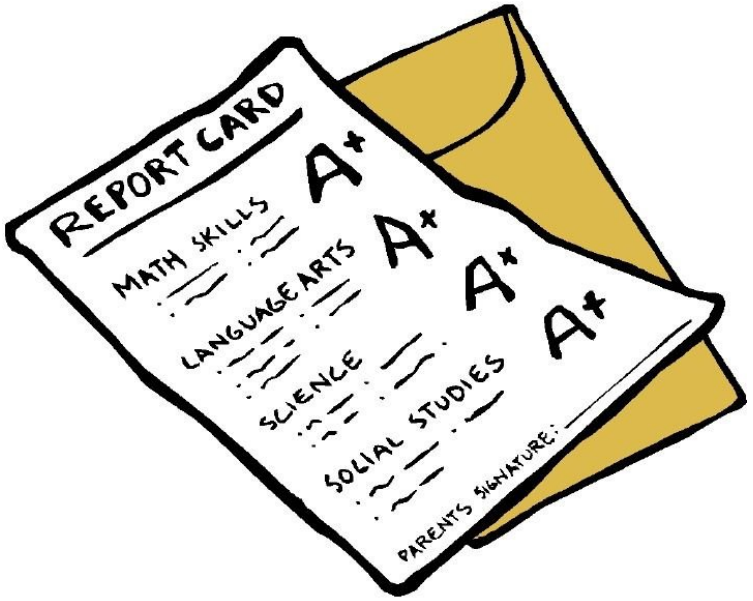
WY 2021 Report for Fillmore and Piru Subbasins

Fillmore and Piru Basins
Groundwater Sustainability Agency
Board Meeting
March 17th, 2022

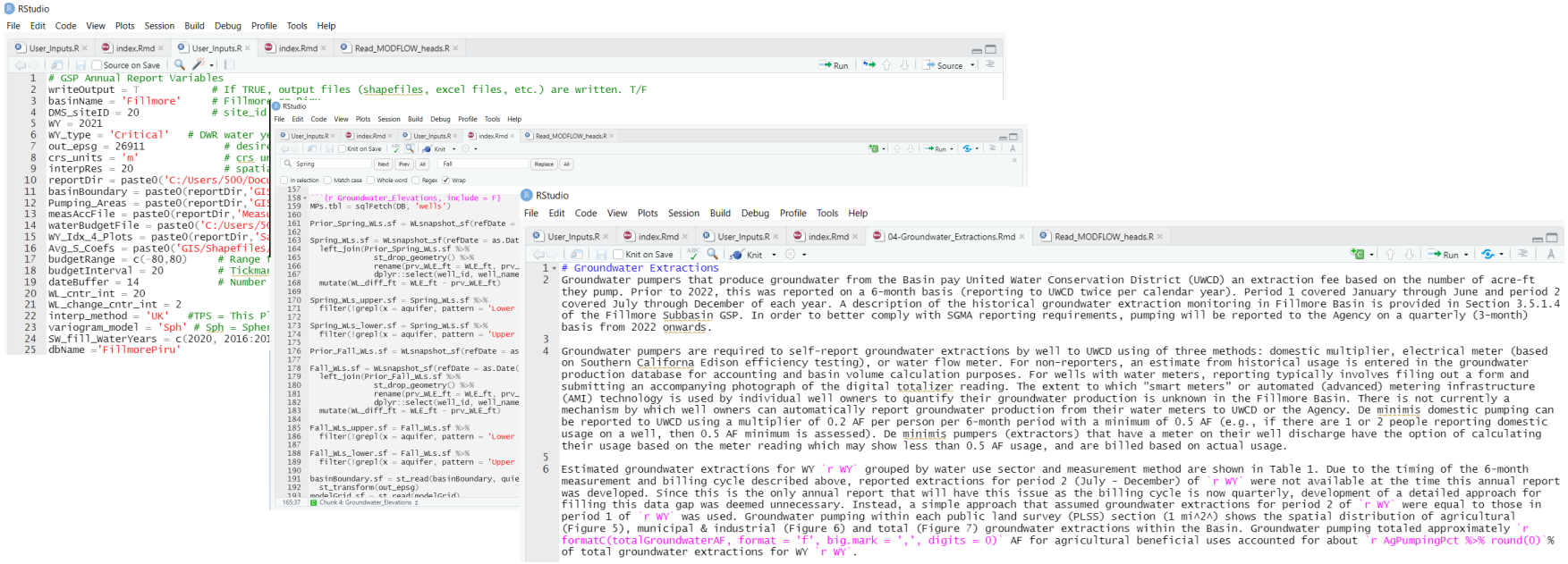
Annual Reports (23 CCR § 356.2)

- Due to DWR April 1 every year
- Summarizes hydrologic conditions and storage changes over the preceding water year
- Describes progress towards plan implementation



Annual Report WY 2021: Oct 1, 2020 - Sep 30, 2021

Automated Workflow



Database Management System

Data and word processing scripts

Maps, plots, and tables

Updated in-text calculations

Fillmore Subbasin Summary: WY 2021

- Water levels changed by -10.45 to +14.02 ft (average of -4.1 ft)
- Only 1 RMP (04N20W36MW104) is approaching minimum threshold
- Groundwater extractions: 56,800 AF (estimated)
- Estimated change in storage: -14,100 AF

Piru Subbasin Summary: WY 2021

- Water levels changed by -2.55 to -47.25 ft (average of -34.60 ft)
- RMP 04N19W36D01S is approaching minimum threshold - projected to exceed in summer 2022 if trend continues
- Groundwater extractions: 13,361 AF (estimated)
- Estimated change in storage: -38,500 AF

Fillmore Basin

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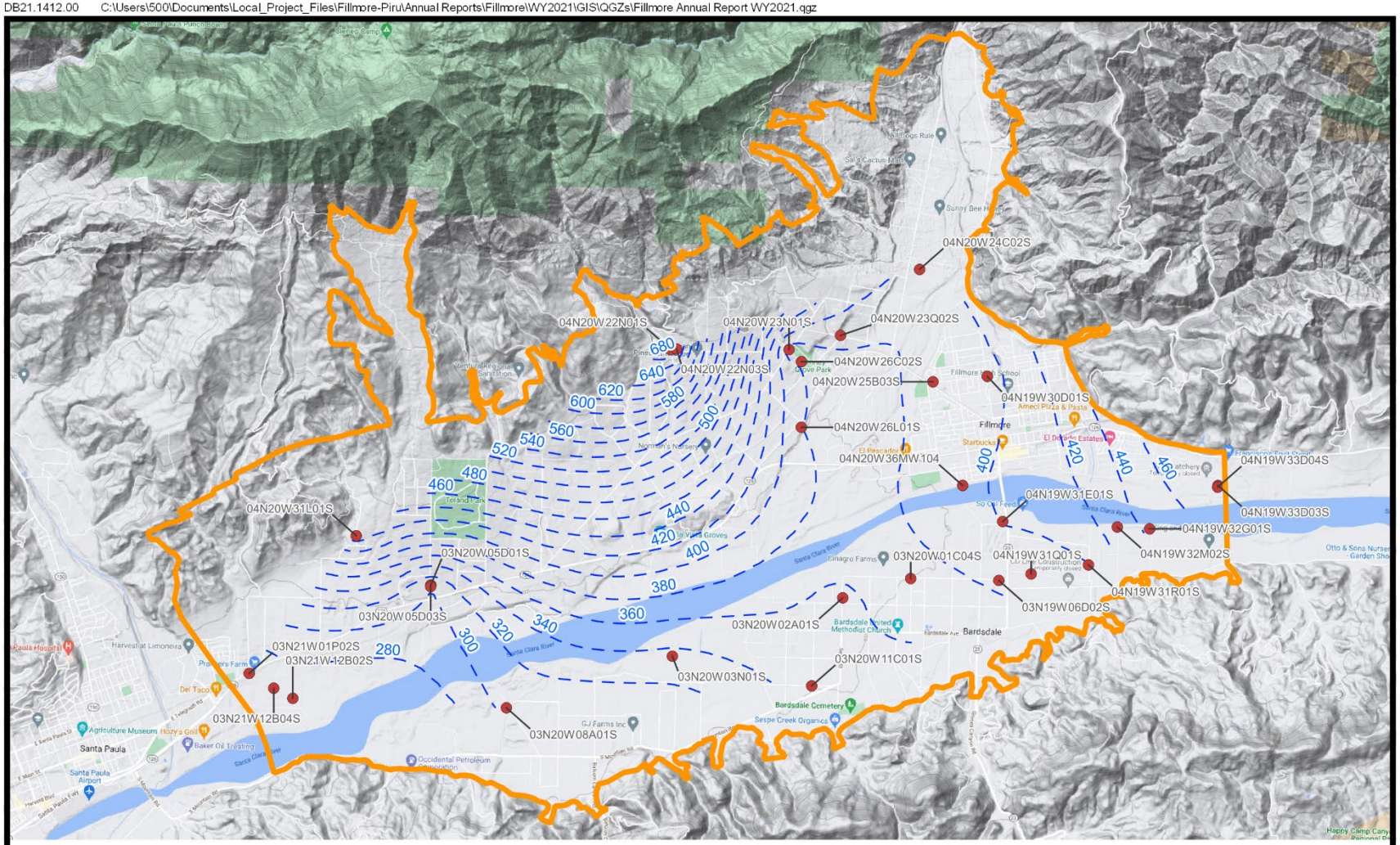

Explanation

Monitoring Well — Water Level Contour (ft amsl) — Groundwater Basin Boundary

0 2,500 5,000 ft

N

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Fillmore Subbasin Annual Report
Groundwater Elevations
Spring 2021

