMP: Groundwater Monitoring Program; GSP: Groundwater Sustainability Plan; TAC: Technical Advisory Committee; TP: Thiessen Polygon.

| | Reviewer | Comment | Response |
|---|---|---|---|
| 1 | Eddie Teasdale, 4/7/21 phone call | Spring 2020 DTW measurements taken from March through June for TP analysis. Proposed using Meadowbrook measurements. | Later Spring 2020 groundwater level (gwl) measurements were influenced by agricultural pumping, resulting in non-representative storage change analysis for WY 2020 Annual Report. A recalculation will be needed to account for this year's storage change. It is recommended that well data not currently in the GWMP be requested from Meadowbrook to expand the TAC's understanding of this area of the groundwater basin, and data be reviewed by the TAC before data substitutions are made. See recommendation #3 above. |
| 2 | Stan Rajtora 11/03/2021 email | There appears to be a major inconsistency between the GSP (page 3-24) and both the 2020 Annual Report (page 21) and the 2019 Annual Report (page12) regarding the ground water storage change, i.e., overdraft. The average overdraft for the five years documented in the 2020 Annual Report (7,737 acre-feet) is less than one-third (31%) the overdraft assumed by the GSP (24,990 acre-feet). The average overdraft for the four years documented in the 2019 Annual Report (5,545 acre-feet) is less than one-fourth (22%) the overdraft assumed by the GSP. This inconsistency was not addressed in the report. Major inconsistencies with the GSP need to be acknowledged as a minimum and reconciled if possible. | The GSP (Table 3-7) used the groundwater model simulating 10-acre model cells with estimated pumping (27,740 AFY) and mountain front recharge (7,650 AFY) to calculate the average annual storage change (-24,990 AFY) from 2011 to 2015.<br>The TP Method used observed dtw changes at 41 monitoring wells to estimate annual storage change.<br>Annual Reports provide updates on key issues and interim calculations. The GSP is updated and revised every 5 years. It is during GSP updates that undesirable results are evaluated with the sustainable management criteria, including loss of groundwater in storage.<br>These methods are inherently different and should be reviewed by the TAC to evaluate the best methodology for reporting this sustainability measurement to DWR in the Annual and 5-Year Reports.<br>See recommendation #1 above. |
| 3 | Stan Rajtora 11/03/2021 email | There are two obvious questions that need to be addressed. First, how confident are we in the accuracy of the process used to calculate the change in water storage, the Thiessen Polygon Methodology? If confidence in the numbers is not high, the report needs to identify actions necessary to increase its credibility. Second, how confident are we the limited sample in the reports represents the long-term overdraft. The report needs to be clear on both issues. | It is recommended that (a) both Model and TP Method be compared over multiple years, and (b) the TAC evaluate the best method for calculating changes to groundwater in storage for use in the Annual and 5-Year Reports.<br>See recommendation #1 above. |
| 4 | Stan Rajtora 11/03/2021 email | Since the 2020 report does not question the calculated numbers, the reader is led to believe they are correct. If accurate, the 2020 Annual Report clearly challenges key conclusions that drive GSP projects. The GSP is a living document. If it needs to be updated, so be it. Since the GSP is closely linked to the basin model, the model would need to be updated as well. | DTW data used in the WY 2020 TP analysis was from multiple months, some of which were after agricultural pumping started. It is recommended (#3 above) that WY2020 estimated change be reevaluated. The issues with and impacts of using Spring 2020 dtw data to calculate change of groundwater in storage for WY 2020 was reported to the Board in April 2021.<br>Also, it is recommended (#1 above) that the TAC review both Model and TP methods and propose the best analysis for reporting this sustainability measure to DWR. This would include any updates to the GSP if necessary in the 2025 5-Year Report. |

| | Reviewer | Comment | Response |
|---|---|---|---|
