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Exempt From Filing Fees Pursuant to Cal. Gov't Code § 6103

SUPERIOR COURT OF THE STATE OF CALIFORNIA

COUNTY OF LOS ANGELES

SANTA BARBARA CHANNELKEEPER, a California non-profit corporation,

Petitioner,

v.

STATE WATER RESOURCES CONTROL BOARD, etc., et al.,

Respondents.

CITY OF SAN BUENAVENTURA, etc.,

Cross-Complainant

v.

DUNCAN ABBOTT, an individual, et al.

Cross-Defendants.

Case No. 19STCP01176

Judge: Honorable William F. Highberger

NOTICE OF HEARING ON ORDER TO SHOW CAUSE RE WATERSHED AND BASIN BOUNDARIES; DECLARATION OF SARAH CHRISTOPHER FOLEY IN SUPPORT THEREOF

Date: December 9, 2021
Time: 2:30 p.m.
Dept: 10

Action Filed: Sept. 19, 2014
Trial Date: Feb. 14, 2022

TO ALL PARTIES AND THEIR COUNSEL OF RECORD:

PLEASE TAKE NOTICE THAT on December 9, 2021, the Court will hold an Order to Show Cause (OSC) hearing as to why the Court should not issue an order establishing (1) the boundaries of the Ventura River Watershed (Watershed), as defined by the U.S. Geological Survey (USGS) National Hydrography Dataset (NHD) and Watershed Boundary Dataset (WBD) as 10-digit Hydrologic Unit Code (HUC) 1807010101 – Ventura River Watershed and (2) the boundaries of the Watershed's four groundwater basins, as defined by the California's Department of Water Resources (DWR) in Bulletin 118, in advance of the Phase 1 Trial.

The OSC hearing will take place on December 9, 2021, at 2:30 p.m. in Department S10 of the Los Angeles County Superior Court, which is located at 312 North Spring Street, Los Angeles, CA 90012. The Court ordered the City of San Buenaventura to provide Notice of the OSC hearing.

PLEASE TAKE FURTHER NOTICE that all parties who want to attend the hearing on the OSC may appear remotely via the Court's remote appearance program, LA Court Connect. Parties may sign up for a remote appearance by going to https://my.lacourt.org/laccwelcome, or calling (213) 830-0400.

The court can issue orders on the following two questions of Phase 1 Trial in advance of Phase 1 Trial:

Issue Number 1: What are the boundaries of the Ventura River Watershed?

Answer: USGS defines the Ventura River Watershed boundaries in its NHD and companion WBD as HUC 1807010101 – Ventura River Watershed, and the Court should order that these are the boundaries in this case.

Issue Number 2: What are the boundaries of the four groundwater basins in the Ventura River Watershed?

Answer: The boundaries four groundwater basins in the Ventura River Watershed are defined in DWR's Bulletin 118, and the Court should order that these are the boundaries in this case.

DISCUSSION

1. Ventura River Watershed Boundaries

The National Hydrography Dataset (NHD)[1] and companion Watershed Boundary Dataset (WBD)[2] are used to portray the flow of surface water on the National Map, which is maintained by USGS.[3] (https://water.ca.gov/Programs/All-Programs/National-Hydrography-Dataset-Stewardship.) DWR is the steward for NHD and WBD in California. (Id.) DWR has declared that NHD's WBD is the authoritative dataset of California's watersheds. (Id.) State agencies, such as the State Water Resources Control Board and the Regional Water Quality Control Boards, use the WBD to define watersheds in California.

The Ventura River Watershed, located in Ventura and Santa Barbara Counties, is a fan-shaped catchment of approximately 226 square miles that drains water from land containing uplands at over 6,000 feet in elevation and extends down to sea level. The Court should issue an order defining the boundaries of the Ventura River Watershed as delineated by the USGS in its NHD and WBD as HUC 1807010101 – Ventura River Watershed. The parties are currently negotiating a proposed illustrative-only map of the Watershed showing the boundaries as delineated by the USGS NHD and WBD geographic information system (GIS) data, and if they can agree, the City will submit an illustrative map in advance of the OSC hearing. (See Declaration of Sarah Christopher Foley (Foley Decl.).)

2. Groundwater Basin Boundaries

DWR's California's Groundwater (Bulletin 118) is the State's official publication on the occurrence and nature of groundwater in California. (https://water.ca.gov/programs/groundwater-management/bulletin-118.) The latest version of the report, California's Groundwater - Update 2020 was publicly released on November 16, 2021. (https://data.cnra.ca.gov/dataset/california-s-

[1] Available at https://www.usgs.gov/core-science-systems/ngp/national-hydrography/national-hydrography-dataset?qt-science_support_page_related_con=0#qt-science_support_page_related_con

[2] Available at https://www.usgs.gov/core-science-systems/ngp/national-hydrography/watershed-boundary-dataset?qt-science_support_page_related_con=4#qt-science_support_page_related_con

[3] An interactive version of the USGS National Map, including the NHD and WBD datasets, is available at https://apps.nationalmap.gov/viewer/.

groundwater-bulletin-118-archive.) Bulletin 118 defines the lateral boundaries and describes the hydrologic characteristics of California's groundwater basins. In conjunction with the release of Update 2020, DWR has compiled a comprehensive list of the official "basin boundary descriptions" for all of California's 515 groundwater basins. (https://data.cnra.ca.gov/dataset/ca-gw-basin-boundary-descriptions.) These descriptions were originally developed by DWR as part of Bulletin 118 – Update 2003 and have been updated for 2020. (Id.) The Update 2020 basin boundary descriptions for the four groundwater basins in the Watershed are available at https://data.cnra.ca.gov/dataset/bbd4.

The original basin descriptions developed for Bulletin 118 – Update 2003 also included summaries of the hydrologic and hydrogeologic setting, groundwater storage capacity and water budget, groundwater level and quality trends, well yields, basin management, and references. These Bulletin 118 – Update 2003 descriptions are now referred to as "basin reports." Ventura previously provided these basin reports to the Court and to the parties, and they are available at https://data.cnra.ca.gov/dataset/bulletin-118-update-2003-basin-reports.[4]

Under the streamlined adjudication statute, basins are defined to have the same meaning as Water Code section 10721, subdivision (b), which defines them as basins or subbasins identified and defined in Bulletin 118. (Code Civ. Proc. § 832, subd. (a).) The streamlined adjudication statute generally provides that the boundaries set by Bulletin 118 should be used as the boundaries in adjudications. (See Code Civ. Proc. § 841, subd. (a).)

The Court should issue an order establishing that there are four DWR-defined groundwater basins and subbasins (basin numbers 4-1, 4-2, 4-3.01, and 4-3.02) located wholly or partially within the Watershed, and their lateral boundaries are defined by DWR's Bulletin 118 as more fully set forth below.

[4] The Bulletin 118 – Update 2003 basin report for the Upper Ojai Basin is attached as Exhibit 1b to the Foley Decl. The Bulletin 118 – Update 2003 basin report for the Ojai Basin is attached as Exhibit 2b to the Foley Decl. The Bulletin 118 – Update 2003 basin report for the Upper Ventura Basin is attached as Exhibit 3b. The Bulletin 118 – Update 2003 basin report for the Lower Ventura Basin is attached as Exhibit 4b to the Foley Decl.

