Salinas Valley Basin GSA

SMC Update & Additional Data

Presented to Forebay Subbasin Committee
November 4, 2020

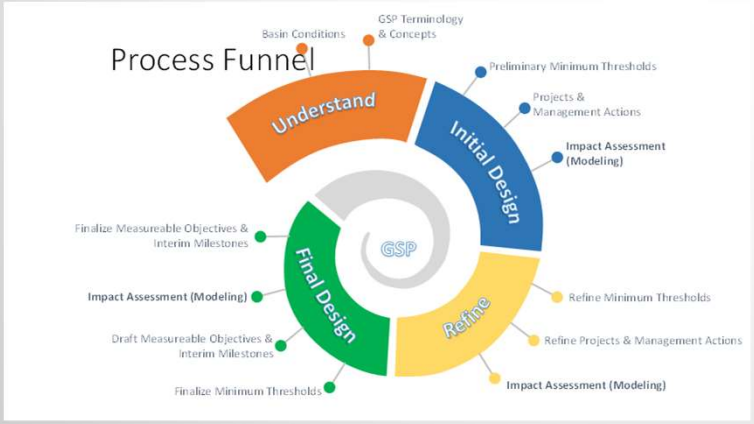
Prepared by

MONTGOMERY & ASSOCIATES

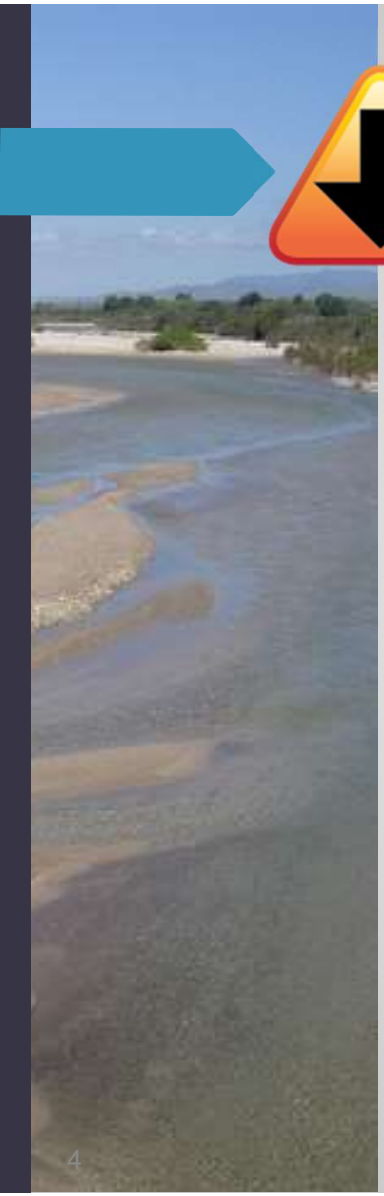
SMC Update

Process

- July 5 Subbasin Committee Meeting – received overview of SMCs in the Monterey Subbasin
- July 28 workshop – provided greater detail on SMC terminology and concepts
- Sept 2 Subbasin Committee Meeting – discussed and gave direction on SMCs in the Monterey GSP
- Sept/Oct – SVBGSA and MCWD worked jointly on SMCs
- Nov 4 Subbasin Committee Meeting – received SMC update and discussed SMC options
- Nov 4 – receive draft SMC chapter



