

Disclaimer: The comments below are my personal comments. They have not been endorsed by the IWW WD. If you have questions, call me at cell: 760-793-6854.

1. The draft GSP contains a set of potential management actions and projects that are being considered to create a sustainable IWW groundwater basin. The document does not clearly demonstrate how the various actions and projects will be integrated together to accomplish the intended goal at an affordable cost. The GSP implementation plan should be updated to include a baseline set of projects and management actions that meet the overall objectives and a decision tree with appropriate branch criteria to non-baseline projects that ensures success of the GSP acknowledging the large uncertainty inherent to some projects.

1.a. Water importation is one of the higher risk projects proposed, but it is pivotal relative to the total plan. The success or failure of this project has major implications for the demands placed upon the remainder of the proposed projects or the need to add additional projects. The GSP needs to have a fall back plan available in case the imported water project does not materialize by a specified deadline or is found to be unaffordable. It is not difficult to show that both imported water projects, depending upon financing, could be well outside the financial means of many IWW residents. The GSP needs to comprehend the limited fiscal resources of many valley residents.

1.b. Conversely, if affordable financing does materialize for the imported water project, many other proposed projects could and should be deleted. While the cost of the imported water is high, the costs of many proposed projects show a very low cost to benefit ratio. Scrubbing some projects could eliminate a significant amount of capital funding, which would be better spent on the imported water project. The decision tree mentioned above should be an integral part of the project deletion strategy.

2. The public has been waiting four years to find out the financial impact of the GSA and GSP. The GSP should identify the financial impact on the various classes of water users. Since the IWW Water District is by far the largest class of residential water users, the GSP should be as specific as possible regarding WD customer impact. The GSP should also state the financial impact on Kern County and the City of Ridgecrest. The GSP should be updated to make it clear who is paying for each project.

2.a. Paragraph 5.2 introduces the concept of an 'augmentation fee'. The GSP is not clear as to how the fee is set, who pays the fee, or to what water the fee applies. GSP fees need to be clear. The GSP should be updated to provide a clear statement defining the augmentation fee and some examples showing how it is calculated for the various classes of water users for the various projects.

2.b. The GSP should discuss possible unintended consequences of all management actions and projects and provide appropriate mitigation. The entire IWW needs to be sustainable; water is only one aspect of sustainability. The GSP must document both the short term and long-term impact of the plan on our economy and quality of life. For instance, some Measure V funding will be needed for roads and police even after the anticipated water fee increases. What is the possible impact?

3. There has been a lot of controversy the last thirty or more years over potential untapped water resources in the El Paso subarea and the northwest. Paragraph 3.6.1.1 addresses a shortfall of monitoring wells in the El Paso subarea. The monitoring well shortfall is a side issue. The real issue is the potential availability of an additional water source in the El Paso subarea. The near term availability of as little as 1,000 AFY could make the difference between near term economic prosperity and economic stagnation for the IWW. Availability of 3,000 AFY of new water could totally change the overall GSP narrative. The GSP should be updated with this potential water source a priority.

3.a. As an example, one well included in the IWWGSP website, AB303-06, indicates the well water level has increased monotonically 3.3 feet according to the last four data points recorded during an eighteen month period. The last measurement point, nominally performed in Oct 2019, has yet to be

recorded. If that last measurement point also indicates raising water level, we clearly have a phenomenon that needs to be explored in the very near future. The flow model also needs to be reviewed for consistency.

4. Section 6 is supposed to include a schedule for the various projects including a timetable for expected initiation and completion (see section 5.1). The GSP is also supposed to include along with the timetable an accrual of expected benefits. Section 6.2 explains why there is a significant amount of uncertainty with the schedule, but then the GSP does provide a schedule without identifying schedule risk. The GSP should state what is being done to resolve the schedule uncertainty as well as indicate when a firm schedule will be available. The GSP should quantify the schedule risk. The GSP should also be updated to include the required timetable of accrued expected benefits.

5. Paragraph 5.1 contains a list of requirements for the GSP originating from CWC §354.44 including an **explanation of benefits** and a **description of estimated cost** for all projects and management actions. Both the benefits and the costs need to be quantified to a level that supports a clear understanding of the cost/benefit of each project or management action. The basis for the cost estimates need to be provided. The GSP needs to justify the expense of each project or management action based upon the benefit provided individually as well as the expense of the collective set of planned projects and management actions. The GSP needs to include more than a simple statement of benefits and a statement of estimated cost.