| 5 | Stan Rajtora<br>11/03/2021<br>email | A review of the 2020 Annual Report figure describing the Thiessen polygons appears to indicate the polygons on the south end of the aquifer conform to the watershed boundary rather than the aquifer boundary. This excluded area represents thousands of acres. This requires clarification. |  The Thiessen Polygon Method was used to estimate changes (not absolute volume) of groundwater in storage. There are a some 'edge' areas not included in this analysis: stream alluvium to the west, south, and north of the groundwater basin alluvium between the watershed divide and the southwest GSA boundary; northeast Navy areas. There are no data available to confirm storage changes in these areas. The general conceptual model indicates no change in these areas given their distances to any pumping centers. A simplifying assumption of "no change" has been used for this calculation. These are data gaps. For completeness, these areas will be clearly indicated on maps and in the tables for any future TP analyses. |
| 6 | Stan Rajtora<br>11/03/2021<br>email | The 2021 Annual Report will add a sixth year of data to the Thiessen analysis, which will be beneficial relative to expanding the sample size. However, if data for years 2012 through 2015 is available for the analysis, that would be even more valuable to add credibility to the conclusions drawn from the analysis. I recommend the 2021 report analysis find that data, if available, and add it to the report. | It is recommended that this comparison analysis be made and reviewed with the TAC.<br>See Recommendation #1 above. |
| 7 | Stan Rajtora<br>11/24/2021<br>Attachment F | Many of the notes for Attachment F talk about DTW change estimates rather than DTW estimates. This appears to be the case in many instances. I suggest moving the note indications from the DTW columns to the DTW change columns to make the notes more understandable. | This change will be included in the TP Method reevaluation.<br>See recommendation #2 above. |
| 8 | Stan Rajtora<br>11/24/2021<br>Attachment F | There are several DTW change estimates that are blank where the associated water storage change estimate is non-zero. For better understanding, I suggest filling in all DTW change estimates that are used to calculate a water storage change. | This change will be included in the TP Method reevaluation.<br>See recommendation #2 above. |
| 9 | Stan Rajtora<br>11/24/2021<br>Attachment F | Subtotals of the five basic regions in the attachment would improve understanding. | Potential management areas (El Paso and Main IWV basin) will be evaluated in the TP Method reevaluation. Note – the previous annual reports included these general areas by polygons. The reevaluation will proportion the polygons to the Basin Areas previously discussed by the TAC Model Ad Hoc Group.<br>See recommendation #2 above. |
| 10 | Stan Rajtora<br>11/24/2021<br>Attachment F | I believe the second sentence of note 1 has TP-1 and TP-2 reversed. | This will be corrected and included in the TP Method reevaluation. |

| | Reviewer | Comment | Response |
|---|---|---|---|
| 11 | Stan Rajtora<br>11/24/2021<br>Attachment F | • TP-2 DTW changes are assumed to be the same as TP-1, but no justification is provided for the assumption. Looking at the one valid data point for TP-2, there appears to be no positive correlation between TP-2 and TP-1. One could argue that there is a negative correlation.<br>• TP-22 and TP-23 DTW changes are assumed to be the same as TP-24, but no justification is provided for the assumption. Looking at the three valid data points for TP-22 and TP-23, there appears to be no positive correlation between TP-24 and either TP-22 or TP-23. In fact, one could argue that there is a negative correlation.<br>• TP-39 DTW changes are assumed to be the same as TP-34, but no justification is provided for the assumption. Looking at the three valid data points for TP-39, there appears to be no positive correlation between TP-39 and TP-34. Once again, one could argue that there is a negative correlation.<br>• TP-27 has a strong influence on the overall groundwater storage change. It appears to be caused by erroneous DRW estimates used in WY 2015, 2016, and 2020. The two valid data points of DTW change, WY 2018 and 2019, show an overall increase rather than a decrease. This anomaly needs to be explained. | WY 2020 data limitations resulted in many data gaps for making the TP analysis. Better data correlations will be addressed with the TAC. Graphs will be provided where data is substituted if necessary.<br><br>See recommendation #2 above. |
| 12 | Stan Rajtora<br>11/24/2021<br>Attachment F | A discussion in the groundwater in storage change section of the report (section 5.3.2) identifying the impact of the various major pumpers, i.e., IWVWD, ag wells, and SVM, on the groundwater in storage by TP could give DWR confidence in the accuracy in the report. | Future discussions of changes of groundwater in storage will correlate pumping patterns to storage changes, as appropriate. See recommendation #2 above. |
