Sustainable Management Criteria

IWVGA PAC Meeting: 10/03/2019

Agenda Item 4cii

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Overview

- Sustainability Goal
- Approach for Min Thresholds, Measurable Objectives, Interim Milestones
  - Reduction of Storage
  - Chronic Lowering of Groundwater Levels
  - Degraded Water Quality
  - Land Subsidence
  - Interconnected Surface Water
  - Seawater Intrusion – Not Applicable to IWV
- Approach Summary Table

Sustainability Goal

- The sustainability goal is to develop a basin-wide management plan to preserve the IWVGB groundwater resource as a sustainable water supply for the NAWS China Lake mission and for future community survival, while also preserving the character of the community and quality of life of the basin residents to the greatest extent possible.
- The sustainability goal will be accomplished by achieving the following objectives:
  - Operate the IWVGB within the sustainable yield.
  - Implement projects and management actions to reduce groundwater demands and increase use of current supplies (recycled water) and obtain additional supplemental water supplies (imported water).
  - Monitor the IWVGB actively and thoroughly to ensure the plan is effective and undesirable results are avoided.

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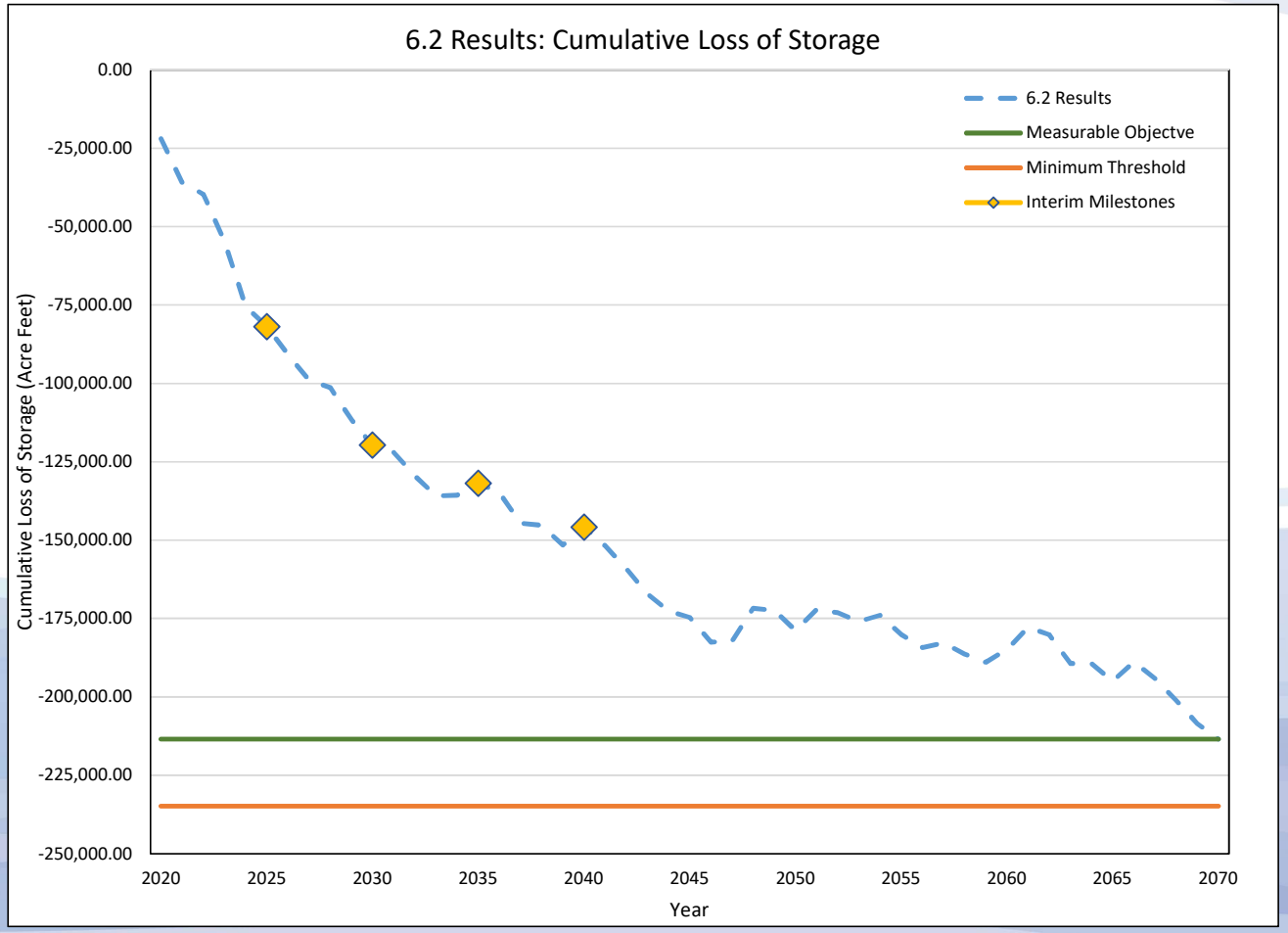
Sustainability Goal (cont.)

