# SAN GORGONIO PASS WATER AGENCY

## REPORT ON WATER CONDITIONS

## Reporting Period 2012

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# Annual Report on Water Conditions

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Prepared by

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# SAN GORGONIO PASS WATER AGENCY

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**On the cover:**

Citrus Reservoir and Citrus Pump Station taking shape in Mentone. Part of Phase 2 of the East Branch Extension, they will be key facilities when online in late 2015.

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# 1.0 Background

The San Gorgonio Pass Water Agency is a State Water Contractor and water wholesaler that provides imported water to retail water agencies within its service area, which extends from Calimesa on the west to Cabazon on the east. Its service area covers approximately 228 square miles, most of which is in Riverside County but which includes two small areas in San Bernardino County. One of these is unpopulated and the other includes three residences owned by the Beaumont Cherry Valley Water District. The service area is depicted on **Figure 1.**

The Agency was created by the San Gorgonio Pass Water Agency Act, passed by the California Legislature in 1961 and signed by Governor Pat Brown on July 12, 1961. The first Board of Directors, appointed by the Riverside County Board of Supervisors, held its initial formal meeting on October 10 of that year. It bad previously met briefly on September 22 to elect Ted Silverwood as the first President of the Agency. The area had a population of approximately 21,000 at the time (today it is closer to 85,000, an increase of 400%).

The San Gorgonio Pass is an elevated, relatively narrow land mass between the San Bernardino Mountains on the north and the San Jacinto Mountains on the south, connecting the San Bernardino Valley on the west to the Coachella Valley on the east. Both of these valleys are at much lower elevations than the Pass region. The region straddles two large watersheds. The western half of the service area is drained primarily by Little San Gorgonio Creek and Noble Creek, which are tributary to San Timoteo Creek and the Santa Ana River. The eastern half of the service area is drained by the Whitewater River, which is part of the Colorado River Basin. A small portion of the region drains to the San Jacinto River. **Figure 2** depicts the drainage basins and principal streams in the region.

This report, published annually by the Agency in some form for over two decades, is intended to help monitor and make available to the public the quantity and quality of water in local groundwater basins. It is based on the Agency's extensive database as well as data from other sources. It includes data from 2012 as well as historical data, which provides a basis to put the most recent data into historical context.

**Tables 1, 2, and 3** are extraction (production) summaries of groundwater pumping within the Agency's service area, hereinafter referred to as the region. These tables summarize annual production for the past 13 years. These data were obtained from the State Water Resources Control Board, Division of Water Rights (State Board); local sources; or in some cases estimated by the Agency. The Agency does not independently verify the data. The State Board does not require reporting for well owners who extract less than 25 acre feet per year (about eight million gallons). Also, it is possible that some well owners do not file as required. The data in these tables represent the Agency's best estimate of actual pumping, based on both actual data and production estimates. Most wells are not metered and therefore data from these wells must be estimated at some level.

The report also includes water quality data from the State Water Project's sampling station at Devil Canyon in San Bernardino. Devil Canyon is the closest sampling station to the Agency and is representative of the water that the Agency receives from the State Water Project. The

data, summarized in Table 5, reflect that the water quality varies from year to year and from month to month. It is primarily a function of water quality conditions in the Sacramento/San Joaquin Delta and of runoff in watersheds tributary to the Delta.

The water quality constituent of most interest to the Agency and its retailers is TDS, or total dissolved solids (also known as salinity or salts). Salinity is becoming more heavily regulated by Regional Water Quality Control Boards throughout the State, especially as water agencies around the state construct recycled water systems. In order to maintain reasonable TDS levels in the lower reaches of the Santa Ana watershed (primarily Orange County), the Santa Ana Regional Board must set standards for TDS at relatively low concentrations in the upper reaches of the watershed, where the western portion of the Agency's service area is located. Salinity is less of an issue in the eastern portion of the region, which is part of the Colorado River watershed. This watershed already has among the highest levels of TDS in the State. Sewage treatment plant effluent from Beaumont and Calimesa is discharged into the Santa Ana River and is regulated by the Santa Ana Regional Board; effluent from Banning is currently regulated by the Colorado River Regional Board though it is possible that the Santa Ana Regional Board may at some time regulate this discharge. This is due to the fact that the City of Banning has plans for a recycled water system, parts of which will overlie a portion of the Santa Ana watershed.

State legislation passed in 2009 requires more extensive groundwater elevation monitoring in basins throughout the State similar to what the Agency has performed for over a decade. The California Department of Water Resources has set up CASGEM (the California Statewide Groundwater Elevation Monitoring system). The Agency has been accepted as the regional monitoring entity for the region. This represents a legislative mandate to perform the groundwater level monitoring that the Agency has been performing on its own for many years. The data uploaded by the Agency to the CASGEM system represent a relatively small subset of the Agency's overall groundwater database.

# 2.0 Water Supply Conditions

There are three principal sources of water within the region—groundwater, which begins as precipitation in the form of rain and snow in the local mountains; imported water from the State Water Project; and recycled wastewater. A fourth source—local runoff of surface water—accounts for a small portion of local water resources, primarily in Edgar and Banning Canyons. Even this runoff is typically recharged into local groundwater basins where it becomes part of the groundwater supply. Recycled water is only used in Calimesa as of this writing; however other retail water agencies, including the Beaumont Cherry Valley Water District and the City of Banning, have plans to implement recycled water systems in the next few years and have begun planning, designing, and constructing the needed infrastructure for these systems.

## 2.1 Precipitation

Annual precipitation in the Beaumont area since 1888 is shown on **Figure 4.** The long-term mean annual precipitation in Beaumont is just under 18 inches. This figure depicts the variable nature of precipitation. Of the approximately 125 years of records, the precipitation in 50 years has exceeded the average, while 75 years have been relatively dry as compared to the average. The figure shows several periods—1897-1904, 1948-1952, 1960-1965, 1986-1992, 1999-2002, and 2005-2009—with multiple consecutive dry years. The figure shows that 2007 and 2009 were among the driest on record in Beaumont (and in fact in all of Southern California), while 2010 was one of the wettest and 2011 and 2012 were below normal. The figure indicates that, since 1999, there have been only three years that met or exceeded the long-term average rainfall. Data presented are for Beaumont because the National Weather Service's official weather station in the region is located in Beaumont.

Precipitation is highly variable, both spatially and temporally. The National Weather Service's official station is at an elevation of about 2600 feet. It is highly likely that higher elevations receive more precipitation, including snow, and lower elevations receive relatively less precipitation. In addition, storms, particularly summer storms, can be highly concentrated and impact one area, while another area a mile or two away may get no rain. Thus, while the long term average rainfall may be approximately 18-inches in one part of the region, it could easily be an inch or two more or less at other locations in the same region.

Groundwater basins are able to capture naturally and store much, but not all, of the precipitation in wet years. During and after a rainfall event, runoff drains to streams where it runs into creeks and rivers. Some of this will recharge the local groundwater basins. During large storm events, much of the runoff will flow downstream. In this case, it will either flow from San Timoteo Creek into the Santa Ana River in Redlands, or it will flow from the San Gorgonio River into the Whitewater River in the Coachella Valley. A small portion of runoff from the region flows to the San Jacinto River in Hemet. Cities and water agencies in the region have begun planning how to capture additional stormwater that currently runs down the Santa Ana River to Prado Dam and eventually to the Pacific Ocean.

Stormwater capture represents a potential new source of water to the region. While additional sources of local water are always good for a region, stormwater capture requires a lot of land, and thus has been found to be too expensive for large-scale development in most areas. Large areas of land are required in order to construct ponds to settle out the particulate matter that accompanies storm flows. Since large storms are not abundant every year, land acquired for large scale stormwater capture would not be used on a consistent basis, and therefore represents a large investment that does not reap benefits every year.

## 2.2 State Water Project

The San Gorgonio Pass Water Agency Act was signed by Governor Pat Brown in 1961, and the Board of Directors, appointed by the Riverside County Board of Supervisors, held its first meeting in September of that year. Within another year, the Agency had signed a contract with the State of California for 15,000 acre feet of water from what at the time was known as the Feather River Project. A year later, the Agency increased its contract amount, or Table A amount, to 17,300 acre feet, an increase of 15%. The Agency's Board of Directors fought hard to get this amount, and made financial sacrifices to do so. The additional water increased the annual amount of debt service owed by the Agency, and the expenditure of these additional funds precluded the ability to begin construction on a pipeline to San Bernardino to take delivery of the water.

The Agency began importing State Water Project water into the region in 2003, when Phase 1 of the East Branch Extension of the California Aqueduct was completed. Since that time, deliveries of State Water Project water within the region have increased nearly every year. **Table 4** summarizes these deliveries. This table shows that the Agency delivered nearly 11,000 acre-feet in 2011 and 2012. The 80% allocation of Table A water in 2011 was the highest since 2006, and enabled the Agency to deliver water that not only met local water demands, but that added to local banked groundwater as well. Even though the 35% allocation of water in 2012 was considerably less, the Agency was able to deliver virtually the same amount as in 2011 due to its ability to carry over water from the previous year.

The Table A allocation is a function of hydraulic conditions in the Sacramento/San Joaquin delta as well as northern California hydrology. The average long-term reliability of the State Water Project is approximately 60%. This points out the importance of being able to store water in those years when the Table A allocation is greater than 60%. The ability to import and store more water locally in the future is a key to the sustainability of the region and to minimizing the amount of additional supplemental water that must be procured to support anticipated growth.

Currently, the Agency can import a maximum of approximately 12,000 acre feet per year with existing infrastructure. When Phase 2 of the East Branch Extension is completed in 2015, the Agency will be able to import its entire Table A allocation when it is available. Completion of this $200 million project is a high priority for the Agency and the San Bernardino Valley Municipal Water District (Valley District), the Agency's partner in this project.

Phase 2 of the project (named EBX 2) consists of a pipeline under the Santa Ana River near Highland, a reservoir and pump station in Mentone, and a short pipeline from this pump station to the existing Crafton Hills Pump Station in Mentone. The project also includes new pumps in

the Crafton Hills Pump Station and the Cherry Valley Pump Station. The new pipeline, which will be 72-inches and 66-inches in diameter, will replace an existing 48-inch diameter line that was constructed in the 1980's. In addition, the Agency and Valley District are constructing improvements to the existing EBX that will make it more reliable and able to deliver water in the event Crafton Hills Reservoir is out of service.

The ability to import and store more water in the region will depend on these projects, additional connection capacity to the East Branch Extension, and additional regional recharge capacity. As of 2012, the total turnout capacity of the pipeline is approximately 25 cfs. The current pipeline capacity is 16 cfs. When EBX 2 goes online in 2015, the total pipeline capacity will be 32 cfs. However, unless additional infrastructure is constructed to be able to convey this additional water out of the pipeline to new or existing recharge facilities, the project will not add appreciably to the region's water resources.

## 2.3 Wastewater

Three public agencies discharge treated wastewater in the region—the cities of Beaumont and Banning, and the Yucaipa Valley Water District. In addition, the Morongo Band of Mission Indians operates a sewage treatment plant in the Cabazon area. The cumulative discharges since 1987 for the three public sewage treatment entities are shown on Figure 5. Figures for the Morongo plant are not included. Unlike precipitation and the State Water Project, which are variable from year to year, wastewater discharges from the region have consistently increased over time, as the region has developed. They have been relatively constant over the past five years. Wastewater treatment plant discharges are a function of indoor water use, not hydrology or exterior water use. Hence they are considered to be relatively more reliable and stable than imported water.

Thus, treated wastewater, or recycled water, is an important asset to the region, because it can be a reliable, non-potable water source in the future. All three of the public agencies mentioned above are in various stages of implementing recycled and/or non-potable water systems for irrigation, golf courses, parks, medians, etc., or to recharge it into local groundwater basins. The Yucaipa Valley Water District will begin implementing its recycled water system in 2013.

As mentioned in Section 1.0, salinity is a growing concern in California, and recycled water is high in dissolved solids or salinity. While recycled water is a huge potential benefit to the region, its use as a water supply will at some point in the future require desalting. Desalting is an expensive process that requires brine disposal, a costly process. The Yucaipa Valley Water District is constructing a desalination plant and brine disposal pipeline. Once this is complete, it will be able to utilize recycled water in lieu of groundwater or imported water for non-potable uses, primarily irrigation and construction water.