| 13 | Stan Rajtora<br>11/29/2021<br>email | When DTW measurements are not available and a substitute estimate of DTW or DTW change is used, there should be some justification for using the substitute number. If we do not provide adequate justification, we risk the real potential of DWR asking for the justification when they read the report. | Better data correlations will be addressed with the TAC. WY 2020 data limitations resulted in many data gaps for making the TP analysis. Graphs will be provided where data is substituted if necessary. |
| 14 | Stan Rajtora<br>11/29/2021<br>email | An alternative to inserting alternative numbers with inadequate justification for unavailable measurements would be to use a zero DTW change (0) for data gaps. Since we are committed to filling these gaps in the coming years DWR would likely accept that explanation without question or criticism. | The best data procedure for addressing data gaps for the TP analysis will be addressed as the method is reevaluated.<br>See recommendation #2 above. |
| 15 | Stan Rajtora<br>11/29/2021<br>GWL Discussion | Both paragraph 3.2.1 and paragraph 5.3.1 discuss groundwater levels in the IWV basin. Both paragraphs are confusing in that they oversimplify the nature of the overdraft problem. | Annual Reports provide updates on key issues and interim calculations. A more complete discussion of overdraft conditions is provided in the GSP. The GSP is updated and revised every 5 years. It is during GSP updates that undesirable results are evaluated with the sustainable management criteria, including loss of groundwater in storage. |

| | Reviewer | Comment | Response |
|---|---|---|---|
| 16 | Stan Rajtora<br>11/29/2021<br>GWL Discussion | 1. Paragraph 3.2.1 indicates ten representative monitoring wells were picked to monitor for chronic lowering of groundwater levels. There is no definition of what is meant by "representative". These ten monitoring wells presumably provide an indication of chronic lowering of groundwater across the basin or at least in that portion of the basin that has historically experienced chronic water depth lowering. Without a clear description of the well selection, it is not understandable how the monitoring of ten wells will serve the intended objective. The annual report needs to add some descriptive information or reference specific sections in the GSP that tie the 10 wells to the objective. | This is addressed in Section 4.4.2.6 (Representative Monitoring Sites) in the IWV GSP, and is referenced in section of 3.2.1 Chronic Lowering of Groundwater Levels of the WY 2021 Annual Report. |
| 17 | Stan Rajtora<br>11/29/2021<br>GWL Discussion | 1a. This paragraph states a key task for WY 2021 will be to evaluate the monitoring well network to determine if the network needs to be revised. I have not seen any effort made on that key task. Any revision to the network should address the issue of pumping concentration playing a primary factor regarding shallow well failures in the basin. | Improvements to the monitoring well network are continuously made. A discussion on the improvements to the monitoring network will be added to the final 2021 Annual Report (currently not in the draft report). See recommendations #2, #4, and #5 above. |
| 18 | Stan Rajtora<br>11/29/2021<br>GWL Discussion | 1b. I was unable to find in the annual report any status on new occurrences of shallow well failures. The annual report should provide the number of new failed shallow wells as well as our efforts to track them via county records or otherwise. Perhaps paragraph 3.2.1 or alternately paragraph 3.1.5 would be a good place to document this. The number of new failed wells should probably also be included in the executive summary. | See recommendation #4 above: "*Local outreach to drillers and county well permit agencies to determine shallow well impacts, in addition to the shallow well program reporting.*" |
| 19 | Stan Rajtora<br>11/29/2021<br>GWL Discussion | 2. Paragraph 5.3.1 indicates that 47 wells are being monitored to "evaluate the average annual groundwater change across the basin". The average groundwater change was calculated to be -0.7 feet/year. While the average groundwater level change of the selected 47 wells may be -0.7 feet/year, the lack of any descriptive information regarding the selection of the 47 wells gives little assurance the average groundwater change across the basin is -0.7 feet/year. The annual report needs to add descriptive information or reference specific sections in the GSP relating the 47 wells to the entire basin.<br>Assuming the average groundwater level change in the basin is actually -0.7 feet/year, the average groundwater storage change would be roughly minus 45 thousand acre-feet per year. This assumes a specific yield of 0.21 and a total basin area of 304 thousand acres. That amount of overdraft is unreasonable. | These data are an average of measured gwl/dtw data collected in Spring 2020 and is not an indication of what is occurring throughout the basin. See response to Comment 20 below for a continuation of this discussion. |

