

Notes and suggestions from PAC ad hoc Committee

by Judie Decker and West Katzenstein 5/31/19 7

PAC ad hoc committee assignment from the PAC meeting of 5/2/19

“Flesh out” Items b., c. and d. from the April 2019 PAC Agenda listed under Shallow Well Draft Memo prepared by Jean Moran.

b. “discuss how to evaluate well owner responsibility for impacted shallow wells (post GSP)”

c. “discuss funding options”

d. “discuss how to evaluate previously impacted shallow wells (pre GSP adoption)”

b. Discuss how to evaluate well owner responsibility for impacted shallow wells (post GSP)

Introduction

The Groundwater Authority Board will adopt a Shallow Well Mitigation Plan as part of its Groundwater Sustainability Plan. The PAC has accepted the Stetson Draft Shallow Well Mitigation Plan at its May Meeting.

The technical details of how to evaluate a well’s physical condition shall be provided by the TAC and incorporated into the evaluation procedures adopted by the GA Board.

The GSA Board will approve a procedure for well evaluation. This will include identification of the professional personnel to do the detailed physical evaluation as well as an application review. The outline of this review are provided in the *Draft Preliminary Impacted Shallow Wells Mitigation Plan and Funding Plan Approach* on page 2 (1b-3d)

A priority list shall be established based on the following: date of application; severity of problem; ability to find alternate water source on a temporary basis.

Domestic Well Registration

The domestic well registration form that the IWV Domestic Well Owners Association submitted to GA Board manager, Don Zdeba, spells out the parameters for evaluating a domestic well. The shallow well failure analysis completed by Jean Moran describes the quantitative condition of a well that has been seriously and negatively impacted by over pumping. There is no question that large and even medium production wells will impact nearby small domestic wells over time.

There are many variables in pumping. They include size of pump/motor, amount of water pumped, rate at which the water is pumped, distance to other pumpers, and type of sediment material where well perforations are located. Over time the cone of depression around a major well expands and deepens. Thus you have shallow domestic wells being impacted by large production wells that are a

mile or more away. Where the large production wells have their perforated zone eventually doesn't matter. The IWV Basin aquifer is connected substantially both in the horizontal and vertical directions in all of the major pumping areas. The more water pumped at a given location over time the wider and deeper the pumping depression becomes.

Shallow well failure evaluation criteria The items below are criteria for the future GSA staff to use to evaluate failed wells.

1. Well location must be within the boundaries of the IWV groundwater Basin 6-54.
2. The well must be for domestic purposes which includes reasonable landscaping.
3. The well must be registered with the IWV Groundwater Authority using the approved registration form.
4. The well has been drilled to AWWA standards. This would include 100 feet (or more) of standing water when new

If the well owner has the driller's log and associated paperwork they should be presented at the time of application for remediation of said well.

If a well has previously failed and been repaired at the owner's expense, then any data about the well and groundwater status at the time of repair should be made available to the GSA.

It is presumed that the GSA Board will hire qualified personnel to execute this program

GSA Shallow Well Failure Compensation

GA will pay for well deepening/well replacement if SWL is at or below the well casing perforations. This would include driller's costs, additional well casing if well is deepened /or new well costs, including casing and drop pipe, if new well must be drilled. Down-hole equipment cost would be paid by well owner (electrical wire, pump and motor).

The GA shall not pay for pump/motor replacement. A responsible well owner should maintain his well equipment.

c. Funding options

Several potential funding sources are listed in the draft mitigation plan. These sources include areas that would have to be applied for by the GSA when the opportunity arose

Mitigation Fees

The GSA has an obligation to bring the entire groundwater basin into sustainability. GSA management actions to achieve this goal will impact every pumper in the basin. Over time every pumper will have to contribute in order to reach this goal.

However until the GA becomes a GSA and becomes a strong governmental organization, impact fees would be assessed on major pumpers in the Valley. These fees would have to be set aside solely for the use of mitigation funds for shallow wells.

It would be in the best interest of the Valley as a whole for all the major pumpers to pay into a Valley wide well restoration fund. A fee would have to be established where all non de minimis pumpers pay a certain amount per acre foot pumped over some minimum established limit. This would be a mandatory fee in addition to any other fees. Well reparation will have to be a line item in the Board's future budget

Grants

Once the GSP is adopted the GA Board will become a GSA. As an independent governing entity dealing with water this agency will be able to apply for grant funding from several sources. There will be a variety of resources for this money including DWR as well as California Regional Water Quality Control Board. Money for DAC communities will also be available.

Possible Federal funding?

Other funding

Funds will also be available on a smaller scale from other sources. To name a few: Inyo Mono Integrated Regional Water Management; and one or all of the 3 counties involved.

This issue will have to be continually explored.

Low Interest Loans

This is another area that will have to be explored by the GA Board when they have a finance manager.

They might, in some cases, want to set up a low interest loan fund. This can only be established after the GSA is in place with a staff, budget and funds

Navy-Coso Royalty Funding This is another area that needs to be examined for funds.

DAC There may be low interest loans for well owners who qualify under DAC. This may especially hold true for Mutuals and/or co-ops. Money is sometimes available through the California Rural Water Association

d. Evaluate pre-GSP impacted shallow wells.

The Stetson analysis of shallow well failure due to declining water levels completed by Jean Moran includes failures occurring before SGMA was enacted.

If it is determined that the Board has responsibility to mitigate wells that have already failed, then the same procedures should be followed as those adopted for **item b**.

These issues are the legal responsibility of GA Board itself, not the Policy Advisory Committee.

Topics Recommended for Future Discussion

From the Ad Hoc Committee May 31, 2019

In the discussion of the Shallow Well Management Plan the committee offers these recommendations for further discussion to assist the PAC and ultimately the GA Board.

Domestic shallow well owners benefits of joining a public water system or Mutual water system. Discuss the advantages/disadvantages and locations in the Valley suitable for “community wells”. Discuss the creation of policy to support this.

Growth Necessary mitigation policies and procedures need needed

Policies regarding well certification when property is sold

GSP Sustainable Management Actions Modeling Scenarios: Model Results

IWVGA PAC MEETING: JUNE 6, 2019

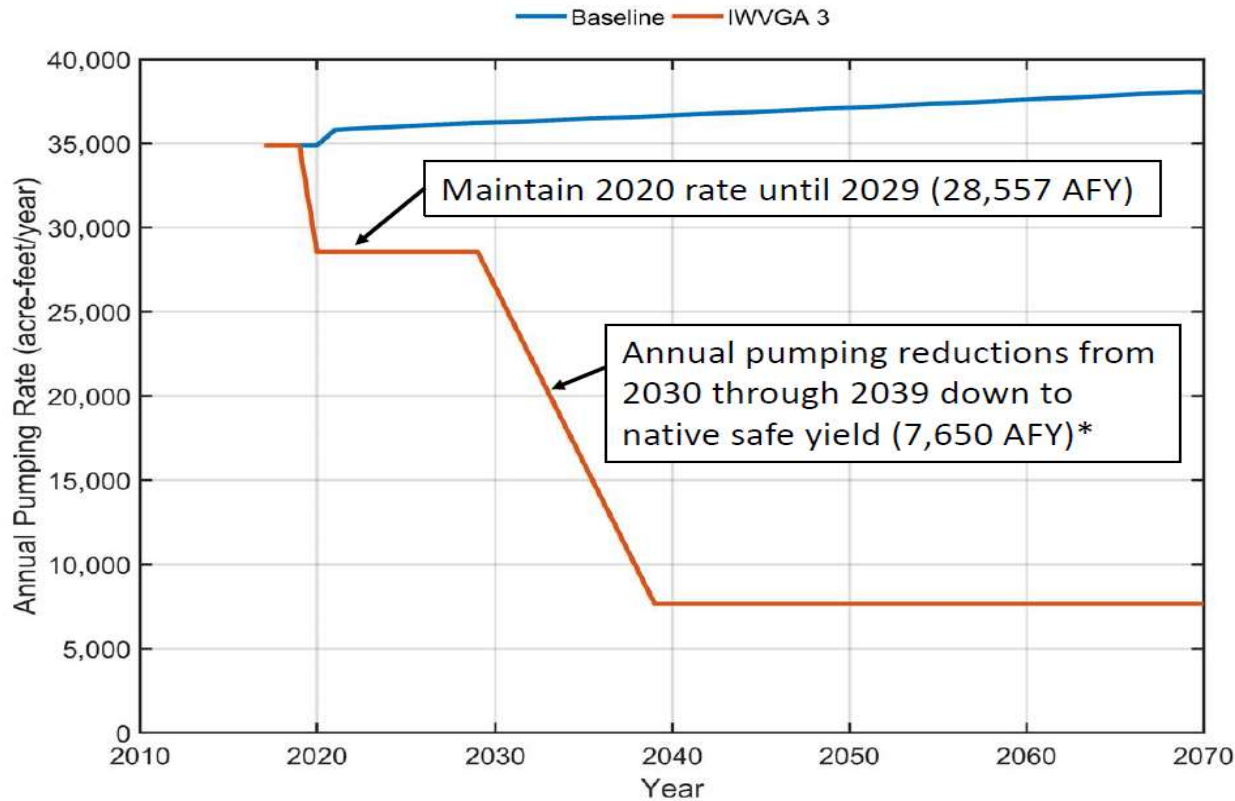
Overview

- Summary and Description of Scenarios
 - White Paper (Scenario 3)
 - Water Buyout (Scenario 4)
 - Immediate Halt to Pumping (IHTP) (Scenario 5)
- Model Results
 - Water Level Change
 - Hydrographs
 - Change in Storage
 - Shallow Well Impacts/Preliminary Mitigation Costs
 - Preliminary mitigation costs
 - Water Quality (TDS Transport)

Scenario 3: White Paper

- Start of Management Action – January 2022
- 2020 through 2029: Total Annual Pumping 28,557 AFY
- 2030 through 2039 (10 years): Reduce Pumping By Equal Increments Each Year (Ramp Down) to Reach 7,650 AFY
- 2039 through 2070: Total Annual Pumping 7,650 AFY
- Direct use of imported and recycled water used to meet demands in excess of natural safe yield (no recharge).

Scenario 3: White Paper



Producers not subject to reductions:

De Minimis (800 AFY)

Navy (2,041 AFY)

City of Ridgecrest (339 AFY)

Direct use of imported and recycled water to meet demands in excess of natural safe yield.

2020 Pumping: Scenario #3 White Paper

Pumping Group	Notes	Total 2020 Pumping (AF) ¹
Meadowbrook Dairy	2	7,524
Mojave Pistachio	3	6,400
Simmons Farm	2	0
Quist Farms	2	750
Sierra Shadows	4	228
Amberglow	4	19
Terese Farms	4	93
Hickle	4	25
Blubaugh	4	0
Bellino	4	15
McGee	4	120
Kern County	5	18
City of Ridgecrest	2	339
IWVWD	2	7,319
Inyokern CSD	2	108
Mutuals	6	300
SVM	2	2,458
Domestic Wells	6	800
Navy	7	2,041

Total 28,557

Notes

- 1) Based on the lowest historical pumping from 2010 - 2014 under California water rights law, unless specified otherwise.
- 2) Historical pumping per the "IWV Ground Water Production Estimates: 1975 - Present" spreadsheet developed by the Indian Wells Valley Cooperative Groundwater Management Group.
- 3) Includes water demand for mature pistachio trees.
- 4) Data not available to determine lowest historical pumping from 2010 - 2014. Total 2020 pumping for small agriculture assumed to equal 500 acre-feet per year, distributed proportionally to individual small agriculture farmers.
- 5) Data not available to determine lowest historical pumping from 2010 - 2014. Total 2020 pumping assumed to equal 18 acre-feet per year based on recent pumping.
- 6) Data not available to determine lowest historical pumping from 2010 - 2014. The sum of pumping for Mutuals (300 AFY) and Domestic Wells (800 AFY) is equal to total 2020 *di minimus* pumping (1,100 AFY) as stated in the *White Paper: Issues and Options for Groundwater Management in the Indian Wells Valley under the Sustainable Groundwater Management Act*.
- 7) Total 2020 pumping equal to value provided by the Navy at October 1, 2018 allocation meeting.