The City of Banning is moving towards a recycled water system, and the City of Beaumont, which owns a sewage treatment plan, and the Beaumont Cherry Valley Water District, which is the water purveyor in the City and surrounding areas, are in talks to distribute the City's treated effluent as part of a recycled water system owned by BCVWD.

Use of recycled water either for direct non-potable use or for recharge requires a permit from the Santa Ana Regional Water Quality Control Board. Such permits will be granted only when the

Regional Board is convinced that the permit holder will take all required steps to meet its standards for salinity based on the current Basin Plan.

# 3.0 Groundwater Conditions

Figure 3 shows the principal groundwater basins, sometimes referred to as storage units, in the region. The boundaries of these basins are as defined by the United States Geological Survey. The Beaumont Basin is the largest and most productive of these basins, and serves a large majority of the population in the region.

The region is characterized by numerous faults, which make for complicated geology. The Beaumont Basin is characterized by a number of smaller sub-basins, but can be viewed as one continuous basin, and has been modeled in that manner. East of the Beaumont Basin is the Banning Basin, and east of that is the Cabazon Basin. The Agency is in the process of expanding its model of the Beaumont Basin (developed by the United States Geologic Survey) eastward to include both the Banning and Cabazon basins. This work should be completed in late 2013.

The existing model is a tool that can be used to predict how various recharge scenarios will impact water levels in the Beaumont Basin.

## 3.1 Groundwater Extractions (Production)

Table 1 summarizes groundwater production from the eleven basins in the region. Table 2 summarizes reported production from each individual producer, whether public or private. Table 3 provides a detailed breakdown of extractions by each reporting producer (including some based in San Bernardino County) for each basin for the thirteen most recent years of available data. Surface diversions from the Whitewater River are not included, as the Agency is not convinced the available data are reliable enough to report. These diversions serve the Banning Bench and parts of the City of Banning. Surface diversions from Edgar Canyon are included.

Figure 6 illustrates the long-term trend in reported groundwater production in the region since 1947. Figure 7 summarizes the same data since 1997, about the time significant growth started. Both figures show a distinct increasing trend in groundwater extractions both over the long term and over the past 14 years, though there is variability within that trend, especially over the past four years. The results of these years show a sharp reduction in local extractions in contrast to decades of increases prior to 2008.

Figure 6 indicates that extractions remained relatively constant from the early 1960's to the early 1980's. Extractions increased gradually from that point until the mid-1990's, when they started to increase significantly. Figure 7 shows a significant increase from 1998 to 2006 (from less than 25,000 AF to over 35,000 AF, an increase of over 40%), and a significant decrease since that time, from over 35,000 AF to less than 30,000 AF (a decrease of about 15%).

Figure 8 illustrates the percentage share for each basin's total extraction within the region in 2012. This does not differ significantly from 2011. The Beaumont Basin is still the largest basin by far, with nearly half of all extractions. The Banning Canyon and Edgar Canyon basins are next. Each of these is fed primarily by surface water runoff, the former through adjudicated inter-basin diversions from the Whitewater River.

The data in Tables 1,2, and 3 include revised data for the Beaumont Basin going back to 2003. Data for one of the overliers, Plantation on the Lake, was incorrectly estimated for the past several years. The data for 2012 is much lower than the values for the previous several years. After some research, it appears that the 2012 number is much closer to the actual number, and the data going back to 2003 have been adjusted accordingly. This points out the fact that the water pumped by overliers is typically not metered; thus estimates are required. While Plantation on the Lake meters its water to its residents, it also pumps water into a lake that is not metered; thus estimates must be made in order to determine actual production.

Table 1 indicates that total production in the region increased about 3% from 2011 to 2012, from 28,594 to 29,575 acre-feet. Compared to the peak year of 2007, when total production totaled 35,474 acre-feet, this represents a 17% reduction in groundwater production over the past five years, and the second slight increase in the past two years (an increase from 28,313 AF in 2010 to 29,575 in 2012, or about 4%).

In the Beaumont Basin, the region's largest, production increased about 5%, from 13,600 to 14,302 acre-feet. This follows a 3% increase in 2011. While the Beaumont Cherry Valley Water District, the Morongo Band of Mission Indians, the Yucaipa Valley Water District, and Oak Valley Management increased their extractions, the City of Banning and Arbor Properties decreased theirs. The decrease from Arbor is likely due to a broken pump. Overall, this represents a 25% reduction in the Beaumont basin from 2007. Much of this decrease can be explained by the continuing recession. Some homes were vacant and therefore had no water demand, while other families and businesses presumably cut back on water use to help make ends meet. Very few new homes have been built over the past several years, meaning that use of construction water has also been reduced.

This same trend can also be seen in the Cabazon Basin, where withdrawals by the Cabazon Water District were down nearly 50% in 2012, from 509 to 269 acre feet. It is noted that there were many vacant homes in Cabazon in 2012. Overall production in the Cabazon Basin was down 15%, from 900 to 654 acre feet. This represents an overall decrease of 63% from 2002, which was the peak year for extractions from that basin.

As noted above, the use of construction water for grading and to control dust, so prevalent in the 2000-2008 period, has virtually disappeared over the past four years, accounting for some of the reduction in water demand. This too can be explained by the recession.

Table 2 summarizes overall production by owner, regardless of basin. In reviewing the production by the major water agencies and overliers, the data are relatively consistent. While production by the Cabazon Water District, Desert Hills Premium Outlets, Arbor Properties, and Los Rios is down significantly (percentage-wise) in 2012, production from most other entities is either similar or higher. During the year, Desert Hills Premium Outlets merged its system with the Cabazon Water District, and as mentioned above, one of the well pumps owned by Arbor Properties became incapacitated.

An examination of the groundwater production data demonstrates that economic conditions and annual precipitation and temperature likely play large roles in determining water demand in any given year. The overall reduction in water production in the region over the past four years can be explained in large measure by reduced construction water use and vacant homes, which are a function of the local economic conditions. Per capita reductions in water use in homes could be explained either by cutbacks due to economic conditions, reduced usage due to higher water rates, or water conservation efforts on the part of local residents. A detailed study would have to be performed to determine the specific impacts of these issues on the reduction in water demand over the past three years. In the case of the Cabazon Water District, an aggressive effort to fix leaks in its distribution system led to a large reduction in production.

The reduction in production due to decreased water demand points out a major issue within the water industry. As water demand falls, water sales revenues fall, making it difficult for public water agencies (and private ones, for that matter) to meet financial obligations. Most of their costs (primarily labor) are fixed and do not decrease when water demand falls. These agencies have to make up for these lost revenues in other ways, either by changing their rate structures, by increasing water rates, by reducing their costs, or by drawing from reserves.

Figure 8 indicates where overall production came from. This represents very little change from the same data in 2011. The percentage of water in the region emanating from the Beaumont Basin increased by 1%, from 47% to 48%. While Edgar Canyon's yield increased from 11% to 12% of overall production, typically indicative of a wet year locally, production in the Banning Canyon basin decreased from 14% to 13%, indicating a somewhat drier year than normal locally. These results are not consistent; however since they change by such a small amount, this is to be considered statistically insignificant.

### 3.2 State of Overdraft

Overdraft of a groundwater basin refers to the amount of water pumped out in excess of its safe yield. Safe yield is the average annual replenishment of a basin through natural sources such as rainfall, runoff, snowmelt, and underflows from other groundwater basins. Safe yield is difficult to establish and represents only an average. In a given year, natural replenishment of a groundwater basin could be more or less than the average safe yield, depending on whether the year is a wet or dry one.

The Agency has been closely monitoring overdraft of the Beaumont Basin since at least 1988, when the Agency's first engineering investigation of the basin indicated that pumping significantly exceeded the basin's probable safe yield. Studies by the Agency have pointed to an estimated long-term average safe yield of about 5,000 to 6,100 acre feet per year for the Beaumont Basin (Boyle Engineering, 1995; Boyle Engineering, 2002). This is smaller than the safe yield of 8,650 acre feet defined in the Beaumont Basin Stipulated Judgment, a number which represents the sum of overlier water rights. Overlier water rights refer to rights based on historical production for water used on the land.

Thus, current and future pumping from the Beaumont Basin, even if in accordance with the Judgment, could exceed the long-term average safe yield of the basin as identified in Boyle. The Judgment includes a clause enabling a party to challenge the determinations of the Judgment

("seek judicial relief") if that party demonstrates harm from the consequences of the Judgment (if pumping activities of others "constitute an unreasonable interference with the complaining party's ability to extract groundwater").

The Judgment also requires the Beaumont Basin Watermaster to "redetermine" the safe yield of the basin at least once every ten years, beginning ten years after the date of entry of the Judgment (no later than February 2014). If the redetermined safe yield were to be different from the 8,650 acre feet per year identified in the Judgment, it would change the amount of overdraft on an annual basis. Depending on the redetermined safe yield, this could be more or less than the current overdraft.

According to the Judgment, the basin must be in balance after 2014. That is, the total amount pumped out cannot exceed the average safe yield as identified by the Watermaster unless it is drawn out of storage accounts already in place at that time, or replenished from additional sources, including State Water Project water, recycled water, stormwater, or some other source.

Total production in 2012 from the basin, as reported, was 14,302 acre feet. Therefore, the Beaumont Basin experienced an apparent overdraft of about 8,202 acre feet, assuming an average safe yield of 6,100 acre feet. This was offset by importing 10,974 acre-feet of supplemental water, essentially adding to the volume of the basin this year by approximately 3000 acre-feet. This is the third time that this has occurred since importation of State Water Project water began in 2003, the first time being in 2010. The excess of imported water recharged to extractions of 3000 acre feet in 2012 is triple the amount from 2010.

Selecting 1997 as a base year (the year when significant increases in production began in the region), the cumulative overdraft in the Beaumont Basin since that time (assuming a safe yield of 6,100 acre feet) would be 137,725 acre feet, an average of approximately 8,600 acre feet per year over the past 15 years, without importation of State Water Project water. Figure 9a depicts this graphically. Through 2012, the Agency has imported nearly 53,000 acre-feet of supplemental water. This offsets the cumulative overdraft and reduces it to less than 85,000 acre-feet over the same time period. This is depicted in Figure 9b. The difference in these two figures shows the immense impact that the State Water Project has had on the region in the last decade.

Although other local groundwater basins are at similar risk of overdraft, the state of the overdraft of the Beaumont Basin is far more apparent (in part because it has been studied more) and, due to the large population served by the basin, more critical to the region. Since the safe yields of other basins in the region have not yet been defined, it is impossible to determine whether or not they are in overdraft at this time.

The Agency is continuing studies of the Cabazon Basin and at some point in the next few years will likely define an average safe yield for this basin. It is estimated that this is the second largest basin in the region based on storage volume. Other basins will require additional studies over time to better understand their geology and hydrology. It is believed that most of them have storage volumes and safe yields far smaller than the Beaumont and Cabazon basins.

### 3.3 Groundwater Levels

The Agency monitors water levels in a large monitoring well network. Currently there are over 120 wells in the system, each of which is monitored for groundwater elevation twice a year, typically in May and November. The monitoring network is depicted in **Figure 10.**

As of 2011, the Agency is part of the California State Groundwater Elevation Monitoring (CASGEM) system. This is a new, formal statewide groundwater monitoring system initiated through 2009 legislation. The Agency is a formal monitoring entity for two basins—the San Timoteo sub-basin and the San Gorgonio sub-basin—which roughly correspond to the Agency's boundaries. The state uses different basin names because it views the statewide geology and hydrology on a larger scale, and aggregates smaller basins into larger ones. What is known in the CASGEM system as the San Timoteo sub-basin is essentially the Beaumont Basin, and what CASGEM labels the San Gorgonio sub-basin is essentially the Cabazon Basin. While the boundaries are not exact, they are similar. The Agency files water level data for selected wells through the Department of Water Resources into the CASGEM database. These data are available on the CASGEM web site.

**Figures 11 through 16** show timeseries groundwater elevations (hydrographs) for selected wells in five different basins within the Agency service area. These same wells have been depicted in this report for the past several years.