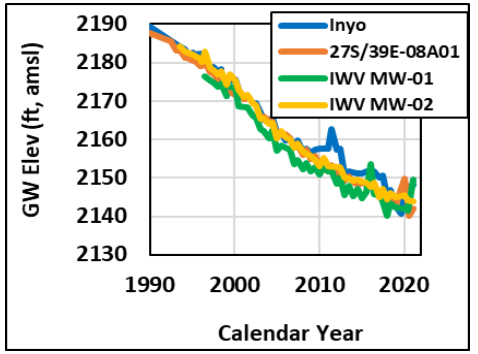
| | Reviewer | Comment | Response |
|---|---|---|---|
| 20 | Stan Rajtora 11/29/2021 GWL Discussion | 2b. Looking at the statistics of just the 47 selected wells, the average groundwater level change was given as -0.7 feet/year, and the median change was given as -2.20 feet/year. The two numbers are inconsistent. If the median is -2.2, more than half of the sample has to be less than -2.2 and the average has to be less than -1.1. The stated statistics need to be consistent. | The median shows the 50th percentile of the 47 ranked (values placed in order) gwl measurements in both Spring 2015 and Spring 2020 ranging from -2.72 ft/year to +3.66 ft/year. The 24$^{th}$ ranked value of available data was -0.06 ft/year. The value of -2.20 ft/year was an error. Spring 2020 monitoring well access included many wells not located within the pumping areas, making this statement non-representative of the complete picture of what is occurring in the IWV Basin. Presenting these data will be reevaluated using 2021 and 2022 data. |
| 21 | Stan Rajtora 11/29/2021 GWL Discussion | 2c. The water in storage paragraph 5.3.2 indicates the overdraft may be significantly less than currently believed. That implies the shallow well problem may be more a pumping distribution problem than an overdraft problem. Unfortunately, paragraph 3.1.7 indicates we are going to spend a lot of money on projects before studying the pumping concentration issue. We should be identifying the problem before spending money on projects we might not need. | See recommendation #6 above to include a review of pumping distribution as a TAC task for the Model CMP. |
| 22 | Tim Parker, 4/26/2021 general comment | 1) The GSP and Annual Reports do not cover the entire IWV basin included in DWR California's Groundwater Bulletin 118, but instead uses the model domain without any explanation. With respect to change in storage, the Annual Report again refers to the main portion of the IWV basin and El Paso subarea as opposed to the B118 boundary. The GSP and Annual Reports should specifically cover the entire B118 basin. | The entire Basin 118 boundary is evaluated in the Annual Reports. Maps prepared for any future TP analyses will be updated to more clearly display areas of assumed no change in storage along edges of aquifer.<br>See recommendation #2 above to reevaluate the storage change calculation. |
| 23 | Tim Parker, general comment | 2) The GSP and selected well hydrographs clearly designate two principal aquifers in the basin, but the narrative text, figures, and graphs only use one, although that is not identified as shallow or deep aquifer. SGMA requires separate groundwater contour maps for separate aquifers. | This will be addressed by the CMP and the model used for the 5-year report. See recommendation #6 above for the first steps in this process. |
| 24 | Tim Parker, general comment | 3) Wells are referred to variously as "Key" wells, CASGEM wells, selected hydrographs, but not as "Representative Monitoring" sites, and as a result it is unclear what the SGMA "Representative Monitoring" sites are for the basin in the Annual Report. Suggest sticking to SGMA terminology to be clear in the report. | "Key Well" was previously used synonymously with "Representative Monitoring Site". In the WY 2021 Annual Report, "Representative Monitoring Site' is used consistent with SGMA terminology. |
| 25 | Tim Parker, general comment | 4) The DWR Groundwater Sustainability Plan Annual Report Elements Guide provides the specific elements to be reported in the annual report, and requires the reporting for the present back thru January 1, 2015 and the on the past water year (WY2020 in this case). The report is inconsistent in what is reported depending on the element, sometimes four years, sometimes five years, not specific to back to January 1, 2015 and not always specifically for WY 2020 for groundwater contour maps, groundwater elevation data and hydrographs, and change in storage. | Consistent with the GSP Emergency Regulations, the following is presented in the annual reports:<br>• Hydrographs showing data to the greatest extent available, including from January 1, 2015 to the current year.<br>• Contours showing data representing the seasonal high and season low conditions of the current reporting year. |