2040 to 2070 Pumping: Scenario #3 White Paper

Pumping Group	Notes	Total 2040 Pumping (AF)
Meadowbrook Dairy	1	1,325
Mojave Pistachio	1	1,127
Simmons Farm	1	0
Quist Farms	1	132
Sierra Shadows	1	40
Amberglow	1	3
Terese Farms	1	16
Hickle	1	4
Blubaugh	1	0
Bellino	1	3
McGee	1	21
Kern County	1	3
City of Ridgecrest	2	339
IWVWD	1	1,289
Inyokern CSD	1	19
Mutuals	1	53
SVM	1	433
Domestic Wells	3	800
Navy	4	2,041

Total 7,650

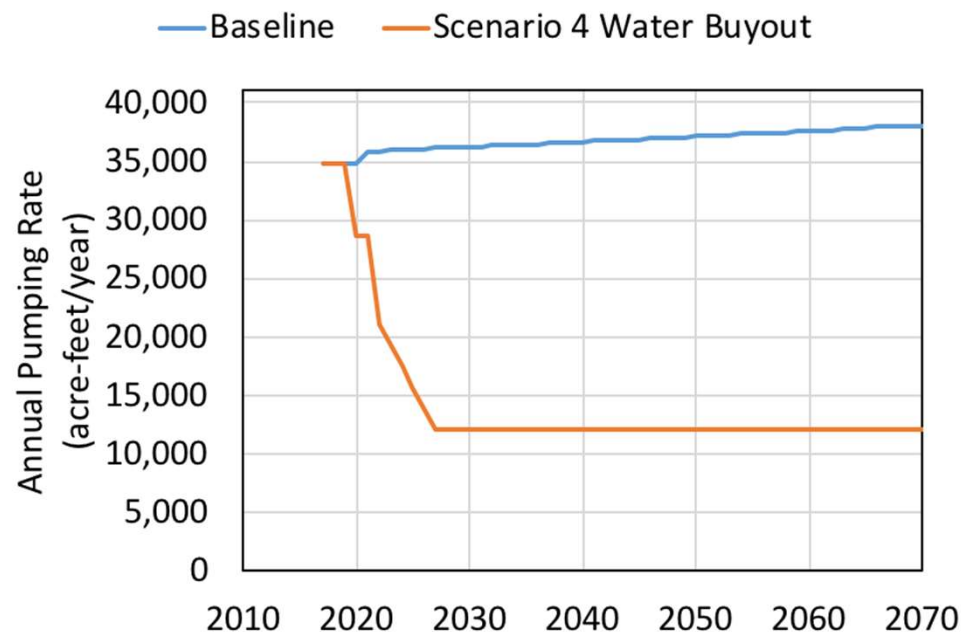
Notes

- 1) Result of 10-year annual pumping ramp-downs (in proportional increments) to the basin native safe yield of 7,650 acre-feet per year.
- 2) Exempt from pumping ramp-downs due to status as a public entity with overlying rights, per the allocation group meeting on April 11.
- 3) Exempt from pumping ramp-downs due to lack of access to alternate water sources.
- 4) Exempt from pumping ramp-downs due to federal reserve right.

Scenario 4: Water Buyout

- 2020: Total pumping of 28,551 AFY
 - Maintained for two years (through 2021)
- Start of Management Action – January 2022
- 2022: Total Pumping Includes Reduced Pumping for Unprotected Allocation (subject to ramp down), Plus Protected Pumping (not subject to ramp down)
- 2022 through 2027: Unprotected Allocations Reduced by Equal Increments Each Year for Total Allocations of ~12,000 AFY in 2027
- 2025: Recycled Water is available to help reduce overdraft
- 2028 through 2070: Total Annual Pumping of ~12,000 AFY
- 2035 through 2070: Total Pumping is Augmented by Imported Water Supply (recharge) for basin to be sustainable

Scenario 4: Water Buyout



Producers not subject to ramp downs:

- De Minimis (800 AFY)
- Navy (2,041 AFY)
- City of Ridgecrest (339 AFY)
- 86% of municipal pumping (Extension of Federal Reserve Rights)
 - IWWWD (6,294 AFY)
 - Inyokern CSD (93 AFY)
 - Mutuels (258 AFY)
 - SVM (Trona supply only) (194 AFY)

Lease Market:

- Meadowbrook discontinues pumping after 2021, allocation made available to lease to others

Imported and recycled water used to augment the natural safe yield to bring basin into balance.

2022 Allocation and Pumping: Scenario #4 Water Buyout

Pumping Group	Notes	Total 2022 Allocations (AF)	Total 2022 Pumping (AF) ¹
Meadowbrook Dairy	2	6,464	0
Mojave Pistachio	2,6	558	6,785
Simmons Farm	3	0	0
Quist Farms	2	644	644
Sierra Shadows	2	196	196
Amberglow	2	16	16
Terese Farms	2	80	80
Hickle	2	21	21
Blubaugh	2	0	0
Bellino	2	13	13
McGee	2	103	103
Kern County	2	15	15
City of Ridgecrest	4	339	339
IWVWD	2,5	7,175	7,175
Inyokern CSD	2,5	106	106
Mutuals	2,5	294	294
SVM	2,5,6	2,139	2,377
Domestic Wells	7	800	800
Navy	8	2,041	2,041

Total 21,006 21,006

Notes

- 1) Total pumping consists only of allocated rights (both Federal Reserved Rights and State Rights).
- 2) Result of 1 year of pumping ramp-downs.
- 3) Allocation under California water rights standard equal to zero due to lack of historical pumping prior to 2013.
- 4) Exempt from pumping ramp-downs due to status as a public entity with overlying rights, per the allocation group meeting on April 11.
- 5) Navy federal reserve rights (exempt from ramp-downs) extended to 86% of municipal pumping from the IWVWD, Inyokern CSD, Mutuals, and SVM (only Trona supply).
- 6) SVM and Mojave lease allocation from Meadowbrook to continue industrial and agricultural pumping beyond allocated rights.
- 7) Exempt from pumping ramp-downs due to lack of access to alternate water sources.
- 8) Exempt from pumping ramp-downs due to federal reserve right.

2027 - 2070 Allocation and Pumping: Scenario #4 Water Buyout

Pumping Group	Notes	Total 2027-2040 Allocations (AFY)	Total 2027-2040 Pumping (AFY) ¹
Meadowbrook Dairy	2	1,166	0
Mojave Pistachio	2	101	101
Simmons Farm	3	0	0
Quist Farms	2	116	116
Sierra Shadows	2	35	35
Amberglow	2	3	3
Terese Farms	2	14	14
Hickle	2	4	4
Blubaugh	2	0	0
Bellino	2	2	2
McGee	2	19	19
Kern County	2	3	3
City of Ridgecrest	4	339	339
IWVWD	2,5	6,453	6,453
Inyokern CSD	2,5	95	95
Mutuals	2,5	265	265
SVM	2,5,6	544	1,710
Domestic Wells	7	800	800
Navy	8	2,041	2,041

Total 12,000 12,000

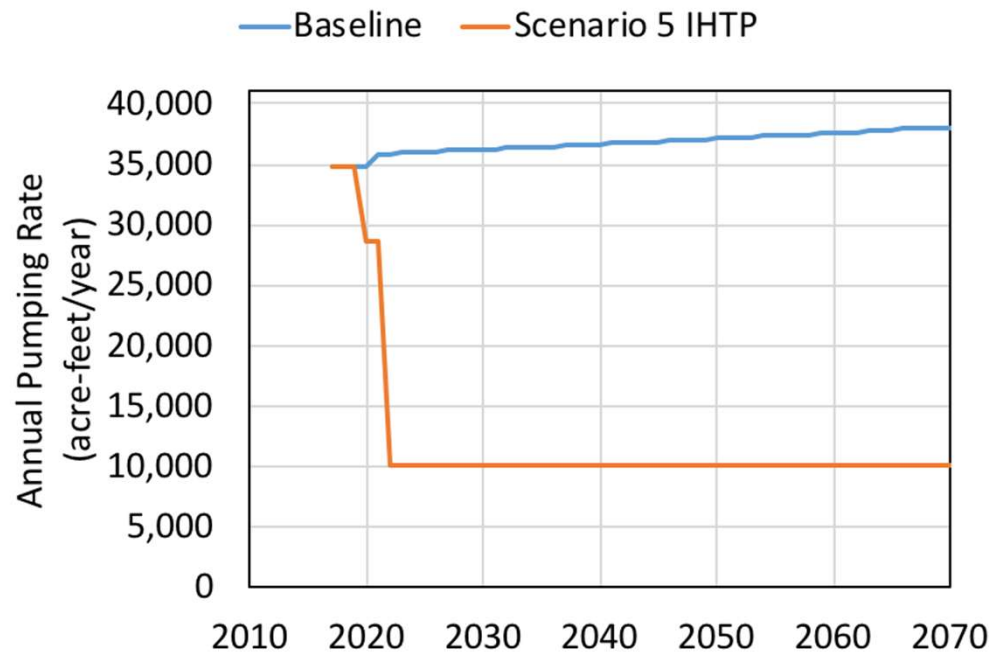
Notes

- 1) Total pumping consists only of allocated rights (both Federal Reserved Rights and State Rights).
- 2) Result of 6 years of pumping ramp-downs.
- 3) Allocation under California water rights standard equal to zero due to lack of historical pumping prior to 2013.
- 4) Exempt from pumping ramp-downs due to status as a public entity with overlying rights, per the allocation group meeting on April 11.
- 5) Navy federal reserve rights (exempt from ramp-downs) extended to 86% of municipal pumping from the IWVWD, Inyokern CSD, Mutuals, and SVM (only Trona supply).
- 6) SVM leases allocation from Meadowbrook to continue industrial pumping beyond allocated rights.
- 7) Exempt from pumping ramp-downs due to lack of access to alternate water sources.
- 8) Exempt from pumping ramp-downs due to federal reserve right.

Scenario 5: Immediate Halt to Pumping

- 2020: Total pumping of 28,551 AFY
 - Maintained for two years (through 2021)
- Start of Management Actions – January 2022
- Negotiate/Fallow All AG Pumping to Zero
- Searles to Find New Supply-Recycled Water?
- Total Annual Pumping 2022 through 2070: ~10,000 AFY
 - Includes IWVWD, Navy, De Minimis, Mutuals, Inyokern, City of Ridgecrest, and Searles/Trona.
- 2025: Recycled Water is available to help reduce overdraft
- 2035 through 2070: Total Pumping is Augmented by Imported Water Supply (recharge) for basin to be sustainable

Scenario 5: Immediate Halt to Pumping



Starting 2022: Zero pumping by large ag, small ag, SVM

Producers not subject to ramp downs:

- De Minimis (800 AFY)
- Navy (2,041 AFY)
- City of Ridgecrest (339 AFY)
- 86% of municipal pumping (Extension of Federal Reserve Rights)
 - IWVWD (6,294 AFY)
 - Inyokern CSD (93 AFY)
 - Mutuels (258 AFY)
 - SVM (Trona supply only) (194 AFY)

Imported and recycled water used to augment the natural safe yield to bring basin into balance.