The two wells shown in **Figure 11** are Banning production wells in the Banning Basin. Each shows great variability in groundwater elevation from 2002 to 2006. Since that time, both wells appear to be higher in elevation. Both of these wells show a long-term trend of lower groundwater levels. However, both appear to be relatively stable over the past few years. The well depicted in Figure 11a appears to be holding at a water level between 325 and 400 feet below ground surface. The well in Figure 11b is down about 75 feet since 1998, but appears to be stable at approximately 350 feet below ground surface.

The five wells depicted in **Figures 12-14** are in the Beaumont Basin. The wells in Figures **12b** and **14b** are in the same location, approximately 1000 feet east of Beaumont Avenue and 50 feet south of Cherry Valley Boulevard in Cherry Valley. This location is likely influenced by the ongoing recharge at Little San Gorgonio Creek, and possibly by the recharge at Noble Creek. The upturn in water levels over the past four years indicate that this is quite likely the case. The wells in **Figures 13** and **14a** are on Calimesa Boulevard near the western fringe of the Beaumont Basin. These wells show continually falling water levels over the past decade. That portion of the Beaumont Basin would appear to not be influenced as yet by the ongoing recharge efforts and reduced production. While it is clear that ongoing recharge and reduced extractions have had an impact on at least some of the wells in the Beaumont Basin, water levels at other wells are still falling.

The two wells in **Figure 15** are both in the Cabazon Basin. They are both production wells—one for the Mission Springs Water District and the other for the Cabazon Water District. Both show severe drops in water surface elevation over the past several years. The well in **Figure 15a** shows a drop of nearly 30 feet over the past ten years. However there does appear to be some stabilizing of the water level recently. It remains to be seen if this will become a trend. The well in **Figure 15b** is changed from previous reports. Previously this report depicted the Cabazon

Water District's Well Number 1. However, this well has become difficult if not impossible to monitor; thus it is replaced with Well Number 2. This well shows a drop of approximately 15 feet over the past five years, though the most recent data might indicate some moderation of this drop, or perhaps even a stabilizing of the water level. These data, along with previous data from the Cabazon Water District Well Number 1, would seem to indicate that, even though the wells are several miles away from each other, that water levels in the Cabazon Basin are dropping and have been for a number of years. This is somewhat surprising, given the decline in extractions from this basin over the past four years. This could mean that inflows to the basin have also declined over the same period of time. It could mean that any impact of reduced extractions just requires a longer period of time before the impact is seen in wells. It certainly means that there are other factors at work in this basin that impact water surface elevations that are beyond the scope of this report. This is one reason that the Agency has worked with the United States Geological Survey to extend its model of the Beaumont Basin to the Cabazon Basin. The Agency wishes to learn more about the Cabazon Basin and how it reacts to various hydrologic events.

The wells depicted in Figure 16 are in the Calimesa and Banning Canyon Basins. The data in Figure 16b show clearly that the Banning Canyon Basin is a shallow basin, and that water levels fluctuate more in such basins. The year 2006 was a wet one locally, and the figure shows that groundwater levels in the basin came up nearly 15 feet that year. The next three years, on the other hand, were dry ones, and the water level dropped nearly seven feet in that time. The data for the well in the Calimesa Basin show that groundwater levels increased in 2006 and have remained relatively constant since. This could have to do with the Yucaipa Valley Water District's filtration plant, which came online in 2006. This event reduced extractions from the Calimesa Basin and most likely contributed to the stabilization of the water level.

These figures represent only a small portion of all groundwater elevation data available in the region. These data indicate that, in general, groundwater elevations continue to decline except in certain areas where recharge of imported water or the switch to surface water is apparently stabilizing or even raising the water levels. Reductions in extractions over the past five years have in many cases slowed the rate of decline.

The implications of lower water levels are great. As water levels decline throughout the local basins, every well will have to pump water from a lower elevation, thus increasing power costs for well owners and rate payers. Some overliers' wells may be quite shallow, and as water levels decline further some of these wells may be in danger of going dry. This would necessitate a large expense to the overlier—either a new well, a deeper well, or connection to one of the water purveyors' systems.

In general, continually decreasing water levels can also lead to land subsidence (sinking) and the drying up of traditional wetlands or streambeds. In the region, most of these wet areas dried up many years ago. The Beaumont Basin Watermaster is charged with monitoring land elevations to determine if subsidence is taking place in the Beaumont Basin. As of this time, the Watermaster has not reported any appreciable land subsidence over the basin.

# 4.0 Water Quality

## 4.1 State Water Project

The Agency takes delivery of its State Water Project water at the Devil Canyon hydroelectric facility in San Bernardino and conveys it through the East Branch Extension to various delivery points. Water quality is a very important component of the Agency's supplemental water supply program.

Table 5 shows six common constituents and their measured amounts from the SWP system at Devil Canyon over the past four years. TDS, or total dissolved solids, is perhaps the most significant constituent in this table. It represents salinity, which is becoming more important to water agencies in California. Over the past four years it can be seen that TDS has mostly been below 300 parts per million (ppm) or milligrams per liter (mg/l). Only twice was the reported concentration greater than this amount. Many readings are in the 240-250 ppm range, and there are a number of readings in the 220 range and below. In 2011, which was a relatively wet year in northern California, TDS readings were very low after January. This is significant because the ambient salinity concentration of the Beaumont Basin is approximately 280 ppm, so the great majority of the time, SWP water reduces the overall concentration of salinity in the Beaumont basin.

Figure 17 shows the monthly average salinity concentration at Devil Canyon since 2004, while Figure 18 shows the annual average since 1990. The annual average is useful because it indicates clearly that salinity is higher in dry years and lower in wet years. The two highest years, 1991 and 1992, were very dry and the last two years of a five year drought in California. The years 1996, 1997, 1998, 2006, and 2011 were all very wet years (in the case of 2011, it was a wet year in northern California, where State Water Project water originates). Salinity in 2010 is significantly lower than the previous three years, which represented a three year drought in California. This inverse correlation between salinity and rainfall comes about because State Water Project passes through the Sacramento/San Joaquin delta. In dry years, there is less fresh water available to flush out the system, so the fresh water/salt water interface is higher in the delta and hence salinity of SWP water is higher.

These figures also point out why it is advantageous to take more water in wet years when it is available—the water has a lower salinity in those years. In the long term, water quality (from a salinity standpoint) is helped by hydrology, as more water is typically delivered in wet years when salinity is lower, and less water is delivered in dry years when salinity is higher.

## 4.2 Groundwater

The Santa Ana Regional Water Quality Control Board's Basin Plan has a maximum benefit goal of 330 ppm of salinity for the Beaumont Management Zone, which includes the Beaumont Basin. The current ambient salinity concentration is the Beaumont basin is approximately 280 ppm. The Basin Plan requires local entities to begin planning desalters when the ambient TDS

concentration increases to 320 ppm or if other conditions are met. These desalters must be online within seven years after that time.

Groundwater quality in the region is very high. There is no known historical industrial or mining activity in the region that has generated harmful plumes of pollutants. In addition to salinity or TDS, nitrate is the only other constituent that needs to be monitored closely. This too is regulated by the Regional Board, but nitrate concentrations are currently well within the maximum benefit standards. Over the past few years there have been isolated incidents of high nitrates at individual wells for short periods of time, typically after a large rainstorm that causes flushing of the system. However these have not proven to be a health hazard.

Nitrates in ambient groundwater do not necessarily translate to a danger in drinking water. Nitrates in drinking water are regulated by the California Department of Public Health, not the Regional Board. Nitrates in groundwater can effectively be managed if needed through dilution. If nitrates were to become a persistent problem in a particular location, the local purveyor may consider installing wellhead treatment for nitrates. Such treatment is costly. However, there is no evidence that such treatment is needed in the region in the near future.

It should be noted that salinity in drinking water is regulated by a secondary water quality standard, while nitrate is regulated under a primary standard. Primary standards are for constituents that can directly impact human health. Secondary standards are for constituents that do not directly impact human health, but that may have aesthetic issues. Salinity is not harmful to human health and safety directly, while nitrate can be harmful at high concentrations, particularly to infants.

### 4.3 Emerging Contaminants

There is a relatively new class of chemical constituents that have recently been found in the environment and in drinking water known as emerging contaminants. These are primarily pharmaceuticals and personal care products (PPCP's) that pass through human or animal bodies or get flushed and end up in sewage or septic flows. They have become known because of the technological ability to measure concentrations at increasingly small concentrations (parts per billion or even parts per trillion). Because of their presence in the environment, the Santa Ana Regional Water Quality Control Board has required that dischargers (those entities that own and operate sewage treatment plants) monitor for these constituents on an annual basis.

There is no evidence that these constituents are harmful to humans in their current concentrations in the environment. Some groups have claimed that these products could harm animals in the environment and thus have called for their regulation. At this point in time they are not regulated. Water agencies in the watershed are developing a database so that the number and concentrations of these constituents can be monitored on an ongoing basis.

Emerging contaminants are mentioned in this report not because they have any immediate impact on water quality in the region, or even that they are expected to have an impact in the near future. They are included because they are mentioned increasingly in the literature and by regulators as a growing issue for the water industry to be aware of.

# 5.0 SUMMARY

Reported groundwater extractions within the region increased slightly for the second consecutive year after decreasing for three consecutive years. Total extractions in 2012 were still approximately 17% below levels for 2007, the peak historical year for extractions in the region. This is likely due to the continued downturn in the economy, some wetter winters, and a new surface water filtration plant in the region.

Local retail water purveyors continue to make progress in implementing recycled water systems. These systems are complex and expensive to complete, and funding and water quality (salinity) are key issues that require attention. Implementation of these systems over the next few years should reduce groundwater extractions significantly. Such reductions could begin as soon as 2013, when the Yucaipa Valley Water District is scheduled to complete a major facility that will export salinity from the region.

Another factor that should lead to reduced withdrawals is the ten year anniversary of the Beaumont Basin Judgment in February 2014. This will end the ten year "temporary surplus" in the basin and require appropriators to replace any water withdrawn that exceeds their share of the basin safe yield as identified in the Judgment. The end of this ten year period will bring about a reduction of 16,000 acre-feet per year in water supply for the region.

Based on data in this report, there is evidence that groundwater levels have increased slightly in portions of the region over the past two to three years. In other areas, the rate of groundwater decline has slowed. Future reports will determine the significance of these data. In much of the region, groundwater levels are continuing to fall, as they have for the past several decades.

Over the past five years, retail water agencies in the region have done a very good job of managing resources. The Yucaipa Valley Water District has built a surface water treatment plant in order to reduce its groundwater withdrawals, and is also constructing a desalter and brine line to facilitate use of recycled water for nonpotable uses. The Beaumont Cherry Valley Water District has constructed a recharge facility in the Beaumont Basin and has purchased a large quantity of replenishment water. The City of Banning has begun purchasing water for replenishment as well, and is working with Southern California Edison and the Banning Heights Mutual Water Company to make improvements to a system that delivers runoff from the San Bernardino Mountains to the Banning Bench and the City of Banning. High Valleys Water District has replaced much of its old, leaky pipe, thus reducing its losses significantly. The Cabazon Water District has also reduced its water losses significantly. The South Mesa Water Company has drilled a new, more efficient well. Several water purveyors have implemented tiered rate structures, which tend to reduce water usage. Three major recycled water systems are in the planning, design, or construction phase. These are all positive steps that will help extend and preserve local groundwater basins into the future.

During this same time period, the Agency has increased its imported water deliveries to such an extent that, in 2012, more water was put into the Beaumont Basin than withdrawn from it for the

third consecutive year. In 2012, the amount recharged into the Beaumont Basin (average safe yield plus imported water) exceeded extractions from this basin by 3,000 acre feet. Since the completion of the East Branch Extension in 2003, the Agency has increased its deliveries to the region every year, with the exception of 2005. Overall, the Agency has delivered approximately 53,000 acre feet of State Water Project water over the past ten years, either for replenishment or for direct deliveries.

In the future, the local economy and local weather patterns will continue to play large roles in determining water demands each year. As new homes are constructed in the future, recent legislation will require lower water use landscaping. This should reduce per capita water consumption for future development, further extending the life of local water resources.

Based on data in this report and observation of ongoing events, it is apparent that the recession is slowly coming to an end, and construction of new homes in the region will begin within the next 1-2 years, gradually increasing water demands. The Agency and retail water purveyors will need to work together to continue to meet the increasing water demands of the region.