Figure 2

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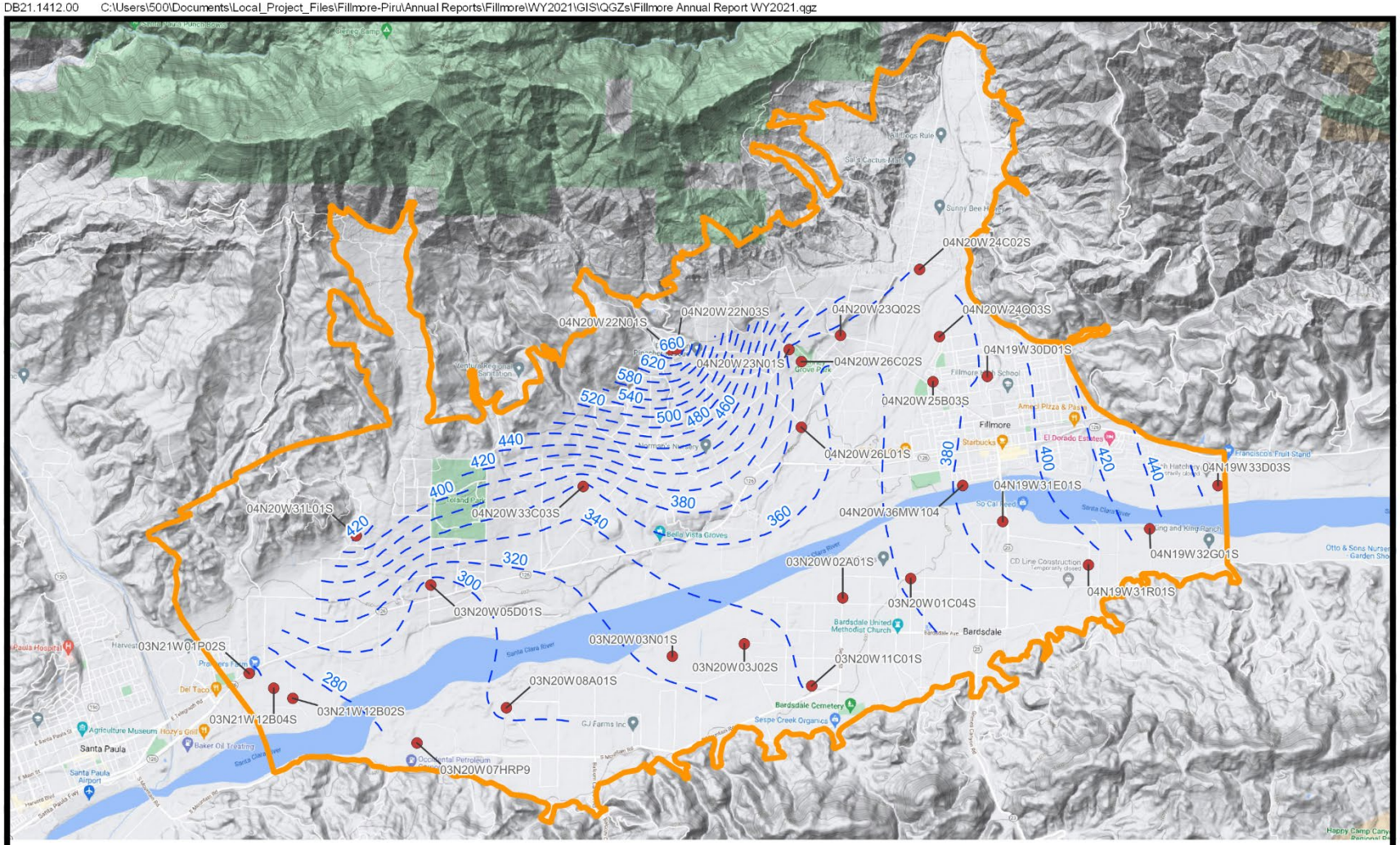

Explanation

Monitoring Well — Water Level Contour (ft amsl) — Groundwater Basin Boundary

0 2,500 5,000 ft

N

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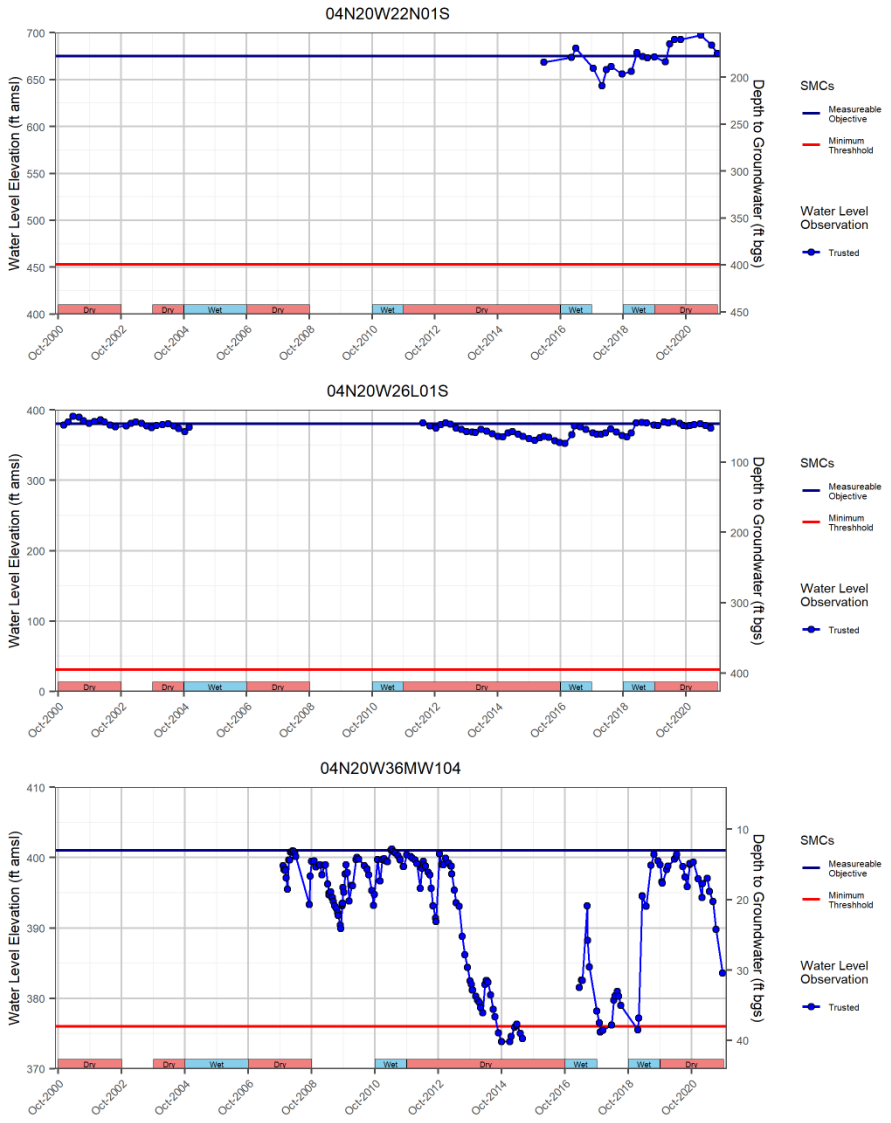
Fillmore Subbasin Annual Report
Groundwater Elevation Contours
Fall 2021

Figure 3



Notes:
1. See Figure 2 for well locations

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Fillmore Subbasin Annual Report
Representative Monitoring Points Hydrographs

Figure 4d

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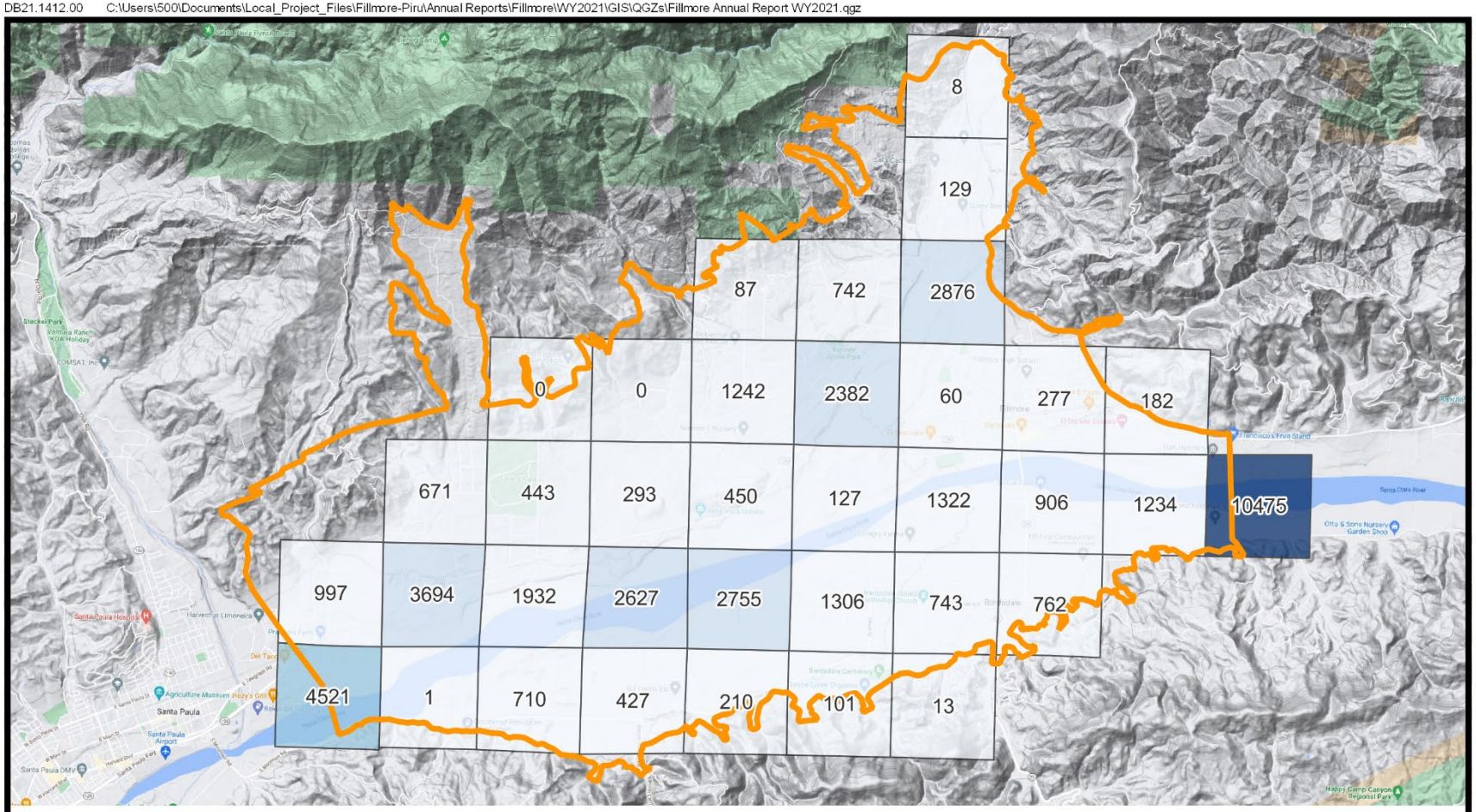