Opinions/guidance will be included in boxes

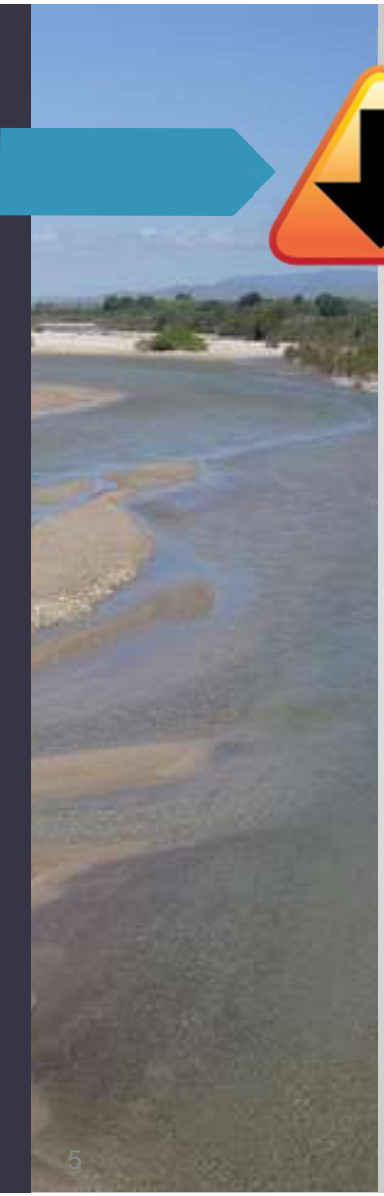


Groundwater Levels
as previously discussed

Subbasin Committee Selected:

Some combination of the following:

- Groundwater elevations in a certain year were significant and unreasonable.
  Minimum threshold = groundwater levels in that year
- Impacting shallow domestic wells is significant and unreasonable.
  Minimum threshold = most shallow domestic wells must have adequate water for operation



Groundwater Levels
latest progress with ASGSA

Metric: Groundwater elevations in representative monitoring wells

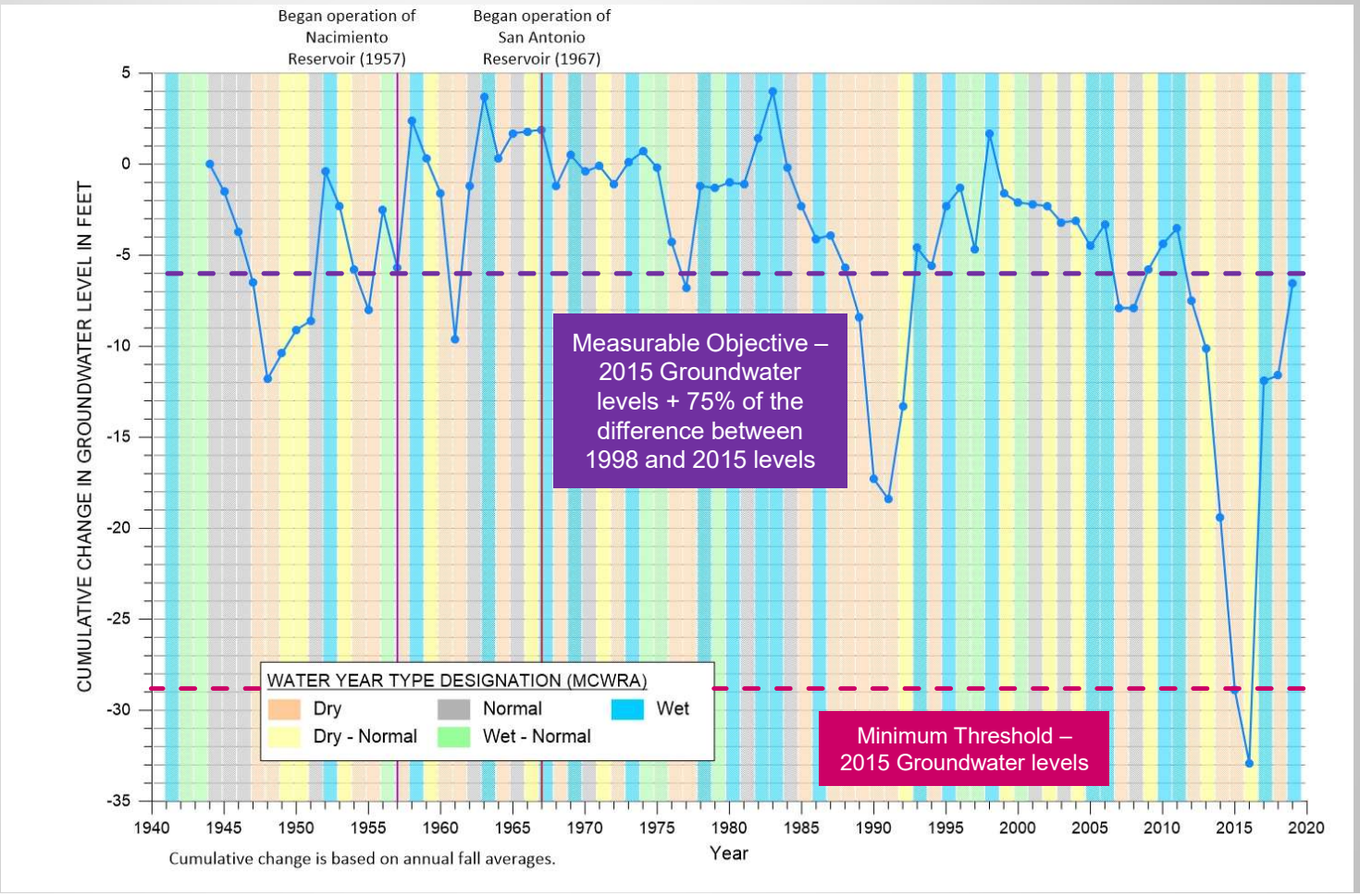
This change chooses a year for the MT groundwater level, regardless of impact on shallow domestic wells.