**San Gorgonio Pass Water Agency**
**Totals by Basin**
**Non-Verified Production Data**
***(in acre feet)***

| Basin | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Banning | 586 | 839 | 1,103 | 2,381 | 1,180 | 1,485 | 1,787 | 2,512 | 1999 | 2,787 | 1,782 | 1845 | 1715 |
| Banning Bench | 730 | 753 | 807 | 952 | 1,319 | 2,332 | 2,987 | 2,199 | 1,299 | 1,415 | 1,561 | 1,395 | 1719 |
| Banning Canyon | 4,955 | 5,600 | 3,024 | 2,582 | 3,329 | 3,649 | 3,464 | 2,662 | 3,237 | 2,771 | 3,941 | 3,820 | 4091 |
| Beaumont | 13,937 | 14,474 | 19,149 | 19,356 | 17,478 | 13,390 | 17,140 | 19,032 | 17,264 | 14,643 | 13,158 | 13,600 | 14302 |
| Cabazon | 594 | 1,182 | 1,749 | 1,208 | 1,604 | 1,379 | 1,314 | 1,466 | 1,412 | 1,258 | 1,054 | 900 | 654 |
| Calimesa (2) | 1,635 | 1,689 | 1,557 | 1,725 | 1,535 | 1,575 | 1,445 | 1,532 | 1,133 | 1,315 | 1,114 | 993 | 1169 |
| Edgar Canyon (1) | 3,979 | 2,926 | 3,039 | 2,549 | 2,759 | 2,766 | 3,872 | 3,085 | 3,140 | 2,784 | 3,100 | 3,467 | 3313 |
| Millard Canyon | - | 256 | 1,366 | 675 | 823 | 595 | 707 | 842 | 757 | 750 | 750 | 750 | 750 |
| San Timoteo | 1,450 | 1234 | 1,465 | 1,392 | 1,469 | 2,132 | 1,904 | 1,384 | 1,533 | 1,367 | 1,329 | 1,297 | 1312 |
| Singleton | 558 | 547 | 535 | 345 | 483 | 636 | 645 | 666 | 471 | 382 | 405 | 412 | 448 |
| South Beaumont | 77 | 77 | 92 | 95 | 92 | 85 | 83 | 94 | 79 | 97 | 119 | 115 | 102 |
| **Totals** | **28,501** | **29,577** | **33,886** | **33,260** | **32,071** | **30,024** | **35,348** | **35,474** | **32,324** | **29,569** | **28,313** | **28,594** | **29,575** |

***Notes:***
Amounts shown are rounded to nearest acre-foot
Amounts as reported to the SWRCB Division of Water Rights, made available by a purveyor, reported by Beaumont Basin Watermaster or estimated by SGPWA
Data revised to agree with basin boundaries as defined in USGS 2004 repor:
(1) Includes wells located in Upper Edgar Canyon in San Bernardino County
(2) Includes wells located in Riverside and San Bernardino County

Table 1: Groundwater Production in San Gorgonio Pass Water Agency by Basin (2000 through 2012 as reported)

**San Gorgonio Pass Water Agency**
**Totals by Owner**
**Non-Verified Production Data**
***(in acre feet)***

| Owner | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Albor Properties III, LP | 122 | 151 | 164 | 163 | 163 | 165 | 170 | 175 | 200 | 193 | 174 | 177 | 4 |
| Banning Heights Mutual Water Co. | 120 | 153 | 275 | 207 | 32 | 73 | 21 | 22 | 31 | 4 | 17 | 13 | 45 |
| Banning, City of (1) | 9,490 | 10,338 | 9,526 | 10,053 | 8934 | 9082 | 10,162 | 10,223 | 9,583 | 8,996 | 8,415 | 8,454 | 8,576 |
| Beaumont-Cherry Valley Water District (1) | 6,522 | 5,614 | 8,762 | 9,205 | 8606 | 7070 | 11,748 | 13,131 | 12,744 | 10,849 | 10,975 | 11,698 | 12,153 |
| Beckman, Walt | | | | | | | 116 | 83 | 13 | | | | |
| Brinton, Barbara | 10 | 10 | 10 | 10 | 10 | 10 | | 10 | 10 | 10 | 10 | 10 | 10 |
| Cabazon Water District | 477 | 1,178 | 1,580 | 1,035 | 1261 | 1069 | 966 | 923 | 875 | 905 | 710 | 509 | 269 |
| Dowling, Frances M. Jr. | 77 | 77 | 92 | 95 | 92 | 85 | 83 | 94 | 79 | 72 | 96 | 92 | 79 |
| Hudson, Merton Lonnie | 385 | 510 | 465 | 430 | 430 | 430 | 435 | 445 | 435 | 430 | 430 | 410 | 485 |
| Illy, Katharina | 267 | 267 | 267 | 267 | 267 | 267 | 267 | 265 | 265 | 265 | 270 | 270 | 270 |
| Lane, Christie | | | | 7 | 7 | 1 | | | | | | | |
| Los Rios Inc . | 359 | 250 | 242 | 226 | 194 | 343 | 343 | 470 | 435 | 386 | 493 | 528 | 505 |
| Merlin Properties, LLC | 535 | 530 | 530 | 520 | 500 | 500 | 100 | 100 | 150 | 175 | 100 | 150 | 200 |
| Mission Spring Water District | | | 165 | 169 | 157 | 171 | 190 | 206 | 164 | 162 | 144 | 150 | 146 |
| Morongo Band of Mission Indians (3) | 1,688 | 1,581 | 2,593 | 2,057 | 2,191 | 1822 | 2,530 | 2,326 | 1,890 | 1908 | 1,541 | 1,634 | 1,736 |
| Oak Valley Management | 718 | 684 | 925 | 950 | 852 | 991 | 965 | 742 | 781 | 753 | 546 | 573 | 821 |
| Oak Valley Partners | 446 | 401 | 383 | 453 | 430 | 350 | 312 | 312 | 311 | 311 | 311 | 12 | 12 |
| Perisits, Jack | 40 | 40 | 40 | 40 | 40 | 40 | | | | | | | |
| Plantation on the Lake (2) | 289 | 286 | 280 | 32 | 32 | 40 | 47 | 46 | 47 | 49 | 43 | 46 | 48 |
| Rancho Calimesa Mobile Home Ranch | 150 | 198 | 206 | 202 | 202 | 60 | 61 | 61 | 40 | 40 | 42 | 42 | 24 |
| Riverside County Parks Department | | | | | | | | | | | | 50 | 50 |
| Riverside Land Conservancy (4) | 160 | 160 | 160 | 160 | 160 | 160 | 165 | 165 | 165 | 165 | 165 | 160 | 165 |
| Robertson's Ready Mix | 117 | 4 | 4 | 4 | 186 | 139 | 158 | 337 | 373 | 191 | 200 | 241 | 239 |
| Roman Catholic Bishop | 114 | 114 | 140 | 140 | 140 | 70 | 70 | 70 | | | | | |
| Sharondale Mesa Owners Association | 167 | 190 | 185 | 182 | 158 | 181 | 189 | 183 | 196 | 154 | 131 | 133 | 145 |
| Shiloh's Hill LLC | | | 107 | 11 | 121 | 160 | 146 | 150 | 61 | 172 | 200 | 229 | 193 |
| South Mesa Water Co. | 2,609 | 2,563 | 2,745 | 2,645 | 2679 | 2,551 | 2,711 | 2,639 | 2,681 | 2,514 | 2,222 | 2224 | 2376 |
| Summit Cemetery District | 55 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 90 | 68 | 88 | 88 |
| Sun Cal Companies | 97 | 82 | 47 | 49 | 89 | 839 | 555 | | | | | | |
| Sunny-Cal Egg & Poultry, Inc. | 1,762 | 1,876 | 1,475 | 1,475 | 1,477 | 1,153 | 50 | 50 | 50 | 50 | 25 | 28 | 28 |
| Wildlands Conservancy, The | 381 | 433 | 460 | 317 | 462 | 283 | 301 | 9 | 21 | 40 | 16 | 8 | 7 |
| Yucaipe Valley Water District | 1,344 | 1,802 | 1,993 | 2,091 | 2,134 | 1,854 | 2,422 | 2,072 | 659 | 685 | 949 | 665 | 901 |
| **Totals** | **28,501** | **29,577** | **33,886** | **33,260** | **32,071** | **30,024** | **35,348** | **35,474** | **32,324** | **29,569** | **28,313** | **28,594** | **29,575** |

***Notes:***
Amounts shown are rounded to nearest acre-foot
Amounts as reported to the SWRCB Division of Water Rights, made available by a purveyor, reported by Beaumont Watermaster or estimated by SGPWA
Data revised to agree with basin boundaries as defined in USGS 2004 report
(1) Amount adjusted for production in 2006, 2007, 2008 & 2009 by BCVWD for City of Banning from co-owned wells
(2) 2010 Data not reported - Preceeding year (2009) data used
(3) Previous Well Owners - Arrowhead Mtn Spring Bottling Co. & East Valley Golf Club LLC
(4) El Casco Lake Ranch merged with Riverside Land Conservancy
(5) Desert Hills Premium Outlets merged with Cabazon Water District

Table 2: Groundwater Production in San Gorgonio Pass Water Agency by Purveyor (2000 through 2012 as reported)

San Gorgonio Pass Water Agency
Totals by Owner by Basin
Non-Verified Production Data
*(In acre feet)*

| Owner | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **BANNING BASIN** | | | | | | | | | | | | | |
| Banning, City of | 586 | 839 | 1,103 | 2,381 | 1,180 | 1,485 | 1,787 | 2,512 | 1,999 | 2,787 | 1,782 | 1,845 | 1,715 |
| **TOTALS FOR BANNING BASIN** | 586 | 839 | 1,103 | 2,381 | 1,180 | 1,485 | 1,787 | 2,512 | 1,999 | 2,787 | 1,782 | 1,845 | 1,715 |
| **BANNING BENCH BASIN** | | | | | | | | | | | | | |
| Banning, City of | 665 | 678 | 732 | 877 | 1,244 | 2257 | 2922 | 2,124 | 1,224 | 1,340 | 1,486 | 1,320 | 1,644 |
| Brinton, Barbara | 10 | 10 | 10 | 10 | 10 | 10 | 0 | 10 | 10 | 10 | 10 | 10 | 10 |
| Summit Cemetery District | 55 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 | 65 |
| **TOTALS FOR BANNING BENCH BASIN** | 730 | 753 | 807 | 952 | 1,319 | 2,332 | 2,987 | 2,199 | 1,299 | 1,415 | 1,561 | 1,395 | 1,719 |
| **BANNING CANYON BASIN** | | | | | | | | | | | | | |
| Banning Heights Mutual Water Co. | 120 | 153 | 275 | 207 | 32 | 73 | 21 | 22 | 31 | 4 | 17 | 13 | 45 |
| Banning, City of | 4,835 | 5,447 | 2749 | 2,388 | 3,290 | 3,575 | 3,443 | 2,640 | 3,206 | 2,767 | 3924 | 3,807 | 4,046 |
| Lane, Christie | 0 | 0 | 0 | 7 | 7 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | |
| **TOTALS FOR BANNING CANYON BASIN** | 4,955 | 5,600 | 3,024 | 2,582 | 3329 | 3,649 | 3,464 | 2,662 | 3,237 | 2,771 | 3,941 | 3,820 | 4,091 |
| **BEAUMONT BASIN** | | | | | | | | | | | | | |
| Albor Properties III, LP | 122 | 151 | 164 | 163 | 163 | 165 | 170 | 175 | 200 | 193 | 174 | 177 | 4 |
| Banning, City of (1) | 3,404 | 3,374 | 4,942 | 4,427 | 3,220 | 1,765 | 2,010 | 2,947 | 3,154 | 1,823 | 1223 | 1,482 | 1,171 |
| Beaumont-Cherry Valley Water District (1) | 3,768 | 3,971 | 7088 | 7,692 | 7,103 | 5,607 | 9,200 | 11,096 | 10,617 | 9,643 | 9,100 | 9539 | 10,163 |
| Walt Beckman | | | | | | | 116 | 83 | 13 | 0 | 0 | 0 | 0 |
| Merlin Properties, LLC | 535 | 530 | 530 | 520 | 500 | 500 | 100 | 100 | 150 | 175 | 100 | 150 | 200 |
| Morongo Band of Mission Indians (2) | 1,688 | 1,325 | 1227 | 1,382 | 1,368 | 1,227 | 1,823 | 1,484 | 1,133 | 1,158 | 791 | 884 | 986 |
| Oak Valley Management, LLC | 718 | 684 | 925 | 950 | 852 | 991 | 965 | 742 | 781 | 753 | 546 | 573 | 821 |
| Oak Valley Partners | 446 | 401 | 383 | 453 | 430 | 350 | 312 | 312 | 311 | 311 | 311 | 12 | 12 |
| Plantation on the Lake | 289 | 286 | 280 | 32 | 32 | 40 | 47 | 46 | 47 | 49 | 43 | 46 | 48 |
| Rancho Calimesa Mobile Home Ranch | 150 | 198 | 206 | 202 | 202 | 60 | 61 | 61 | 40 | 40 | 42 | 42 | 24 |
| Roman Catholic Bishop | 114 | 114 | 140 | 140 | 140 | 70 | 70 | 70 | 0 | 0 | 0 | 0 | 0 |
| Sharondale Mesa Owners Association | 167 | 190 | 185 | 182 | 158 | 181 | 189 | 183 | 196 | 154 | 131 | 133 | 145 |
| Sunny-Cal Egg & Poultry, Inc. | 1,762 | 1,876 | 1,475 | 1,475 | 1,477 | 1,153 | 50 | 50 | 50 | 50 | 25 | 28 | 28 |
| Yucaipa Valley Water District | 774 | 1,374 | 1,604 | 1,738 | 1,833 | 1,281 | 2,027 | 1,683 | 572 | 494 | 672 | 534 | 700 |
| **TOTALS FOR BEAUMONT BASIN** | 13,937 | 14,474 | 19,149 | 19,356 | 17,478 | 13,390 | 17,140 | 19,032 | 17,264 | 14,643 | 13,158 | 13,600 | 14,302 |
| **CABAZON BASIN** | | | | | | | | | | | | | |
| Cabazon Water District | 477 | 1,178 | 1,580 | 1035 | 1,261 | 1,069 | 966 | 923 | 875 | 905 | 710 | 509 | 269 |
| Mission Springs Water District | 0 | 0 | 165 | 169 | 157 | 171 | 190 | 206 | 184 | 162 | 144 | 150 | 146 |
| Robertson's Ready Mix | 117 | 4 | 4 | 4 | 186 | 139 | 158 | 337 | 373 | 191 | 200 | 241 | 239 |
| **TOTALS FOR CABAZON BASIN** | 594 | 1,182 | 1,749 | 1208 | 1,604 | 1,379 | 1,314 | 1,466 | 1,412 | 1,258 | 1,054 | 900 | 654 |