6. The GSP recycled water discussion, paragraph 5.3.2 and subsections, does not clearly define the quality of the recycled water that is being used for the various recycled water projects. Since the quality of the recycled water impacts the cost of the projects, the GSP should be updated to clearly define the required water quality for each project and the impact on cost.

6.a. The GSP should also clearly identify the quality of water needed to support the industrial water needs of Searles Valley Minerals.

6.b. Paragraph 5.3.2.1 should use the most current data for the effluent flows available for water recycling. Ridgecrest's 2018 annual SWRCB sewer report states processing of 820.2 million gallons of effluent; equal to 2,500 AF. Water production of the IWWWD is down slightly for 2019 indicating that effluent processing is also likely to be down in 2019. If the conservation project, see paragraph 5.3.3, is even a little successful, the future could see available effluent below 2,400 AF. A serious conservation project could create modest reductions in both groundwater production and WWTF effluent for several years. The GSP should be updated using current data.

6.c. The GSP recycled water discussion does not address seasonal versus non-seasonal use. A major benefit of recycled water use is a major reduction in the needed evaporation pond capacity. We need a year round market for the recycled water. The GSP should be updated to address this issue.

7. Paragraph 5.3.2.4 states the City's new WWTF includes a new tertiary treatment facility, and therefore the GSP does not include the cost of a tertiary treatment facility. The City's latest WWTF design document, Provost and Pritchard, dated October 2015, does NOT include a tertiary component in the baseline design. It does, however, include a recommendation for new evaporation/percolation ponds to accommodate the expected future increase in effluent. The tertiary discussion in the P&P report is limited to future growth options. The GSP should be updated using the correct assumptions.

7.a. Paragraph 2.7.5.3 indicates the City WWTF site contains 4 evaporation/percolation ponds. According to the latest WWTF report, P&P, dated 2015, the City WWTF includes 11 ponds at the NAWS site and 4 more ponds at the old City site. Many of the total 15 evaporation/percolation ponds would not be needed if the effluent were recycled. New ponds would certainly not be needed; thus creating a corresponding cost savings.

8. Paragraph 5.3.2 is entitled: Project No. 2: Optimize Use of Recycled Water. Optimization can

mean many different things. The performance index used for the optimization needs to be well defined. That is, what was the logic used? What are the set of pros and the set of cons that established the allocation? As a minimum, the GSP should be updated to provide a cost/benefit analysis for each recycled water project and the rationale for the allocation of recycled water.

8.a. Figures 5.3, 5.4, and 5.5 show the location of the recycled water source being at the Navy sewage site. The City of Ridgecrest has not yet selected the site for the new wastewater treatment plant. The two options are the Navy site and the older City site. Not including both options in the trade study may well skew the results.

8.b. The recycled water generated by the wastewater treatment plant is the property of the wastewater fund, an enterprise fund. The recycled water is a commodity that should be sold to defray the cost of the wastewater treatment. That commodity cost does not appear to be included in any of the GSP cost analysis. The analysis needs to be updated appropriately.

8.c. Recycled Water Subproject 1 is for landscape irrigation of Ridgecrest and China Lake. Assuming a thirty-year loan for the capital expense at 2% interest, the yearly cost of the project is \$2,295,811. Based upon the latest "Sustainable Yield Allocation" chart the City pumps either 115 AFY or 339 AFY of groundwater. Assuming 115 AFY of pumped groundwater, the cost of reducing ground pumping one AFY is \$19,964. Assuming 339 AFY of pumped groundwater, the cost of reducing ground pumping one AFY is \$6,772. Both numbers appear to be a nonstarter. Has the City agreed to fund the over two million dollars per year? If the City does not pay for the City's recycled water project, who is going to pay? The same questions need to be answered for Cerro Coso's recycled water.

8.c.1. The GSP discussion indicates that a portion of the recycled landscape water is to be used by the Navy. Has the Navy committed to sharing the cost of the project?

8.c.2. The GSP (see page 5-25) states the combined irrigation needs of the City and the Navy is 930 AFY with the large majority of the irrigation occurring in the City. This disagrees with the latest Sustainable Yield Allocation that has a maximum City allocation of 339 AFY and current usage of 115 AFY. There is a major disconnect somewhere. The numbers are not consistent. The Stetson recycled water report dated July 2018 indicates the City has 53.4 acres of landscape area requiring 416.5 AFY of water. The GSP needs to be updated to make all assumptions logical, clear and consistent.