2022 - 2070 Allocation and Pumping: Scenario #5 Immediate Halt to Pumping

Pumping Group	Notes	Total 2022-2040 Allocations (AFY)	Total 2022-2040 Pumping (AFY)
Meadowbrook Dairy	1	0	0
Mojave Pistachio	1	0	0
Simmons Farm	1	0	0
Quist Farms	1	0	0
Sierra Shadows	1	0	0
Amberglow	1	0	0
Terese Farms	1	0	0
Hickle	1	0	0
Blubaugh	1	0	0
Bellino	1	0	0
McGee	1	0	0
Kern County	1	0	0
City of Ridgecrest	2	339	339
IWVWD	3	6,294	6,294
Inyokern CSD	3	93	93
Mutuals	3	258	258
SVM	3	194	194
Domestic Wells	4	800	800
Navy	5	2,041	2,041
Total		10,019	10,019

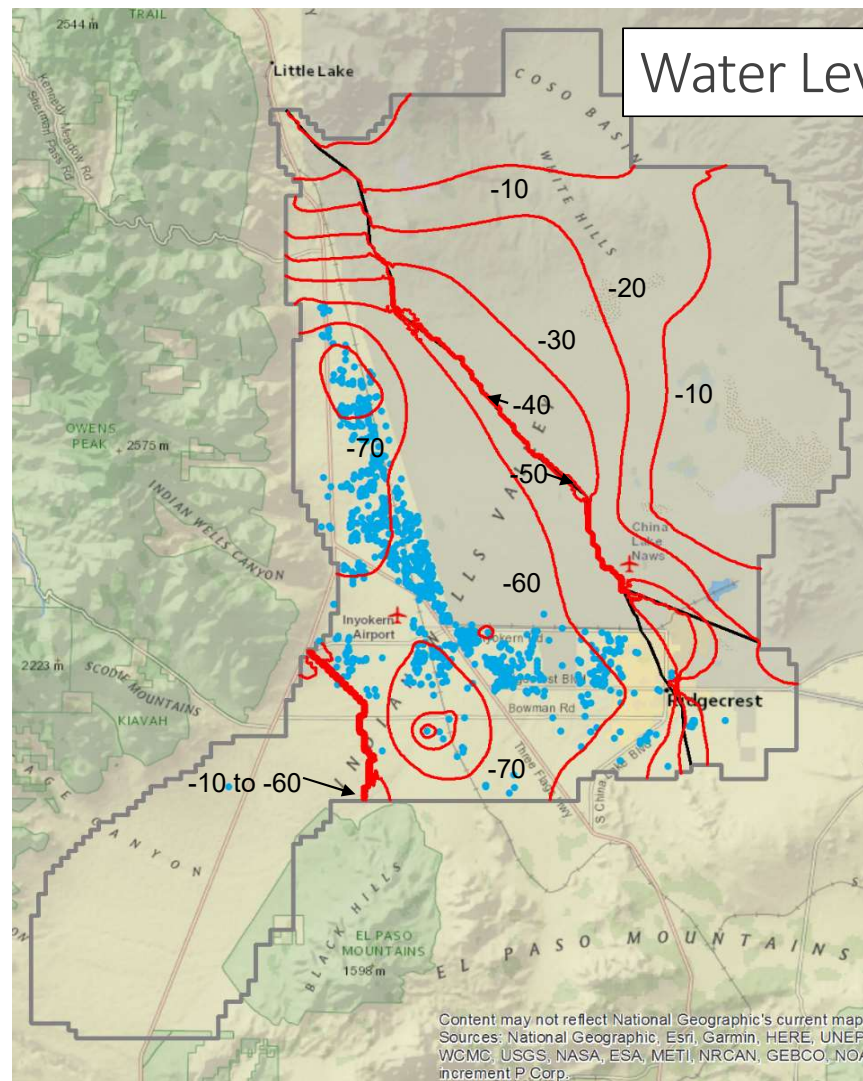
Notes

- 1) Total allocations and pumping from 2022-2040 consist only of Federal Reserve rights, extensions of Federal Reserve rights to municipal pumping, or overlying rights of public entities (City of Ridgecrest).
- 2) Exempt from pumping reductions due to status as a public entity with overlying rights, per the allocation group meeting on April 11.
- 3) Navy federal reserve rights (exempt from reductions) extended to 86% of municipal pumping from the IWVWD, Inyokern CSD, Mutuals, and SVM (only Trona supply).
- 4) Exempt from pumping reductions due to lack of access to alternate water sources.
- 5) Exempt from pumping reductions due to Federal Reserve right.

Model Results

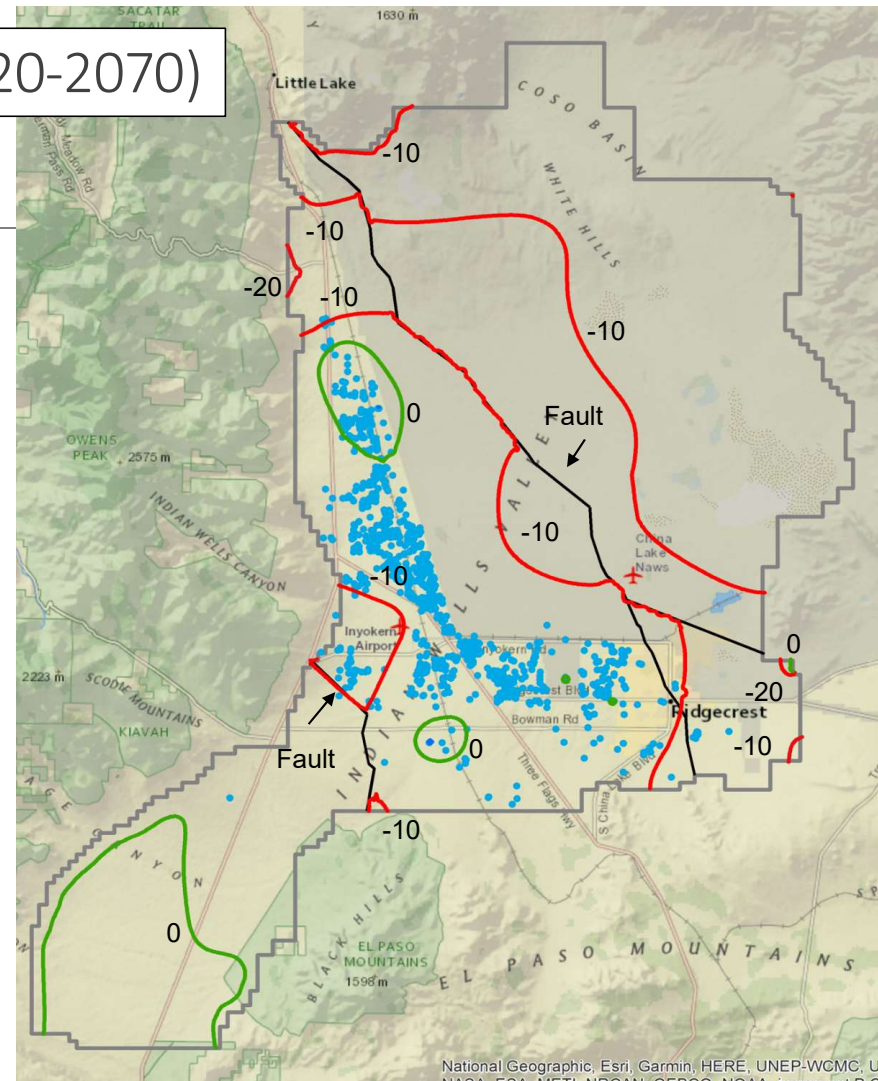
- Water Level Change
- Hydrographs
- Change in Storage
- Shallow Well Impacts
 - Preliminary Mitigation Costs
- Water Quality Results (TDS Transport)
 - Scenario 3 (White Paper) Only

Water Level Change (2020-2070)



— Rising
— Neutral
— Falling

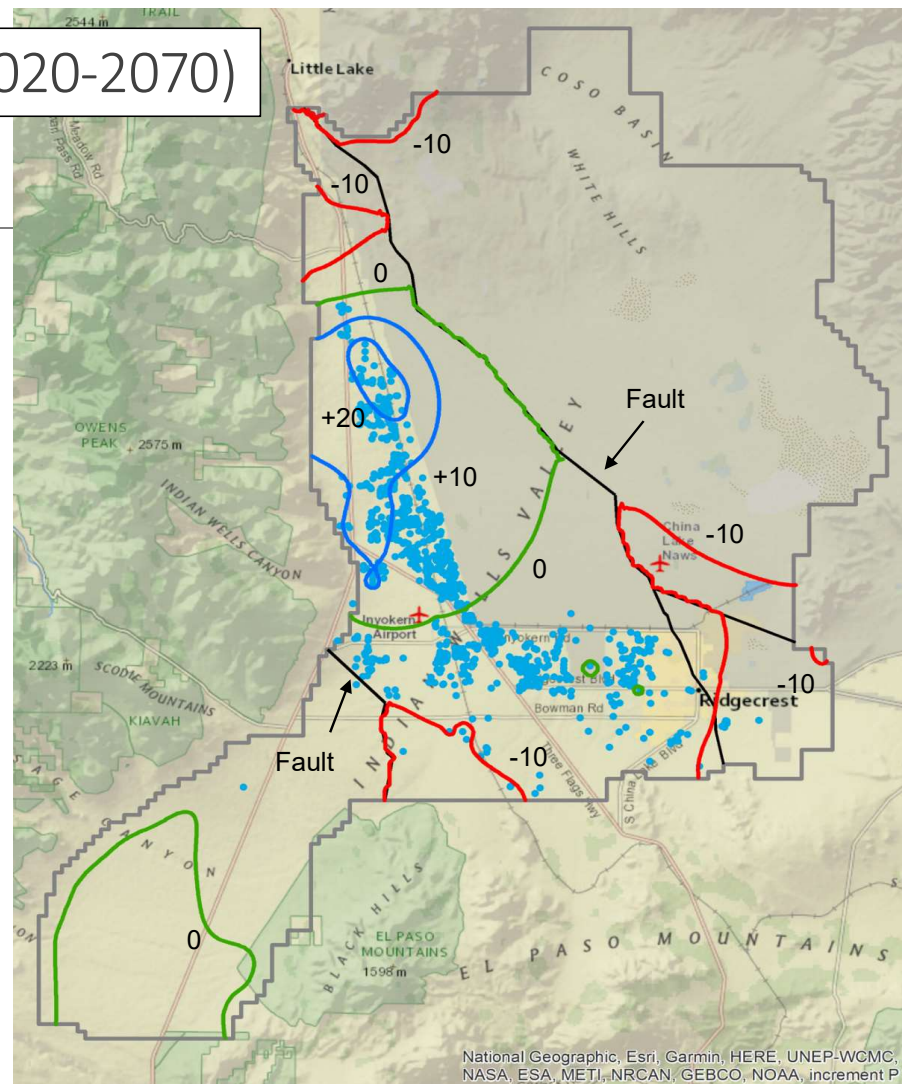
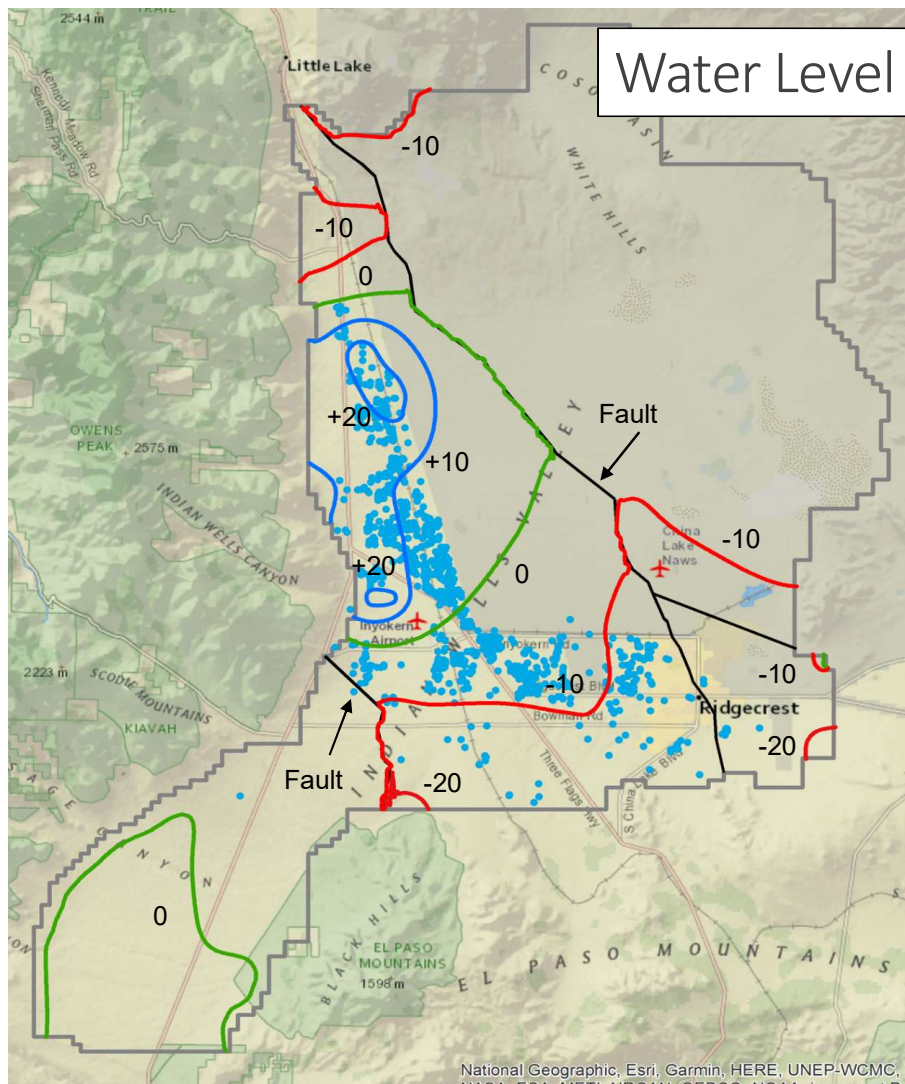
Units: feet