Table 3: Groundwater Production in San Gorgonio Pass Water Agency by Purveyor by Basin (2000 through 2012 as reported)

San Gorgonio Pass Water Agency
Totals by Owner by Basin
Non-Verified Production Data
*(in acre feet)*

| Owner | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CALIMESA BASIN** | | | | | | | | | | | | | |
| Illy, Katharina | 267 | 267 | 267 | 267 | 267 | 267 | 267 | 265 | 265 | 265 | 270 | 270 | 270 |
| Peelsis, Jack | 40 | 40 | 40 | 40 | 40 | 40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| South Mesa Water Co. | 858 | 1044 | 952 | 1,117 | 976 | 782 | 662 | 954 | 842 | 930 | 653 | 675 | 781 |
| Yucaipa Valley Water District | 470 | 338 | 298 | 301 | 252 | 466 | 296 | 313 | 28 | 120 | 191 | 48 | 118 |
| **TOTALS FOR CALIMESA BASIN** | 1,635 | 1,689 | 1,557 | 1,725 | 1,535 | 1,575 | 1,445 | 1,532 | 1,133 | 1,315 | 1,114 | 993 | 1,169 |
| **EDGAR CANYON BASIN** | | | | | | | | | | | | | |
| Beaumont-Cherry Valley Water District | 2,754 | 1643 | 1,674 | 1,513 | 1,503 | 1,483 | 2,548 | 1,935 | 2,127 | 1,685 | 1875 | 2,159 | 1,990 |
| Hudson, Merton Lonnie | 385 | 510 | 465 | 430 | 490 | 430 | 435 | 445 | 435 | 430 | 430 | 410 | 485 |
| Los Rios Inc | 359 | 250 | 242 | 226 | 194 | 343 | 343 | 470 | 435 | 386 | 493 | 528 | 505 |
| Riverside County Parks Department | | | | | | | | | | | | 50 | 50 |
| Shiloh's Hill LLC | 0 | 0 | 107 | 11 | 121 | 160 | 146 | 150 | 61 | 172 | 200 | 229 | 193 |
| Wildlands Conservancy, The | 381 | 433 | 460 | 317 | 462 | 283 | 301 | 9 | 21 | 40 | 16 | 8 | 7 |
| Yucaipa Valley Water District | 100 | 90 | 91 | 52 | 49 | 87 | 99 | 76 | 61 | 71 | 86 | 83 | 83 |
| **TOTALS FOR EDGAR CANYON BASIN** | 3,979 | 2,926 | 3,039 | 2,549 | 2,759 | 2,766 | 3,872 | 3,085 | 3,140 | 2,784 | 3,100 | 3,467 | 3,313 |
| **MILLARD CANYON BASIN** | | | | | | | | | | | | | |
| Morongo Band of Mission Indians (3) | 0 | 256 | 1,366 | 675 | 823 | 595 | 707 | 842 | 757 | 750 | 750 | 750 | 750 |
| **TOTALS FOR MILLARD CANYON BASIN** | 0 | 256 | 1,366 | 675 | 823 | 595 | 707 | 842 | 757 | 750 | 750 | 750 | 750 |
| **SAN TIMOTEO BASIN** | | | | | | | | | | | | | |
| Morongo Band of Mission Indians (2) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Riverside Land Conservancy | 160 | 160 | 160 | 160 | 160 | 160 | 165 | 165 | 165 | 165 | 165 | 160 | 165 |
| South Mesa Water Co. | 1,193 | 992 | 1258 | 1,183 | 1,220 | 1,133 | 1,184 | 1,219 | 1,368 | 1,202 | 1,164 | 1,137 | 1,147 |
| SunCal Companies | 97 | 82 | 47 | 49 | 89 | 839 | 555 | 0 | 0 | 0 | 0 | 0 | 0 |
| **TOTALS FOR SAN TIMOTEO BASIN** | 1,450 | 1,234 | 1,465 | 1,392 | 1,469 | 2,132 | 1,904 | 1,384 | 1,533 | 1,367 | 1,329 | 1,297 | 1,312 |
| **SINGLETON BASIN** | | | | | | | | | | | | | |
| South Mesa Water Co. | 558 | 547 | 535 | 345 | 483 | 636 | 645 | 666 | 471 | 382 | 405 | 412 | 448 |
| **TOTALS FOR SINGLETON BASIN** | 558 | 547 | 535 | 345 | 483 | 636 | 645 | 666 | 471 | 382 | 405 | 412 | 448 |
| **SOUTH BEAUMONT BASIN** | | | | | | | | | | | | | |
| Dowling, Frances M. Jr. | 77 | 77 | 92 | 95 | 92 | 85 | 83 | 94 | 79 | 72 | 96 | 92 | 79 |
| Summit Cemetery District | | | | | | | | | | 25 | 23 | 23 | 23 |
| **TOTALS FOR SOUTH BEAUMONT BASIN** | 77 | 77 | 92 | 95 | 92 | 85 | 83 | 94 | 79 | 97 | 119 | 115 | 102 |
| **TOTALS FOR ALL BASINS** | 28,501 | 29,577 | 33,886 | 33,260 | 32,071 | 30,024 | 35,348 | 35,474 | 32,324 | 29,569 | 28,313 | 28,594 | 29,575 |

*Notes:*
Amounts shown are rounded to nearest acre-foot
Amounts as reported to the SWRCB Division of Water Rights, made available by a purveyor, reported by Beaumont Basin Watermaster or estimated by SGPWA
Data revised to agree with basin boundaries as defined in USGS 2004 report
(1) Amount adjusted for production in 2006, 2007, 2008 & 2009 by BCVWO for City of Banning from co-owned wells
(2) Previous Well Owner - East Valley Golf Club LLC
(3) Previous Well Owner - Arrowhead Mountain Spring Water Bottling Co.



Table 3: Groundwater Production in San Gorgonio Pass Water Agency by Purveyor by Basin (2000 through 2012 as reported)

State Water Project Deliveries to
San Gorgonio Pass Water Agency Service Area

| Calendar Year | Amount in Acre-Feet | Allocation |
|---|---|---|
| 2003 (1) | 116 | 90% |
| 2004 | 814 | 65% |
| 2005 | 687 | 90% |
| 2006 (2) | 4420 | 100% |
| 2007 (2) | 4815 | 60% |
| 2008 (2) | 4905 | 35% |
| 2009 (2) | 6609 | 40% |
| 2010 (2) | 8403 | 50% |
| 2011 (2) | 10,730 | 80% |
| 2012 (2) | 10,974 | 35% |

(1) Start Up/ Partial Year
(2) Includes deliveries to Yucaipa Valley Water District

Deliveries to Beaumont Cherry Valley Water District began in September 2006
Source: San Bernardino Valley Municipal Water District Operations Manager

Table 4: State Water Project Deliveries to
San Gorgonio Pass Water Agency Service Area

## Water Quality Analysis at Devil Canyon Afterbay

| DATE | TDS mg/L | Chloride mg/L | Sodium mg/L | Sulfate mg/L | Nephelometric Turbidity Units | Nitrate+ Nitrite mg/L |
|---|---|---|---|---|---|---|
| Jan-09 | 276 | 76 | 61 | 47 | <1 | 0.76 |
| Feb-09 | 266 | 70 | 58 | 43 | <1 | 0.79 |
| Mar-09 | 270 | 72 | 55 | 44 | 1 | 0.65 |
| Apr-09 | 282 | 73 | 63 | 47 | 1 | 0.52 |
| May-09 | 299 | 76 | 64 | 52 | 2 | 0.61 |
| Jun-09 | 295 | 77 | 62 | 54 | 1 | 0.43 |
| Jul-09 | 325 | 89 | 67 | 52 | 4 | 0.35 |
| Aug-09 | 225 | 58 | 42 | 30 | 5 | 0.33 |
| Sep-09 | 235 | 78 | 56 | 26 | 1 | 0.15 |
| Oct-09 | 287 | 93 | 63 | 33 | 1 | 0.37 |
| Nov-09 | 274 | 83 | 62 | 37 | 1 | 0.56 |
| Dec-09 | 245 | 69 | 52 | 35 | 4 | 0.76 |
| Jan-10 | 254 | 70 | 53 | 36 | 1 | 0.68 |
| Feb-10 | 222 | 56 | 42 | 33 | 6 | 0.74 |
| Mar-10 | 214 | 50 | 41 | 35 | 1 | 0.85 |
| Apr-10 | 240 | 54 | 45 | 46 | 2 | 0.80 |
| May-10 | 226 | 49 | 40 | 55 | 3 | 0.54 |
| Jun-10 | 241 | 59 | 45 | 43 | 2 | 0.52 |
| Jul-10 | 234 | 56 | 41 | 37 | 3 | 0.40 |
| Aug-10 | 205 | 54 | 43 | 30 | 2 | 0.21 |
| Sep-10 | 214 | 60 | 41 | 26 | 16 | 0.14 |
| Oct-10 | 275 | 94 | 60 | 25 | 18 | 0.32 |
| Nov-10 | 264 | 87 | 55 | 27 | 1 | 0.46 |
| Dec-10 | 255 | 82 | 54 | 28 | 1 | 0.44 |
| Jan-11 | 276 | 64 | 44 | 26 | 2 | 0.61 |
| Feb-11 | 168 | 35 | 29 | 27 | 4 | 0.41 |
| Mar-11 | 165 | 32 | 27 | 29 | 16 | 0.49 |
| Apr-11 | 168 | 34 | 30 | 35 | 5 | 0.40 |
| May-11 | 113 | 19 | 18 | 19 | 4 | 0.21 |
| Jun-11 | 139 | 30 | 25 | 20 | 2 | 0.19 |
| Jul-11 | 122 | 24 | 20 | 19 | 4 | 0.36 |
| Aug-11 | 140 | 30 | 27 | 20 | 2 | 0.33 |
| Sep-11 | 148 | 30 | 25 | 19 | 1 | 0.24 |
| Oct-11 | 125 | 24 | 20 | 17 | 2 | 0.24 |
| Nov-11 | 130 | 20 | 21 | 15 | 1 | 0.35 |
| Dec-11 | 166 | 34 | 30 | 25 | 2 | 0.41 |
| Jan-12 | 179 | NR | 34 | NR | 1 | 0.53 |
| Feb-12 | 266 | 73 | 52 | 35 | 1 | 0.55 |
| Mar-12 | 278 | 84 | 59 | 39 | <1 | 0.48 |
| Apr-12 | 274 | 71 | 57 | 41 | <1 | 0.61 |
| May-12 | 286 | 69 | 55 | 49 | <1 | 0.51 |
| Jun-12 | 254 | 63 | 51 | 41 | 2 | 0.55 |
| Jul-12 | 244 | 59.5 | 47 | 37 | <1 | 0.31 |
| Aug-12 | 202 | 52 | 41 | 27 | <1 | 0.23 |
| Sep-12 | 200 | 59 | 43 | 20 | <1 | 0.08 |
| Oct-12 | 282 | 99 | 64 | 24 | 2 | 0.09 |
| Nov-12 | 305 | 103 | 65 | 27 | 1 | 0.27 |
| Dec-12 | 281 | 91 | 60 | 29 | 1 | 0.41 |

mg/L: milligrams per liter
Source: SWP/DWR O & M, Table 32 DWR Monthly OPS Report
NR: Not Reported