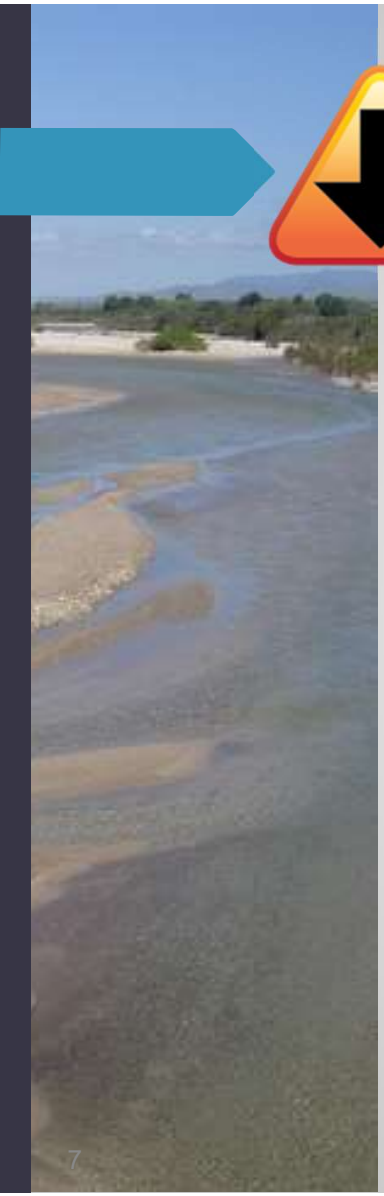
***MT*:** December 2015 groundwater levels

***MO*:** 2015 groundwater elevations plus 75% of the difference between the 2015 groundwater elevation and the 1998 groundwater elevations. (The 1998 groundwater levels are considered the highest reasonable groundwater elevations.)

Undesirable Results:
Qualitatively, can include increased pumping cost, reduced well output, the pump breaking suction, and corrosion of the well screen.
Quantitatively, when 15% of the MTs are exceeded in any one year.

