Revisit Approach for Developing Undesirable Results for Degraded Groundwater Quality and

Proposed Minimum Thresholds and Undesirable Results for Chronic Lowering of Groundwater Levels

> Presented by Georgina King, Montgomery & Associates Santa Margarita Groundwater Agency September 24, 2020

1







These are Best Management Practices that has DWR has provided to help guide Sustainable Management Criteria development



These are considerations discussed at previous Board meetings or provided in emails after previous Board meetings. These have been used to guide development of the degraded groundwater quality undesirable results.



At the last meeting, the board discussed potential use of moving averages to quantify undesirable results.

However, recent DWR input does not recommended using moving averages to determine Undesirable Results.

Therefore a new approach needs to be considered



Undesirable results only occur if caused by projects and management actions, therefore if preexisting exceedances of MT have occurred at a RMP, future exceedances will not constitute an undesirable result. Potential for this to occur is low, rigorous water quality studies (EIR) are required prior to PMA implementation



Undesirable results only occur if caused by projects and management actions, therefore if preexisting exceedances of MT have occurred at a RMP, future exceedances will not constitute an undesirable result. Potential for this to occur is low, rigorous water quality studies (EIR) are required prior to PMA implementation



New Example Undesirable Results for Degraded Groundwater Quality Undesirable results occur if exceedances of minimum thresholds occur at Representative Monitoring Points where:

- Minimum Thresholds have not been exceeded prior to PMAs,
- An immediate resampling confirms the exceedance, and
- The exceedance is caused by a PMA

10

Based on the new approach this is an example of what the criteria are for defining an undesirable result





Presented in Approach fo	n May 2020 or Setting Minim	um Thresholds	
Chemical Constituent	Standard	Minimum Threshold / Drinking Water Standard	
TDS	Secondary	1,000 mg/L	
Chloride	Secondary	250 mg/L	
Nitrate and N	< Primary of 10 mg/L	3 mg/L	
Arsenic	Primary	0.01 mg/L	
MTBE	Primary	0.013 mg/L	
PCE	Primary	0.005 mg/L	
TCE	Primary	0.005 mg/L	
cis-1,2-DCE	Primary	0.07 mg/L	
Chlorobenzene	Primary	0.07 mg/L	
			13

In an effort to meet the San Lorenzo River TMDL, in May 2020 we initially recommended using 3 mg/L as the nitrate as N Minimum Threshold instead of the drinking water standard of 10 mg/L.

## Reasons for Having a Nitrate Minimum Threshold Less than the Drinking Water Standard

- Setting Nitrate as N Minimum Threshold at drinking water standard of 10 mg/L will allow nitrate concentrations in groundwater to increase from where they are now (generally < 3 mg/L)</p>
- Even at a concentration of <3 mg/L throughout the Basin, nitrate concentrations in the San Lorenzo River exceed the Total Maximum Daily Load (TMDL)
- Difference between TMDL and drinking water standard
- Balance Hydrologics work on the San Lorenzo River shows increased nitrate in the river starting where the Santa Margarita aquifer first contributes flow downstream of Love Creek
- Cannot have projects and management actions introduce new water into the Basin that will prevent the nitrate TMDL from being achieved









Discussion at previous meetings supported two approaches to preliminary MT- the absolute minimum of all observations at a well, and the average of the 5 lowest measurements. The first approach sometimes requires exclusion of outlier data points, while the second accounts for all data.



The MT lines drawn horizontally on this hydrograph are based on the methodology presented earlier. Sometimes the minimum point on the hydrograph might be a bad measurement. This is an extraction well and not a MW so sometimes the GWL measured is a recovering level and not a static level. However if we use the average of the 5 lowest measurements, the minimum threshold appears more representative of next lowest elevations at that well.



Monthly data provides for more data to plot on the hydrograph. The absolute minimum is corroborated by the average of the 5 lowest levels



The probably erroneous minimum levels is excluded when averaging the lowest 5 measurements



The possible erroneous levels at the start of monitoring are averaged out by averaging the 5 lowest levels. Proposed Minimum Threshold is 12 feet lower than existing levels.





SMC BMP definition of Undesirable Results for Chronic Lowering of Groundwater Levels Chronic lowering of groundwater levels indicating a significant and unreasonable depletion of supply <u>if continued</u> over the planning and implementation horizon.

Overdraft during a period of drought is not sufficient to establish a chronic lowering of groundwater levels if extractions and groundwater recharge are managed as necessary to ensure that reductions in groundwater levels or storage during a period of drought are offset by increases in groundwater levels or storage during other periods.

The Lompico aquifer has groundwater in storage even though some of its storage has been depleted. If groundwater levels fall more than they have historically in the Basin (ie. below minimum thresholds), some wells will need to be deepened since the aquifer still has groundwater in storage. Although there is effectively depletion of supply, there is still groundwater in storage that can be used but there will be a cost to upgrade/replace wells to extract the deeper water. This depletion of supply has to be weighed against the statement of Significant and Unreasonable as being: significant and unreasonable chronic lowering of groundwater levels occurs if lowered levels materially impair groundwater supply or cause undue financial burden for a significant number of the Basin's beneficial users or uses.



This slide shows how it is possible to have levels below the minimum threshold before 2042 since DWR has allowed 20 years to achieve sustainability. After 2042, groundwater levels that fall below the minimum threshold are officially undesirable results, except if that happens in response to a declared drought. The predictive model will include periods of extended drought that should stress the basin to give us a good idea of how the basin responds to drought with respect to the minimum thresholds.



- Absolute minimum level (no flexibility)
- 2. Average monthly level (more flexibility)
  - If only one measurement per month this is the only level
  - If a data logger is installed, more frequent measurements can be averaged
- Moving average over several years not recommended
- Many other Basins define Undesirable Results as up to 30% of Representative Monitoring Points exceed their Minimum Threshold for more than 2 consecutive years