Table 5: Water Quality Analysis at Devil Canyon Afterbay near San Bernardino (Selected Constituents)

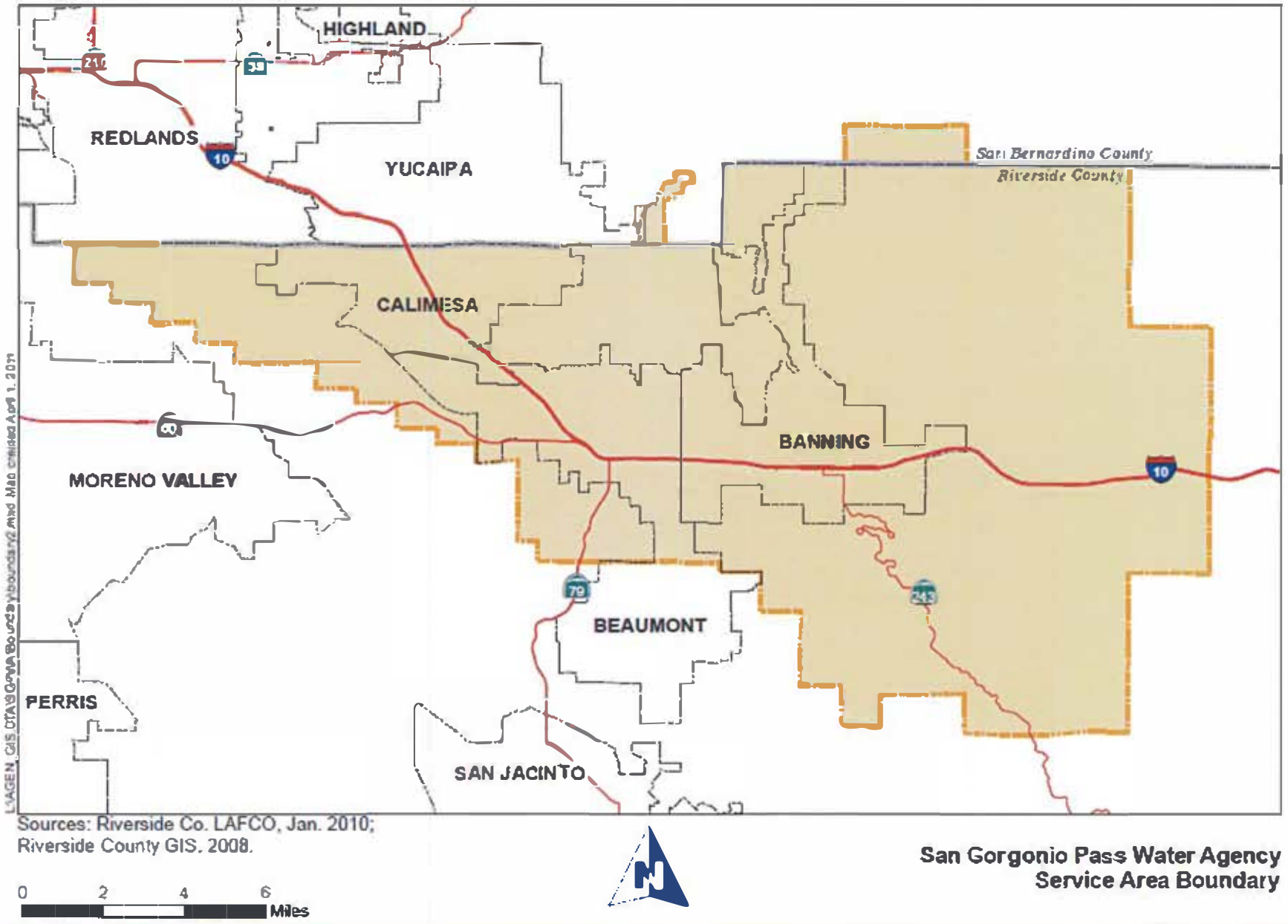



Figure 1: San Gorgonio Pass Water Agency

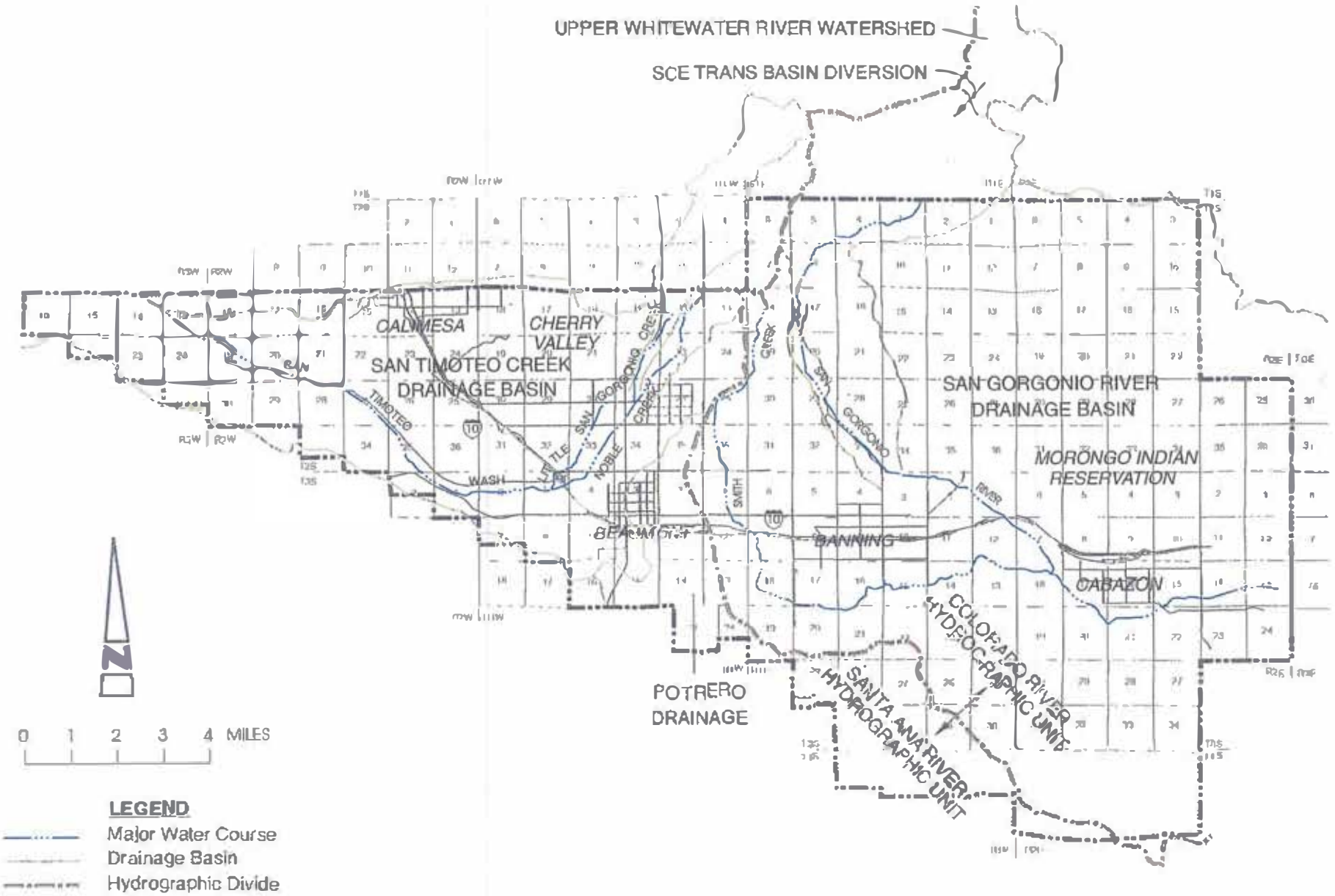
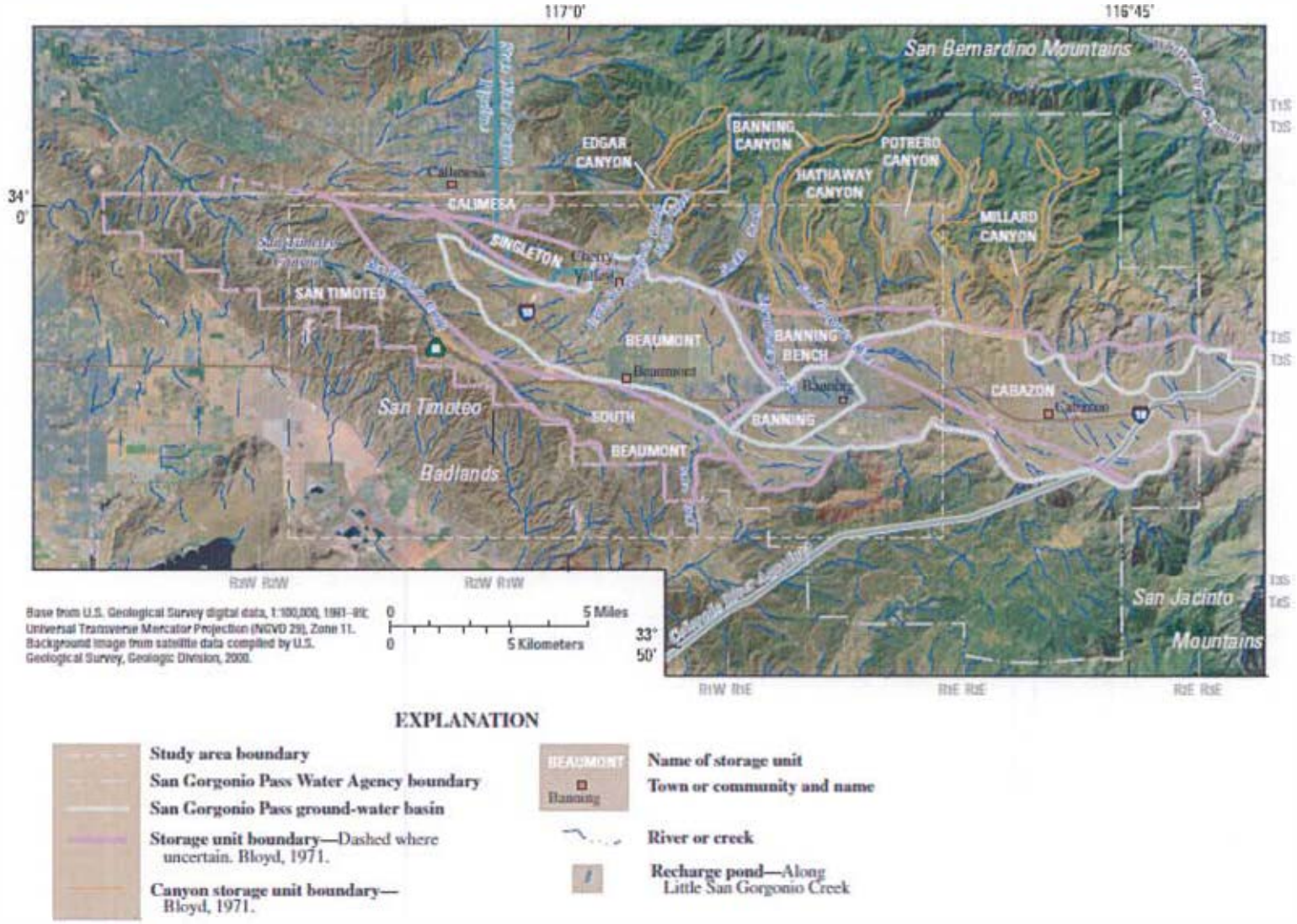