Groundwater Levels

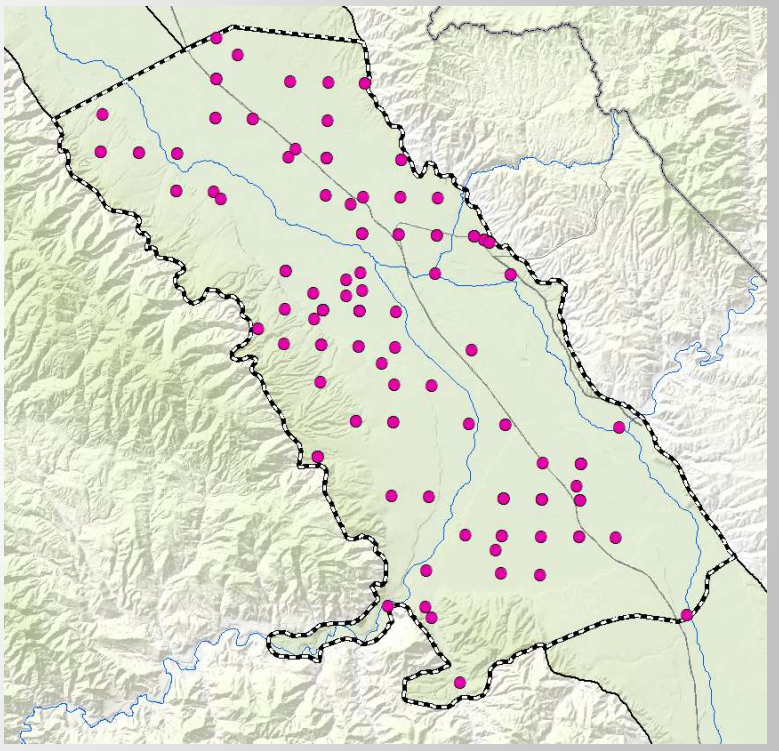


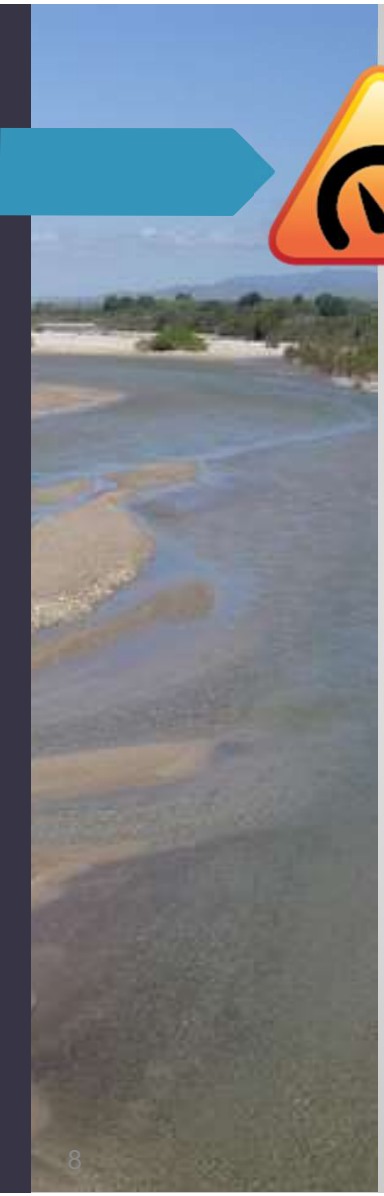


Groundwater Levels

- Based on 2015 groundwater elevations
- Very dependent on location of wells
- Most wells are set as the centroid of the section

Impacted Domestic Wells (with 25 ft buffer)	31
Total Wells	149
Percentage	21%



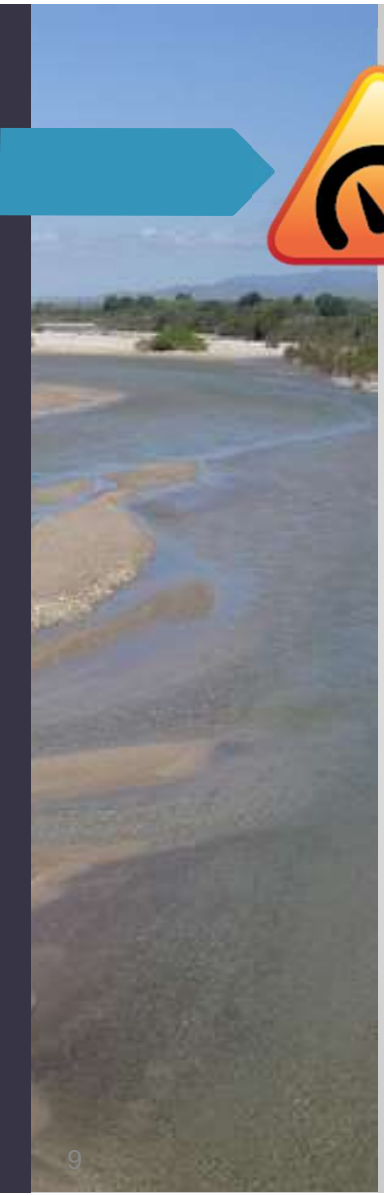


Groundwater Storage
as previously discussed

Subbasin Committee Selected:

- Pumping in excess of the sustainable yield* is significant and unreasonable.
- Minimum Threshold = Measurable Objective
  = pump within the sustainable yield*

** An initial estimate of sustainable yield will be refined with better data.*



Groundwater Storage
latest progress with ASGSA

Metric – Calculate groundwater storage based on groundwater elevations

Minimum Threshold (MT) **-** The amount of groundwater in storage when groundwater elevations are at their MTs.