Explanation

Extraction Volume (AF)

- 0 - 2,000
- 2,000 - 4,000
- 4,000 - 6,000
- 6,000 - 8,000
- 8,000 - 10,000
- 10,000 - 12,000
- Groundwater Basin Boundary

0 5,000 10,000 ft

N

Notes:
1. Estimated extraction volumes aggregated by public land survey system section.
2. Labels indicate estimated extraction volume in acre-ft (AF).
3. Values estimated from January - July 2021 pumping records.

Figure 5

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Fillmore Subbasin Annual Report
Estimated Agricultural Groundwater Extractions
WY 2021

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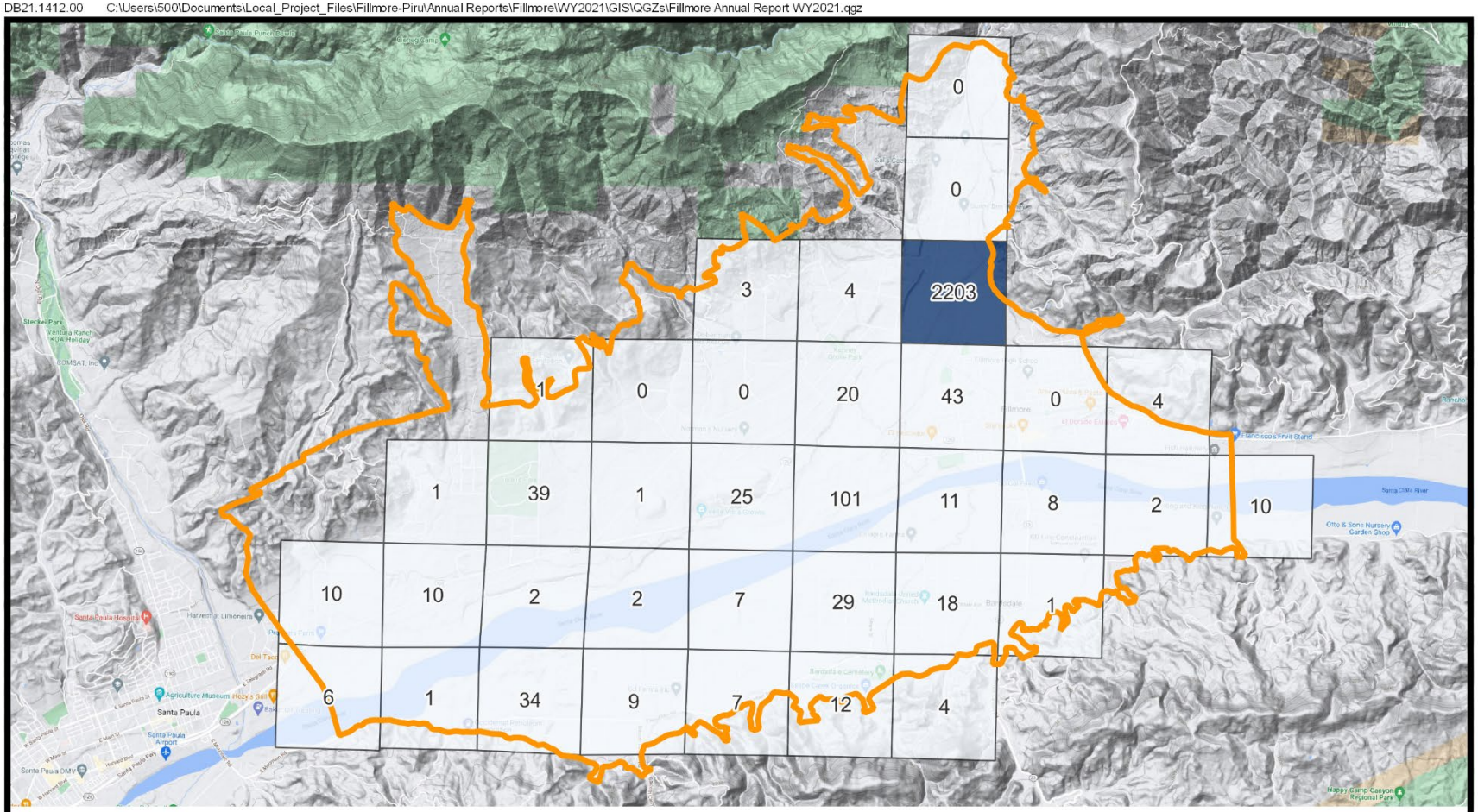

Explanation

Extraction Volume (AF)

- 0 - 500
- 500 - 1,000
- 1,000 - 1,500
- 1,500 - 2,000
- 2,000 - 3,000
- Groundwater Basin Boundary

0 5,000 10,000 ft

N

Notes:
1. Estimated extraction volumes aggregated by public land survey system section.
2. Labels indicate estimated extraction volume in acre-ft (AF).
3. Values estimated from January - July 2021 pumping records.

Figure 6

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Estimated Municipal and Industrial Groundwater Extractions
WY 2021

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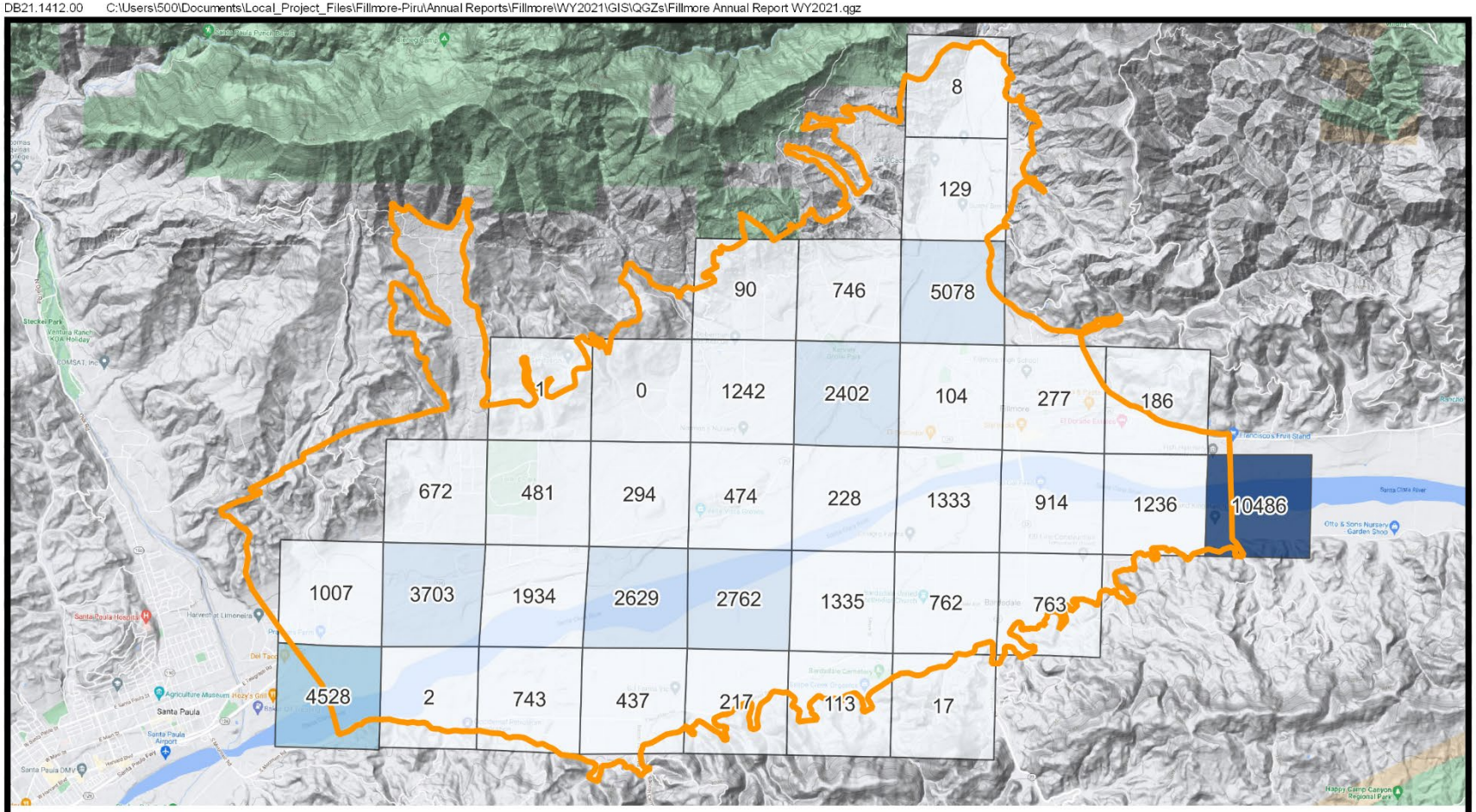

Explanation

Extraction Volume (AF)

- 0 - 2,000
- 2,000 - 4,000
- 4,000 - 6,000
- 6,000 - 8,000
- 8,000 - 10,000
- 10,000 - 12,000
- Groundwater Basin Boundary

0 5,000 10,000 ft

N

Notes:
1. Estimated extraction volumes aggregated by public land survey system section.
2. Labels indicate estimated extraction volume in acre-ft (AF).
3. Values estimated from January - July 2021 pumping records.