- GSP Sustainability Goal Text provided on 10/2
- Comments on text requested by 10/10

Sustainable Management Criteria for Reduction of Storage

- Information/Criteria Used: Results from Scenario 6.2
- Minimum Threshold Approach: Scenario 6.2 estimated value in 2070 plus 10% to account for uncertainties with projects/management implementation schedule
- Measurable Objective Approach: Scenario 6.2 estimated value in 2070
- Interim Milestones Approach: Scenario 6.2 estimated values in 5-year increments

Sustainable Management Criteria for Reduction of Storage



Sustainable Management Criteria for Chronic Lowering of Groundwater Levels

- Information/Criteria Used: Historical data, Results from Scenario 6.2
- Minimum Threshold Approach: Dependent on groundwater level historical trends in individual wells
  - Trends of historical data used instead of Scenario 6.2 trends if it provides greater operational flexibility
  - Recent minimum historical values used if wells have large variability in order to provide appropriate operational flexibility
  - If there isn't enough operational flexibility between minimum thresholds and measurable objectives using initial approaches, the minimum threshold will be lowered appropriately considering the historical data ranges.
- Measurable Objective Approach: Scenario 6.2 estimated value in 2040
- Interim Milestones Approach: Scenario 6.2 estimated values in 5-year increments

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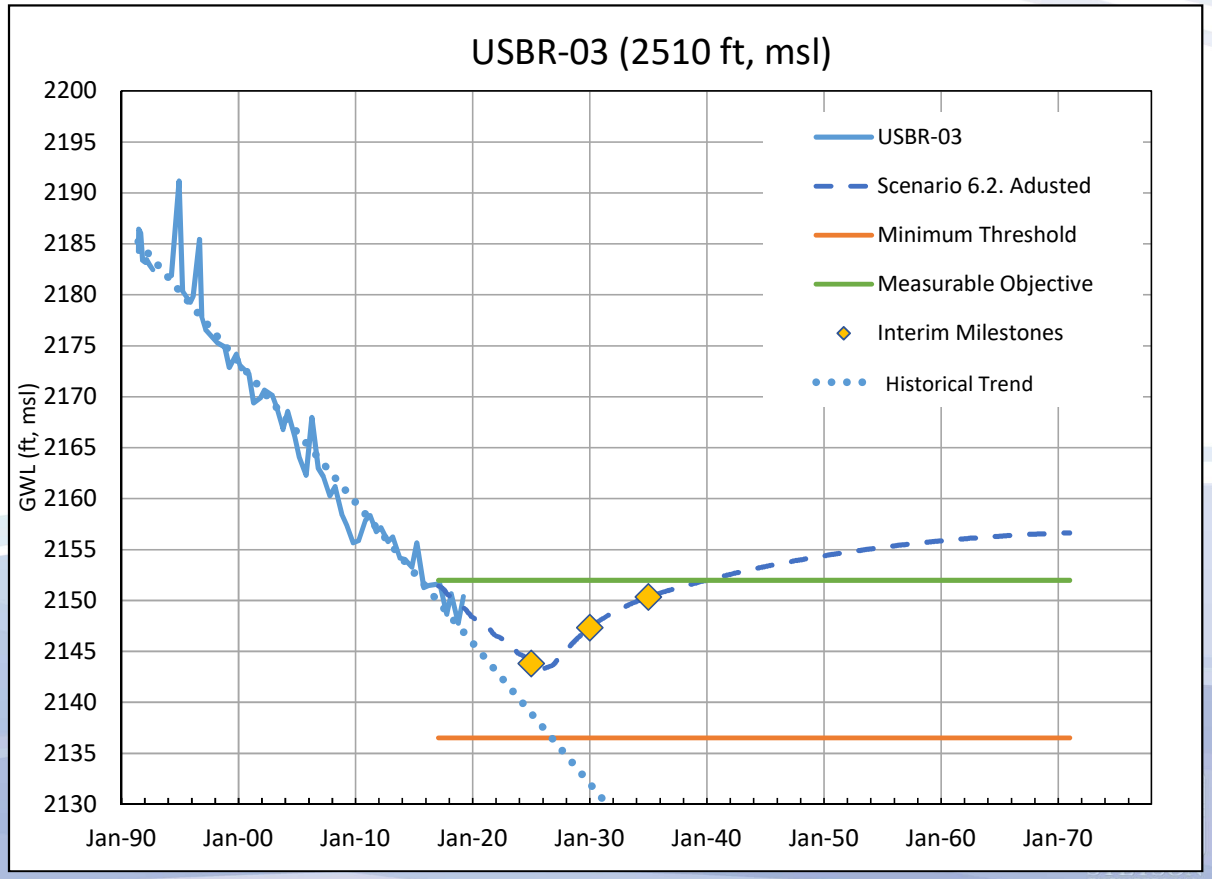
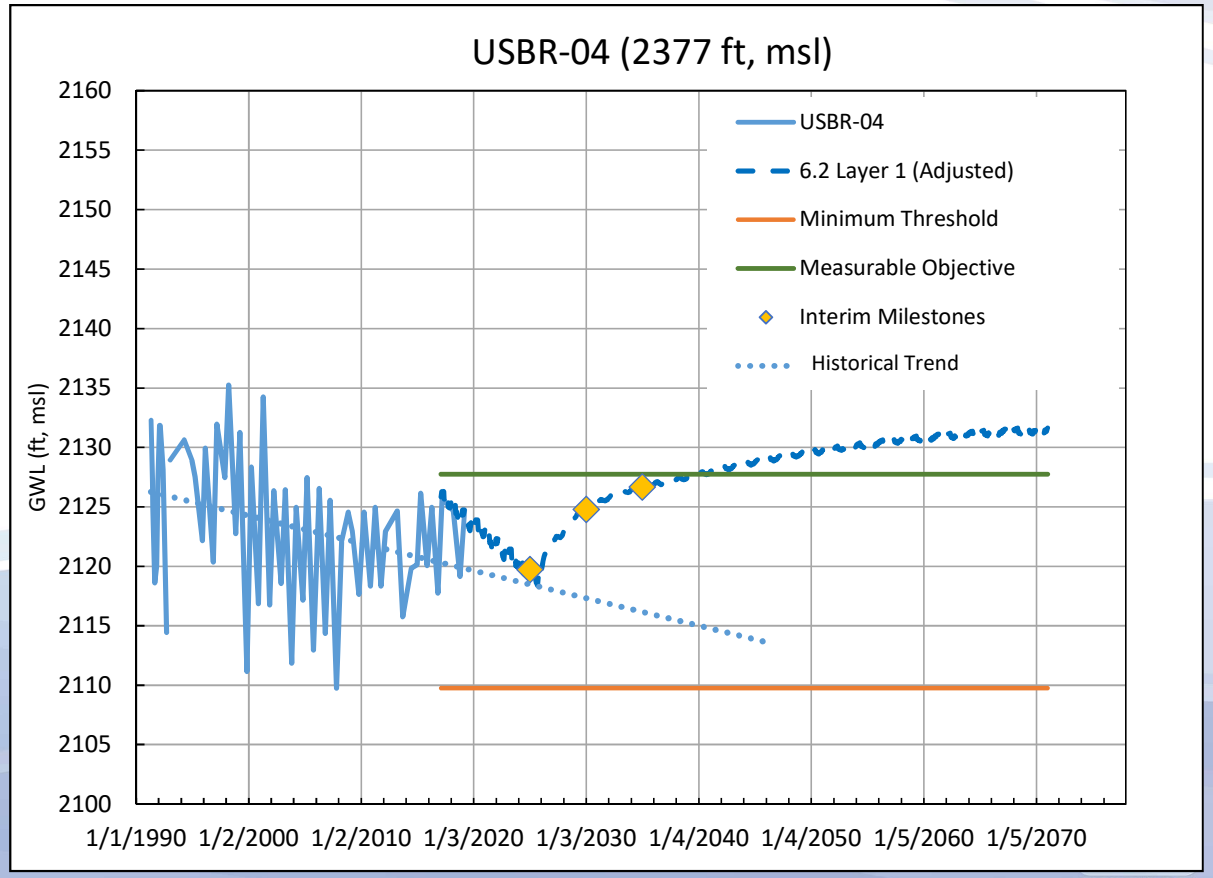
Sustainable Management Criteria for Lowering of Groundwater Levels

