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# DRAFT MEMORANDUM

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| **Date:** | June 4, 2021 |
| **To:** | Cameron Tana, Montgomery & Associates |
| **From:** | Greg Kamman, cbec eco engineering |
| **Project:** | 20-1044 |
| **Subject:** | Summary of Agency Meetings on ISW TMs and SMC<br>Basin Management Plan: Groundwater Sustainability Update 2022 (GSU22) |

This memorandum presents a summary of key issues and outcomes discussed during two recent meetings with resource agency staff regarding technical findings and proposed sustainable management criteria (SMC) for interconnected surface water (ISW) in the Pajaro Valley Subbasin (Basin). The video conference meetings, held on May 21, 2021 and June 1, 2021, were in response to:

- NOAA's National Marine Fisheries Service's (NMFS) comment letter received 5/12/21 (dated 3/8/21) on cbec's Pajaro Valley Technical Memorandum on subject "Quantify Depletions of Interconnected Surface Waters" (ISW TM; dated 1/8/21);
- cbec's TM response (dated 5/15/21) to the NMFS comment letter on ISW; and
- cbec's Interconnected Surface Water Technical Memorandum on subject "Sustainability Management Criteria for Depletions of Interconnected Surface Waters" (SMC TM, dated 5/7/21).

Both meetings included staff and representatives of the following agencies: NOAA NMFS, California Department of Fish and Wildlife (CDFW), California Department of Water Resources (DWR), and PV Water. The full list of attendees is provided below. The key issues and outcomes from the meetings are presented below and a summary of the revised proposal for ISW SMC based on the meeting outcomes is presented first. This GSU22 Committee will consider this revised proposal at its June 10, 2021 meeting for recommendation to the PV Water Board.

## 1. SUMMARY OF REVISED PROPOSAL FOR SUSTAINABLE MANAGEMENT CRITERIA OF DEPLETIONS OF INTERCONNECTED SURFACE WATERS

The following paragraphs summarize sustainable management criteria (SMC) for depletions of interconnected surface waters (ISW) in the Pajaro Valley Subbasin (Pajaro Valley Basin or Basin). The development process and rationale for each of the SMC components is provided in the SMC TM. The SMC TM also describes representative monitoring points and proposed values for measurable objectives.

**Statement of Significant and Unreasonable Conditions**
The proposed statement of significant and unreasonable conditions for depletions of interconnected surface waters is:

> *Significant and unreasonable depletions of interconnected surface waters occur when pumping groundwater in the Aromas aquifer causes depletions of interconnected surface waters greater than what occurred during Water Years 2000-2015 in surface waters typically interconnected with groundwater in the Aromas aquifer during Water Years 2000-2015.*

This statement is designed to be protective of beneficial uses of surface water that occurred from Water Years 2000-2015.

**Minimum Thresholds**
Based on the best available information described in *Quantify Depletions of Interconnected Surface Waters, Basin Management Plan: Groundwater Sustainability Update 2022 (GSU22)* dated January 8, 2021, surface water in the Basin is minimally connected with groundwater in the Aromas aquifer from 2000-2015. As there is no currently known potential for significant and unreasonable conditions in the Basin for ISW, there is no need to define minimum thresholds for depletion of ISW.

**Undesirable Results**
As there is no currently known potential for significant and unreasonable conditions for ISW in the Basin for ISW, there is no need to define undesirable results for depletion of ISW.

**Measurable Objectives**
Measurable objectives are equal to the adjacent channel bed elevations to increase the frequency and duration of ISW between the Aromas aquifer and surface water in the Basin where reasonably achievable.

## 2. KEY ISSUES AND OUTCOMES FROM MEETINGS WITH AGENCIES

The key issues and outcomes from the 5/21/21 and 6/1/21 meetings with NMFS, CDFW, and DWR are presented below.