Fillmore Subbasin Annual Report
Estimated Total Groundwater Extractions
WY 2021

Figure 7

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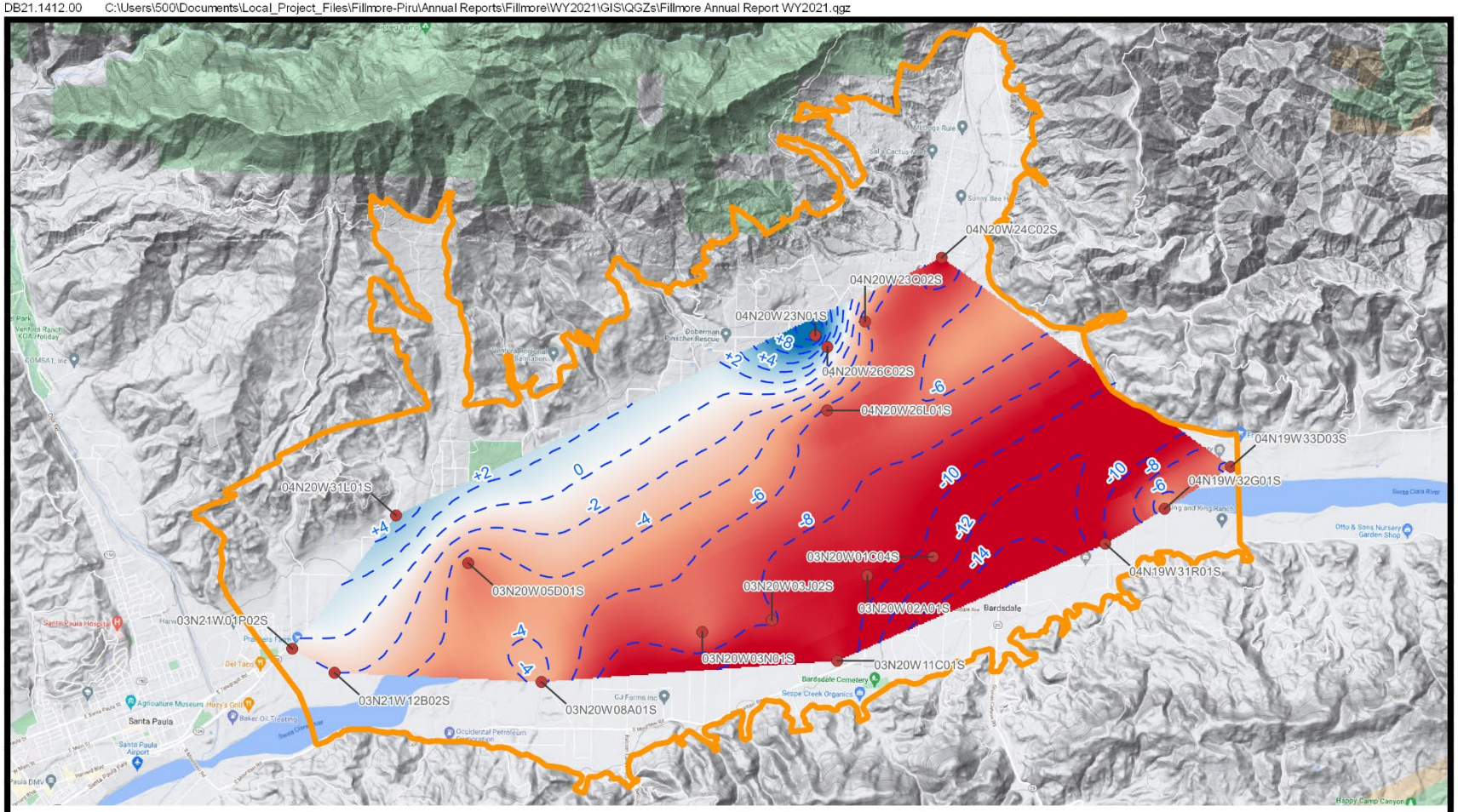

Explanation

Estimated Groundwater Storage Change (AF)

0.1

-0.1

Monitoring Well

Water Level Elevation Change Contour (ft)

Groundwater Basin Boundary

Notes:
1. Storage change estimated by interpolating changes in observed water levels to a 65 x 65 ft grid and multiplying by the vertically integrated aquifer storage coefficient for each grid cell.
2. Vertically integrated aquifer storage coefficient calculated as the thickness weighted average of aquifer storage coefficients for each model layer used in the UWCD groundwater model.
3. Estimated WY 2021 total groundwater storage change is -14,100 AF.

0 5,000 10,000 ft

N

Figure 8

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Fillmore Subbasin Annual Report
Change in Groundwater Storage
WY 2021

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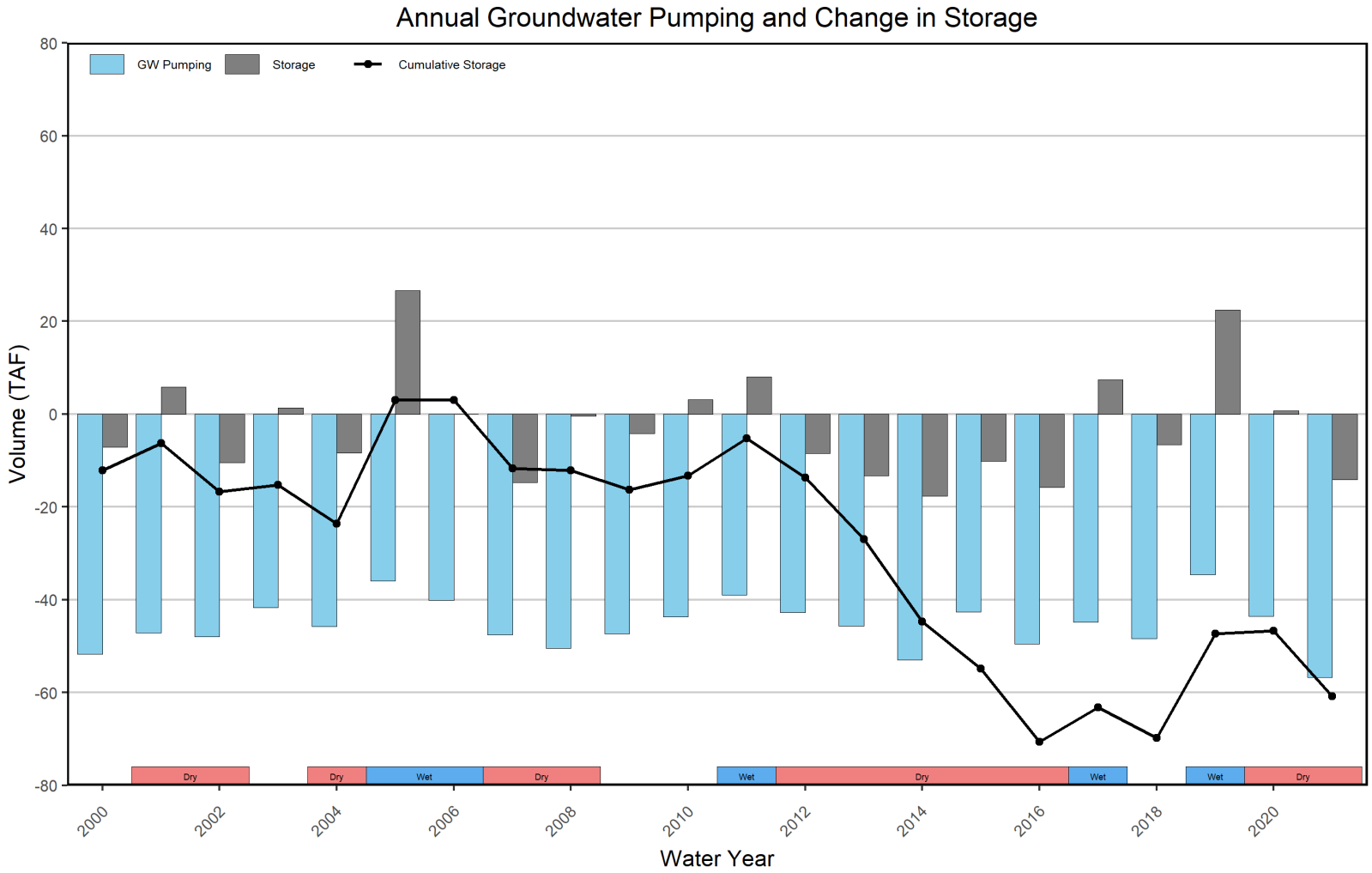

Notes:
1. Negative GW pumping values indicate extractions from groundwater aquifer.
2. Positive storage values indicate increasing groundwater levels.
3. GW pumping volume estimated for WY 2021.