- Example of well where trend of historical data closely matches trend of Scenario 6.2 Results
- Minimum Threshold set at level of historical trend at time when model predicts lowest point
- Result is lower minimum threshold which provides greater operational flexibility compared to using Scenario 6.2 Results only



Sustainable Management Criteria for Lowering of Groundwater Levels

- Example of well where trend of historical data is variable
- If Minimum Threshold is set using either historical data or Scenario 6.2 results (very similar results), there would not be enough operational flexibility to account for variability
- Minimum Threshold is set at lowest value of historical record
- Result is lower minimum threshold which provides greater operational flexibility compared to historical trend or Scenario 6.2 results



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Sustainable Management Criteria for Degraded Water Quality

- Information/Criteria Used: Historical data (very limited in some areas), Results from Scenario 6.2
- Key Wells: subset of GAMA wells (longer periods of record) and other wells with higher density of key wells in sensitive/vulnerable areas
- Minimum Threshold Approach: Dependent on historical values and trends in individual wells
  - Secondary TDS MCL (500 mg/l) used in in areas of higher water quality
  - Upper Limit TDS MCL (1,000 mg/l) used in areas with documented poorer water quality (pre-SGMA undesirable results)
- Measurable Objective Approach: Dependent on historical trends along with Scenario 6.2 transport results in 2040
- Interim Milestones Approach: Scenario 6.2 estimated values in 5-year increments
- Baseline TDS data is required due to significant water quality data gaps in some areas of the basin

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Sustainable Management Criteria for Land Subsidence

- Information/Criteria Used: historical data, DRI analysis of existing data
  - Three IWV areas of most concern of tectonic/groundwater level related subsidence
    - Southern Subsidence Area (greater Ridgecrest region)
    - Northern Subsidence Area (China Lake)
    - Coso Geothermal Field
- Monitoring Methods: InSAR survey, level-line surveys, extensometers,
  - Reference monitoring points will be selected
- Minimum Threshold Approach: Rate of subsidence over 5-year period not to exceed 0.16 inches/year (4 mm/year) for operational flexibility
- Measurable Objective Approach: Current rate of subsidence (approximately 0.12 inches/year (3 mm/year))
- Interim Milestones Approach: Same as Measurable Objective

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Sustainable Management Criteria for Interconnected Surface Water

- There a currently no known undesirable caused from depletion of interconnected surface waters in the IWV
  - No Sustainable Management Criteria will be proposed
- The relationship between springs and groundwater levels is currently unknown and is a GSP data gap
- Springs on NAWS China Lake may support Groundwater Dependent Ecosystems
  - Work with the Navy for investigation and monitoring

Sustainable Management Criteria Draft Approach Summary

Sustainability Indicator	Significant/Unreasonable Undesirable Results	Minimum Threshold Draft Approach	Measurable Objective Draft Approach
Chronic Lowering of Groundwater Levels	Current production wells are impacted beyond acceptable value that can be reasonably mitigated (based on shallow well impacts).	Estimated value of trend of historical data at time period of Scenario 6.2 minimum value and/or Minimum of Model Scenario 6.2 Predictive Water Levels.	Model Scenario 6.2 Predictive Water Levels at 2040
Reduction of Groundwater Storage	Depletion of reserve of useable groundwater. Current production wells are impacted beyond acceptable value that can be reasonably mitigated (based on shallow well impacts).	Model Scenario 6.2 Cumulative Loss of Storage at 2070 with 10% buffer	Model Scenario 6.2 Cumulative Loss of Storage at 2070
Seawater Intrusion	Not Applicable	Not Applicable	Not Applicable
Degraded Water Quality	Produced groundwater is unsuitable for current beneficial use.	Historical data trends from GAMA wells (and others) used to determine if secondary TDS MCL (500 mg/l) or Upper Limit (1,000 mg/l) is appropriate.	Evaluation of historical trends along with Scenario 6.2 transport results in 2040
Land Subsidence	Current facilities and/or infrastructure are impacted.	Rate of land subsidence of 0.16 inches/year (4 mm/year)	Current rate of land subsidence: 0.12 inches/year (3 mm/year)
Depletion of Interconnected Surface Water	No known undesirable results. Data Gap.	Not applicable at this time – Data Gap.	Not applicable at this time – Data Gap.

Discussion