1. The main topic of discussion during the 5/21/21 meeting centered on explaining why empirical monitoring data was used in cbec's assessment of the location and timing of ISW conditions and not the Pajaro Valley Hydrologic Model (PVHM, Hanson et al., 2014). PV Water representatives explained that groundwater level and stream flow monitoring data provided the best available

information to complete this task as it provided suitable coverage of the basin and represented real-time conditions. The USGS developed the PVHM using the MODFLOW code, which is designed to simulate the flow of saturated groundwater. The model integrated both the streamflow routing and farm process packages to account for surface water and groundwater interactions. As described below, the model does a good job at simulating hydrologic conditions over large areas and long periods of time, but it is not as accurate at simulating conditions within smaller areas and over shorter time scales. For example, there are limitations in the time-step resolution of the model in capturing short-lived high stream flow conditions that promote possible hydraulic connection between groundwater and surface water. Although accurate and useful in estimating surface water contributions to the groundwater budget, the model is not currently set up to capture the more short-lived (episodic) hydraulic connections that drive ISW where and when it potentially occurs in the Basin.

2. During both meetings, it was clarified that future and expanded monitoring by PV Water of groundwater in both the upper alluvial aquifer and the Aromas as the principal aquifer would be completed to continue to evaluate direct and indirect hydraulic connection between the Aromas and surface waters. This is consistent with the recommendation in NMFS 3/8/21 comment letter.

3. During the 6/1/21 meeting, NMFS staff noted that the analysis of ISW conditions emphasized identifying interconnection of surface water with the Aromas, the principal aquifer for the Basin, although ISW typically occurs via the alluvium. NMFS staff acknowledged that the ISW SMC did evaluate interconnection via the alluvium and emphasized importance of additional evaluation as planned by PV Water, but asked questions related to definition and treatment of principal aquifers under SGMA. DWR staff's response to these questions is summarized as follows.
    a. The Groundwater Sustainability Agency (GSA) makes the determination of the principal aquifer that is the focus of management under SGMA
    b. Shallow alluvial aquifers are typically not considered "principal aquifers" in Groundwater Sustainability Plans (GSPs) submitted to date.
    c. The GSA can make the determination that there is a need to address the shallow alluvial aquifer (non-principal aquifer) if an evaluation reveals there is a potential indirect hydraulic connection between the principal aquifer and surface water via intervening alluvium.
    d. SMC are set for the principal aquifer and don't strictly apply to non-principal aquifers, but other units and hydraulics need to be evaluated, as described above.

4. NMFS asked the question about how much pumping occurs from the shallow alluvial aquifer in the Basin and whether it could be considered a principal aquifer. DWR staff responded that it was up to the GSA to determine how pumping and management of the principal aquifer is impacting other aquifers and beneficial uses. PV Water representatives cited Figure 41 in the USGS Integrated Hydrologic Model report (Hanson et al., 2014) in determination of the principal aquifer, which indicates the percent total pumpage from the alluvium is approximately 20-25% in the Pajaro Valley, while total pumping from the Aromas is between 60-70%.

5. With regard to the findings of the ISW TM that best available information indicates limited ISW in the Basin and very low potential for depletion of ISW from pumping in the Aromas, DWR staff described a 3-step process for ISW assessment:
    a. Identify where connectivity is occurring
    b. Quantify depletion rates
    c. Identify data gaps where there is uncertainty on hydraulic connectivity between principal aquifer and surface water (both directly and indirectly).

    DWR staff indicated that the ISW TM adequately completed the first two steps but reiterated the need for a monitoring plan that addresses data gaps and further substantiates the findings.

6. Acknowledging that ISW conditions only occur in winter, NMFS staff asked the question, could the effects of summertime depletions carryover into winter and have an adverse impact on the establishment of ISW conditions? PV Water representatives responded that the establishment of ISW conditions result from stream water infiltration and recharge during wet season high stream flow events. In addition, groundwater level trends throughout the basin indicate a long-term rise in both the winter highs and summer lows in response to management actions of the past 20-years, regardless of water year type. Thus, the thickness of the unsaturated zone beneath surface waters required to become saturated to set up ISW conditions during high stream flow events is being reduced. This trend of rising groundwater levels is protective of the adverse impacts to ISW associated with carryover storage.