1. 4-1 Upper Ojai Valley Groundwater Basin (Upper Ojai Basin). The Bulletin 118 – Update 2020 basin boundaries description, including a map, for the Upper Ojai Basin is attached as Exhibit 1a to the Foley Decl.
2. 4-2 Ojai Valley Groundwater Basin (Ojai Basin). The Bulletin 118 – Update 2020 basin boundaries description, including a map, for the Ojai Basin is attached as Exhibit 2a to the Foley Decl.
3. 4-3.01 Ventura River Valley – Upper Ventura River Subbasin (Upper Ventura Basin). The Bulletin 118 – Update 2020 basin boundaries description, including a map, for the Upper Ventura Basin is attached hereto as Exhibit 3a.
4. 4-3.02 Ventura River Valley – Lower Ventura River Subbasin (Lower Ventura Basin).[5] The Bulletin 118 – Update 2020 basin boundaries description, including a map, for the Lower Ventura Basin is attached as Exhibit 4a to the Foley Decl.

Dated: November 23, 2021

BEST BEST & KRIEGER LLP

By: _____
SHAWN HAGERTY
CHRISTOPHER M. PISANO
SARAH CHRISTOPHER FOLEY
PATRICK D. SKAHAN
Attorneys for Respondent and Cross-Complainant
CITY OF SAN BUENAVENTURA

[5] The Court is only making a determination as to the lateral boundaries of the groundwater basins as defined in Bulletin 118 and is not making any specific determination as to the definition in Bulletin 118 regarding the depth or definable bottom, if any, of the Lower Ventura Basin. The Court is expressly reserving issues raised by Cross-Defendant Aera Energy LLC regarding the connectivity of the Lower Ventura Basin with geologic formations employed for oil and gas-related operations and the "exempt aquifer" below the Lower Ventura Basin as defined by the California Department of Conservation Geologic Energy Management Division and the U.S. Environmental Protection Agency under the federal Safe Drinking Water Act. Such questions shall be reserved for future phases of the trial, if not otherwise addressed by stipulation of the parties.

DECLARATION OF SARAH CHRISTOPHER FOLEY IN SUPPORT OF NOTICE OF HEARING OF ORDER TO SHOW CAUSE RE ESTABLISHING WATERSHED AND BASIN BOUNDARIES

I, Sarah Christopher Foley, declare as follows:

1. I am an attorney at law licensed to practice before all courts in the State of California. I am a partner with the law firm Best Best & Krieger, LLP ("BBK"), counsel of record for Defendant and Cross-Complainant, City of San Buenaventura ("City") in the above-captioned action. If called upon to testify about the facts set forth below, I could and would do so competently.

2. The parties are currently negotiating a proposed illustrative-only map of the Watershed showing the boundaries as delineated by the USGS NHD and WBD geographic information system (GIS) data, and if they can agree, the City will submit an illustrative map in advance of the OSC hearing.

3. Attached hereto as Exhibit 1a is a true and correct copy of Bulletin 118 – Update 2020, basin boundaries description for the 4-1 Upper Ojai Valley Groundwater Basin, available at https://data.cnra.ca.gov/dataset/34cdc58b-3892-400b-9234-30b1ee0e7d8b/resource/fce2ac1e-1d06-494b-94ee-ceb07bf3caee/download/4-001_upper-ojai-valley_basinboundarydescription.pdf

4. Attached hereto as Exhibit 1b is a true and correct copy of Bulletin 118 – Update 2003, basin report for the 4-1 Upper Ojai Valley Groundwater Basin, available at https://data.cnra.ca.gov/dataset/12e534ff-f604-4ba9-82db-486d81e082ff/resource/8596af7b-9a92-4a4a-9411-e9038aaa1595/download/b118_2003_basindescription_4_001.pdf

5. Attached hereto as Exhibit 2a is a true and correct copy of Bulletin 118 – Update 2020, basin boundaries description for the 4-2 Ojai Valley Groundwater Basin, available at https://data.cnra.ca.gov/dataset/34cdc58b-3892-400b-9234-30b1ee0e7d8b/resource/e31251c6-8c95-47fe-95d5-79f589318326/download/4-002_ojai-valley_basinboundarydescription.pdf

6. Attached hereto as Exhibit 2b is a true and correct copy of Bulletin 118 – Update 2003, basin report for the 4-2 Ojai Valley Groundwater Basin, available at

https://data.cnra.ca.gov/dataset/12e534ff-f604-4ba9-82db-486d81e082ff/resource/95e8d538-6b62-4157-a12c-3a3c3ed9fe61/download/b118_2003_basindescription_4_002.pdf

7. Attached hereto as Exhibit 3a is a true and correct copy of Bulletin 118 – Update 2020, basin boundaries description for the 4-3.01 Ventura River Valley – Upper Ventura River Subbasin, available at https://data.cnra.ca.gov/dataset/34cdc58b-3892-400b-9234-30b1ee0e7d8b/resource/0408135f-0a5d-47ea-bef4-d82d9221608d/download/4-003.01_ventura-river-valley_upper-ventura-river_basinboundarydescription.pdf

8. Attached hereto as Exhibit 3b is a true and correct copy of Bulletin 118 – Update 2003, basin report for the 4-3.01 Ventura River Valley – Upper Ventura River Subbasin, available at https://data.cnra.ca.gov/dataset/12e534ff-f604-4ba9-82db-486d81e082ff/resource/cae7b2eb-a893-4cef-acf0-aeeea1ee5c9f/download/b118_2003_basindescription_4_003_01.pdf

9. Attached hereto as Exhibit 4a is a true and correct copy of Bulletin 118 – Update 2020, basin boundaries description for the 4-3.02 Ventura River Valley – Lower Ventura River Subbasin, available at https://data.cnra.ca.gov/dataset/34cdc58b-3892-400b-9234-30b1ee0e7d8b/resource/8ae9e2a0-a720-4e45-82c1-7004f41d645f/download/4-003.02_ventura-river-valley_lower-ventura-river_basinboundarydescription.pdf

10. Attached hereto as Exhibit 4b is a true and correct copy of Bulletin 118 – Update 2003, basin report for the 4-3.02 Ventura River Valley – Lower Ventura River Subbasin, available at https://data.cnra.ca.gov/dataset/12e534ff-f604-4ba9-82db-486d81e082ff/resource/134be84f-c4cd-418b-a142-508303ddd298/download/b118_2003_basindescription_4_003_02.pdf

I declare under the penalty of perjury pursuant to the laws of the State of California that the foregoing is true and correct.

Executed on November 23, 2021 in New Orleans, Louisiana.

