Item 4: Consideration of Land Subsidence SMC Amendments

Vina Stakeholder Advisory Committee

May 27, 2026

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Purpose today

Frame the proposed GSP amendments and support SHAC discussion and potential recommendation to the Vina GSA Board.

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Why this item is before SHAC now

How to respond to DWR's land subsidence RCA in the Periodic Evaluation / amendment process?

Background

Vina GSP adopted in 2021 and approved by DWR in 2023.

DWR provided Recommended Corrective Actions to be considered in the first Periodic Evaluation.

First Periodic Evaluation is due January 2027.

Why land subsidence?

The 2022 GSP uses groundwater levels as a proxy for land subsidence. DWR requested a clearer, quantitative approach and direct monitoring of land elevation change.

DWR's 2026 Best Management Practice document provides new guidance for this sustainability indicator.

What SHAC is asked to do

Review the proposed amended GSP sections.

Discuss whether the approach is appropriate for Vina.

Make a recommendation to the Vina GSA Board.

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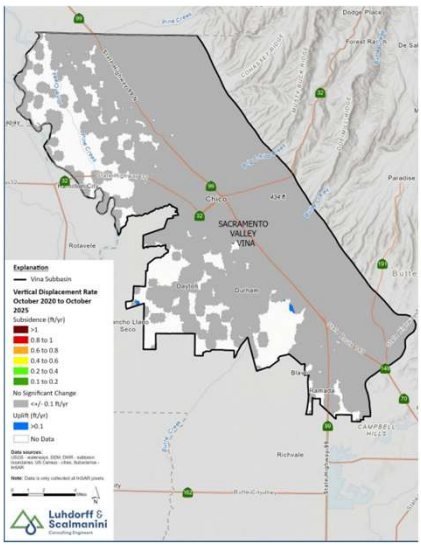
Current Vina conditions: no observed inelastic subsidence

The issue is not an existing impact; it is whether the GSP should be amended to use direct subsidence SMC going forward.



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recorded inelastic land subsidence in recent annual reporting

2020–2025

InSAR period shown as "no significant change" across most of the Subbasin

<0.10 ft/yr

treated as within InSAR measurement uncertainty

DWR expectations: RCA 5 and Land Subsidence BMP

RCA 5 asks the GSAs to:

1. Quantitative undesirable result

Provide a clear, quantitative definition of when undesirable results for land subsidence may occur in the Subbasin, as required by the GSP regulations, to support the selection of land subsidence minimum thresholds that demonstrate avoidance of undesirable results.

2. Direct monitoring of land elevation change

Establish sustainable management criteria for land subsidence for the Subbasin utilizing a monitoring network that directly measures land elevation change such as remote sensing data, survey monuments, or global positioning system stations.

Best Management Practice (BMP) Scenario 2

Little or no subsidence has been observed to date.

Groundwater levels may be allowed to decline below historical lows under the 2022 GSP Groundwater Level MT framework.

Monitoring and SMC should identify conditions that could lead to significant and unreasonable impacts.

SMC= Sustainable Management Criteria
RCA= Recommended Corrective Action
MT= Minimum Threshold
GWL= Groundwater Level

What has changed since the April strawman proposal?

The proposal was revised based on public discussion and written comments.

April 24, 2026, Land Subsidence Strawman released
May 7, 2026 Discussion Session (hybrid)

Public input led to several focused changes:

0.10 ft/yr	Measurement uncertainty clarified as 0.10 feet per year.
Causation	MT and Undesirable Result language tied to declining groundwater levels.
5-year cumulative MT	Annual-rate MT removed to reduce risk of reacting to noise in the data or temporary movement (elastic subsidence)
InSAR + wells	Representative InSAR locations paired with groundwater monitoring wells where feasible – map provided

The current proposal is no longer the April strawman; it is draft amendment language for SHAC consideration.

MT= Minimum Threshold
UR= Undesirable Result

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Neighboring subbasins informed the revisions

Public feedback encouraged consistency with nearby Sacramento Valley approaches where appropriate.

Comparison Topic	How it informed Vina proposal
Cumulative MTs	Red Bluff, Los Molinos, Corning, and Butte use 0.5 ft over a five-year period or similar cumulative framing.
InSAR network	Nearby basins use InSAR as a direct land-surface monitoring tool, often near groundwater-level RMS wells.
Causation language	Several approaches tie subsidence to declining groundwater levels rather than unrelated land surface movement.
Colusa distinction	Colusa includes an areal PLSS trigger, but it has measurable subsidence; Vina does not.