- *Recognizing the storage fluctuates from year to year, additionally requires no long-term (e.g. 30-year) net decrease in storage.*
- *Implicitly requires that long-term average pumping in the Subbasin shall not exceed the sustainable yield.*
- *Initial estimate of sustainable yield should be based on model simulations that include climate change but not growth or changes in land use. The GSP shall clearly state that this is only an initial estimate of sustainable yield, and this estimate will be refined during GSP implementation.*

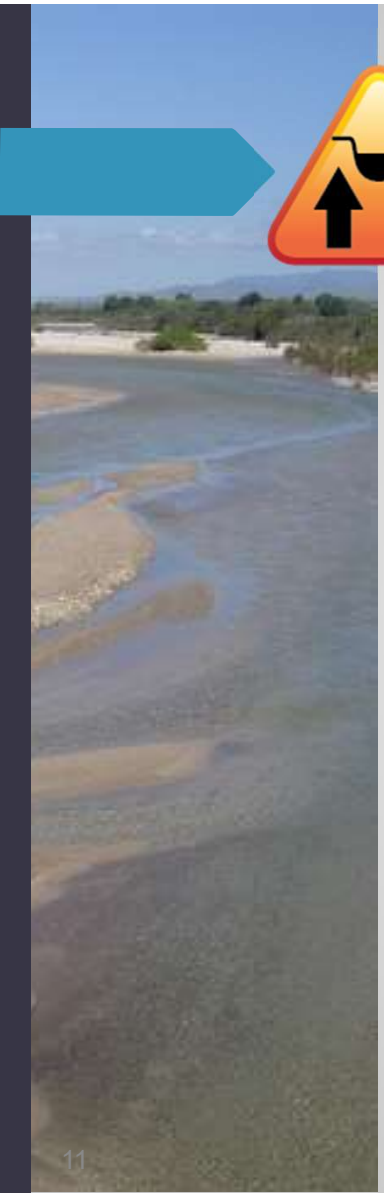
Measurable Objective (MO) **-** The amount of groundwater in storage when groundwater elevations are at their MOs. That amount is defined by the surplus beyond the MT that would be sufficient to provide water during a significant but plausible, multi-year drought.

Undesirable Results – Qualitatively is not having enough groundwater available during a drought to meet beneficial uses without drawing water levels down to below their MTs. Quantitatively defined as when more than 15% of the representative monitoring wells have water levels below their MTs in December of any year.

Reduction in Groundwater Storage - Metrics

- **PUMPING**
- Cons:
  - Not favored by ASGSA consultant
- Pros:
  - Simple, easy for annual report
  - Can be used to control pumping

- **CALCULATED BASED ON GROUNDWATER ELEVATIONS**
- Cons:
  - Doesn't control pumping
  - Time-consuming calculation for annual reports
- Pros:
  - Can interpolate groundwater elevation contours between monitoring wells

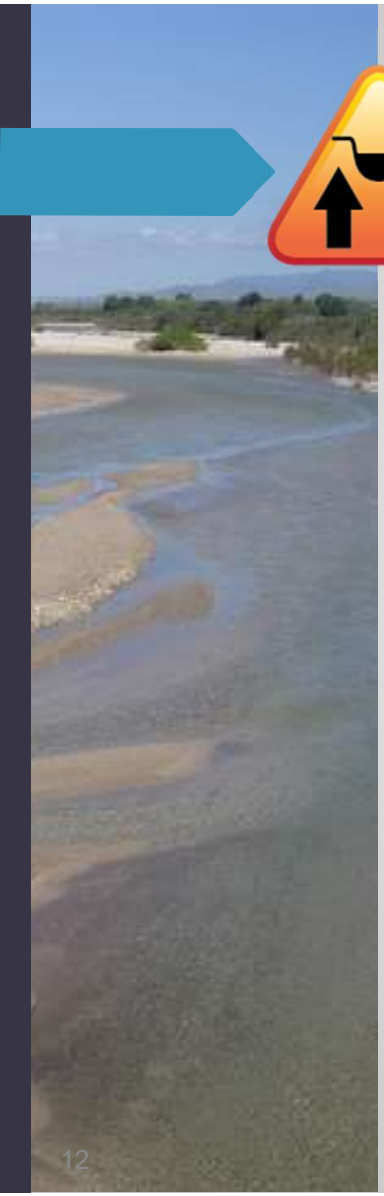


Interconnected Surface Water

as previously discussed

Subbasin Committee Selected:

- The current rate of surface water depletion is not unreasonable (although it may be significant).
- Minimum Threshold = Measurable Objective
  = today's simulated rate of depletion, or
  today's shallow groundwater levels



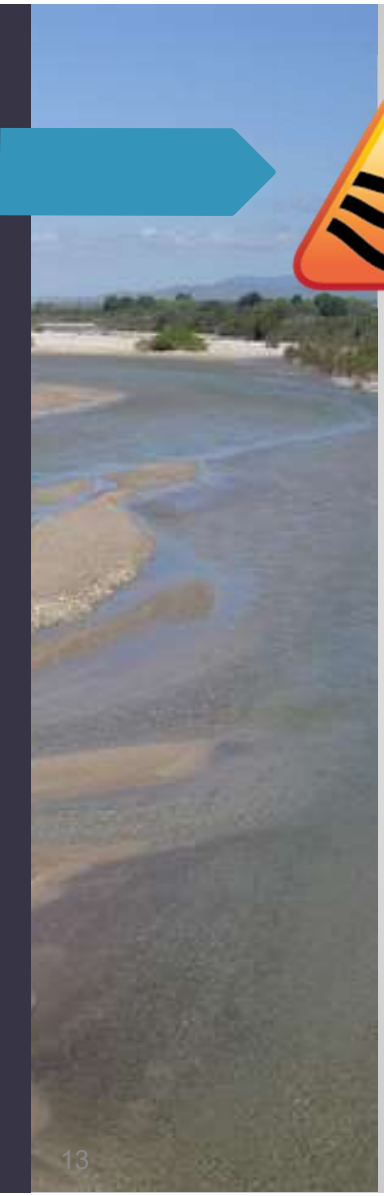
Interconnected Surface Water
latest progress with ASGSA

Metric: shallow groundwater elevations in shallow wells adjacent to interconnected surface water bodies as a proxy for depletion rates.

***MTs*:** December 2015 groundwater elevations in shallow monitoring wells near river reaches that are hydraulically connected to groundwater at least some of the time. MTs for shallow monitoring wells newer than 2015 will be estimated by either correlation with other wells or from groundwater model results.

***MOs*:** groundwater levels that are 75% of the distance between the 2015 and 1998 water levels. Although the relationship between GDE health and water level is not necessarily linear, lower depletion and greater in-stream flow generally improves GDE health.

Undesirable Results: Qualitatively includes decreased groundwater recharge from river percolation along downstream reaches, decreased availability of surface flow for diversion at downstream locations, reduced extent or decreased vigor of riparian vegetation, and decreased populations of aquatic and riparian animals that rely on groundwater-derived base flow.
Quantitatively, when greater than a specified percentage of representative water-level monitoring wells have water levels below the MT in December of any year. It would be reasonable to use the same percentage that was selected for the water-level undesirable results.



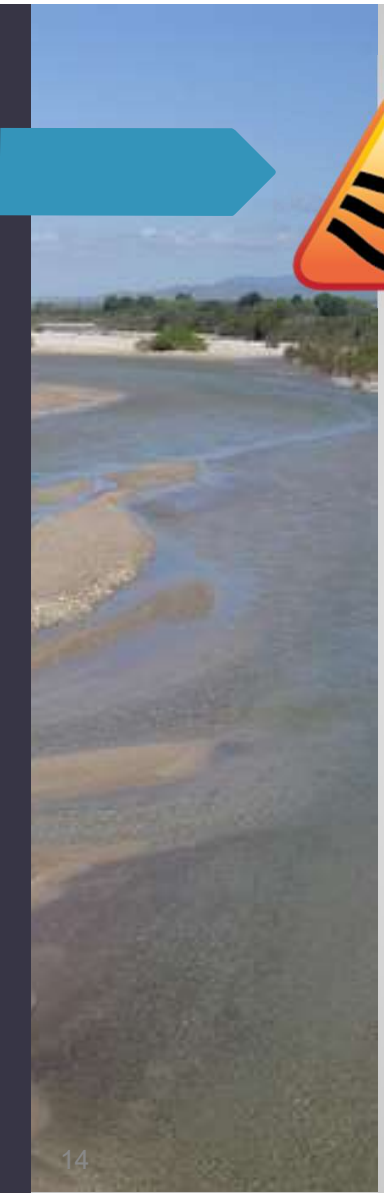
Land Subsidence

as previously discussed

Subbasin Committee Selected:

Any subsidence anywhere in the Subbasin is significant and unreasonable

- Minimum threshold = 0 subsidence (+/- 0.1ft InSAR data)
- Measurable Objective = 0 subsidence (+/- 0.1ft InSAR data)



Land Subsidence
latest progress with ASGSA

Metric **-** InSAR data

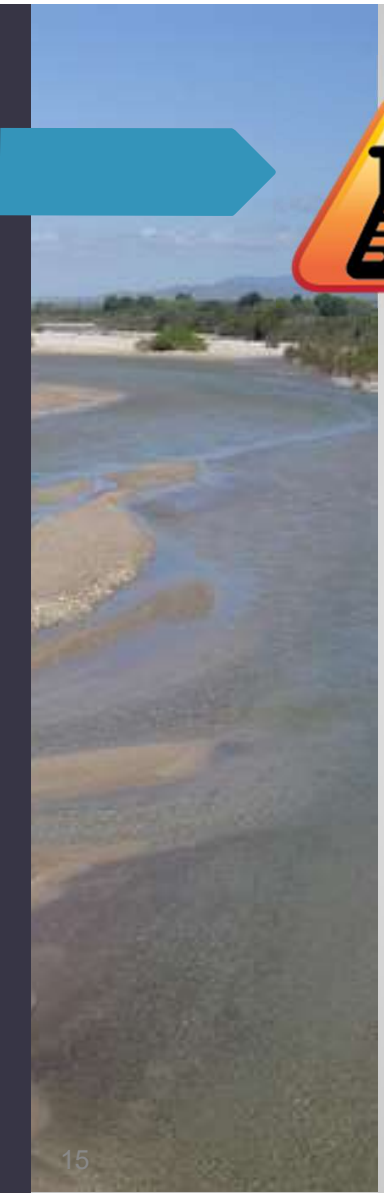
MT- the annual rate of subsidence that results based on less than one foot of cumulative subsidence over the planning and implementation horizon, and accommodates potential measurement error

MO **-** Two options :

- Zero cumulative subsidence over the 50-year planning and implementation horizon. This would clearly be desirable.
- Less than 1 foot of cumulative subsidence over the 50-year planning and implementation horizon. This option recognizes that inelastic subsidence is not reversible. If a small amount occurred at some point, it thereafter be impossible to achieve a measurable objective of zero cumulative subsidence.

Undesirable Results

- Only subsidence associated with lowered groundwater levels
- Qualitatively, loss of canal and drainage ditch capacity due to overflowing, increased flooding extent and duration near stream channels, reduced or reversed slopes in sewers, storm drains and other gravity flow pipelines, degradation of leveling in laser-leveled fields, and damage to well casings due to compaction of subsurface clay layers.
- Quantitatively, when subsidence caused by groundwater elevation declines exceed the MTs defined above.



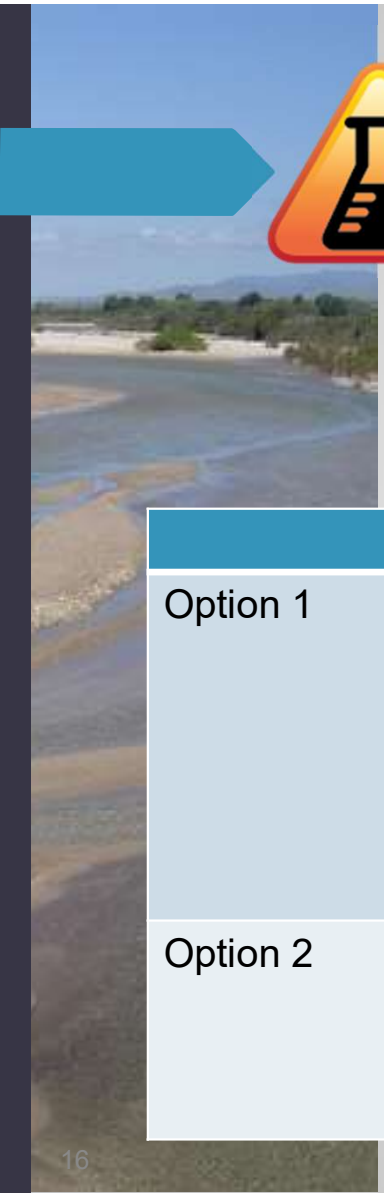
Degradation of Groundwater Quality

as previously discussed

Subbasin Committee Selected:

Degraded groundwater quality resulting from direct GSA actions is significant and unreasonable as measured by the number of supply wells

- Minimum threshold = maintain current groundwater quality impacts
- Measurable objective = same as minimum threshold



Degradation of Water Quality
latest progress with ASGSA

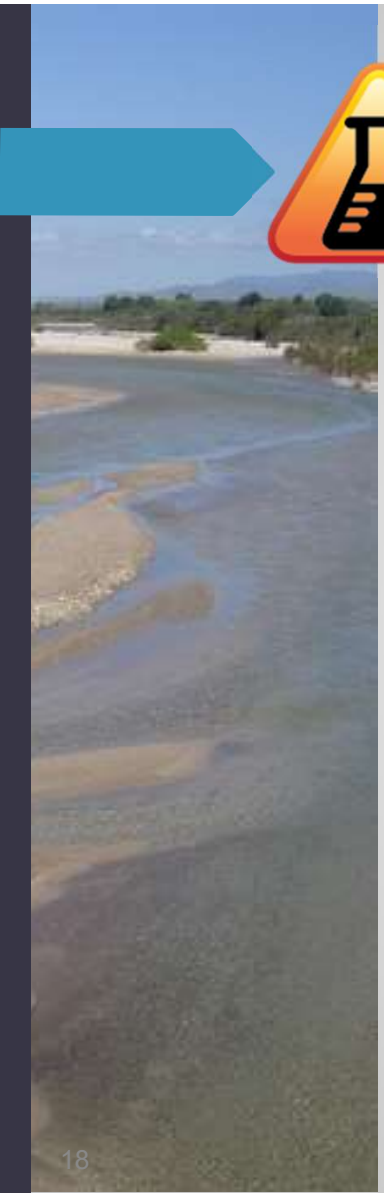
***Metric*: the current number of wells that exceed primary and secondary drinking water MCLs, and/or to Basin Plan Objectives. Measured concentrations at individual wells will be compared with those standards. I added this because the regulation is for a number of wells rather than the levels themselves.**

	MT	MO
Option 1	MTs [at each well] for constituents regulated by drinking water standards are the primary or secondary MCLs for those constituents, whichever applies. For irrigation wells, the MTs for salinity and other constituents that could significantly reduce crop production are the Basin Plan Objectives for those constituents in the area where the well is located.	MO shall be concentrations lower than the MTs specified for each constituent, location and well type.
Option 2	MT is no increase in the number of wells with constituents that exceed levels of concern. The levels of concern are the primary or secondary MCLs for potable supply wells, and irrigation related Basin Plan Objectives for irrigation wells.	MO shall be the same as the MT: not increase in the number of wells with constituents exceeding levels of concern.

Degradation of Water Quality
latest progress with ASGSA

Undesirable Result:

- Qualitatively, increased public health risk for primary drinking water MCLs, decreased consumer aesthetic experience and plumbing fixture longevity for secondary drinking water MCLs and decreased crop yields or crop quality for constituents related to irrigation water (salinity, sodium, boron, etc.).
- Quantitatively, any increase in the occurrence of wells with measured concentrations of a constituent of concern greater than the MT. Options to be considered in refining this definition include:
  - Specify the increase as the number of wells or the percentage of wells. Either way, a single well with an increase in measured concentration would trigger the undesirable result, as written.
- Only undesirable result if due to GSA action



Degradation of Water Quality
Key questions

1) Should all wells be monitored for Title 22 drinking water constituents?

2) Should the MT/MO be set at each well or per the number of supply wells?

3) Should the MO have lower concentrations than the MT (e.g. cleaner than Title 22 standards)? *If so, the GSP needs to include a plan to reach those concentrations*

Questions?