SARAH CHRISTOPHER FOLEY

EXHIBIT 1a

EXHIBIT 1a

4-001 UPPER OJAI VALLEY

Basin Boundaries Description

2003

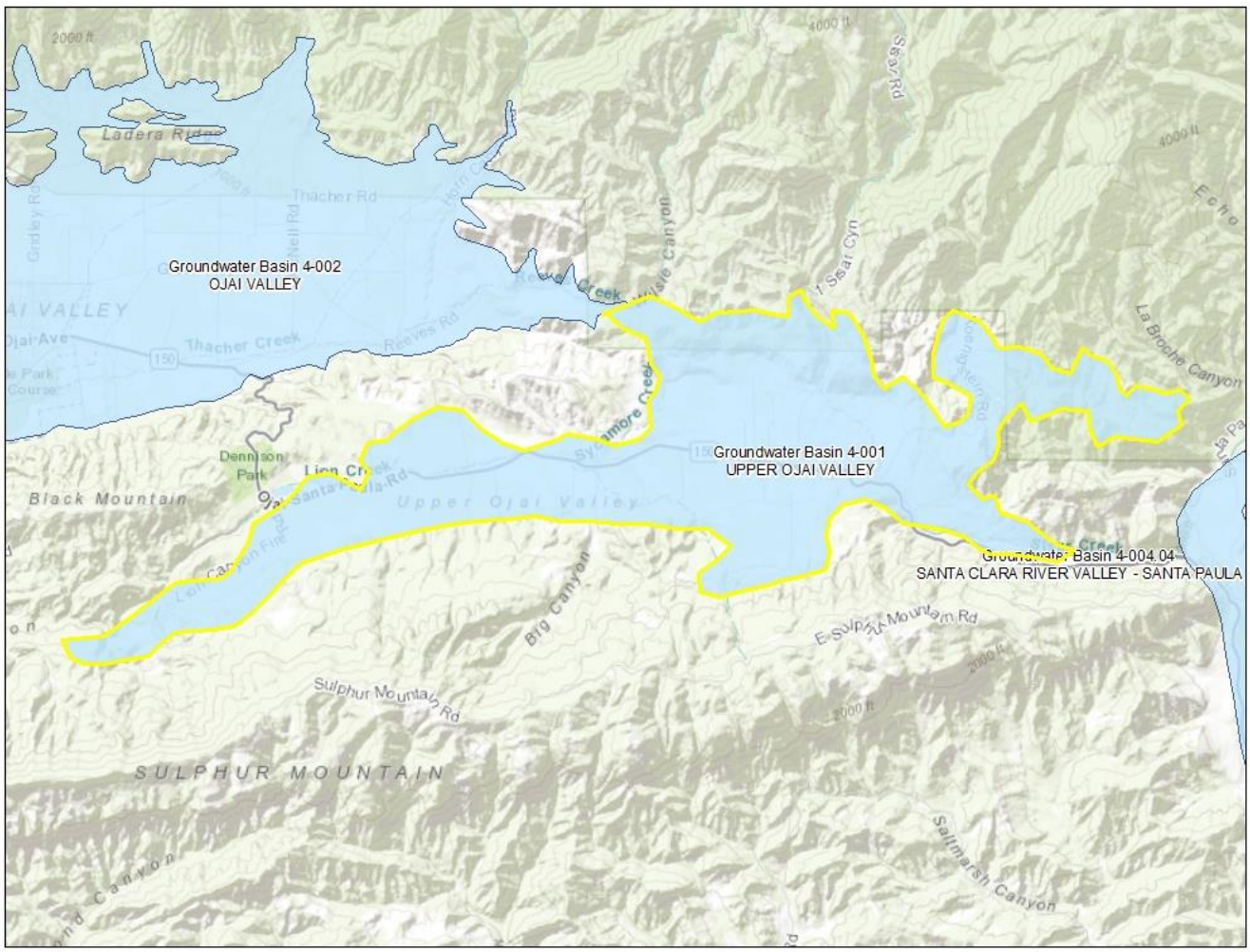
- County: Ventura
- Surface Area: 3,800 acres (5.9 square miles)

Summary

The Upper Ojai Valley Groundwater basin is bounded by the Ojai Valley Groundwater Basin on the north, the Topatopa Mountains on the east, Sulfur Mountain on the south, and near impermeable rocks of the Santa Ynez Mountains elsewhere. The valley is drained westward by Lion Canyon into San Antonio Creek and eastward by Sisar Creek to Santa Paula Creek.

Map

4-001 – OJAI VALLEY



Map Link

References

This table contains the reference listings for the citations noted in the Summary. Each reference contains the name of the reference and the publication date. For more information, email sgmps@water.ca.gov.

Citation	Pub Date

EXHIBIT 1b

EXHIBIT 1b

Upper Ojai Valley Groundwater Basin

- Groundwater Basin Number: 4-1
- County: Ventura
- Surface Area: 3,800 acres (5.9 square miles)

Basin Boundaries and Hydrology

The Upper Ojai Valley Groundwater basin is bounded by the Ojai Valley Groundwater Basin on the north, the Topatopa Mountains on the east, Sulfur Mountain on the south, and near impermeable rocks of theSanta Ynez Mountains elsewhere. The valley is drained westward by Lion Canyon into San Antonio Creek and eastward by Sisar Creek to Santa Paula Creek. Average annual precipitation ranges from 24 to 28 inches.

Hydrogeologic Information

Water Bearing Formations

Groundwater in the basin is found chiefly in Holocene and Pleistocene age alluvium that averages about 60 feet thick and reaches a maximum of about 300 feet thick near Sisar Creek (CSWRB 1953). The average specific yield of the alluvium is estimated at 8 percent (CSWRB 1953). Minor groundwater is found in fractures in the Tertiary sediments underlying the alluvium.

Restrictive Structures

A surface and groundwater divide is found in the eastern part of the basin the separates groundwater flow westward toward San Antonio Creek and eastward toward Santa Paula Creek.

Recharge Areas

The chief source of recharge in the basin is derived from percolation of precipitation (Panaro 2000). Other minor recharge contributions include irrigation return and underflow from the fractured rock beneath the basin (Panaro 2000).

Groundwater Level Trends

Hydrographs show groundwater levels that fluctuate seasonally by about 10 to 20 feet during 1992 through 1999. The groundwater levels return to about the same elevation every year, consistent with a small basin recharged chiefly by annual precipitation. Groundwater in the eastern part of the basin moves eastward toward Sisar Creek and in the western part of the basin moves westward toward Lion Canyon.

Groundwater Storage

Groundwater Storage Capacity. The total storage capacity is estimated to be 6,000 af (DWR 1975) and 5,681 af (Panaro 2000).

Groundwater in Storage. The basin is estimated to have been 70 percent full in 1999 (Panaro 2000), suggesting about 3,980 af of groundwater in storage.

Groundwater Budget (Type A)

Natural recharge into the basin is estimated to be 400 af/yr (DWR 1975). Recharge into the basin is estimated to be 320 af/yr from return irrigation flow and about 600 af/yr from underflow(Panaro 2000). Pumping in 1999 was estimated to be less than 700 af (Panaro 2000).

Groundwater Quality

Characterization. Groundwater character is calcium-sodium bicarbonate in the western part of the basin and calcium sulfate in the eastern part of the basin. Analyses of water from 12 wells sampled during 1951 and 1952 show an average TDS content of 707 mg/L with a range of 438 to 1,249 mg/L (DWR 1959). Water from one public supply well shows a TDS concentration of 500 mg/L.

Impairments. High boron concentrations are found in groundwater in the southern part of the basin (DWR 1959). Locally, sodium chloride waters with TDS concentrations ranging from 2,000 to 3,000 mg/L are found in the eastern part of the basin (DWR 1959). High nitrate, sulfate, iron, and chloride concentrations have been reported for groundwater in the basin (Panaro 2000).