Figure 9

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Groundwater Pumping and Change in Storage
WY 2000-2021

Piru Basin

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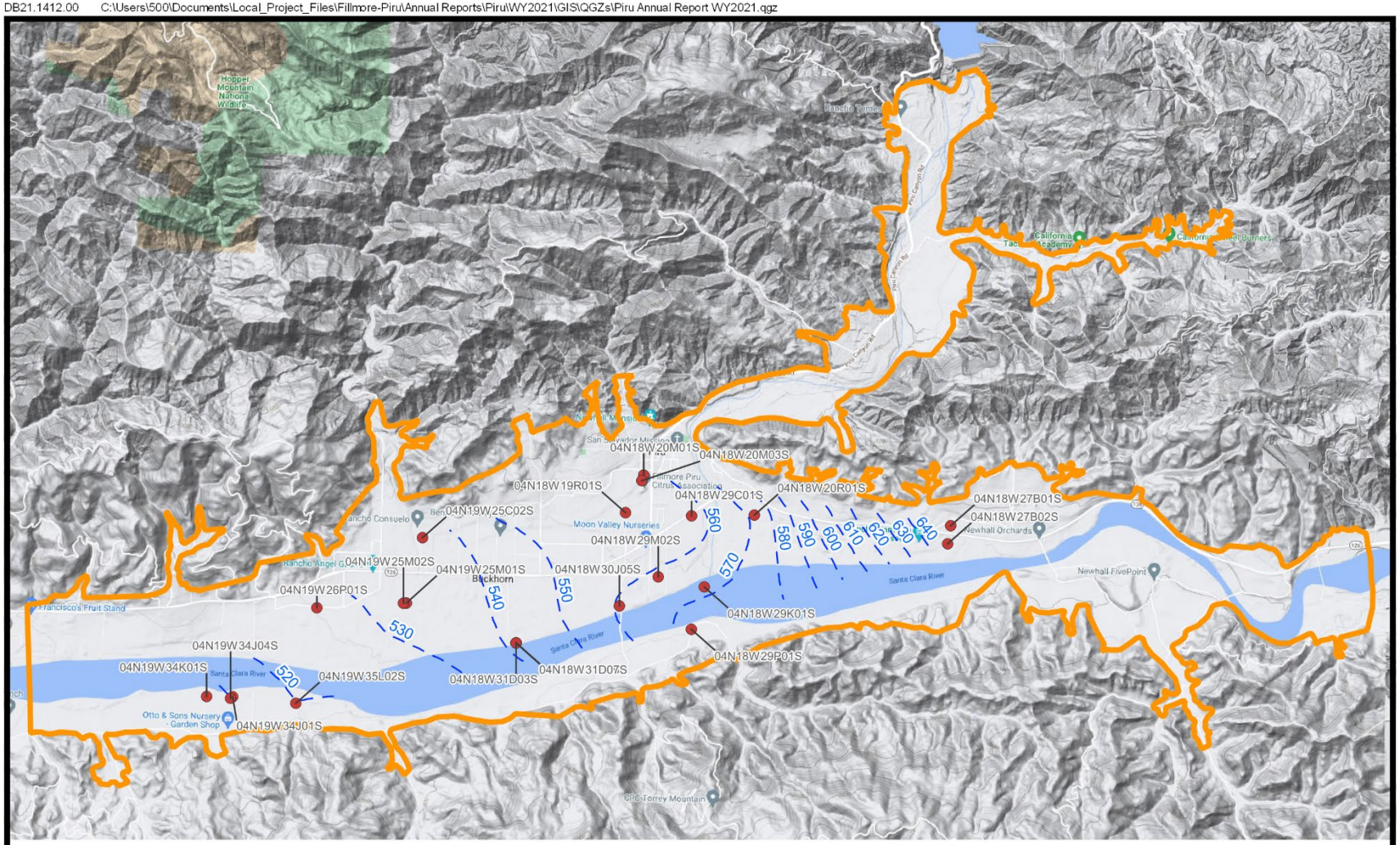

Explanation

- Monitoring Well
- Water Level Contour (ft amsl)
- Groundwater Basin Boundary

0 2,500 5,000 ft

N

Piru Subbasin Annual Report
Groundwater Elevations
Spring 2021

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Figure 2

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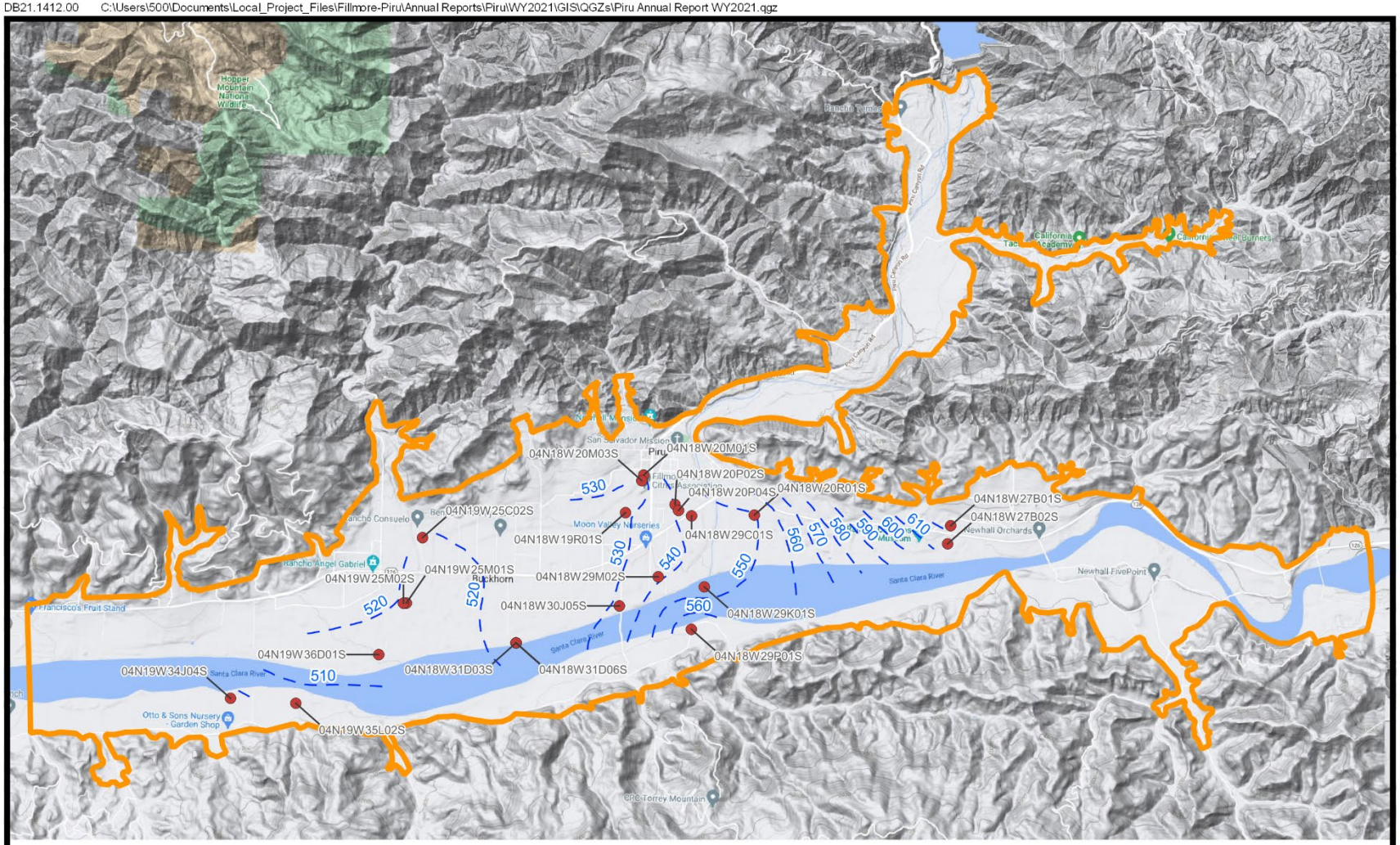

Explanation

Monitoring Well — Water Level Contour (ft amsl) — Groundwater Basin Boundary

0 2,500 5,000 ft

N

Figure 3

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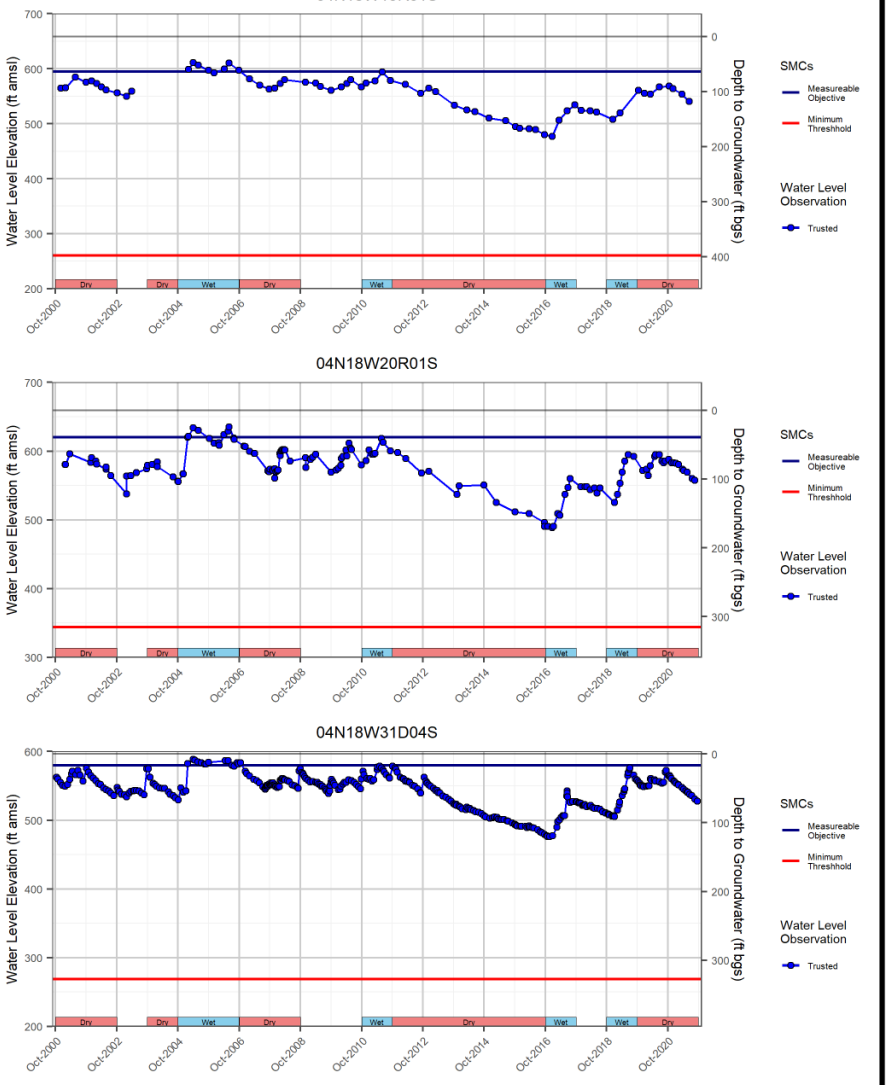
Piru Subbasin Annual Report
Groundwater Elevation Contours
Fall 2021