Figure 2: Drainage Basins and Principal Streams




Source USGS Scientific Investigations Report 2006-5026

Figure 3: Groundwater Storage Units

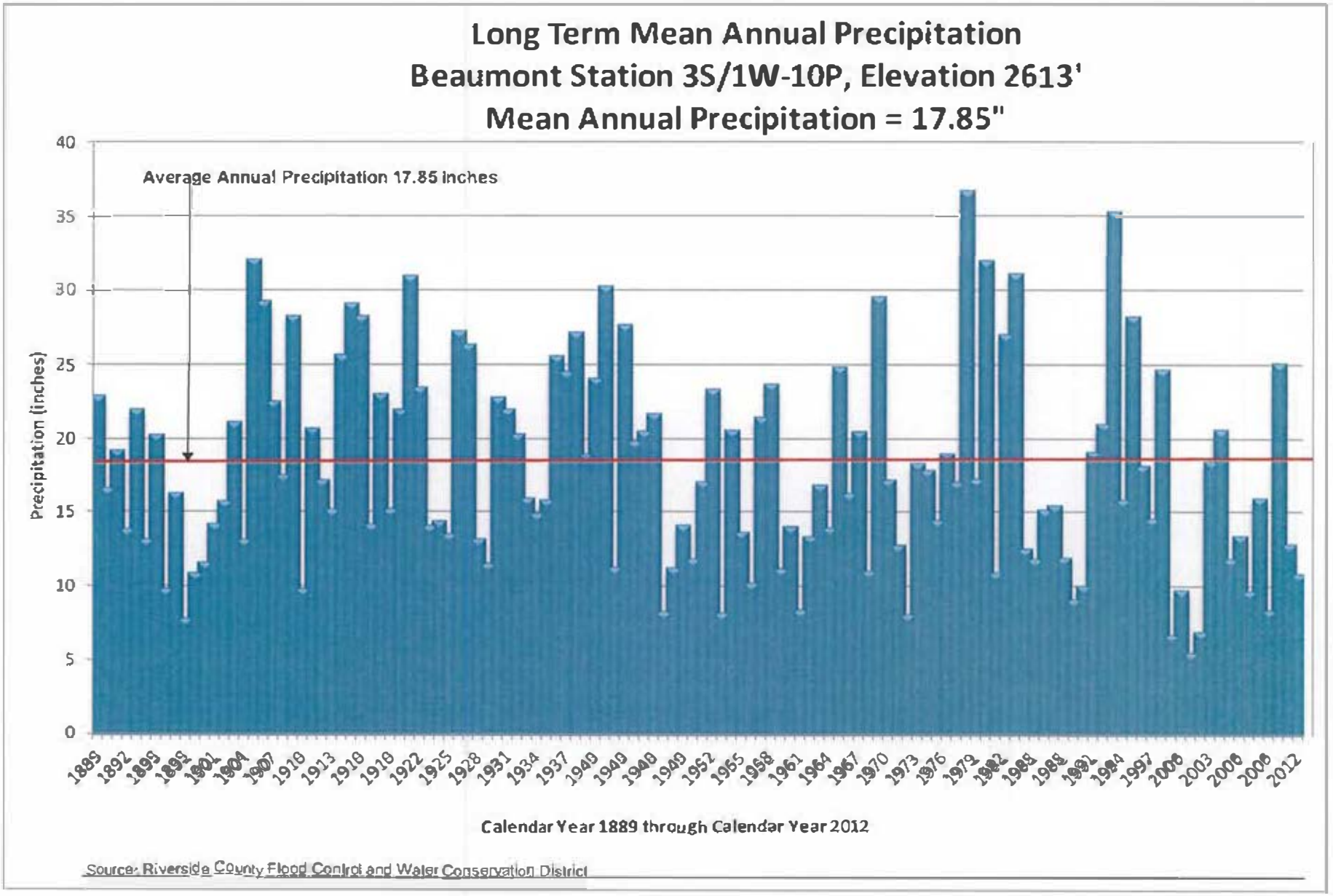



Figure 4: Long Term Mean Annual Precipitation at Beaumont

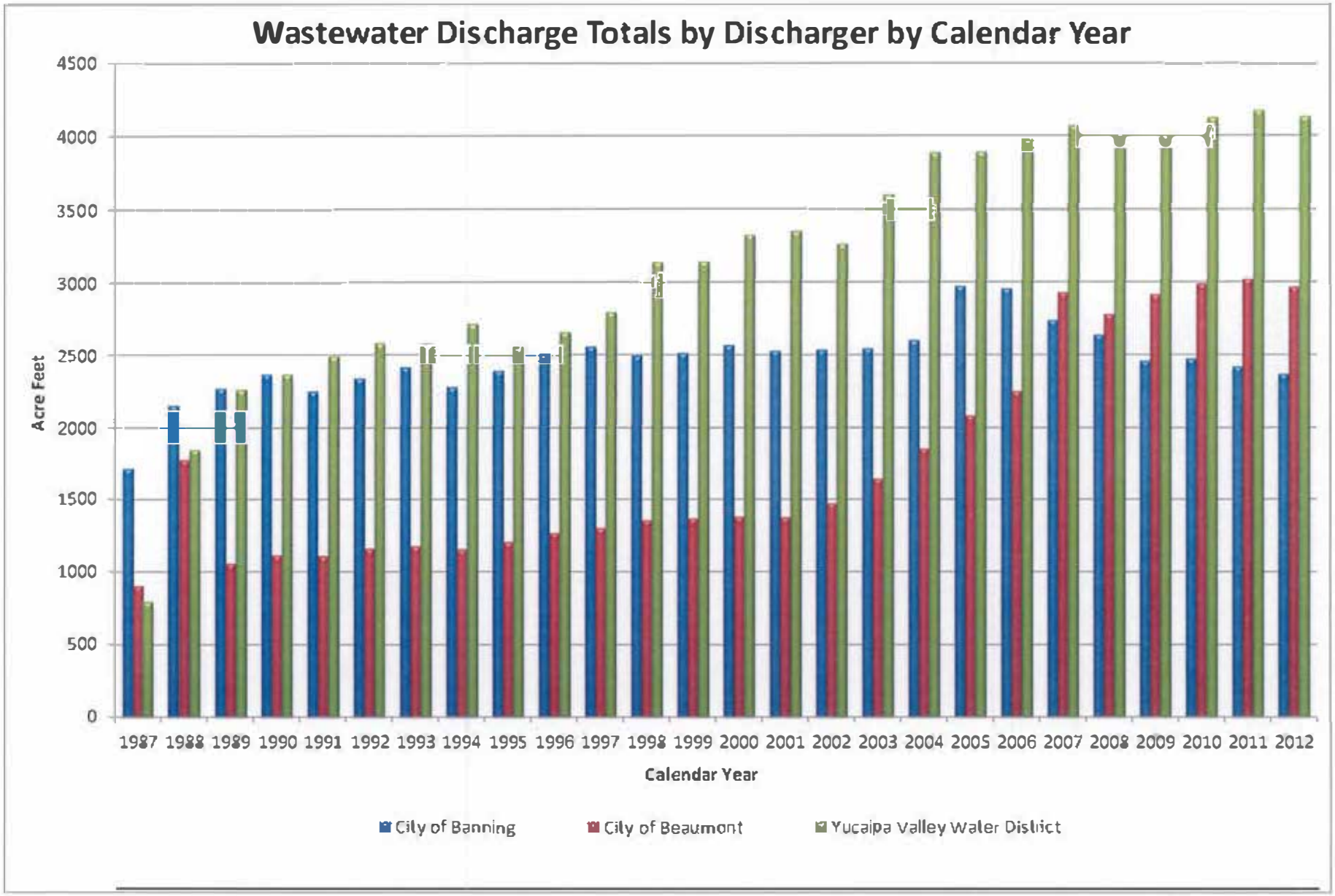



Figure 5: Wastewater Discharge Totals by Discharger by Calendar Year

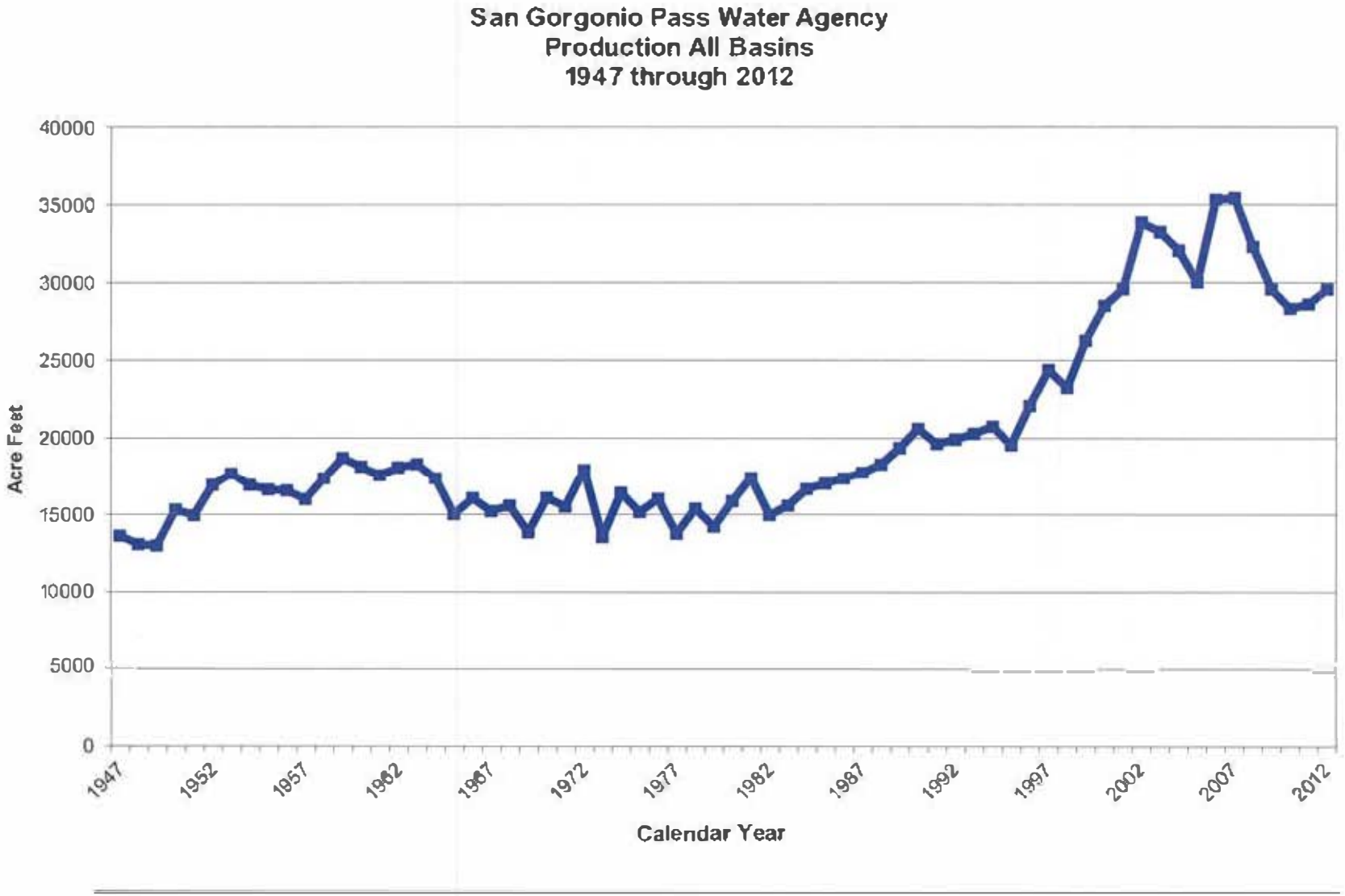



Figure 6: Historical Groundwater Production All Basins 1947 through 2012 (as reported)