Water Quality in Public Supply Wells

Constituent Group[1]	Number of wells sampled[2]	Number of wells with a concentration above an MCL[3]
Inorganics – Primary	1	0
Radiological	1	0
Nitrates	1	0
Pesticides	1	0
VOCs and SVOCs	1	0
Inorganics – Secondary	1	1

[1] A description of each member in the constituent groups and a generalized discussion of the relevance of these groups are included in *California's Groundwater – Bulletin 118* by DWR (2003).
[2] Represents distinct number of wells sampled as required under DHS Title 22 program from 1994 through 2000.
[3] Each well reported with a concentration above an MCL was confirmed with a second detection above an MCL. This information is intended as an indicator of the types of activities that cause contamination in a given basin. It represents the water quality at the sample location. It does not indicate the water quality delivered to the consumer. More detailed drinking water quality information can be obtained from the local water purveyor and its annual Consumer Confidence Report.

Well Production characteristics

	Well yields (gal/min)	
Municipal/Irrigation	Range: 10 – 200 gal/min	Average: 50 gal/min (CSWRB 1953), 20-50 gal/min (Panaro 2000)
	Total depths (ft)	
Domestic	Range:	Average:
Municipal/Irrigation	Range:	Average:

Active Monitoring Data

Agency	Parameter	Number of wells /measurement frequency
Ventura County Water Resources Department	Groundwater levels	4
Department of Health Services and cooperators	Title 22 water quality	1

Basin Management

Groundwater management:

Water agencies

Public	Ventura County Public Works Agency
Private	Southern California Water Company

References Cited

California Department of Water Resources (DWR). 1959. *Water Quality and Water Quality Problems, Ventura County.* Bulletin 75. Two Volumes. 195 p.

_____. 1975. *California's ground water.* Bulletin 118. 135 p.

California State Water Resources Board (CSWRB). 1953. *Ventura County Investigation.* Bulletin 12. Two Volumes.

Panaro, D. 2000. Fox Canyon Groundwater Management Agency: Written Communication to R.R. Davis (DWR), March 21, 2000.

Southern California Water Company (SCWC). 2001. *Water Quality Report.* http://www.aswater.com/2kWQRpts/Ojai.PDF (March 2002).

Ventura County Public Works Agency (VCPWA). 1996. *Ventura County Groundwater Quality Assessment Report.* 57 p.

_____. 2002. "Ventura County Groundwater Basins." http://www.ventura.org/vcpwa/wre/wrd/pages/BASINS.htm (March 2002).

Additional References

California Department of Public Works, Division of Water Resources (DPW). 1933. *Ventura County Investigation.* Bulletin 46.

Leason F. P. & Associates. 1959. *Upper Ventura River Valley and Ojai Valley Sewerage Study.* Pasadena, Calif.: The Associates.

Richardson, H. E., and others. 1968. *Ventura River Project Extensions, Feasibility Study, Ground-Water Geology and Resources Appendix*. United States Bureau of Reclamation (USBR): unnumbered Report.

Turner, J. M. 1971. *Ventura County Water Resources management Study, Geohydrology of the Ventura River System.* Ventura County Department of Public Works, Flood Control District: unnumbered Report.

Errata

Changes made to the basin description will be noted here.

EXHIBIT 2a

EXHIBIT 2a

4-002 OJAI VALLEY

Basin Boundaries Description

2016

Summary

The Ojai Valley groundwater basin is located in the central-western portion of Ventura County. The basin is bound on the north by consolidated rocks of the Topatopa Mountains. The easternmost portion of the basin is separated from the adjacent Upper Ojai Valley groundwater basin by the San Cayetano fault. The basin is bound on the south by the Santa Ana fault and the consolidated rocks of Black Mountain. A surface water divide and a subsurface bedrock ridge that forms a groundwater divide separates the basin from the adjoining Upper Ventura River subbasin to the west. South of the Santa Ana fault, thin terrace deposits underlain by bedrock and lacking direct subsurface hydraulic connection with the basin are excluded from the basin. These alluvial terrace deposits have little to no significant groundwater storage capacity. The boundary is defined by 13 segments detailed in the descriptions below.

Segment Descriptions

This table describes each line segment composing the basin boundary polygon for this basin. It includes fields describing the segment label, segment type, segment description, and cited reference. For more information, email sgmps@water.ca.gov.

Segment Label	Segment Type	Description	Ref
1-2	- Alluvial	Begins from point (1) and crosses the Quaternary alluvium to point (2).	{a}
2-3	E Alluvial	Continues from point (2) and follows the contact of Quaternary alluvium with various Tertiary sedimentary rocks to point (3).	{b}
3-4	- Alluvial	Continues from point (3) and crosses Quaternary alluvium to point (4).	{a}
4-5	E Alluvial	Continues from point (4) and follows the contact of Quaternary alluvium with Tertiary Cozy Dell Shale to point (5).	{b}
5-6	- Alluvial	Continues from point (6) and follows the contact of Quaternary alluvium with various Tertiary sedimentary rocks to point (7).	{b}
6-7	E Alluvial	Continues from point (5) and crosses Quaternary alluvium to point (6).	{a}
7-8	- Fault	Continues from point (7) and follows the San Cayetano fault to point (8).	{c}
8-9	E Alluvial	Continues from point (8) and follows the contact of Quaternary alluvium with various Tertiary sedimentary rocks to point (9).	{b}
9-10	- Fault	Continues from point (9) and follows the Santa Ana fault to point (10).	{a}

10-11	E Alluvial	Continues from point (10) and follows the contact of Quaternary alluvium with Sespe Formation to point (11).	{d}
11-12	I Groundwater Divide	Continues from point (11) and follows a subsurface bedrock ridge and a surface divide to point (12).	{a}
12-1	E Alluvial	Continues from point (12) and follows the contact of Quaternary alluvium with various Tertiary sedimentary rocks and ends at point (1).	{d}
13-13	E Alluvial	Island within the basin boundary: begins from point (13) and follows the contact of the Quaternary alluvium with Coldwater Sandstone and Cozy Dell Shale and ends at point (13).	{b}