Baseline

Scenario #3 White Paper

Water Level Change (2020-2070)

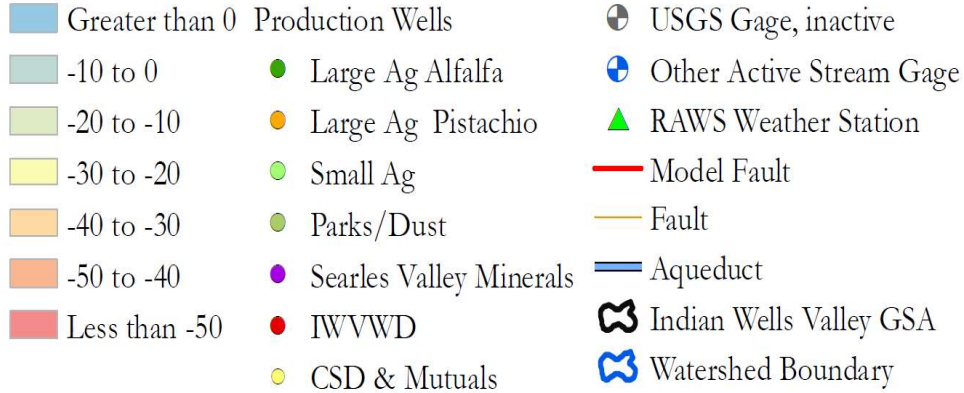


Scenario #4 Water Buyout

Scenario #5 Immediate Halt

Water Level Change #3 White Paper

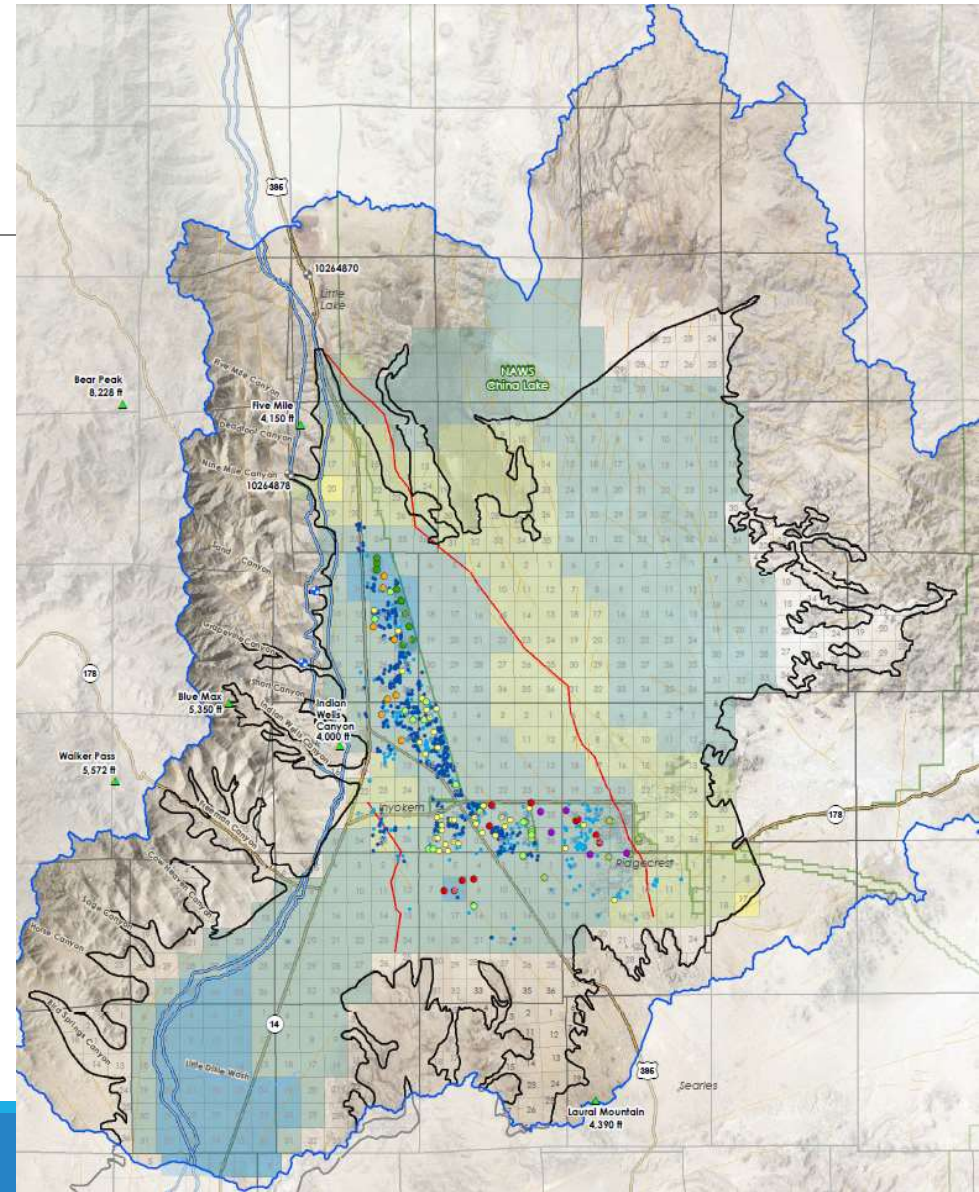
Groundwater Elevation Change
2020 to 2070 (feet)



Estimated Domestic Well Location

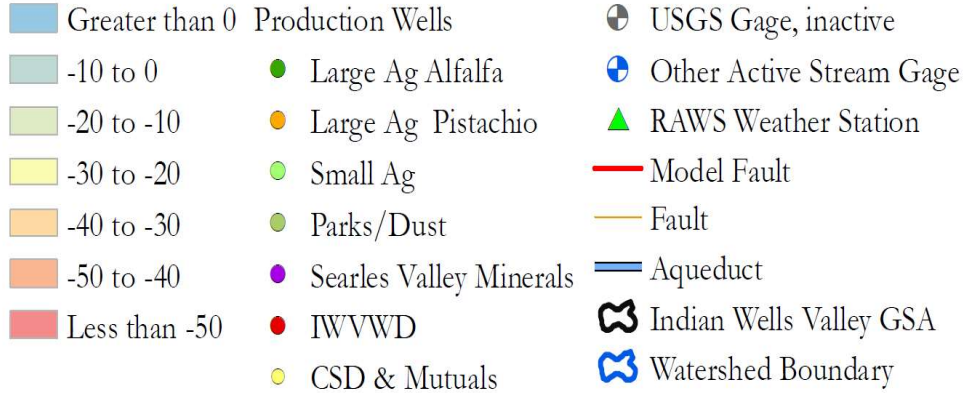
- Permit Database
- Other Private

NOTE: Navy production wells are not shown on this map.



Water Level Change #4 Water Buyout

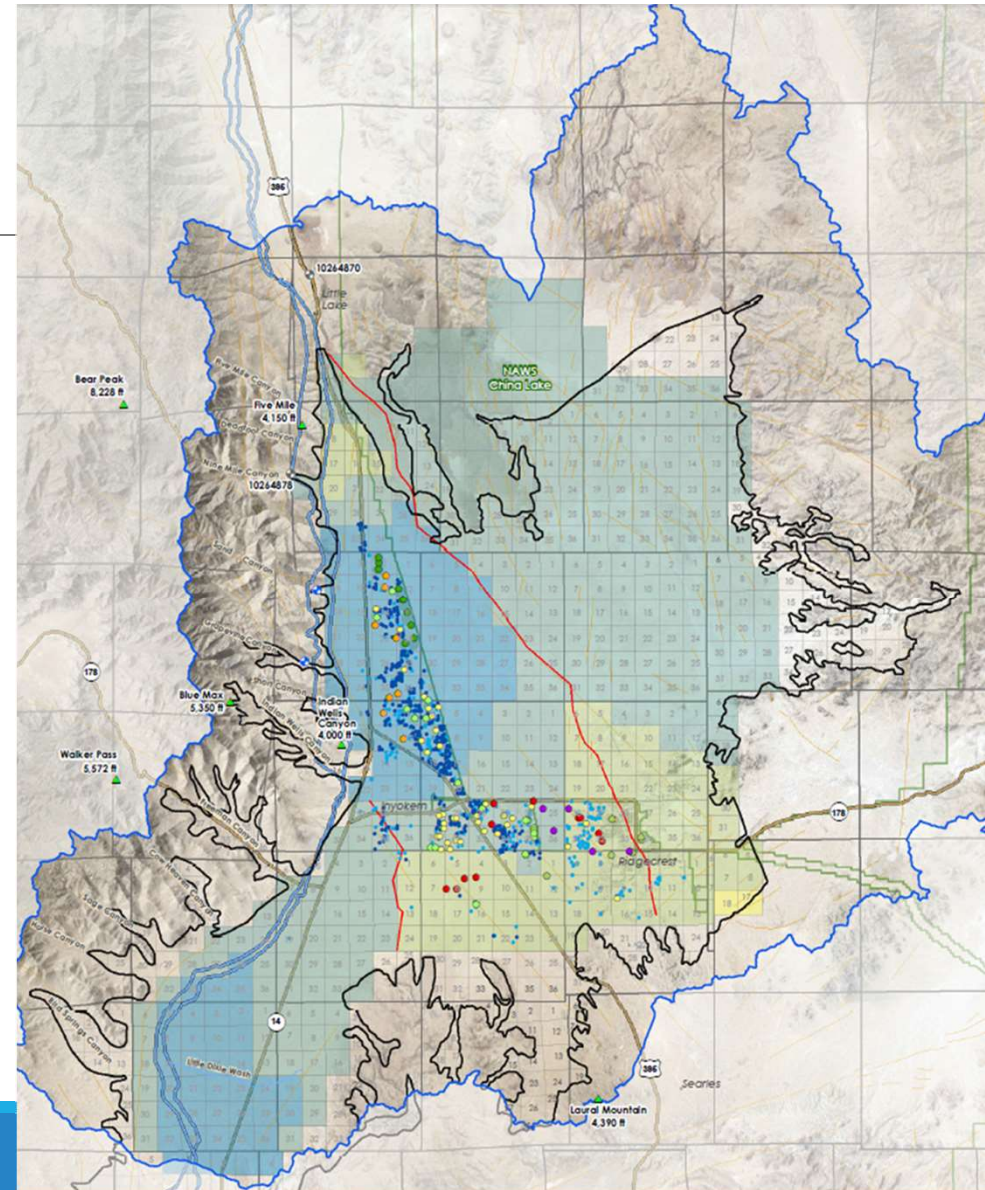
Groundwater Elevation Change
2020 to 2070 (feet)