| | Reviewer | Comment | Response |
|---|---|---|---|
| | | | • Groundwater extraction data for the current reporting year. (While not explicitly required by the regulations, other production data from past reporting years are presented for comparison and basin understanding purposes.)<br><br>Due to data collection issues, the WY 2021 Annual Report will not be providing groundwater in storage data for WY 2021. |
| 26 | Tim Parker, general comment | 5) The annual report should include in the new data section, a summary of what data gaps have been addressed, and what data gaps remain. | Chapter 7 (Other Data Collection and Basin Management Tasks) of the WY 2021 Annual Report has been updated to include a bulleted list of data gaps outlined in the IWV GSP, and summaries of tasks completed to address these data gaps. |
| 27 | Tim Parker, general comment | 6) The Report discusses the progress made on the management actions and replenishment fees. The Report should acknowledge the pending legal challenges to the GSP and related actions. | Stetson does not recommend commenting on pending legal actions in the Annual Report. |
| 28 | Tim Parker, general comment | 7) The Report includes information on the Projects and Management Actions in the GSP, but neglects conceptual projects. We recommend including in Section 3 the update on the Brackish Groundwater Resources Project (Attachment 1), to inform DWR on the project progress and that the feasibility study is planned for completion in the fall 2021. | An update on the Aquifer Performance Test conducted by the Brackish Water Group was provided by Wade Major for WY 2021 Annual Report. During the preparation of the 5-year update to the GSP, conceptual projects will be considered by the IWVGA for further development/implementation. |
| 29 | Tim Parker, specific comment | 8) Figures List - One of the Figures should include Representative Monitoring site locations. | Figure 3-1 of the WY 2021 Annual Report includes the locations of the Representative Monitoring site locations for the chronic lowering of groundwater levels. |
| 30 | Tim Parker, specific comment | 9) Figure 2-1 The report makes several references to the "main portion of the IWV basin," and "El Paso subarea" - these areas should be identified on the figures. | Figure 3-1 & 5-5 of the WY 2021 Annual Report have been updated to show the extent of these areas. |
| 31 | Tim Parker, specific comment | 10) Figure 1 & 2 The IWV GSP identifies a shallow and deep aquifer, multi-depth nested well hydrographs demonstrate at least two (shallow and deep) separate potentiometric zones, and the DWR Groundwater Sustainability Plan Annual Reports Elements Guide requires "(A) Groundwater elevation contour maps for each principal aquifer in the basin illustrating, at a minimum, the seasonal high and seasonal low groundwater conditions." The maps provided do not identify either aquifer. | This will be addressed once the CMP has been approved and a TAC model group reconvenes to review more recent geological data (i.e. SkyTEM, HCF, new wells, multi-level well data)<br>See recommendation #6 above. |
| 32 | Tim Parker, specific comment | 11) Figure 5-3 - Why not use/stick to SGMA terminology for "Representative Monitoring sites or points? | The terminology has been updated in the WY 2021 Annual Report to use "Representative Monitoring Sites'. |

| | Reviewer | Comment | Response |
|---|---|---|---|
| 33 | Tim Parker, specific comment | 12) Figure 5-4 - This figure uses well nests but does not identify the depth being used, and whether it is the deep or shallow aquifer. | This figure number has been updated to Figure 5-6 for the WY 2021 Annual Report. Figure 5-6 includes a note in red in the bottom right corner stating "All multi-level piezometers on this map use data from the shallowest piezometer available for measurements." |
| 34 | Tim Parker, specific comment | 13) Figure 5-5 – This figure ignores a portion of B-118 basin, using the model domain as the boundary instead - and therefore under-estimates the positive storage contribution of the El Paso subarea to the total basin storage change. | The entire Basin 118 boundary is evaluated in the Annual Reports. Maps prepared for any future TP analyses will be updated to more clearly display areas of assumed no change in storage along edges of aquifer. |
| 35 | Tim Parker, specific comment | 14) Figure 5-6 - The total IWV basin annual and cumulative storage change needs to be included - also an estimate of the pumping in the "El Paso subarea" since it is broken out separately. | For Basin management purposes, the El Paso Subarea is separated from the main Basin area. Reported pumping is currently not available for the El Paso Subarea. This is currently a data gap. |