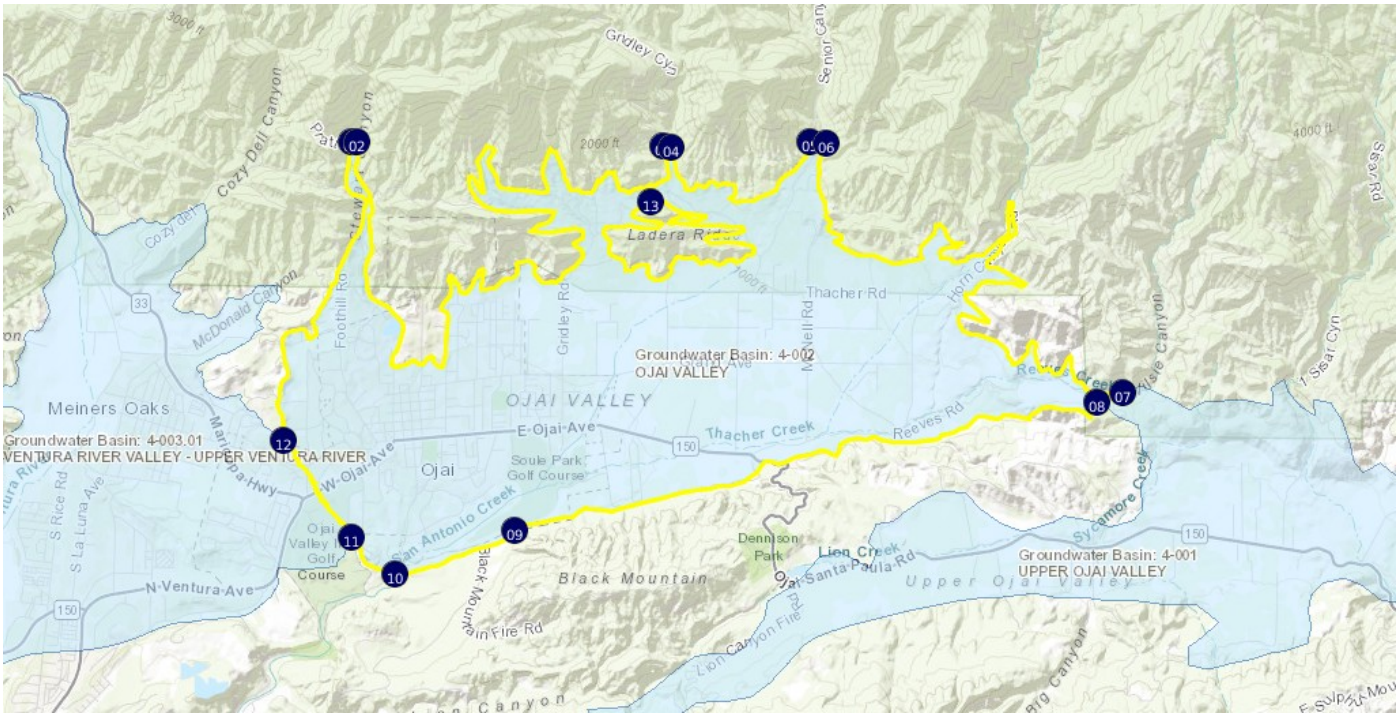
Significant Coordinates

This table contains the latitudes and longitudes of all the beginning and ending points of each segment comprising the basin boundary polygon for this basin. For more information, email sgmps@water.ca.gov.

Point	Latitude	Longitude
1	34.478450793	-119.254761878
2	34.478452261	-119.253960199
3	34.478005123	-119.215409106
4	34.477954846	-119.214341855
5	34.478460727	-119.196917412
6	34.478300258	-119.19480887
7	34.452385212	-119.157425748
8	34.451419976	-119.160576289
9	34.438199307	-119.234069884
10	34.433549061	-119.249251927
11	34.437432018	-119.254670854
12	34.44740611	-119.263274675
13	34.472303032	-119.216908514

Map

4-002 OJAI VALLEY



Map Link

References

This table contains the reference listings for the citations noted in the segment description table. Each reference contains the name of the reference, in addition to the publication date. For more information, email sgmps@water.ca.gov.

Ref	Citation	Pub Date	Global ID
{a}	BBMRS	varies	45
{b}	California Department of Conservation, California Geologic Society (CGS), Geologic Map of the Ojai 7.5' Quadrangle, Ventura County, California: A Digital Database, Version 1.0, 1:24,000, S.S. Tan, P.J. Irvine, C.I. Gutierrez.ftp://ftp.consrv.ca.gov/pub/dmg/rgmp/Prelim_geo_pdf/Ojai_prelim.pdf	2005	78
{c}	California Geological Survey (CGS), Geologic Atlas of California Map No. 008, Los Angeles Sheet, , 1:250,000, Charles W. Jennings and Rudolph G. Strand.URL: http://www.quake.ca.gov/gmaps/GAM/losangeles/losangeles.html	1969	33
{d}	California Geological Survey (CGS), Geologic Map of the Matilija Quadrangle, 1:24,000, S.S. Tan and T.A. Jones.URL: http://www.conservation.ca.gov/cgs/rghm/rgm/Pages/preliminary_geologic_maps.aspx	2006	51

Footnotes

- I: Internal
- E: External

EXHIBIT 2b

EXHIBIT 2b

Ojai Valley Groundwater Basin

- Groundwater Basin Number: 4-2
- County: Ventura
- Surface Area: 6,830 acres (10.7 square miles)

Basin Boundaries and Hydrology

The Ojai Valley Groundwater Basin is bounded on the west and east by nonwater-bearing Tertiary age rocks, on the south by the Santa Ana fault and the Sulphur Mountain Range, and on the north by Black Mountain and the Topatopa Mountains. The basin is drained by Thacker and San Antonio Creeks to the Ventura River. Average annual precipitation ranges from 20 to 24 inches.

Hydrogeologic Information

Water Bearing Formations

Groundwater is found in alluvium and to some extent in fractures and interstices of the underlying older Tertiary sedimentary rocks (CSWRB 1953). Groundwater in the basin is mostly unconfined, but locally confined conditions are found. The estimated average specific yield of the basin is 5.5 percent (CSWRB 1953).

Alluvial Deposits. Groundwater is found in alluvium of Holocene and Pleistocene age, which consists of sand, gravel, and clay. The alluvium is composed of about 50 to 100 feet of sediments similar to those occurring in the underlying Pleistocene alluvium though usually less weathered (CSWRB 1953). These alluvial deposits are the most productive units in the basin, with well yields that range from 100 to 600 gpm (CSWRB 1953).

Tertiary Sediments. The weathered sediments of Tertiary age are usually consolidated or cemented and typically yield minor amounts of poor quality water (CSWRB 1953; VCPWA 2002). Well yields are typically 2 to 5 gpm, reaching a maximum of about 50 gpm (CSWRB 1953).

Recharge Areas

Recharge to the basin is from infiltration of precipitation on the valley floor, and percolation of surface waters through alluvial channels, and water diverted into the Ojai spreading grounds (CSWRB 1953). Some additional recharge is provided by excess irrigation flow and a minor amount of subsurface flow (CSWRB 1953). This basin is quickly recharged during wet periods, and conversely is rapidly depleted during periods of drought (CSWRB 1953).

Groundwater Level Trends

In the western part of the basin, groundwater levels generally rose about 10 feet from 1973 to 2000, with hydrographs showing seasonal variations of 10 to 15 feet. In the central part of the basin, seasonal variation increases and some wells experienced flowing conditions. In the eastern part of the basin, seasonal variation is pronounced, with one hydrograph showing a seasonal rise of 90 feet and a typical seasonal variation at that well of about 40 feet.

Hydrographs do not indicate a long-term decline for this basin during 1973 through 2000.

Groundwater Storage

Groundwater Storage Capacity. The total storage capacity has been estimated to be 70,000 af (CSWRB 1953), 84,000 af (VCPWA 2002), and 85,000 af (DWR 1975).

Groundwater in Storage. The groundwater in storage was estimated to be 75 to 80 percent full in 1999 (Panaro 2000), or about 63,000 to 67,200 af.