Estimated Domestic Well Location

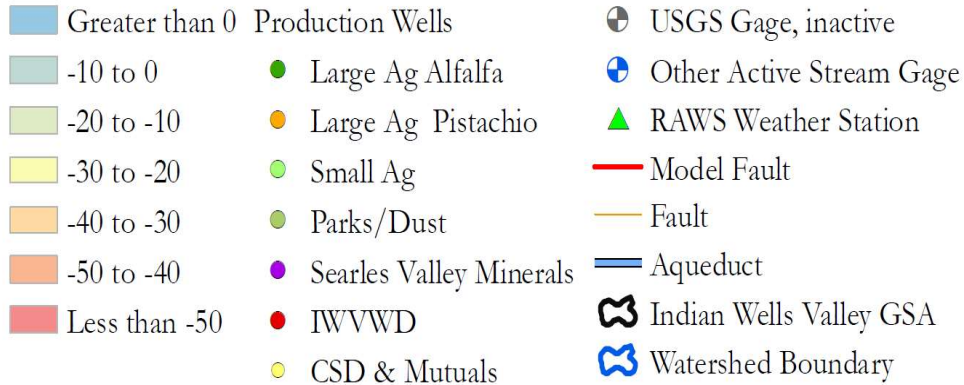
- Permit Database
- Other Private

NOTE: Navy production wells
are not shown on this map.



Water Level Change #5 Immediate Halt

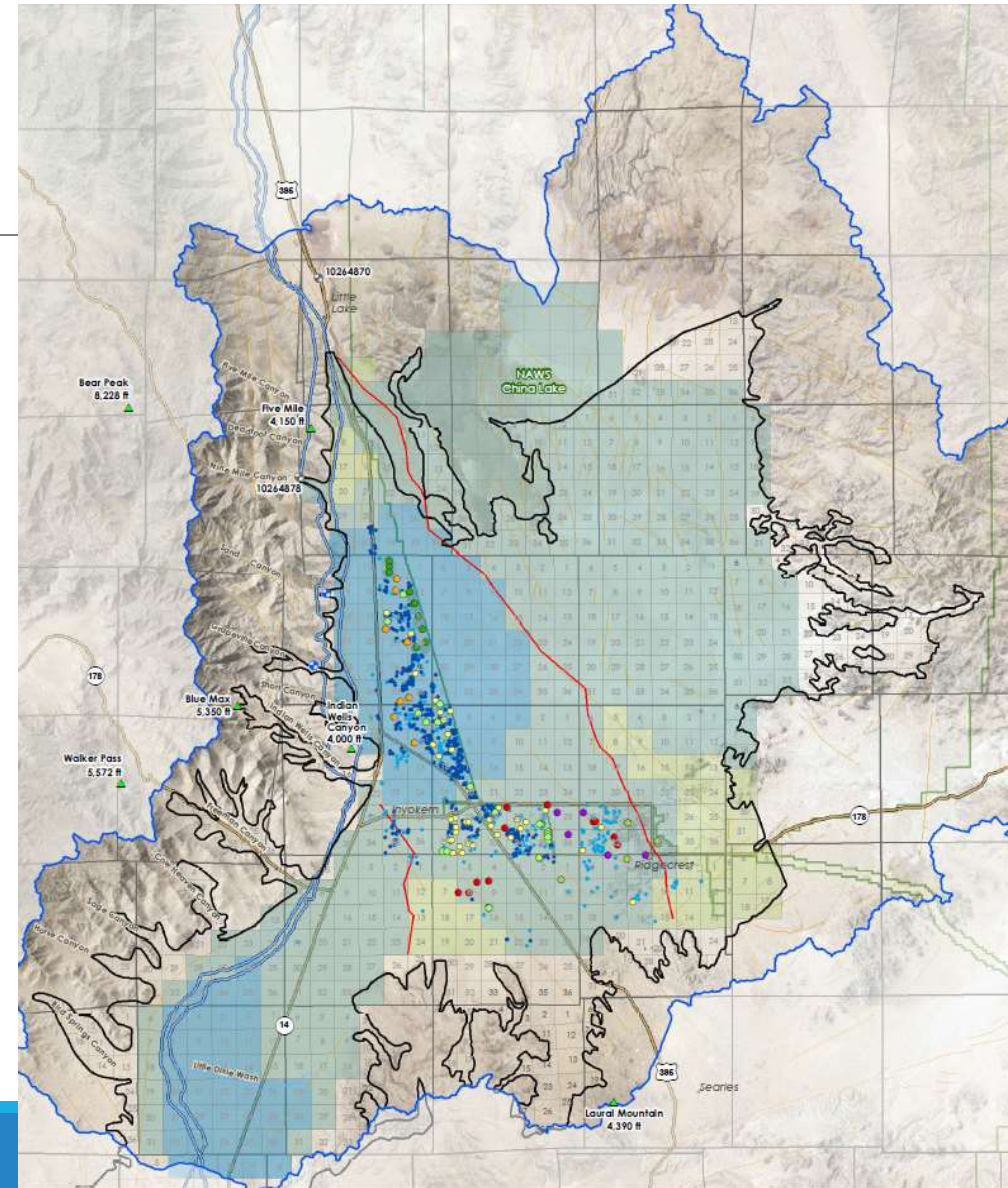
Groundwater Elevation Change
2020 to 2070 (feet)



Estimated Domestic Well Location

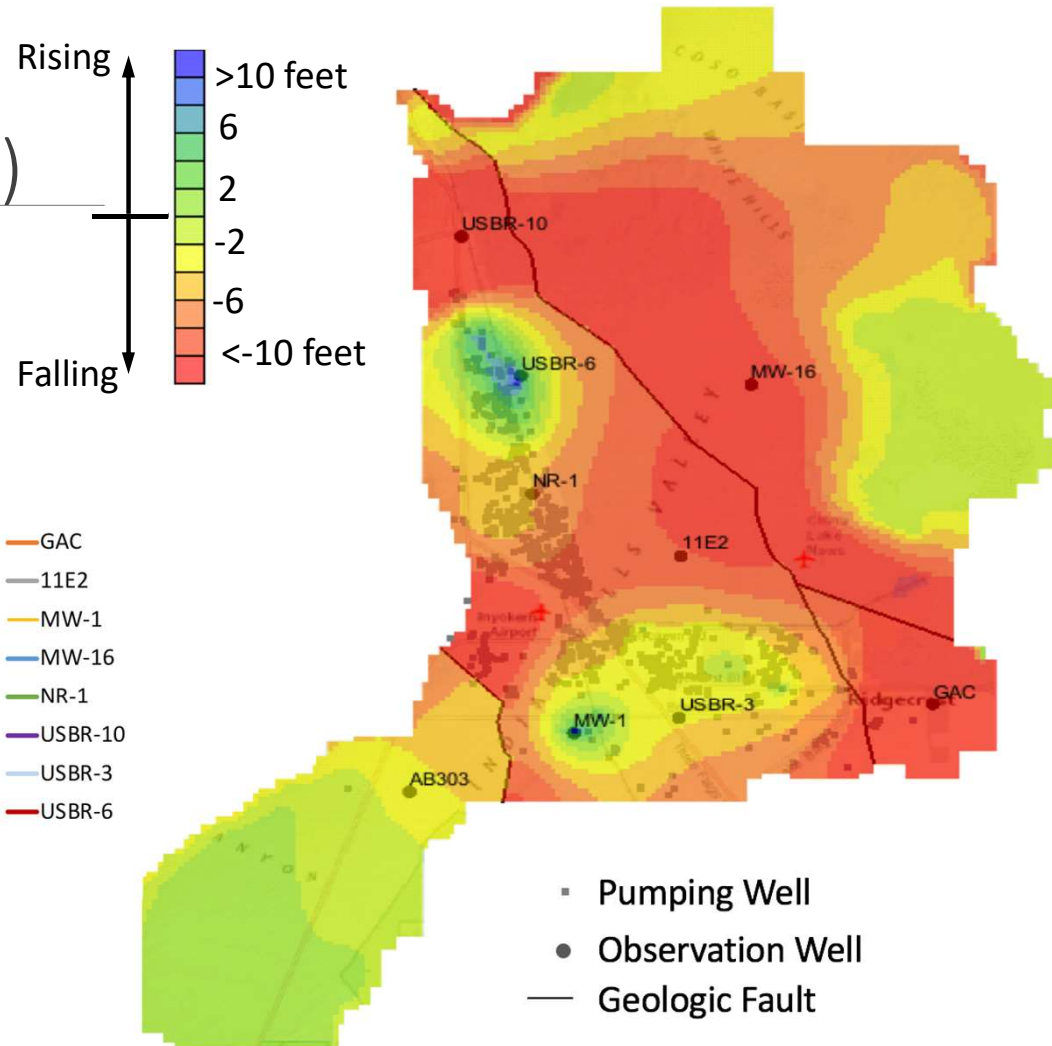
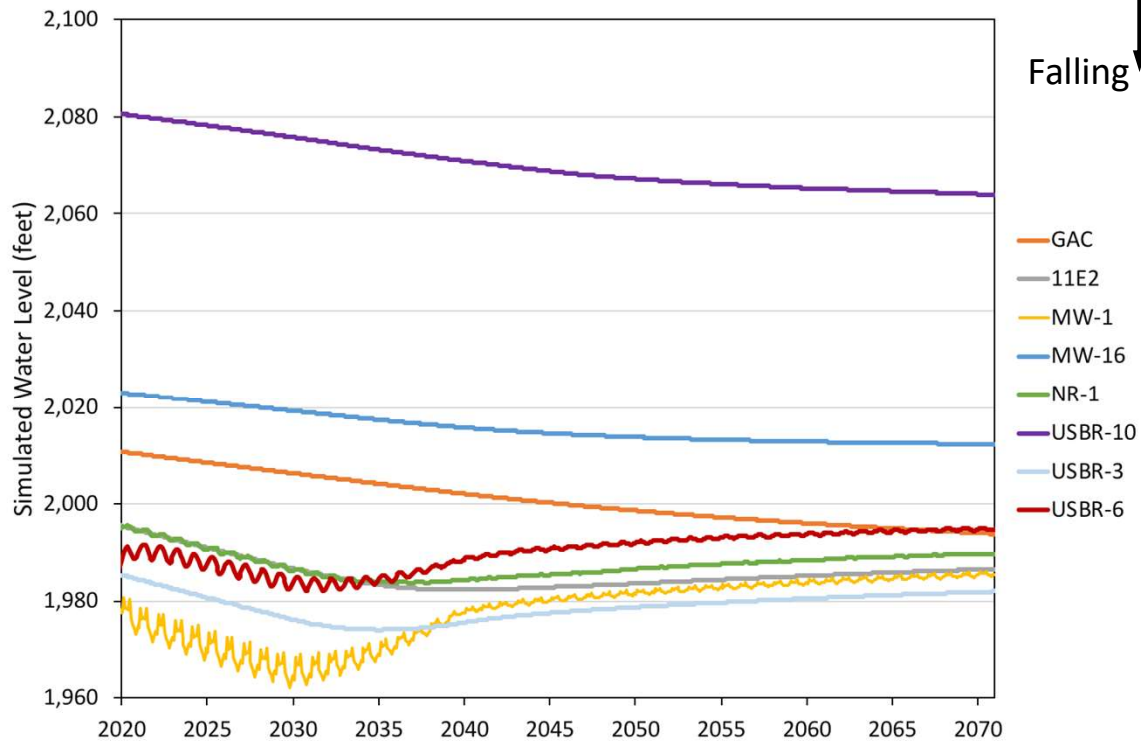
- Permit Database
- Other Private

NOTE: Navy production wells are not shown on this map.