| 36 | Tim Parker, specific comment | 15) Figure 6-1 - The figure is missing a number of "El Paso subarea" domestic wells that Stetson staff and TAC members have observed in the field. | Noted. This is a data gap to be addressed. |
| 37 | Tim Parker, specific comment | 16) Page 2, Executive Summary - The Exec Summary should include reporting out on the entire B118 basin, not just part of the basin (see redline markup). The Exec Summary should also note the estimated groundwater level change of -10.8 feet where the previous trend was increasing that results in an anomalous groundwater storage change of -17,270 AF in an area with little or no pumping.<br>As further noted on Page 21 comments, the WY2020 18,274 AF storage loss includes an anomalous estimated groundwater level change of -10.8 feet for Thiessen Polygon TP-27, resulting in a storage loss value of -17,270 AF for this polygon alone. This value is reported in a well with an increasing trend over the past five years, only to have an estimated loss reported in an above normal year preceded by a wet year. We believe this data value is an anomaly that is not related to groundwater extraction and should be removed from the analysis of storage loss. | WY 2020 field measurements resulted in limited data for making the storage change calculation.<br><br>See recommendations #1 and #2 above for addressing the storage change calculation moving forward. |
| 38 | Tim Parker, specific comment | 17) Page 5, Chapter 3 - Recommend adding a section or place for "Conceptual Projects Under Consideration", and include an update on the Brackish Groundwater Resources Feasibility Study being funded by the DWR provided in Attachment 1. | An update on the Brackish Groundwater Resources Feasibility Study is provided in the WY 2021 Annual Report. During the preparation of the 5-year update to the GSP, conceptual projects may be considered by the IWVGA for further development/implementation. |
| 39 | Tim Parker, specific comment | 18) Page 10, Section 3.2.1 - Provide reference to a figure with the SGMA GSP Representative Monitoring sites shown in the Annual Report.<br>Suggest being more specific - what is meant by "recent data"? | Figure 3-1 of the WY 2021 Annual Report has been added to include the locations of the Representative Monitoring site locations. Sections have been updated to further define "recent data" when used. |

| | Reviewer | Comment | Response |
|---|---|---|---|
| 40 | Tim Parker, specific comment | 19) Page 11, Section 3.2.4 While land subsidence due to groundwater pumping does not currently appear to be an issue in the basin, conditions can change in the future before groundwater levels are actually stabilized over the next 15 to 20 years. This could result in subsidence due to pumping, and could also result in accelerated rates of subsidence prior to groundwater levels are stabilized.<br>More recent data is freely available from DWR through the InSAR program and should be used by the IWVGA as DWR is monitoring basin progress through these datasets (see Attachment 3 for an example of before and after the Ridgecrest earthquakes). | As discussed in section 4.4.4.6 of the GSP, the IWVGA will evaluate InSAR (and other data) as it is available to monitor for potential land subsidence impacts. Recent InSAR data is discussed in the WY 2021 Annual Report. |
| 41 | Tim Parker, specific comment | 20) Page 15-17, Section 5.2 Use SGMA terminology - Representative Monitoring sites or points. The narrative should report explicitly on WY2020 hydrograph results as specified in the DWR "GSP Annual Report Elements Guide" as well as back to January 1, 2015. The narrative in each well/well nest discussion should be similar in terms of information covered, including the screened intervals referenced to gw levels being discussed.<br>Why 4 years change reported, versus the five years specified in the chapter intro? Suggest mentioning that WY2019 was wet according to data interpreted by WRM in GSP.<br>"closer" than what? Provide well to well distances if you are going to have this as part of the scientific discussion.<br>Include that USBR-6 which sits on the edge of the alfalfa fields.<br>Add pumping well type since "agricultural pumping" is specified earlier.<br>How are you defining long-term here? Not mentioned in previous well narratives.