Notes:
1. See Figure 2 for well locations

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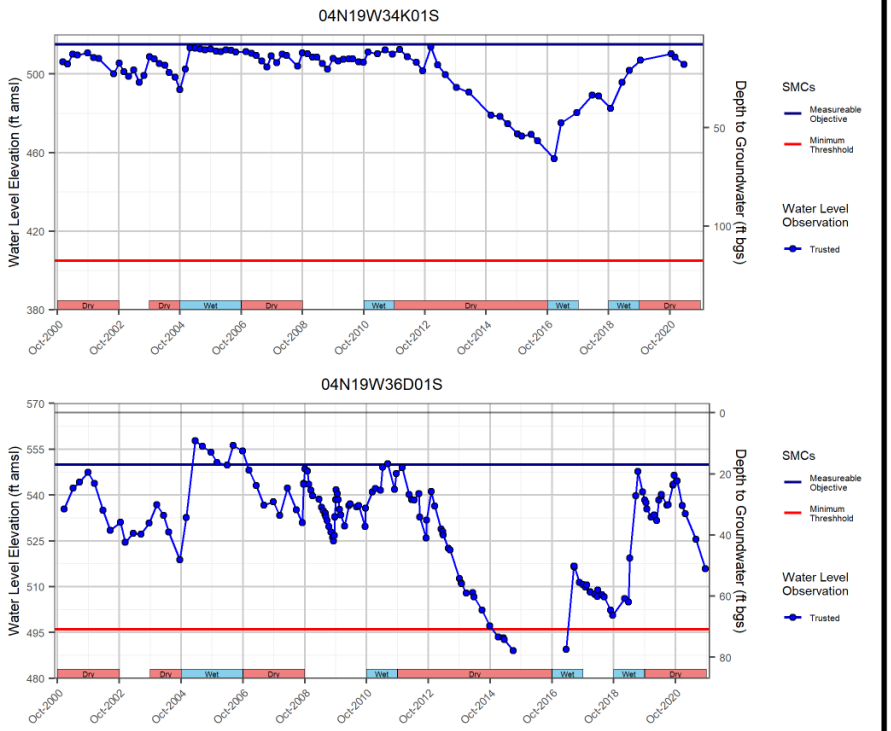
Piru Subbasin Annual Report
Representative Monitoring Points Hydrographs

Figure 4a



Notes:
1. See Figure 2 for well locations

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Representative Monitoring Points Hydrographs

Figure 4c

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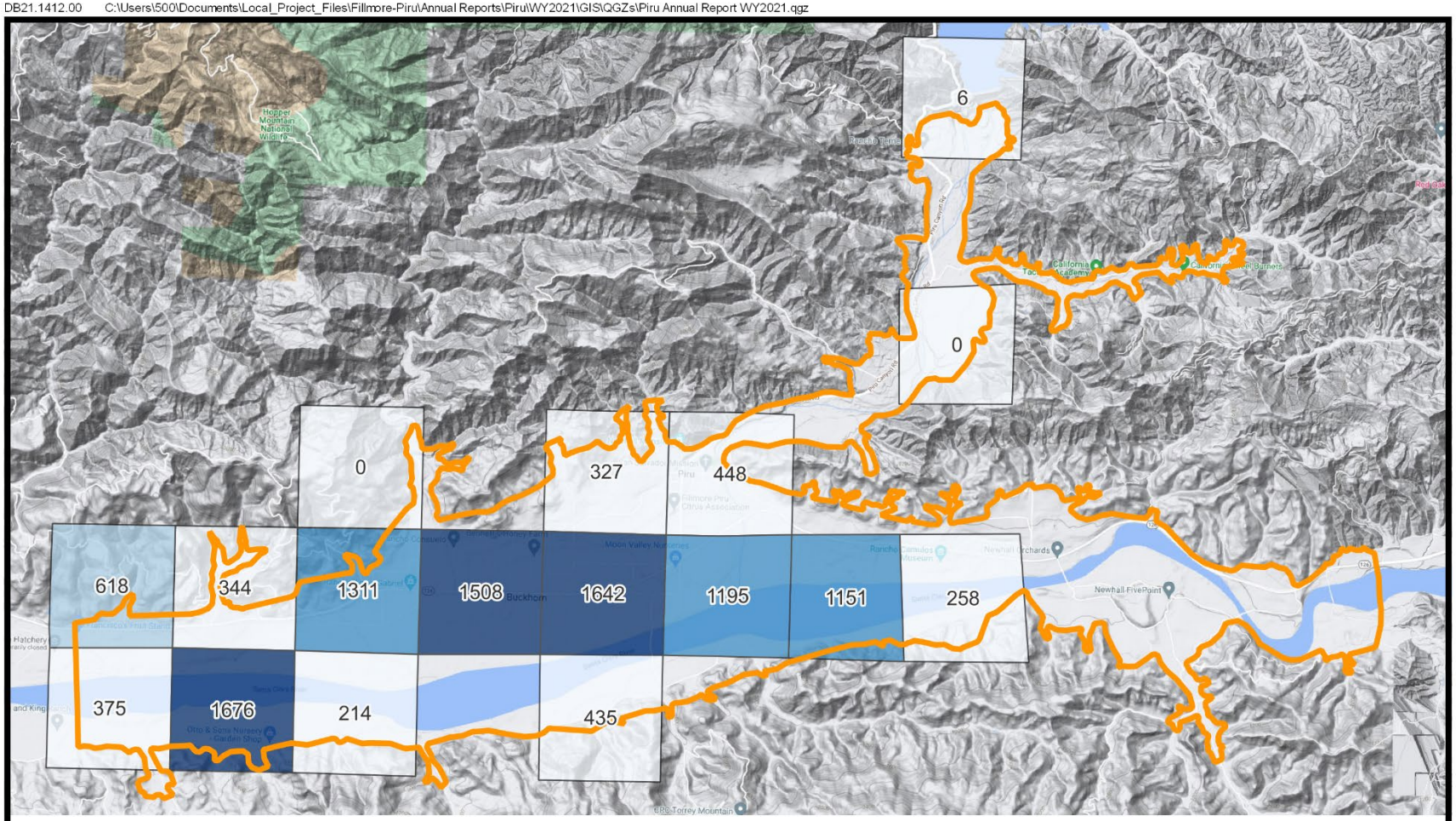

Explanation

Extraction Volume (AF)

- 0 - 500
- 500 - 1,000
- 1,000 - 1,500
- 1,500 - 2,000
- Groundwater Basin Boundary

0 2,500 5,000 ft

N

Notes:
1. Estimated extraction volumes aggregated by public land survey system section.
2. Labels indicate estimated extraction volume in acre-ft (AF).
3. Values estimated from January - July 2021 pumping records.