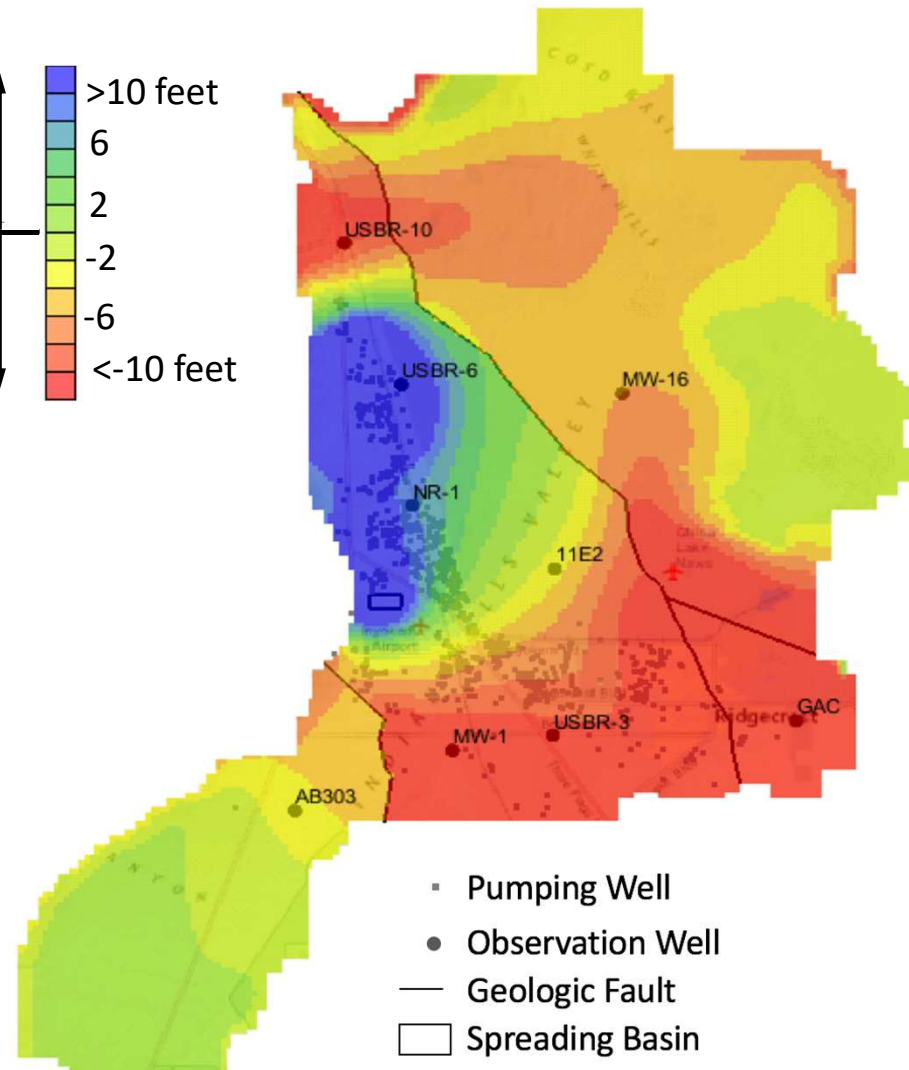
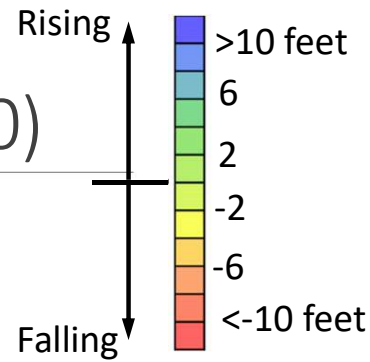
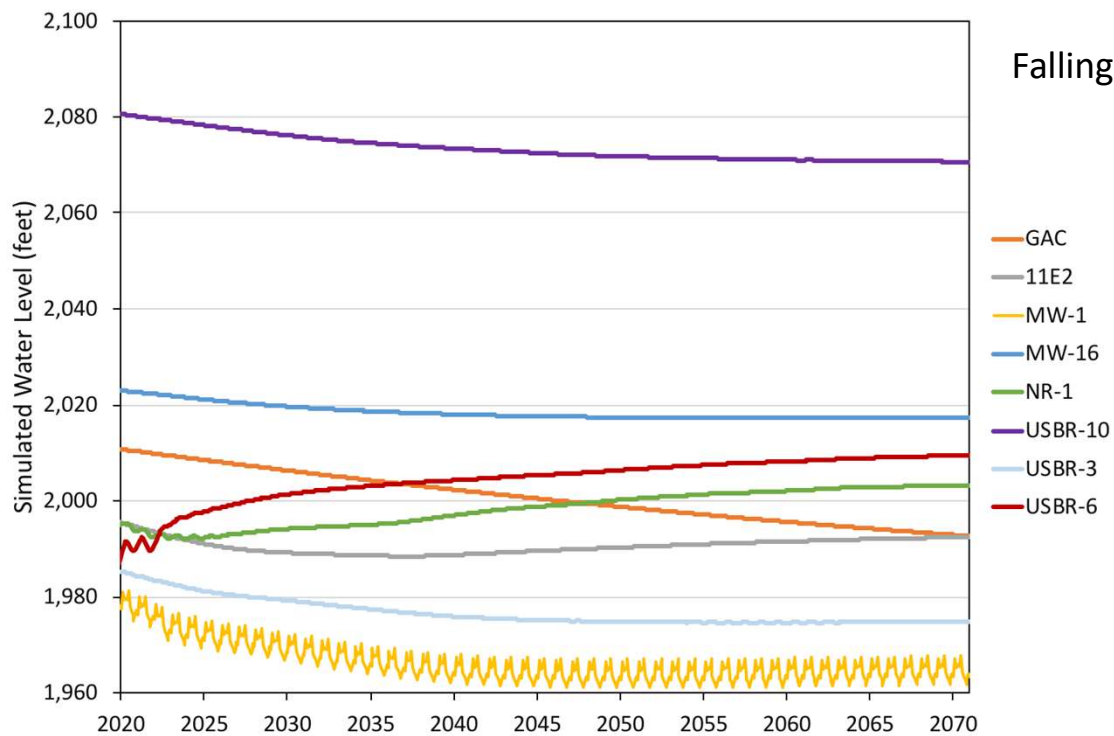


Water Level Change

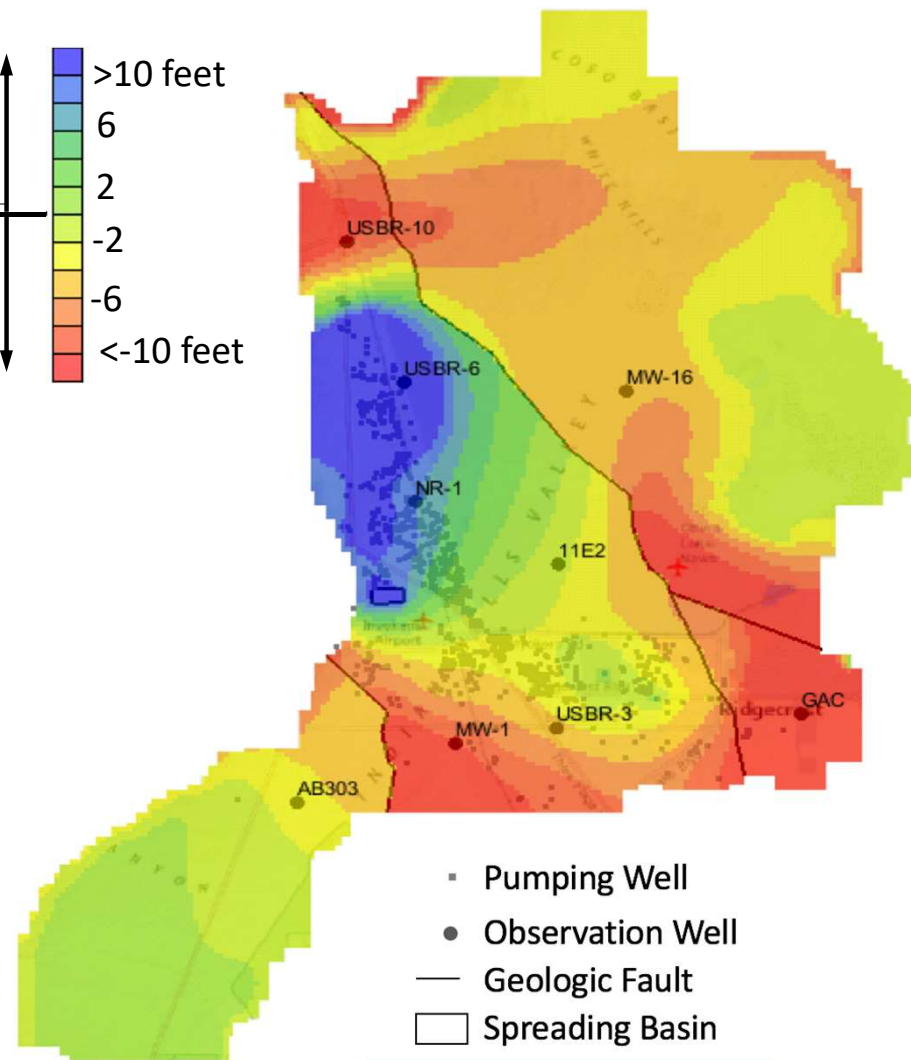
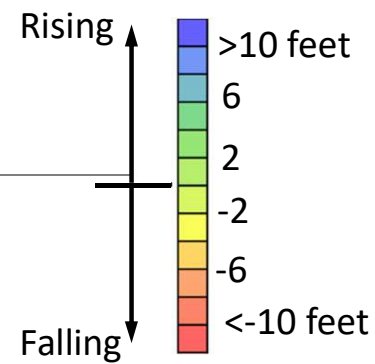
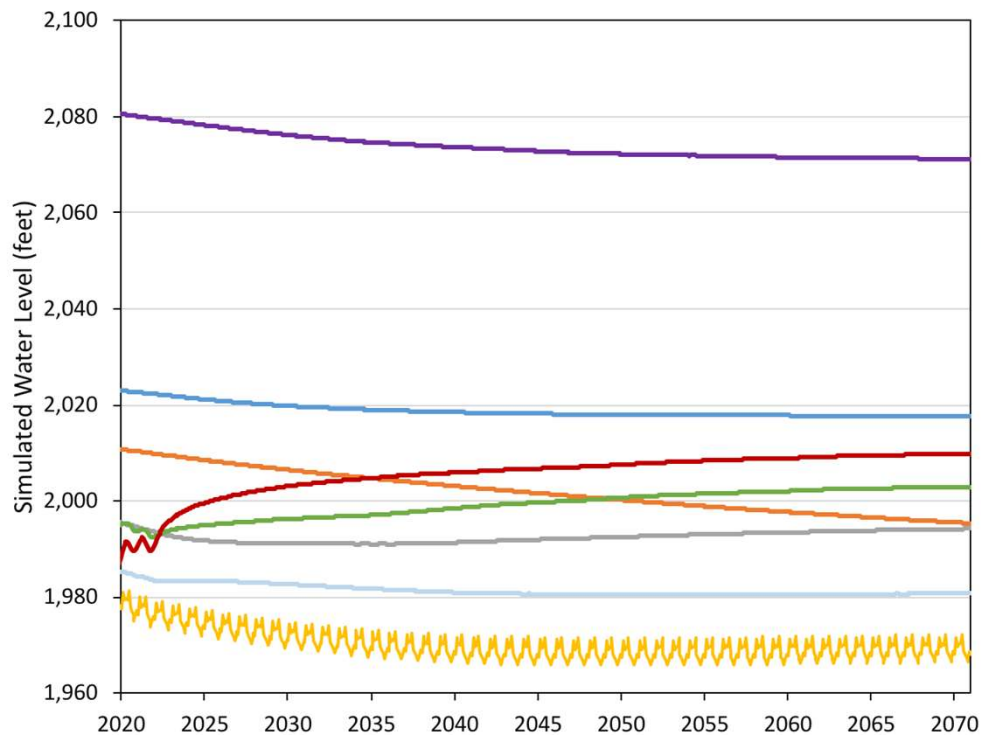
#3 White Paper (2020-2070)