Groundwater Budget (Type A)

Estimated groundwater storage depletion during the seven-year drought period from 1944 to 1951 amounted to about 28,000 af (CSWRB 1953). Total consumptive use of water on overlying lands, including precipitation, was estimated to have been about 71,000 af (CSWRB 1953). Consumptive use of applied water from 1944 to 1951 was estimated to have been about 28,200 af (SWRB 1953). Underflow into the basin is estimated to range from 800 to 2,500 af/yr (Panaro 2000). Recharge from percolation of excess irrigation is estimated to be 2,350 af/yr (Panaro 2000).

Groundwater Quality

Characterization. Groundwater in the basin is mainly calcium bicarbonate-sulfate in character (DWR 1959). Analyses of water from 19 wells sampled in 1952 show average TDS content of 640 mg/L with a range from 450 to 1,140 mg/L (DWR 1959). The average TDS content for analyses in 2000 was 665 mg/L, ranging from 568 to 790 mg/L (SCWC 2001). Analyses of water from 6 public supply wells show TDS content ranging from 568 to 790 mg/L with an average of about 703 mg/L.

Impairments. Comparison of samples collected from 9 wells in 1933 with samples collected in 1952 show that the average TDS content level increased about 150 mg/L (DWR 1959). The increase in average TDS content from 1952 (DWR 1959) and 2000 (SCWC 2001) suggests that this trend may be continuing, though at a lower rate. High nitrate and sulfate concentrations have been reported in the basin (Panaro 2000). Twenty-one wells sampled in the basin in 1994 to 1995 indicate medium to high nitrate concentrations for many parts of the basin (VCPWA 1996).

Water Quality in Public Supply Wells

Constituent Group[1]	Number of wells sampled[2]	Number of wells with a concentration above an MCL[3]
Inorganics – Primary	8	0
Radiological	8	1
Nitrates	8	1
Pesticides	8	0
VOCs and SVOCs	6	0
Inorganics – Secondary	8	8

[1] A description of each member in the constituent groups and a generalized discussion of the relevance of these groups are included in *California's Groundwater – Bulletin 118* by DWR (2003).
[2] Represents distinct number of wells sampled as required under DHS Title 22 program from 1994 through 2000.
[3] Each well reported with a concentration above an MCL was confirmed with a second detection above an MCL. This information is intended as an indicator of the types of activities that cause contamination in a given basin. It represents the water quality at the sample location. It does not indicate the water quality delivered to the consumer. More detailed drinking water quality information can be obtained from the local water purveyor and its annual Consumer Confidence Report.

Well Production characteristics

	Well yields (gal/min)	
Municipal/Irrigation	Range: 100 – 600 gal/min (CSWRB 1953)	Average: 383 gal/min (VCWA 2002)
	Total depths (ft)	
Domestic	Range:	Average:
Municipal/Irrigation	Range:	Average:

Active Monitoring Data

Agency	**Parameter**	**Number of wells /measurement frequency**
Ventura County Department of Water Resources	Groundwater levels	24
Department of Health Services and cooperators	Title 22 water quality	22

Basin Management

Groundwater management:

Water agencies

Public	Ventura County Public Works Agency, Ojai Basin Groundwater Management Agency, Casitas Municipal Water District
Private	Southern California Water Company

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Errata

Changes made to the basin description will be noted here.

EXHIBIT 3a

EXHIBIT 3a

4-003.01 VENTURA RIVER VALLEY – UPPER VENTURA RIVER

Basin Boundaries Description

2016

Summary

The Upper Ventura River groundwater subbasin is located in central-western Ventura County. The subbasin is bound on the north by impermeable rocks of the Santa Ynez Mountains. A subsurface bedrock ridge and groundwater divide separates the subbasin from the adjacent Ojai Valley groundwater basin to the east. The subbasin is bound on the southeast and the west by consolidated Tertiary sediments. The subbasin extends south in the Ventura River Valley to where it meets the Lower Ventura River subbasin at a narrow portion of the valley and at the approximate location of the Red Mountain fault. The subbasin boundary is defined by eleven (11) segments detailed in the descriptions below.

Segment Descriptions

This table describes each line segment composing the basin boundary polygon for this basin. It includes fields describing the segment label, segment type, segment description, and cited reference. For more information, email sgmps@water.ca.gov.

Segment Label	Segment Type	Description	Ref
1-2	E Alluvial	Begins at point (1) and generally follows the contact of Quaternary alluvium with various Tertiary sedimentary rocks to point (2).	{a}
2-3	I Groundwater Divide	Continues from point (2) and follows a subsurface bedrock ridge, a groundwater divide, and a surface divide to point (3).	{b}
3-4	E Alluvial	Continues from point (3) and follows the contact of Quaternary alluvium with Sespe Formation to point (4).	{a}
4-5	- Fault	Continues from point (4) and follows an unnamed fault to point (5).	{c}
5-6	E Alluvial	Continues from point (5) and follows the contact of active alluvium and colluvium with lower permeability older alluvium to point (6).	{b}
6-7	- Fault	Continues from point (6) and follows the Santa Ana Fault to point (7).	{a}
7-8	E Alluvial	Continues from point (7) and follows the contact of active alluvium with older alluvium and various Tertiary sedimentary rocks to point (8).	{d}
8-9	I Alluvial	Continues from point (8) and crosses the alluvium of the Ventura River valley at the Casitas Vista bridge to point (9).	{b}

9-10	E Alluvial	Continues from point (9) and generally follows the contact of Quaternary alluvium with various Tertiary sedimentary rocks to point (10).	{d}
10-11	E Alluvial	Continues from point (10) and crosses the older alluvium, excluding an area of thin alluvium and Sespe Formation in the west and including areas of thick alluvium in the east, to point (11).	{b}
11-1	E Alluvial	Continues from point (11) and generally follows the contact of Quaternary alluvium with various Tertiary sedimentary rocks and ends at point (1).	{d}

Significant Coordinates

This table contains the latitudes and longitudes of all the beginning and ending points of each segment comprising the basin boundary polygon for this basin. For more information, email sgmps@water.ca.gov.

Point	Latitude	Longitude
1	34.483285737	-119.296538818
2	34.44740611	-119.263274675
3	34.437432018	-119.254670854
4	34.434436555	-119.256415077
5	34.434229067	-119.263895252
6	34.429193615	-119.26953361
7	34.423808356	-119.299086585
8	34.352634947	-119.30500381
9	34.352287913	-119.310520285
10	34.425195196	-119.311964195
11	34.435726436	-119.308534536

Map

4-003.01 VENTURA RIVER VALLEY - UPPER VENTURA RIVER

Map Link

References

This table contains the reference listings for the citations noted in the segment description table. Each reference contains the name of the reference, in addition to the publication date. For more information, email sgmps@water.ca.gov.