7. PV Water representatives summarized the SMC TM by stating that because ISW TM findings indicate there is limited ISW in the Basin and very low potential for depletion of ISW from pumping in the Aromas, there is no need to define minimum thresholds (MT) and undesirable results (UR). However, PV Water desires to set goals to improve conditions by increasing ISW where reasonably achievable through establishing measurable objectives (MO). Emphasizing this may need to change in the future based on new information collected in a monitoring plan

that addresses data gaps, DWR staff indicated that this approach is appropriate, but provided the following comments.

a. In its Alternative submittal approved by DWR, PV Water described MT for depletion by pumping of interconnected surface water at 2015 conditions and depletion in excess of 2015 depletion as UR.
b. The SMC TM proposed a statement of significant and unreasonable conditions that concluded "there is no potential for significant and unreasonable depletions of ISW from pumping groundwater in the Aromas aquifer." Based on the possibility that future monitoring could change this conclusion, DWR suggested revising the proposed qualitative statement of significant and unreasonable conditions to be more consistent with the Alternative submittal and justify how SMC will be protective of beneficial uses.

8. DWR and CDFW staff expressed concern with using 2015 to establish baseline conditions because that year was during a multi-year drought. PV Water representatives agreed with the concern and pointed out that the findings of limited ISW represent a multi-decade condition prior to 2015 and continuing to this date. The proposed ISW SMC are not based on conditions specific to 2015 or drought years in general.

9. PV Water representatives explained the proposed statement of significant and unreasonable conditions by reiterating that there is virtually no hydraulic connection between groundwater and surface water and therefore no current depletions of surface water. However, if PV Water basin management actions lead to increased/improved ISW, future depletions of ISW by pumping could occur. Under these circumstances, there is a concern that even though there are no depletions now, future depletions (due to improved ISW conditions) would be considered an undesirable result and risk leading to intervention by the state.
    a. DWR staff clarified that there would be discussion, analysis and negotiation of the specific situation before state intervention is implemented.
    b. DWR staff commented that if conditions are improving, the risk of UR occurring should be low if the suggested change to qualitative significant and unreasonable conditions based on 2015 or current conditions is made.

10. PV Water consultants agreed to revise the qualitative statement of significant and unreasonable conditions but will make clear that future depletions of increased/improved ISW would not be significant and unreasonable. This revision is included in the summary of the revised proposal for ISW SMC provided prior to the meeting summary items (Section 1, above).

11. When queried about the suitability of ISW SMC measurable objectives (MO) designed to monitor increased ISW, NMFS staff stated it was a good approach and they support actions that improve ISW conditions. They also indicated that SMC are "fluid" throughout the GSP process and the collection and analysis of additional data may require changes to SMCs. CDFW staff agreed with NMFS and stated they wanted to see how future data will be used in long-term reevaluation of SMC. DWR staff elaborated that they want to see a narrative justifying an approach for filling data gaps and how SMC would be reevaluated based on future findings.

12. The 6/1/21 meeting ended acknowledging that both meetings were very helpful and productive, continued collaboration is desired by all, and another would be set in late July to discuss data gaps and monitoring plan development.

13. Meeting participants included the following. Except where otherwise indicated, participants attended both meetings.

    a. Rick Rogers, Andres Ticlavilca, Joel Casagrande – NMFS
    b. Jessie Maxfield, Angela Murvine (5/21/21 only) - CDFW
    c. Andrew Renshaw, Amanda Peisch-Derby (5/21/21 only) – DWR
    d. Brian Lockwood, Casey Meusel – PV Water
    e. Cameron Tana, Montgomery & Associates (PV Water consultant)
    f. Greg Kamman, cbec, inc. (PV Water consultant)



## 3. REFERENCES

Hanson, R.T., Schmid, Wolfgang, Faunt, C.C., Lear, Jonathan, and Lockwood, Brian, 2014, Integrated hydrologic model of Pajaro Valley, Santa Cruz and Monterey Counties, California: U.S. Geological Survey Scientific Investigations Report 2014–5111, 166 p., http://dx.doi.org/10.3133/sir20145111.