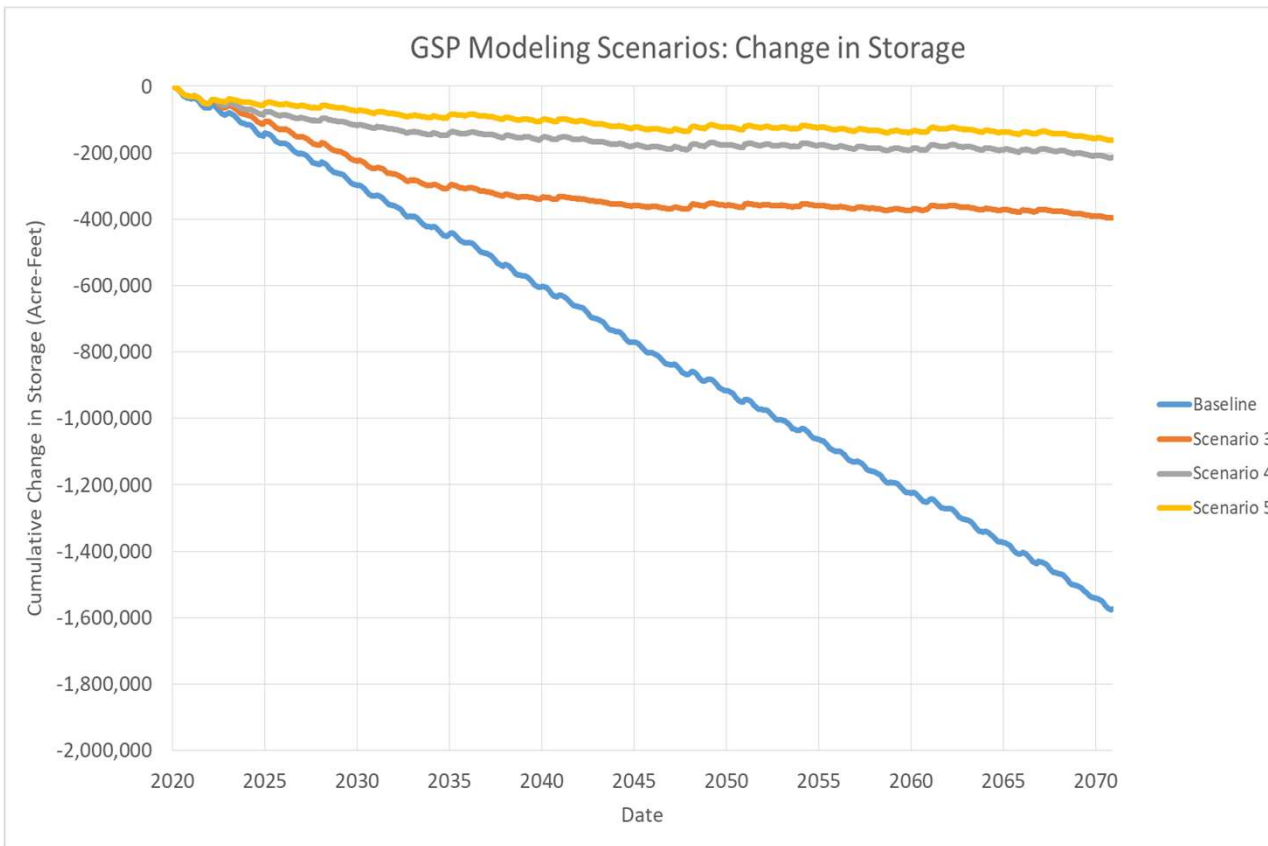
Water Level Change #4 Water Buyout(2020-2070)



Water Level Change #5 IHTP (2020-2070)



Change in Storage



Baseline Approximate Total Loss of Storage (2020 to 2070): **1,574,000 AF**

Scenario 3 White Paper Approximate Total Loss of Storage (2020 to 2070): **395,000 AF**

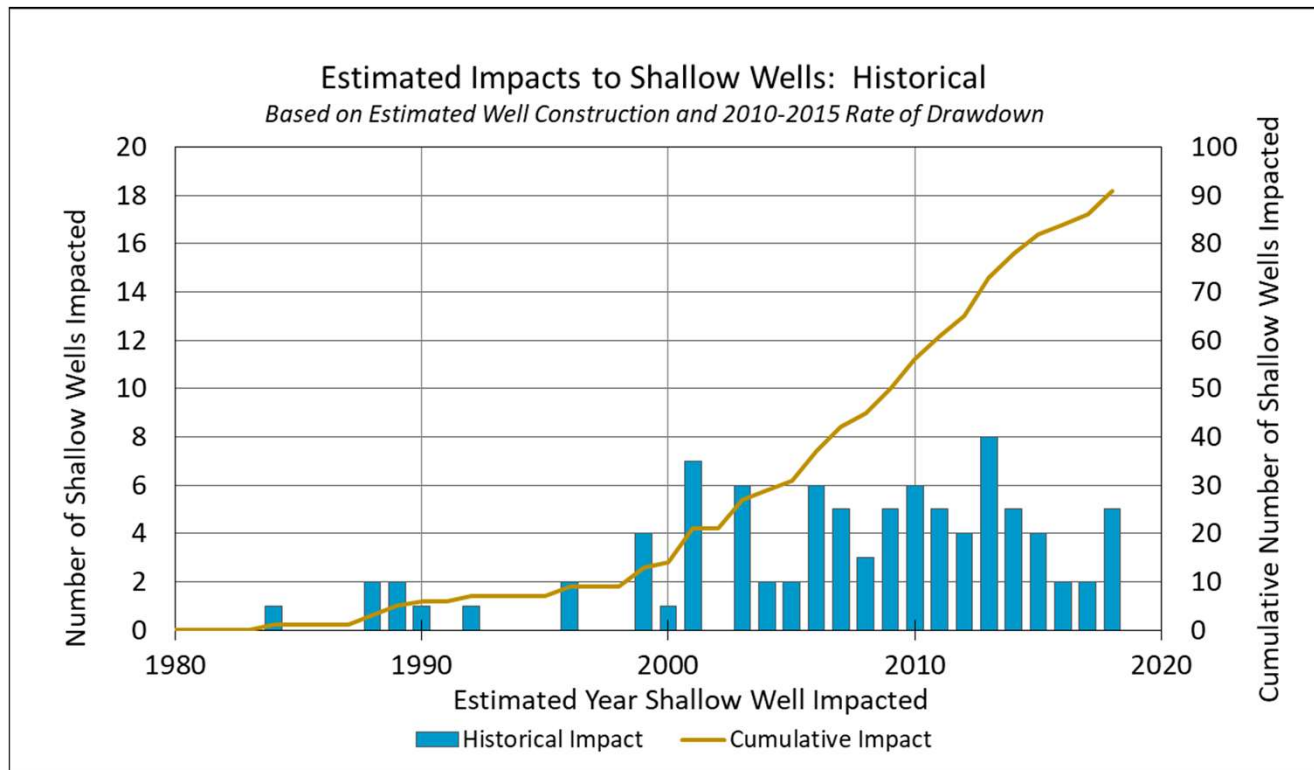
Scenario 4 Water Buyout Approximate Total Loss of Storage (2020 to 2070): **213,000 AF**

Scenario 5 Immediate Halt Approximate Total Loss of Storage (2020 to 2070): **162,000 AF**

Change in Storage: Summary

Approximate Loss of Storage (Acre-Feet)				
Time Period	Baseline	Scenario #3 (White Paper)	Scenario #4 (Water Buyout)	Scenario #5 (Immediate Halt to Pumping)
2020 – 2030	297,000	224,000	116,000	74,000
2030 – 2040	308,000	115,000	43,000	32,000
2040 – 2070	969,000	56,000	54,000	56,000
2020 – 2070	1,574,000	395,000	213,000	162,000