8.d. Recycled Water Subproject 2 is for groundwater recharge. Assuming a thirty-year loan for the capital expense at 2% interest, the yearly cost of the project is \$1,493,544. The cost of this 352 AFY alternate water supply is \$4,243 per acre-foot. Comparing that cost with the cost of importing water, the feasibility of this effort needs to be questioned. If less than 352 AFY is available, the cost escalates dramatically.

8.d.1. It appears one reason for the high cost of the groundwater recharge is the small quantity of water being recharged. Since no information is given for the basis of the cost estimate, it is impossible to identify cost drivers. The analysis should be updated looking parametrically at capacities of 1000, 1500, 2000, and 2500 AFY, and it should base the calculations on using both the Navy WWTF site and the older City WWTF site.

8.d.2. My calculations show availability of roughly 2,200 to 2,400 AFY of recycled wastewater that could be recharged. The most recent Sustainable Yield Allocation shows the IWWWD needs 2,046 AFY water augmentation. It is pretty obvious that the first 2,100 AFY of recycled water should be dedicated to augmenting the WD water supply. This is a simple matter of beneficial use priority.

9. The draft GSP (see page 5-14) relies on a prior imported water study (see appendix 5-B) to justify the assumed 5,000 AFY of required imported water. However, the study does not account for

pumpers pumping more water than allocated if they pay the augmentation fee, which leaves the actual required amount of alternate water supply unknown. The prior water study does not account for ET, which can be thousands of AFY. The prior study was not clear regarding growth in the valley. Last, the numbers presented in the prior study are not consistent with the numbers in the latest Sustainable Yield Allocation Chart. The alternate water requirement should be updated to account for possible additional over allocation water pumping, ET, and planned residential and industrial growth.

9.a. The draft GSP does not discuss potential synergism between the imported water project and deep well recycled water project. The AVEK water supply is presumably direct use water; but years where additional water is available at good rates it might be beneficial to store extra water in an injection well. The LADWP water supply would presumably be a recharge effort. However, the water could be treated and injected into a recharge well. Alternately, the water from the recycled effort could be spread with the LADWP water. The recycled water would presumably require less treatment. There may not be synergism that can be exploited, but the GSP should explain the various issues.

10. Paragraph 5.3.3.1 states the GA will encourage additional voluntary and rebate-based conservation efforts for domestic beneficial uses. The entire valley has been encouraged for the last ten years to conserve water. That effort has been very successful with one segment of the local residents. Unfortunately, voluntary conservation has been very unsuccessful with other local residents. The current year WD water production appears to show a slight decrease, but we may be close to the limit of what can be attained by voluntary conservation.

10.a. The State is currently formulating mandatory conservation ordinances. Indoor water usage regulations are already formulated. Outdoor water regulations are in process. The GA should be able to use available information to form an estimate of water savings due to State mandate. The GSP should be updated to have a conservation goal, voluntary or otherwise. If conservation is going to be included in the projected accrual of reduced pumping, there needs to be a goal.

10.b. Water purveyors' fee structure can have a major role encouraging water conservation. The laws of supply and demand will always apply. This needs to be addressed in the GSP. The GSP should quantitatively describe how each of the primary water purveyors, including the larger mutuals, encourages conservation via their water fee structure.

10.c. The impact of fees paid by both de minimis and non de minimis well owners also needs to be discussed relative to conservation.

11. Paragraph 5.3.6.1, page 5-46, indicates the pumping optimization will be performed to minimize localized declining water levels. According to paragraph 3.3.4.3, page 3-22, the current ET is 4,850 AFY or 63% of our entire recharge. ET is wasted water. Reducing the ET would reduce outflows, which is critical to the overall water budget. The pumping optimization project needs to redistribute water pumping to both minimize localized declining water levels and reduce ET. The GSP should be updated to address both aspects of pumping optimization and include an ET goal. The GSP should also provide a quantitative cost benefit justification for the twenty-three million dollar capital expense.

12. Paragraph 5.4.2, Direct Potable Reuse Project, gives the impression that Direct Potable Reuse is a futuristic concept that is not compatible with the IWV timetable. We need to be sustainable by 2040, more than 20 years from now. DPR is a State priority, which is being vigorously pursued by the SWRCB. It is logical to expect the State to make both grants and low cost loans readily available for DPR. DPR needs to be a priority. We need to consider the synergism and compatibility of initial projects with future integration with a DPR strategy. The GSP should describe appropriate synergism between the currently proposed recycled water projects and a future DPR strategy.