<br>The beginning of the narrative paragraph says five year change is … and the end references spring 2015 thru spring 2019 (four years) - why state five years and then report four years and leave out WY2020? | • The terminology has been updated in the WY 2021 Annual Report to use "Representative Monitoring Sites'. The hydrographs presented in the Annual Report show data to the greatest extent available including from January 1, 2015 to the current year, as required per the GSP Emergency Regulations.<br>• The WY 2020 and WY 2021 Annual Report had a limited subset of data to report due to the ongoing COVID-19 pandemic and associated restrictions as a result. The WY 2021 Annual Report has been updated to explicitly say when and where data was limited or unavailable.<br>• Ambiguous language with respect to distances have been addressed in the WY 2021 Annual Report with the addition of approximate distances to known landmarks.<br>• The description of USBR-6 has been updated in the WY 2021 Annual Report ("These nested wells are located in the northwest adjacent to alfalfa fields, and near fan deposits from Sand Canyon.").<br>• Pumping well types have been added to the WY 2021 Annual Report.<br>• Long term is defined in the sentence with the qualifier "since the early 1990's".<br>• References to time periods have been updated and corrected for the WY 2021 Annual Report |
| 42 | Tim Parker, specific comment | 21) Page 21, Section 5.3.2 - Several things should be clarified in this last paragraph based on data in Attachment E:<br>(1) the 2020 groundwater level in well TP-27 25S/39E-28P01 was not measured but estimated from a hydrograph, and the hydrograph should be provided in the report,<br>(2) the well was for the most part on a rising trend 2015 thru 2019, rising some 8.3 feet, | • WY 2020 data limitations resulted in many data gaps for making the TP analysis. See above recommendation #2 above regarding addressing data correlations with the TAC.<br>• In future Annual Reports and analyses, graphs will be provided where data are substituted. |

| | Reviewer | Comment | Response |
|---|---|---|---|
| | | (3) after a wet year in 2019 and above normal year in 2020, the estimated and not measured groundwater level change is -10.8 feet, an anomalous metric that needs to be explained, or identified as an outlier and removed from the analysis. What's most significant about this metric is the contribution to estimated groundwater storage change in 2020: -17,270 AF in 2020, approaching the total storage loss reported for the IWV Main Basin in 2020 of -18,274 AF.<br>All the above suggests that the approach being taken to estimate storage change on an annual basis as reported in annual reports to DWR needs a thorough review including application of appropriate QA/QC measures on data being used in the process.<br>Additionally, we recommend considering use of the InSAR data to assess the linkages between seismicity and the aquifer system by reviewing recorded groundwater level changes before, during and subsequent to the July 4, 2019 Ridgecrest Earthquake , which could provide useful information regarding location and effect of faulting on groundwater levels and flow patterns in the basin. | • See above recommendation #1: *Develop a comparison of the Thiessen Polygon Method and the Model for calculating change in storage for IWV groundwater basin. Review both methods with the TAC and develop recommendations for reporting this sustainability measurement to DWR in future Annual Reports and 2025 5-Year Report.*<br>• There are ongoing studies by others regarding the 2019 Ridgecrest earthquake's effect on gwl. As these studies are completed, they will be forwarded to the TAC for review. |
| 43 | Tim Parker, specific comment | 22) Page 24, Table 6-1 - WY2020 Total Estimated Pumping column - the value 1,410 is repeated in rows 5 and 6 - is this an error? | The estimated WY 2020 production data was 1,410 AF for both Federal production and Domestic/Mutuals production. |
| 44 | Tim Parker, specific comment | 23) Page 25, Table 6-2 - The water used to 'partially support the Mojave Tui Chub habitat on NAWS China Lake' should be categorically listed as "Environmental Water," as is standard jargon in the water industry for fish and habitat water beneficial use. | The recycled water used for partial maintenance of the Mojave Tui Chub habitat has been identified as "environmental water" in the WY 2021 Annual Report. |
| 45 | Tim Parker, specific comment | 24) Page 26, Chapter 7 - This section should tie back to identified data gaps in the GSP to demonstrate progress to DWR where it is made, like a checklist. | Chapter 7 (Other Data Collection and Basin Management Tasks) of the WY 2021 Annual Report has been updated to include a bulleted list of data gaps outlined in the IWV GSP, and summaries of tasks completed to address these data gaps. |
