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CITY OF SAN BUENAVENTURA

EXEMPT FROM FILING FEES PURSUANT TO GOVERNMENT CODE SECTION 6103

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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.	Case No. 19STCP01176 Judge: Hon. William F. Highberger NOTICE OF SERVICE RE BULLETIN 118 Action Filed: Sept. 19, 2014 Trial Date: Feb. 14, 2022
CITY OF SAN BUENAVENTURA, etc., Cross-Complainant, v. DUNCAN ABBOTT, an individual, et al., Cross-Defendants.	

NOTICE OF SERVICE RE BULLETIN 118

Pursuant to Court's Order via File & Serve Xpress message board post on Friday, October 15, 2021, the City of Ventura (City) is serving excerpts of California Department of Water Resources' (DWR), California's Groundwater (Bulletin 118) for the four groundwater basins of the Ventura River Watershed as set forth below and as attached hereto. The City previously included these documents in Initial List of Documents Supporting Interconnectivity, filed and served on June 25, 2021 in accordance with the Court's order.

1. Bulletin 118 – excerpt re Ojai Valley Groundwater Basin No. 4-2. Updated February 27, 2004, published March 3, 2020, available at https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Bulletin-118/Files/2003-Basin-Descriptions/4_002_OjaiValley.pdf, attached hereto as Exhibit A.

2. Bulletin 118 – excerpt re Upper Ojai Valley Groundwater Basin No. 4-1, available at https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Bulletin-118/Files/2003-Basin-Descriptions/4_001_UpperOjaiValley.pdf, attached hereto and Exhibit B.

3. Bulletin 118 – excerpt re Ventura River Valley Groundwater Basin, Upper Ventura River Subbasin No. 4-3.01, available at https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Bulletin-118/Files/2003-Basin-Descriptions/4_003_01_UpperVenturaRiverSubbasin.pdf, attached hereto as Exhibit C.

4. Bulletin 118 – excerpt re Ventura River Valley Groundwater Basin, Lower Ventura River Subbasin No. 4-3.02, available at https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Bulletin-118/Files/2003-Basin-Descriptions/4_003_02_LowerVenturaRiverSubbasin.pdf, attached hereto as Exhibit D.

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As set forth on DWR's website "California's Groundwater (Bulletin 118) is the State's official publication on the occurrence and nature of groundwater in California. The publication defines the groundwater basin boundaries and summarizes groundwater information for each of the State's 10 hydrologic regions." The full report, and updates thereto, is available on DWR's website at https://water.ca.gov/programs/groundwater-management/bulletin-118.

Dated: October 18, 2021

BEST BEST & KRIEGER LLP

By: _____

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EXHIBIT A

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

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

Alam el Din, Ibrahim O. 1964. *Water in the Ojai Valley, Ventura County, Southern California.* University of California, Los Angeles. Unpublished M.A. Thesis. 104 p.

Bush, G. L. 1956. *Geology of Upper Ojai Valley.* 60 p.

Clark, M. N. 1982. *Tectonic Geomorphology and Neotectonics of the Ojai Valley and Upper Ventura River*. University of California, Santa Barbara. Unpublished M.A. Thesis. 77 p.

Dibblee, T. W. Jr. and H. E Ehrenspeck. 1987. *Geologic map of the Ojai quadrangle, Ventura County, California.* Thomas Wilson Dibblee Jr. Geological Foundation. Scale 1:24,000.

Lippincott, J. B. 1925. *Report on Source of Water Supply and Proposed Irrigation System for the Ojai Valley*. Unpublished Manuscript.

Errata

Changes made to the basin description will be noted here.

EXHIBIT B

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 C

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.

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.

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 (CDPW). 1933. *Ventura County Investigation.* Bulletin 46.

_____. 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.

_____, Southern District. 1981. *Ventura County and Upper Santa Clara River Drainage Area Land Use Study, 1980: District Report.* 25 p.

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 D

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.

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

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

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 Water Resources (DWR). 1975. *California's Ground Water.* Bulletin 118. 135 p.

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

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.

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.