Ref	Citation	Pub Date	Global ID
{a}	California Geological Survey (CGS), Geologic Map of the Matilija Quadrangle, 1:24,000, S.S. Tan and T.A. Jones.URL: http://www.conservation.ca.gov/cgs/rghm/rgm/Pages/preliminary_geologic_maps.aspx	2006	51
{b}	BBMRS	varies	45
{c}	Minor, S.A., and Brandt, T.R., 2015, Geologic map of the southern White Ledge Peak and Matilija quadrangles, Santa Barbara and Ventura Counties, California: U.S. Geological Survey Scientific Investigations Map 3321, 34 p., 1 sheet, 1:24,000, https://dx.doi.org/10.3133/sim3321.	5/26/2015	96
{d}	California Geological Survey (CGS), Geologic Compilation of Quaternary Surficial Deposits in Southern California, T.L. Bedrossian, P. Roffers, C.A. Hayhurst, J.T. Lancaster, and W.R. Short.URL: http://www.conservation.ca.gov/cgs/fwgp/Pages/sr217.aspx	2012	50

Footnotes

- I: Internal
- E: External

EXHIBIT 3b

EXHIBIT 3b

Ventura River Valley Groundwater Basin, Upper Ventura River Subbasin

- Groundwater Basin Number: 4-3.01
- County: Ventura
- Surface Area: 7,410 acres (11.6 square miles)

Basin Boundaries and Hydrology

The Upper Ventura River Subbasin is bounded on the south by the Lower Ventura River Subbasin, on the east by the Ojai Valley Groundwater Basin, and elsewhere by impermeable rocks of the Santa Ynez Mountains (DPW 1933). The surface is drained by the Coyote, Matilija, and San Antonio Creeks and the Ventura River. Average annual precipitation ranges from 14 to 24 inches.

Hydrogeologic Information

Water Bearing Formations

In the basin, groundwater is chiefly found in Holocene and Pleistocene age alluvium (DPW 1933; Panaro 2002) and is unconfined. Thickness of the alluvium ranges from 60 to 100 feet; however, it apparently is only 5 to 30 feet in the San Antonio and Coyote Creek areas, (DWR 1959). The average specific yield of the basin is estimated at 8 percent (CSWRB 1953).

Restrictive Structures

The east-trending Santa Ana fault crosses the basin, but it is not known whether or not the fault is a barrier to groundwater movement. In 1906, the City of Ventura constructed a partial subsurface barrier in the alluvium of the Ventura River near Foster Park to create rising water, which was to be diverted for domestic and irrigation uses (CSWRB 1953).

Recharge Areas

Recharge to the basin is primarily by percolation of flow in the Ventura River and, to a lesser extent, by percolation of rainfall to the valley floor and excess irrigation water. A slight amount of recharge is derived from subsurface inflow through fractures in the underlying impermeable rocks (CSWRB 1953).

Groundwater Level Trends

Groundwater moves southward through the alluvium following the surface drainage, ultimately entering Lower Ventura River Subbasin below Foster Park. Hydrographs indicate that groundwater levels have been mostly stable in this subbasin. Water levels fluctuate seasonally by 5 to 20 feet, but usually recover each year to about the previous high level. These hydrographs also show gradual decline and rise of water levels associated with dry and wet weather cycles; however, these long term cycles typically are of lower amplitude than the seasonal cycles.

Groundwater Storage

Groundwater Storage Capacity. The total storage capacity for this subbasin has been estimated to be 10,000 af (CSWRB 1953), 35,000 af (DWR 1975), and 35,118 af (Panaro 2000).

Groundwater in Storage. The subbasin is estimated to have been 90 percent full (Panaro 2000;VCWA 2002), or have about 31,600 af of groundwater in storage in 1999.

Groundwater Budget (Type C)

Recharge by underflow is estimated to be at least 3,500 af/yr.

Groundwater Quality

Characterization. Groundwater in the subbasin is calcium bicarbonate-sulfate in character. Analyses of water from 23 wells sampled in the 1950s show TDS content that ranges of 732 to 1,420 mg/L (DWR 1959). The average TDS content in the basin has been reported at 680 mg/L (VCWA 1996). Water from 18 public supply wells show TDS content ranging from 500 to 1,240 mg/L with an average of approximately 706 mg/L.
Impairments. TDS content is high in some parts of the subbasin.

Water Quality in Public Supply Wells

Constituent Group[1]	Number of wells sampled[2]	Number of wells with a concentration above an MCL[3]
Inorganics – Primary	17	4
Radiological	17	0
Nitrates	18	2
Pesticides	16	0
VOCs and SVOCs	16	0
Inorganics – Secondary	17	4

[1] A description of each member in the constituent groups and a generalized discussion of the relevance of these groups are included in *California's Groundwater – Bulletin 118* by DWR (2003).
[2] Represents distinct number of wells sampled as required under DHS Title 22 program from 1994 through 2000.
[3] Each well reported with a concentration above an MCL was confirmed with a second detection above an MCL. This information is intended as an indicator of the types of activities that cause contamination in a given basin. It represents the water quality at the sample location. It does not indicate the water quality delivered to the consumer. More detailed drinking water quality information can be obtained from the local water purveyor and its annual Consumer Confidence Report.

Well Characteristics

	Well yields (gal/min)	
Municipal/Irrigation	Range: - 10 to 200 gal/min (CSWRB 1953)	Average: 600 gal/min (Panaro 2000)
	Total depths (ft)	
Domestic	Range:	Average:
Municipal/Irrigation	Range:	Average:

Active Monitoring Data

Agency	Parameter	Number of wells /measurement frequency
Ventura County	Groundwater levels	17
Department of Health Services and cooperators	Title 22 water quality	18

Basin Management

Groundwater management:

Water agencies

Public	Ventura County Public Works Agency
Private	Southern California Water Company

References Cited

California Department of Water Resources (DWR). 1959. *Water Quality and Water Quality Problems, Ventura County.* Bulletin 75. Two Volumes. 195 p.

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_____. 1965. *Ventura County and Upper Santa Clara River Drainage Area Land and Water Use Survey, 1961***.** Bulletin 122. 59 p.

_____. 1975. *California's ground water*. Bulletin 118. 135 p.

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Errata

Changes made to the basin description will be noted here.