Piru Subbasin Annual Report

Estimated Agricultural Groundwater Extractions

WY 2021

Figure 5

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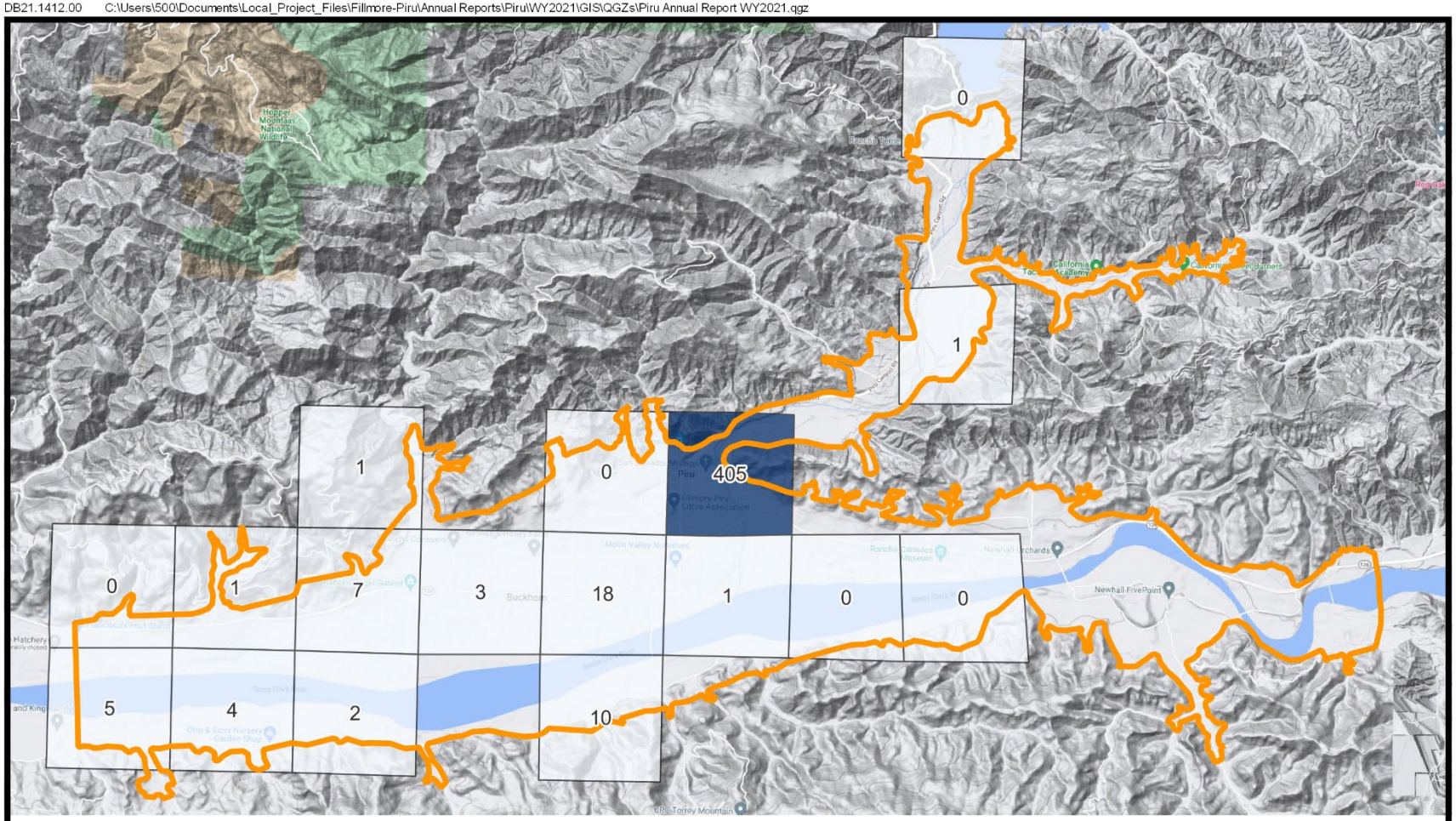

Explanation

Extraction Volume (AF)
- 0 - 100
- 100 - 200
- 200 - 300
- 300 - 400
- 400 - 500

Groundwater Basin Boundary

0 2,500 5,000 ft

N

Notes:
1. Estimated extraction volumes aggregated by public land survey system section.
2. Labels indicate estimated extraction volume in acre-ft (AF).
3. Values estimated from January - July 2021 pumping records.

Figure 5

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Estimated Municipal and Industiral Groundwater Extractions
WY 2021

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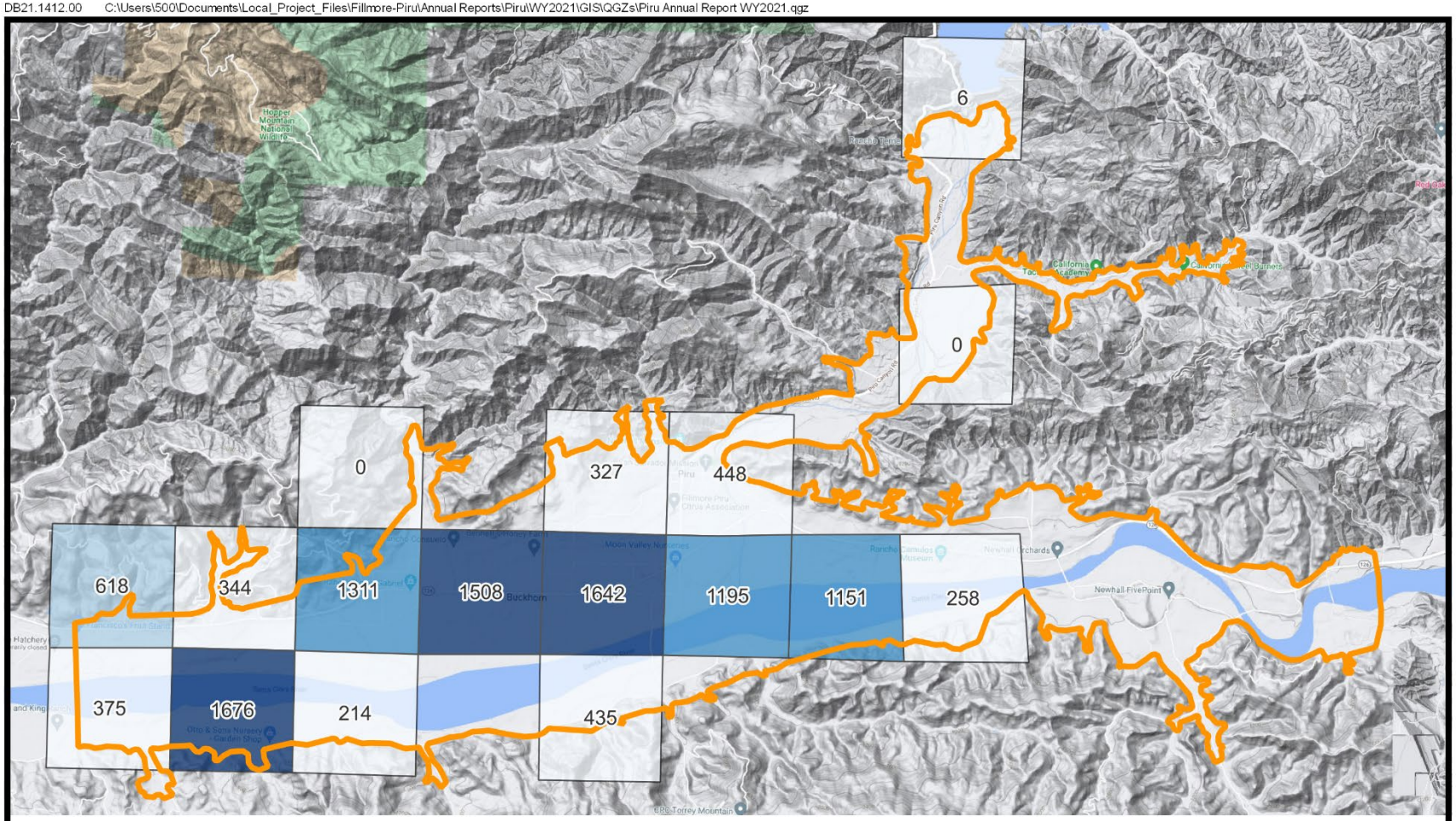

Explanation

Extraction Volume (AF)

- 0 - 500
- 500 - 1,000
- 1,000 - 1,500
- 1,500 - 2,000
- Groundwater Basin Boundary

0 2,500 5,000 ft

N

Notes:
1. Estimated extraction volumes aggregated by public land survey system section.
2. Labels indicate estimated extraction volume in acre-ft (AF).
3. Values estimated from January - July 2021 pumping records.

Figure 5

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Estimated Total Groundwater Extractions
WY 2021

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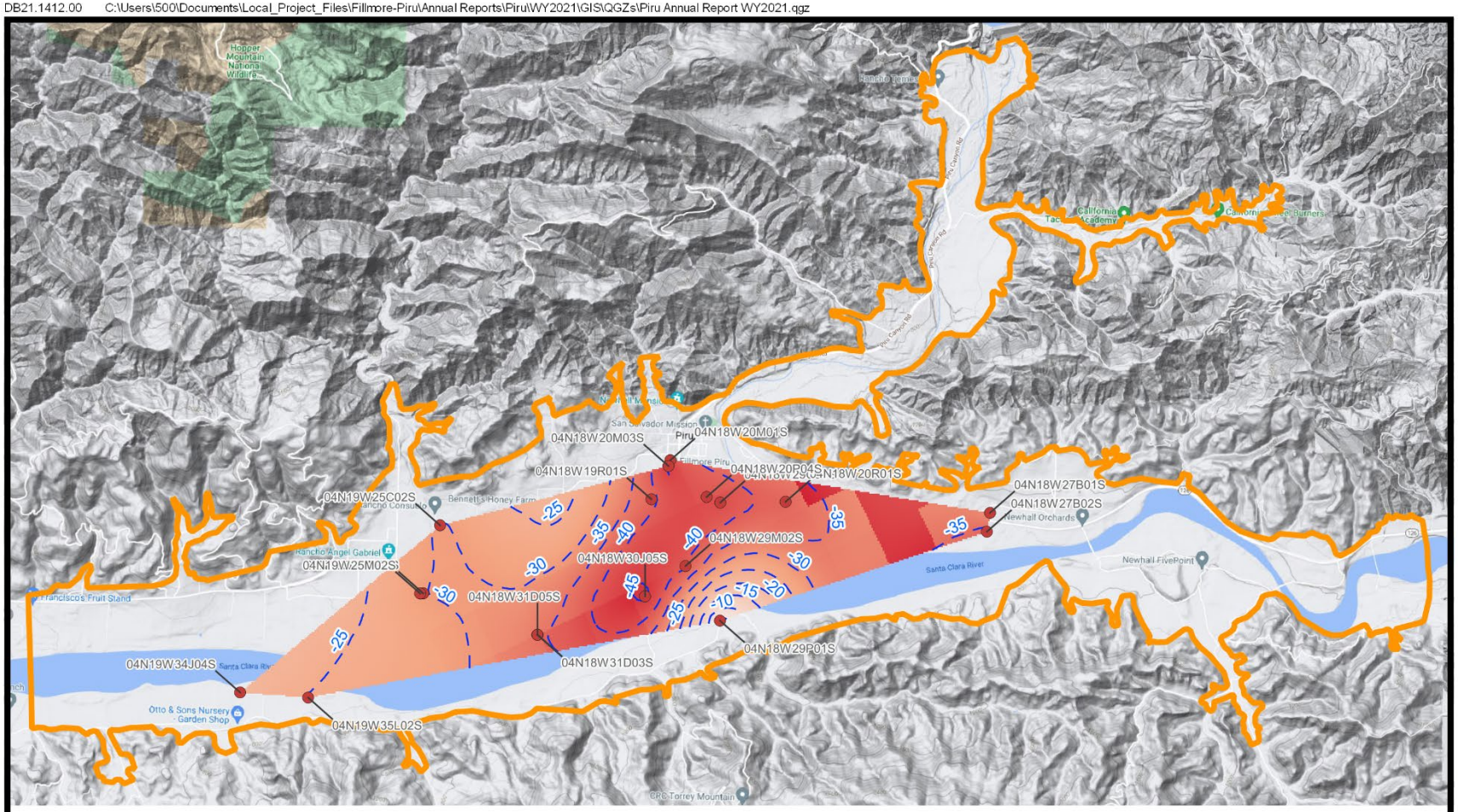