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Current 2022 GSP approach vs. proposed amendment

The proposed amendment changes the basis for evaluating the land subsidence sustainability indicator.

	2022 GSP	Proposed amendment
Monitoring	Groundwater level network used as proxy	All InSAR data + one GPS station; RMS InSAR clusters near wells / infrastructure
SMC basis	Groundwater-level SMC used for subsidence	Direct land-surface deformation SMC
Minimum Threshold	Groundwater-level MT used as proxy	0.5 ft cumulative subsidence over 5 years, attributable to declining GWLs
Undesirable Result	Groundwater-level UR used as proxy	MT exceedance for 2 consecutive years + confirmed infrastructure impacts + declining GWLs

Takeaway: the proposal retains groundwater levels as context/causation information, but no longer relies on GWLs as the SMC proxy.

Proposed SMC: nuts and bolts

Draft amendment language is written to replace GSP Sections 3.7, 4.5, and add Section 4.9.3.

MO	0.0 ft/yr of land subsidence at representative monitoring locations, recognizing uncertainty.
MT	0.5 foot cumulative subsidence over a 5-year period at the same location, as a result of declining groundwater levels.
IM	No interim milestone needed because no subsidence has occurred in the Subbasin.
UR	MT exceedance at the same representative location for two consecutive years with confirmed infrastructure impacts and declining groundwater levels.
Uncertainty	<0.10 ft/yr considered within the range of InSAR measurement uncertainty.

Annual rates remain useful for context, but compliance is based on rolling 5-year cumulative change.

Monitoring approach: Broad network + RMS network

Use all available data for screening; use selected representative locations for SMC compliance.

Broad monitoring network

All available DWR-provided InSAR data across the Subbasin.

One available GPS station in Vina used to corroborate displacement estimates.

Reviewed annually for spatial patterns and emerging trends.

Representative monitoring locations

44 representative monitoring locations.

Each location is a groundwater monitoring well plus one central InSAR pixel and eight supporting pixels.

Nine-pixel cluster average used for SMC compliance.

Why pair with wells?

Supports interpretation of falling/rising groundwater levels and land surface change at the same location.

Helps evaluate whether observed subsidence is linked to groundwater management.

Keeps the network stable and repeatable over time.

This approach preserves the full InSAR dataset for basin-wide understanding while creating a clear RMS network for reporting and compliance.

Representative monitoring site (RMS) network

The proposed RMS network covers each management area and key infrastructure corridors.

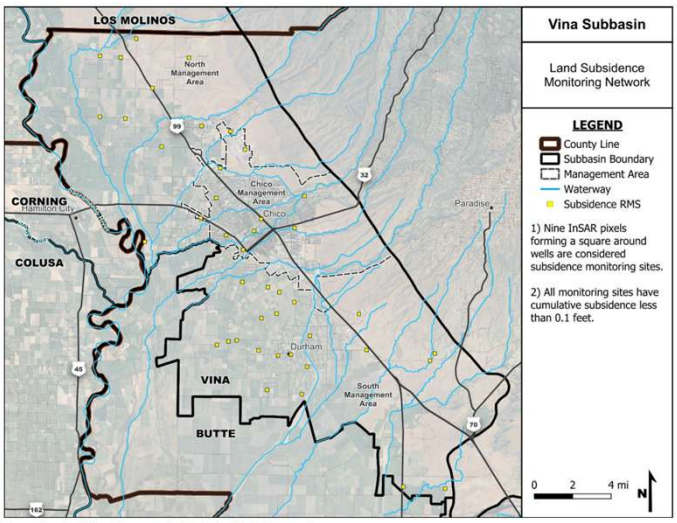

Figure 2. Land Subsidence Representative Monitoring Site (RMS) network

Network features

44 representative monitoring locations

9 InSAR pixels per well location

Selection emphasis

- Data quality
- Infrastructure
- Groundwater pairing
- Spatial coverage

Requested SHAC recommendation

SHAC is asked to make a recommendation to the Vina GSA Board on two related items.

1. Approach to amend the GSP

Whether the GSP should be amended now to address DWR's land subsidence RCA.

Whether the proposed direct InSAR/GPS monitoring framework is an appropriate path for the Periodic Evaluation.

2. Content of amendment language

Any specific edits, additions, or clarifications SHAC recommends before Board consideration.

Requested action: provide direction and a recommendation for the Vina GSA Board's June consideration.