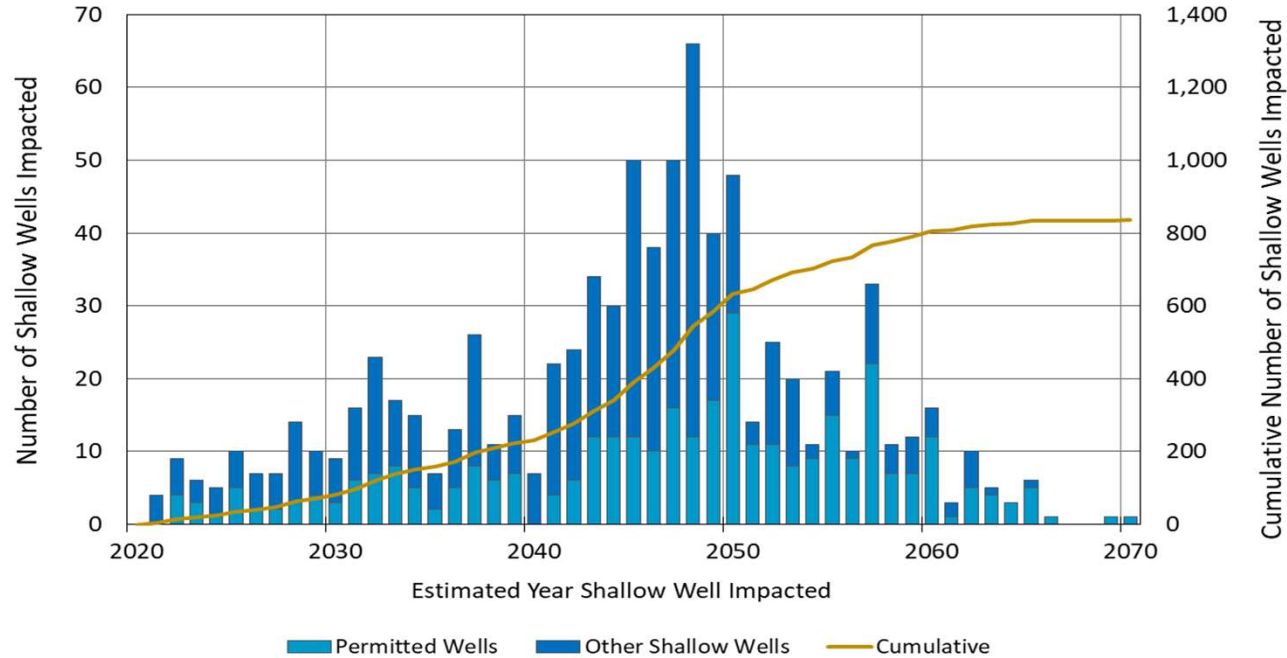
Shallow Well Impacts - Historical



Wells Impacted
Prior to 2019: **91**

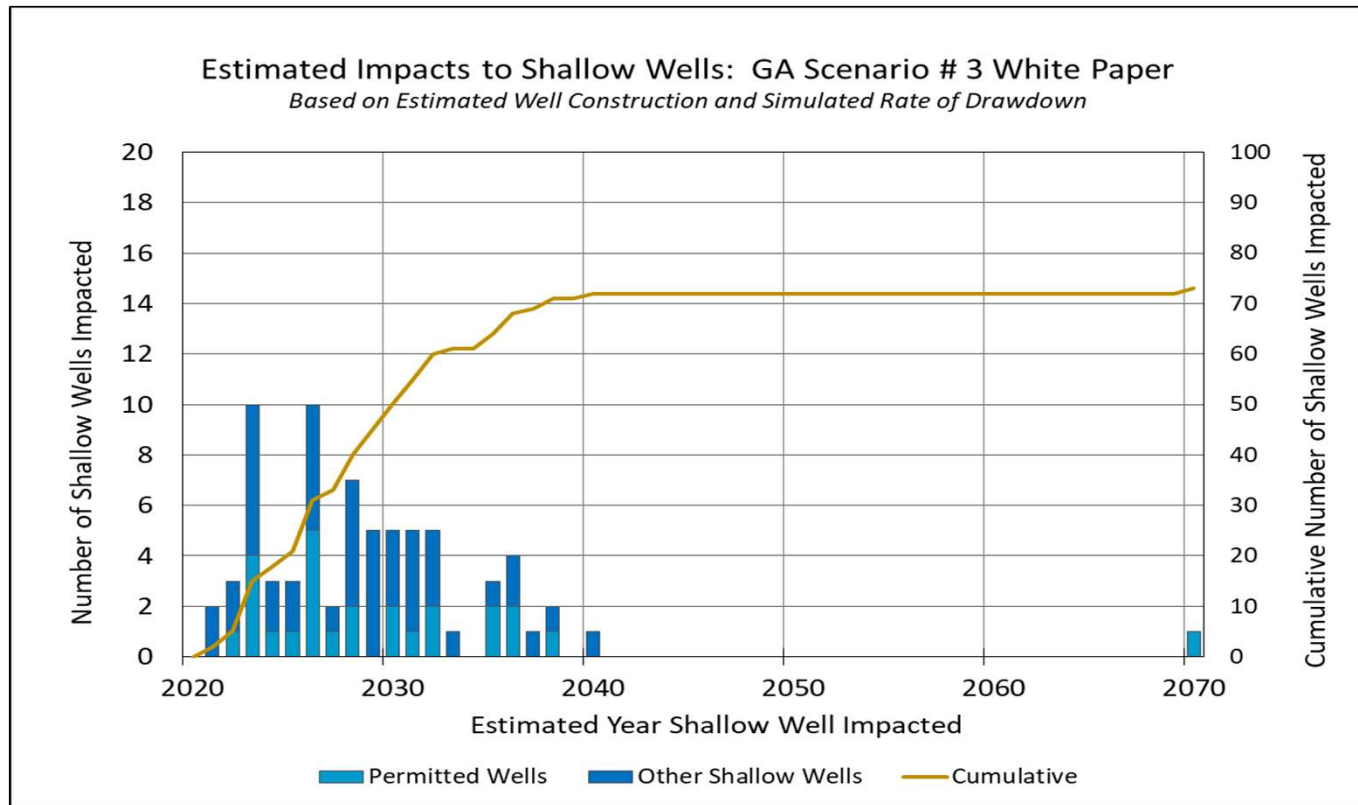
Shallow Well Impacts - Baseline

Estimated Impacts to Shallow Wells: Baseline (No Action) Scenario
Based on Estimated Well Construction and Simulated Rate of Drawdown



Total Impacted Shallow
Wells by 2070: **836**

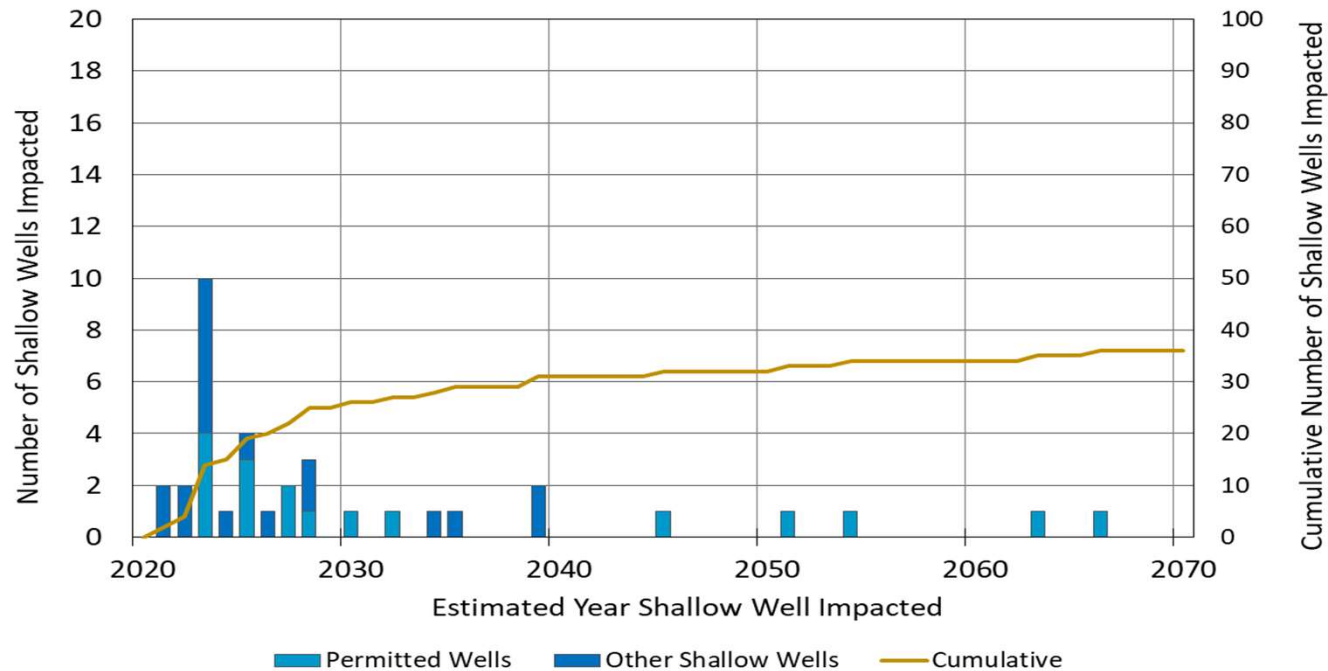
Shallow Well Impacts – White Paper (Scenario #3)



Total Impacted Shallow
Wells by 2070: **73**

Shallow Well Impacts – Water Buyout (Scenario #4)

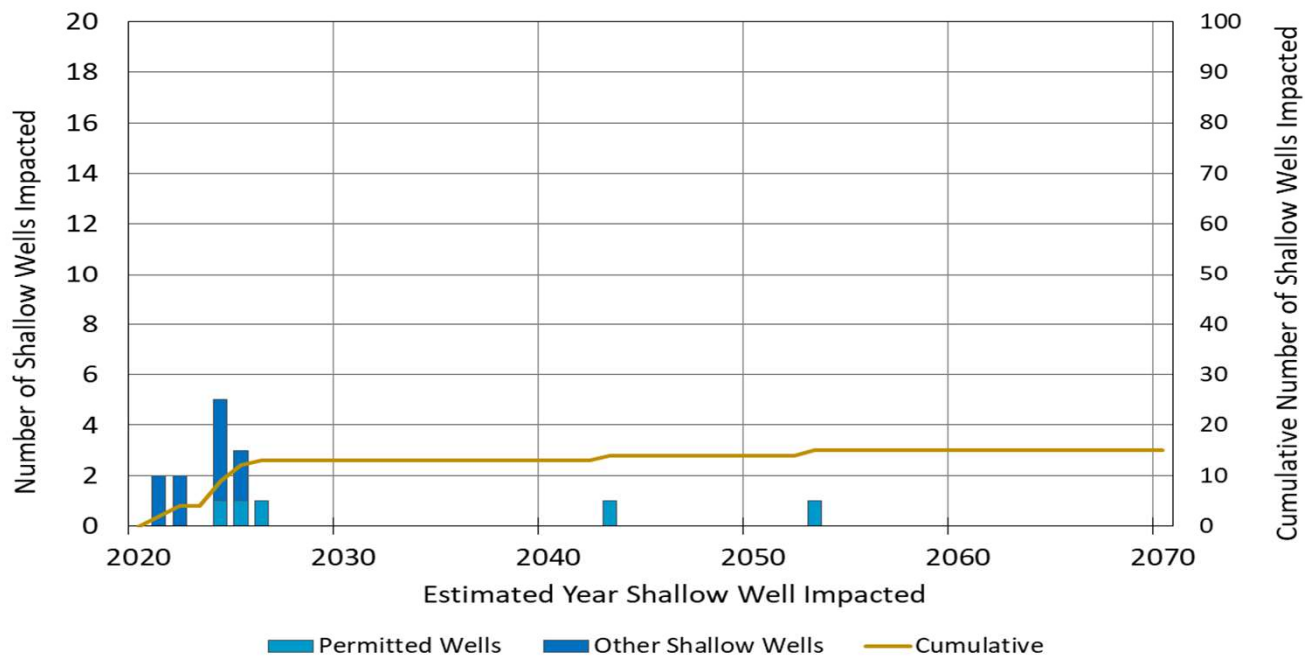
Estimated Impacts to Shallow Wells: GA Scenario # 4 Water Buyout
Based on Estimated Well Construction and Simulated Rate of Drawdown



Total Impacted Shallow
Wells by 2070: **36**

Shallow Well Impacts – Immediate Halt to Pumping (Scenario #5)

Estimated Impacts to Shallow Wells: GA Scenario # 5 Immediate Halt
Based on Estimated Well Construction and Simulated Rate of Drawdown



Total Impacted Shallow Wells by 2070: **15**

Shallow Well Impacts - Summary

	Historical		Baseline		Scenario #3 (White Paper)		Scenario #4 (Water Buyout)		Scenario #5 (Immediate Halt to Pumping)	
Year	Cumulative Impacted Wells	Cumulative Mitigation Costs	Cumulative Impacted Wells	Cumulative Mitigation Costs	Cumulative Impacted Wells	Cumulative Mitigation Costs	Cumulative Impacted Wells	Cumulative Mitigation Costs	Cumulative Impacted Wells	Cumulative Mitigation Costs
Pre-2020	91	\$6,825,000	-	-	-	-	-	-	-	-
2025	-	-	34	\$2,550,000	21	\$1,575,000	19	\$1,425,000	12	\$900,000
2030	-	-	81	\$6,075,000	50	\$3,750,000	26	\$1,950,000	13	\$975,000
2040	-	-	231	\$17,325,000	72	\$5,400,000	31	\$2,325,000	13	\$975,000
2070	-	-	836	\$62,700,000	73	\$5,475,000	36	\$2,700,000	15	\$1,125,000

Water Quality (TDS) – White Paper (Scenario #3)

Year	Approximate Number of Wells with TDS > 500 ppm
2020	306
2030	311
2040	323
2070	350