Explanation

Estimated Groundwater Storage Change (AF)

0.6

-0.6

Monitoring Well

Water Level Elevation Change Contour (ft)

Groundwater Basin Boundary

Notes:
1. Storage change estimated by interpolating changes in observed water levels to a 65 x 65 ft grid and multiplying by the vertically integrated aquifer storage coefficient for each grid cell.
2. Vertically integrated aquifer storage coefficient calculated as the thickness weighted average of aquifer storage coefficients for each model layer used in the UWCD groundwater model.
3. Estimated WY 2021 total groundwater storage change is -38,500 AF.

0 2,500 5,000 ft

N

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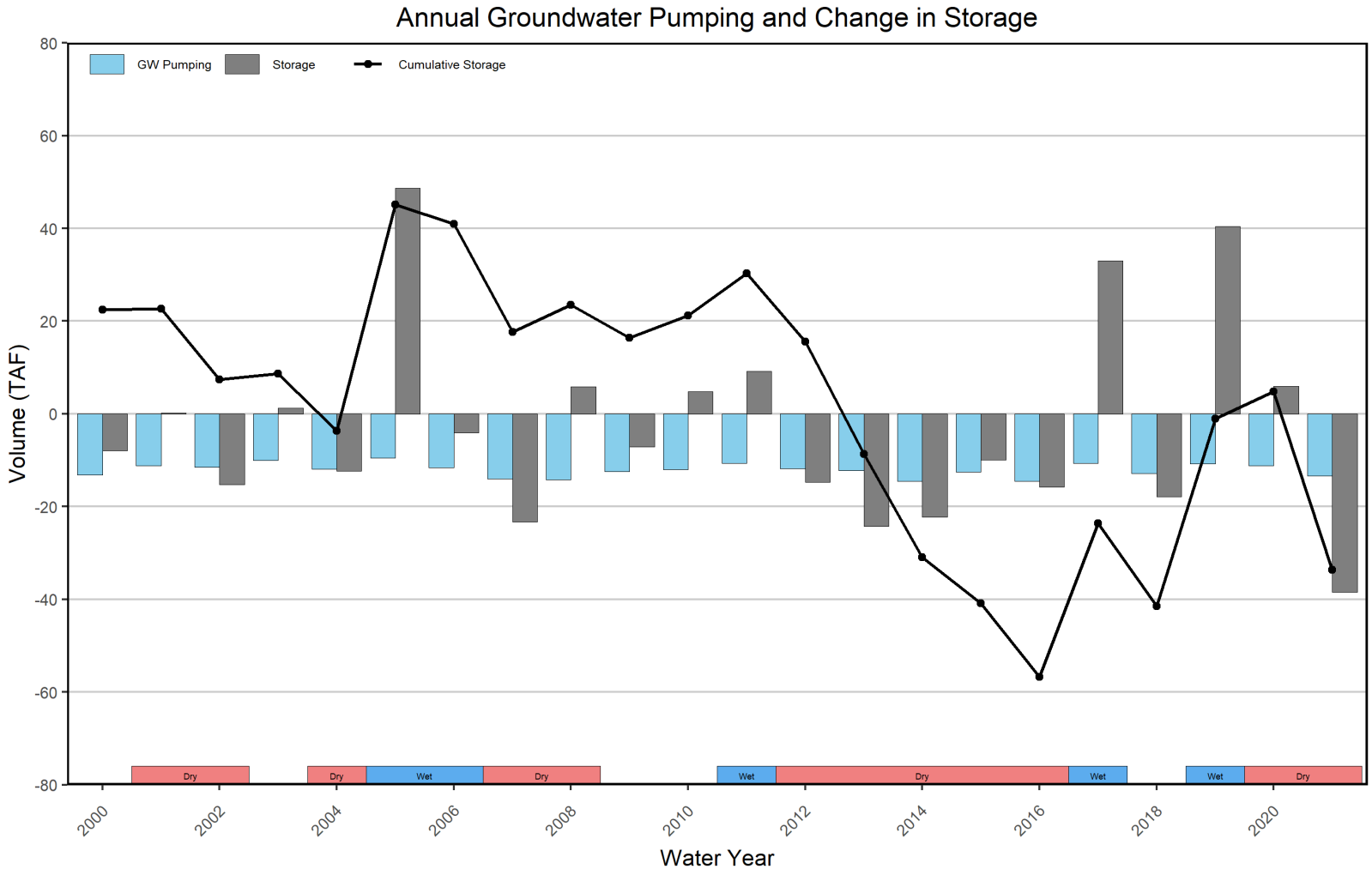
Change in Groundwater Storage
WY 2021

Figure 8



Notes:
1. Negative GW pumping values indicate extractions from groundwater aquifer.
2. Positive storage values indicate increasing groundwater levels.
3. GW pumping volume estimated for WY 2021.

Figure 9

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Fillmore Subbasin Annual Report
Groundwater Pumping and Change in Storage
WY 2000-2021

QUESTIONS?

Table 1. Fillmore Subbasin Groundwater Extractions

Sector	Method	GW Extraction Volume (AF)	Accuracy (%)	Range (AF)
Agriculture	Domestic	8	± 20	7 - 10
	Electrical Efficiency	18,046	± 20	14,437 - 21,655
	Water Meter	36,107	± 5	34,302 - 37,912
Agriculture Subtotal		54,161		48,746 - 59,577
Municipal and Industrial	Domestic	102	± 20	81 - 122
	Electrical Efficiency	88	± 20	70 - 105
	Water Meter	2,436	± 5	2,314 - 2,557
Municipal and Industrial Subtotal		2,626		2,465 - 2,784
Total		**56,787**		**51,211 - 62,361**

Table 2. Fillmore Subbasin Surface Water Use

Surface Water Source	Method	Annual Volume Used (AF)	Accuracy (%)	Range (AF)
Local Supplies	Estimated from previously reported diversions	1,794	± 33	1,202 - 2,386
	Water Meter	988	± 5	939 - 1,037
	Weir	494	± 5	469 - 519
Total		**3,276**		**2,610 - 3,942**

Table 3. Fillmore Subbasin Total Water Use

Sector	Method	Total Annual Volume (AF)	Accuracy (%)	Range (AF)
Agriculture	Domestic	8	± 20 %	7 - 10
	Electrical Efficiency	18,046	± 20 %	14,437 - 21,655
	Estimated from previously reported diversions	1794	± 33 %	1,202 - 2,386
	Water Meter	37,095	± 5 %	35,241 - 38,949
	Weir	494	± 5 %	469 - 519
Agriculture Subtotal		57,437	-	51,356 - 63,519
Municipal and Industrial	Domestic	102	± 20 %	81 - 122
	Electrical Efficiency	88	± 20 %	70 - 105
	Water Meter	2,436	± 5 %	2,314 - 2,557
Municipal and Industrial Subtotal		2,626	-	2,465 - 2,784
Total		**60,063**		**53,821 - 66,303**

Table 1. Piru Subbasin Groundwater Extractions

Sector	Method	GW Extraction Volume (AF)	Accuracy (%)	Range (AF)
Agriculture	Domestic	-	± 20	0 - 0
	Electrical Efficiency	3,057	± 20	2,446 - 3,668
	Water Meter	9,847	± 5	9,355 - 10,340
Agriculture Subtotal		12,904		11,801 - 14,008
Municipal and Industrial	Domestic	21	± 20	17 - 25
	Electrical Efficiency	11	± 20	9 - 13
	Water Meter	425	± 5	404 - 447
Municipal and Industrial Subtotal		457		430 - 485
Total		**13,361**		**12,231 - 14,493**

Table 2. Piru Subbasin Surface Water Use

Surface Water Source	Method	Annual Volume Used (AF)	Accuracy (%)	Range (AF)
Local Supplies	Estimated from previously reported diversions	1,794	± 33	1,202 - 2,386
	Water Meter	988	± 5	939 - 1,037
	Weir	494	± 5	469 - 519
Total		**3,276**		**2,610 - 3,942**

Table 3. Piru Subbasin Total Water Use

Sector	Method	Total Annual Volume (AF)	Accuracy (%)	Range (AF)
Agriculture	Domestic	0	± 20 %	0 - 0
	Electrical Efficiency	3,057	± 20 %	2,446 - 3,668
	Estimated from previously reported diversions	1,794	± 33 %	1,202 - 2,386
	Water Meter	10,835	± 5 %	10,294 - 11,377
	Weir	494	± 5 %	469 - 519
Agriculture Subtotal		16,180	-	14411 - 17950
Municipal and Industrial	Domestic	21	± 20 %	17 - 25
	Electrical Efficiency	11	± 20 %	9 - 13
	Water Meter	425	± 5 %	404 - 447
Municipal and Industrial Subtotal		457	-	430 - 485
Total		**16,637**		**14841 - 18435**