| 46 | Don Decker 12/7/2021 email | 1. The El Paso Basin, although included by DWR as part of 6-54, is hydraulically disconnected from the main Basin and has supported only very small groundwater pumping quantities historically and to the present. The El Paso sub-Basin is about 25% of the area of the main Basin. It is the main Basin that is being pumped and is in critical overdraft. | • As required by SGMA, the entire Basin must be included in the GSP evaluations. The El Paso Subarea has been called out in Figure 3-1.<br>• See above recommendation #1 and #2 for the TAC to be a part of developing the best method for reporting annual storage change to DWR.<br>• Production data is covered in Chapter 6 of the WY 2021 Annual Report |

| | Reviewer | Comment | Response |
|---|---|---|---|
| | | Including the El Paso sub-Basin in the Stetson sustainability assessment in the 2020 Annual Report results in a very skewed conclusion that the Basin (6-54) is a lot closer to sustainability than thought. This mistake must be corrected in the 2021 Annual Report. The repair is simple: a) discuss the El Paso Basin as an isolated sub-Basin of 6-54 with very little pumping and report its well water level results separately. b) concentrate the effort in the 2021 Report on the main Basin results that are of high interest. | |
| 47 | Don Decker 12/7/2021 email | 2. The distribution of the monitoring wells selected to represent the Basin groundwater sustainability condition is not adequate in the SW and SE areas of the main Basin. The SW area is most critical since this is the very area in the main Basin showing greatest well level declines from heavy local pumping. It is important that monitoring wells be located in the central, northern and western portions of the SW area. This is why redrilling/replacing of the "bucket well" and especially the "old Inyo" well are so important. It is also important that the Water District monitoring well on the old "balloon site" south of Inyokern be brought into the sustainability well monitoring effort. At the same time, other areas are over-sampled in the current scheme, especially the northwest area of the main Basin (north Brown RD area). I have brought these issues up many times, these comments are not new. | These data gaps should be revisited by the TAC for potential replacement. See recommendation #5 above re SW/SE data gaps.<br>Ron Garrison (driller) reviewed deepening or rehabbing the Inyo well and said that it would need to be replaced.<br>The Inyo well has nearby monitored wells 27S/39E -08A01, IWV-MW-01, and IWV-MW-02 (see graph) that show this continued decline in gwl trends.<br>  |
| 48 | Don Decker 12/7/2021 email | 3. The Thiessen polygon method provides an interpolation to map the discrete effects (well water levels) onto the full area of the Basin. However, using the method without proper well locations (as was just emphasized in 2 above) results in a skewed representation. Even with proper well locations, great care in constructing the individual polygons is required. The averaging inherent in the method is biased if the well locations are not central to their respective polygons. The existing Kern County Water Agency water level contour maps provide very useful guidance in well location and polygon construction. | See recommendation #2 above to involve the TAC in the review of the available well network/data available for evaluating the TP method, as well as determining the best methodology for estimating this sustainability measure. |
| 49 | Don Decker 12/7/2021 email | 4. There were many smaller issues I brought up in my Comment Report.<br>It is often thought that well BR-2 is located in the main Basin but it is south of the "barrier fault" and is in the El Paso sub-Basin. | Yes, USBR-2 is located in the El Paso Subarea (south of the main Basin).<br>We have updated our map figures that mislabel this fault as the El Paso fault. Fault naming will be discussed with Steve Bacon / DRI, USGS, and TAC. |

| | Reviewer | Comment | Response |
|---|---|---|---|
| | | This barrier fault has been informally called the "El Paso Fault". However, this name has been long since applied to a fault that is a splay off of the Garlock Fault, five miles to the south. This El Paso Fault strikes nearly E-W and is located at the mouth of Red Rock Canyon. The "barrier fault" was first mapped by Dutcher and Moyle, 1973 but was unnamed by them. I have suggested earlier we name the barrier fault the Freeman Fault (for nearby Freeman Canyon). I did not bring up this naming issue in my CR because it is a diversion from the main areas of concentration. I have brought up the naming conflict several times earlier and decided to do so again here. | |
| | | | |