EXHIBIT 4a

EXHIBIT 4a

4-003.02 VENTURA RIVER VALLEY – LOWER VENTURA RIVER

Basin Boundaries Description

2003

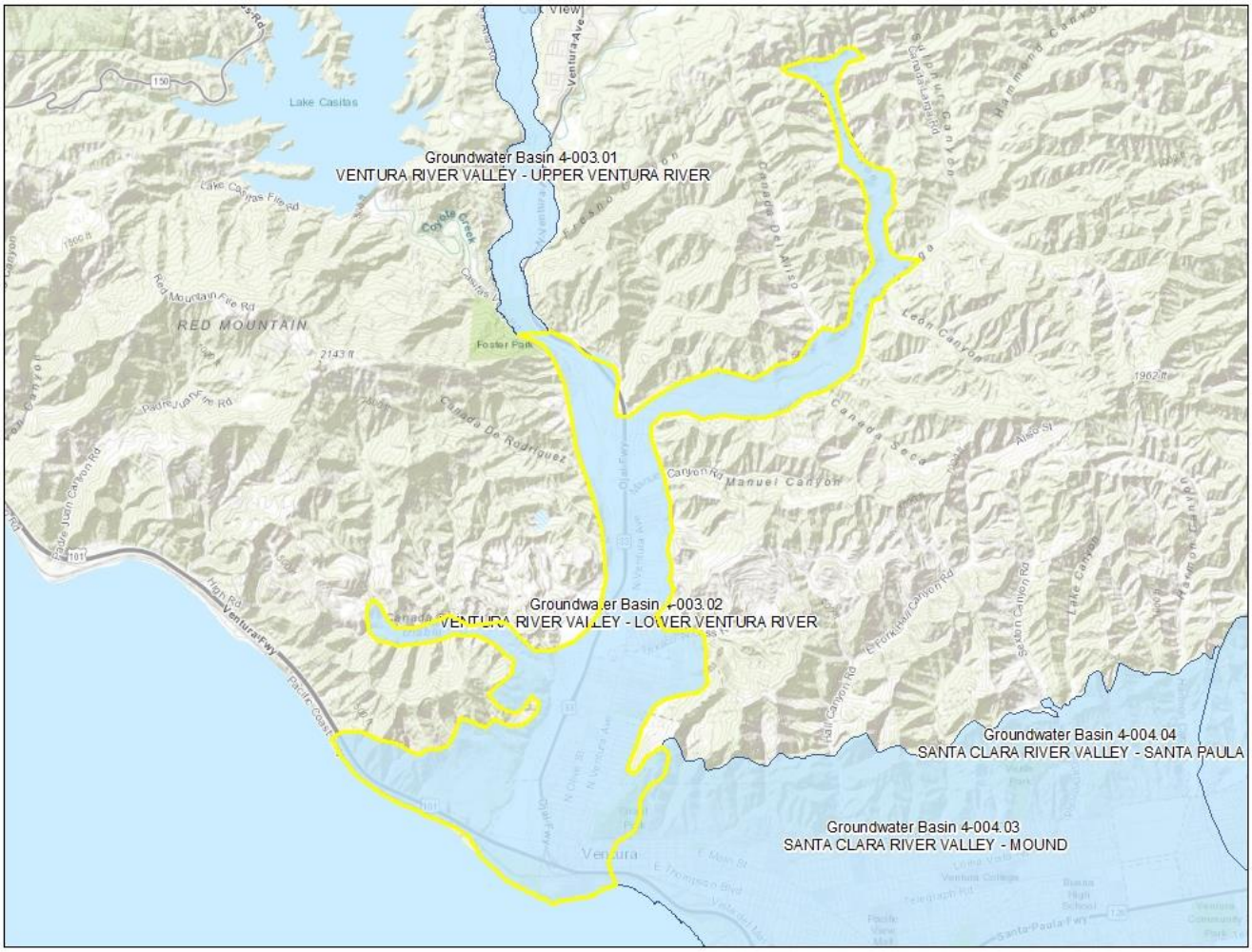
- County: Ventura
- Surface Area: 5,300 acres (8.3 square miles)

Summary

The Lower Ventura River Subbasin is bounded on the north by the Upper Ventura River Subbasin, on the south by the Pacific Ocean and Mound Subbasin of the Santa Clara River Valley Groundwater Basin, and elsewhere by near impervious rocks of the Santa Ynez Mountains (DPW 1933; Panaro 2000). The valley is drained by Canada Larga and the Ventura River.

Map

4-003.02 – VENTURA RIVER VALLEY – LOWER VENTURA RIVER



Map Link

References

This table contains the reference listings for the citations noted in the Summary. Each reference contains the name of the reference and the publication date. For more information, email sgmps@water.ca.gov.

Citation	**Pub Date**
California Department of Public Works, Division of Water Resources (DPW). 1933. *Ventura County Investigation.* Bulletin 46.	1933
Panaro, D. 2000. Fox Canyon Groundwater Management Agency: Written Communication to R.R. Davis (DWR), March 21, 2000.	2000

EXHIBIT 4b

EXHIBIT 4b

Ventura River Valley Groundwater Basin, Lower Ventura River Subbasin

- Groundwater Basin Number: 4-3.02
- County: Ventura
- Surface Area: 5,300 acres (8.3 square miles)

Basin Boundaries and Hydrology

The Lower Ventura River Subbasin is bounded on the north by the Upper Ventura River Subbasin, on the south by the Pacific Ocean and Mound Subbasin of the Santa Clara River Valley Groundwater Basin, and elsewhere by near impervious rocks of the Santa Ynez Mountains (DPW 1933; Panaro 2000). The valley is drained by Canada Larga and the Ventura River. Average annual precipitation ranges from 14 to 16 inches.

Hydrogeologic Information

Water Bearing Formations

Groundwater is found in alluvium of Holocene and Pleistocene age and the San Pedro Formation of Pleistocene age. Groundwater in the basin is unconfined (Panaro 2000). The estimated average specific yield of the basin is 8 percent (CSWRB 1953).

Alluvial Deposits. The alluvium of Holocene and Pleistocene age consists of sand, gravel, and clay. The deposits range from 60 to 100 feet thick beneath the floor of the Ventura River Valley (CSWRB 1953).

San Pedro Formation. The San Pedro Formation consists of gravel, sand, silt, and clay, which near the river mouth is at least partially hydraulically isolated from the Holocene alluvium by relatively impervious material (CSWRB 1953).

Recharge Areas

The basin is recharged by percolation of Ventura River water, precipitation to the valley floor, and irrigation return flow and by subsurface inflow from the Upper Ventura River Subbasin (Panaro 2000).

Groundwater Level Trends

Groundwater moves southward following the course of the Ventura River to the Pacific Ocean. During 1948 through 1956, groundwater levels in one well fluctuated about 25 feet and experienced flowing conditions in 1950 and 1954 (Panaro 2002).

Groundwater Storage

Groundwater Storage Capacity. The total storage capacity is estimated at 264,000 af (Panaro 2000; VCPWA 2002).

Groundwater in Storage. Unknown.

Groundwater Budget (Type A)

Estimates of recharge include underflow of 1,100 af/yr and irrigation return of less than 100 af/yr (Panaro 2000). Extractions are estimated to be less than 400 af/yr (Panaro 2000).

Groundwater Quality

Characterization. Groundwater in the basin is sodium bicarbonate in character. Water from 2 public supply wells has an average TDS content of 772 mg/L in the basin with a range from 760 to 784 mg/L. However, TDS content can range from 1,100 to 3,000 mg/L during extended dry spells (VCPWA 1996).

Impairments. Hydrogen sulfide gas has been reported in the water, particularly during periods when water levels are lowest (DWR 1959). Oil has also been found in the water (DWR 1959). High sulfate and nitrate minerals are common along the shallow alluvium drainage courses where most remaining water wells are found (VCPWA 1996).

Well Characteristics

	Well yields (gal/min)	
Municipal/Irrigation	Range:	Average: 20 gal/min (Panaro 2000)
	Total depths (ft)	
Domestic	Range:	Average:
Municipal/Irrigation	Range:	Average:

Active Monitoring Data

Agency	Parameter	Number of wells /measurement frequency
Department of Health Services and cooperators	Title 22 water quality	2

Basin Management

Groundwater management:

Water agencies

Public	Ventura County Public Works Agency
Private	Southern California Water Company

References Cited

California Department of Public Works, Division of Water Resources (DPW). 1933. *Ventura County Investigation.* Bulletin 46.

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_____. 2002. Fox Canyon Groundwater Management Agency: Written Communication to T. M. Ross (DWR), July 2, 2002.

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Richardson, H. E., and others. 1968. *Ventura River Project Extensions, Feasibility Study, Ground-Water Geology and Resources Appendix*. United States Bureau of Reclamation (USBR): unnumbered Report.

Errata

Changes made to the basin description will be noted here.