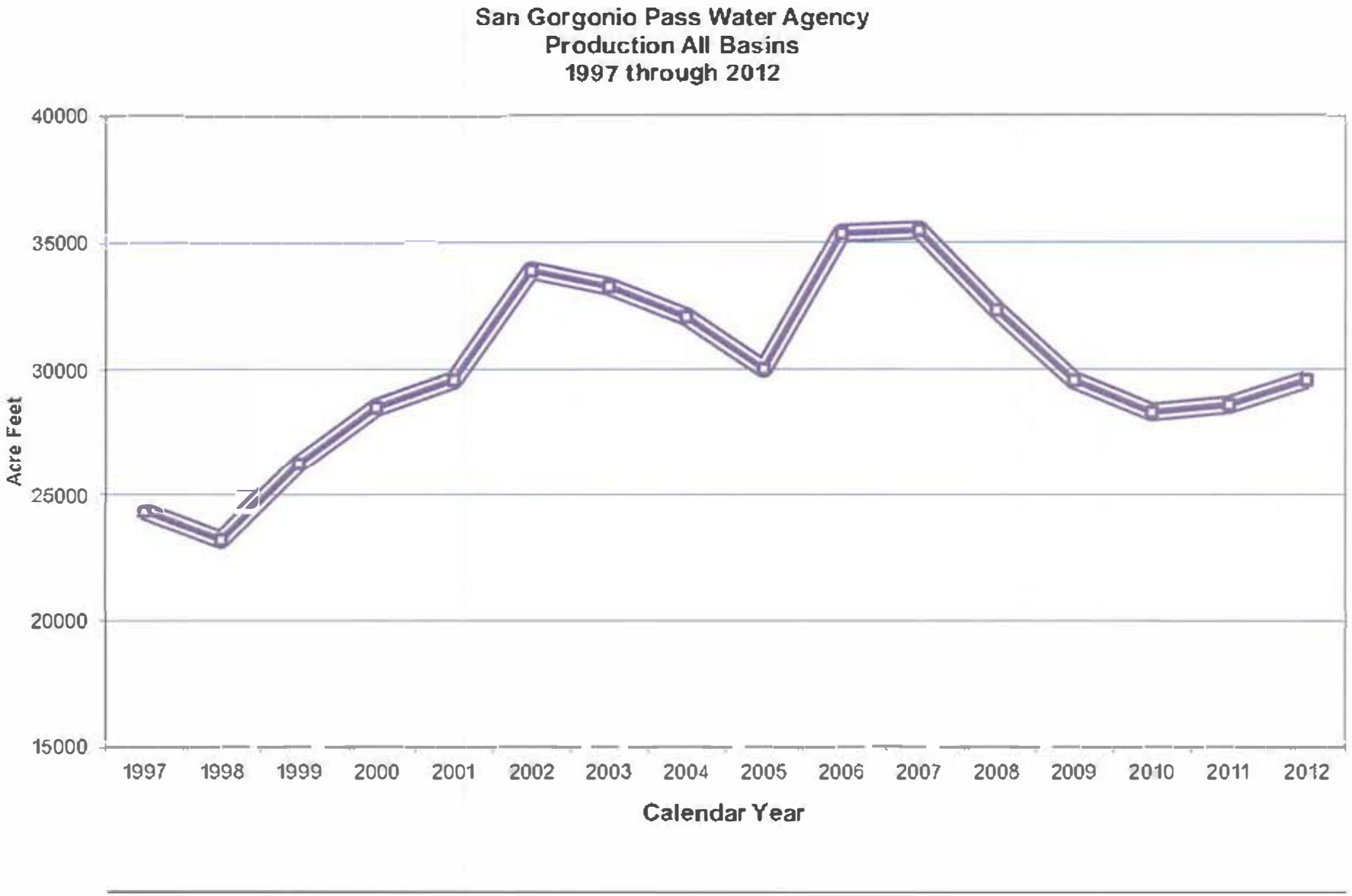



Figure 7: Historical Groundwater Production All Basins 1997 through 2012 (as reported)

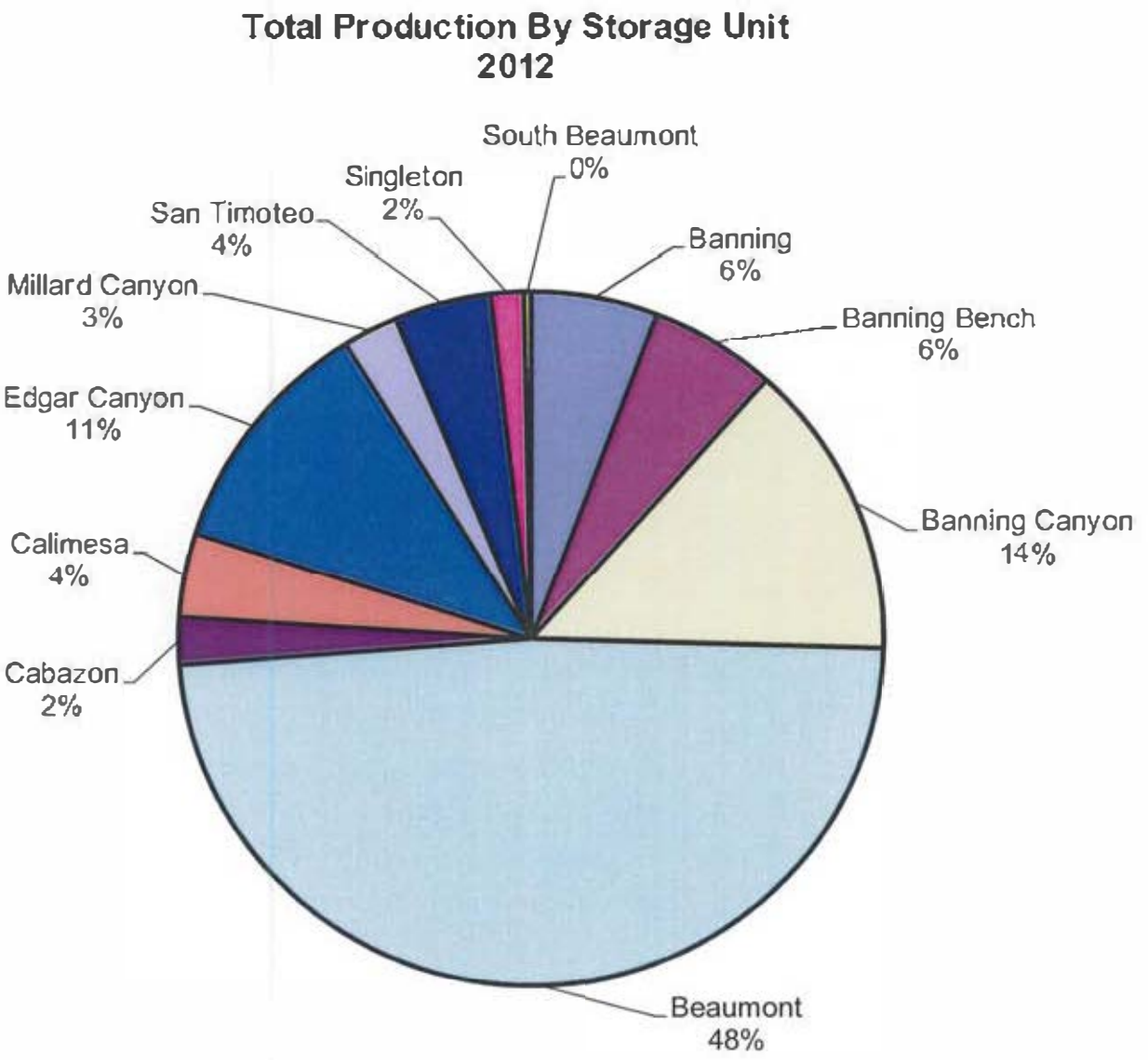



Figure 8: Total Production by Storage Unit in 2012 (as reported)

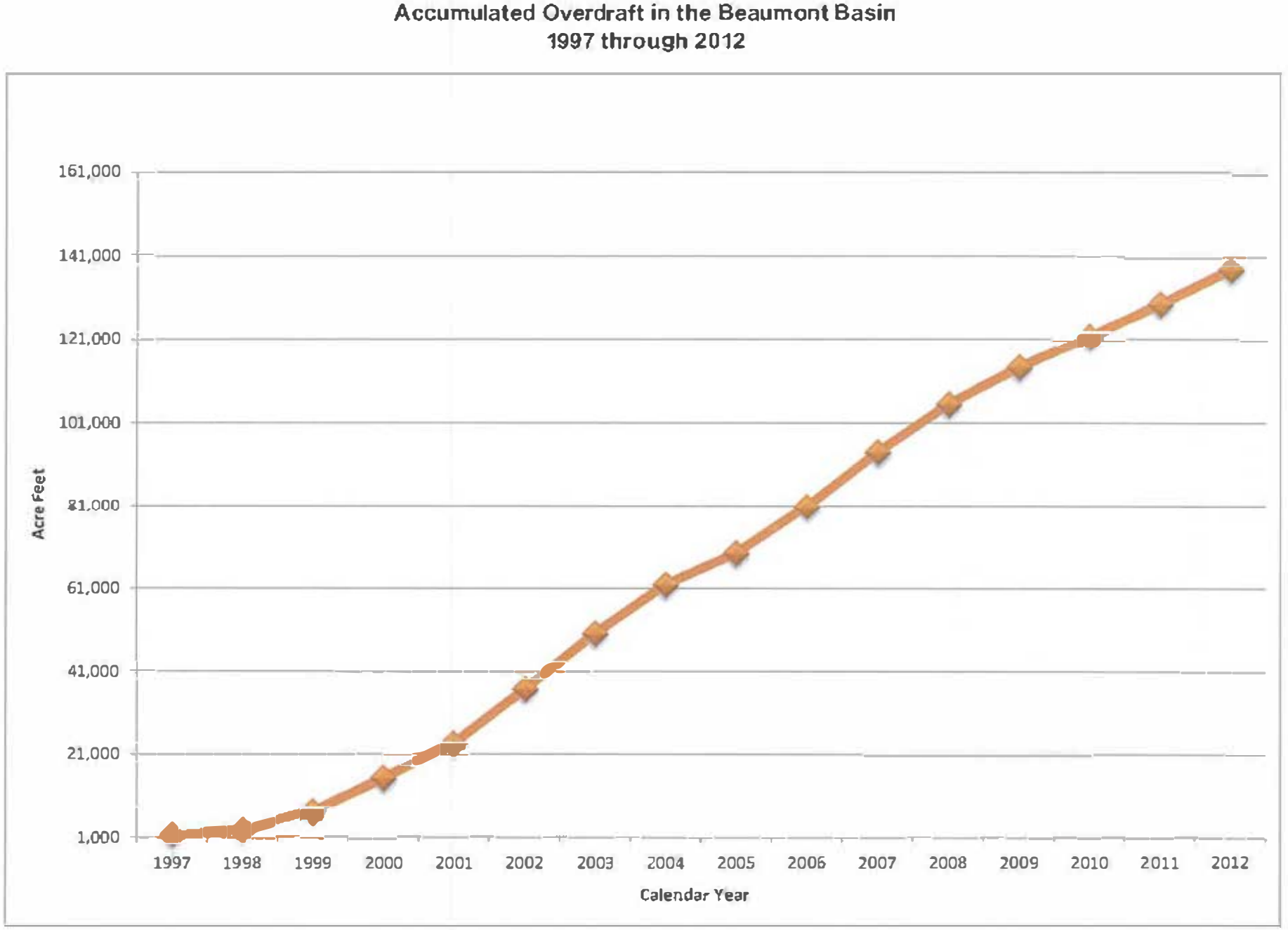



Figure 9a: Accumulated Overdraft in the Beaumont Basin 1997 through 2012

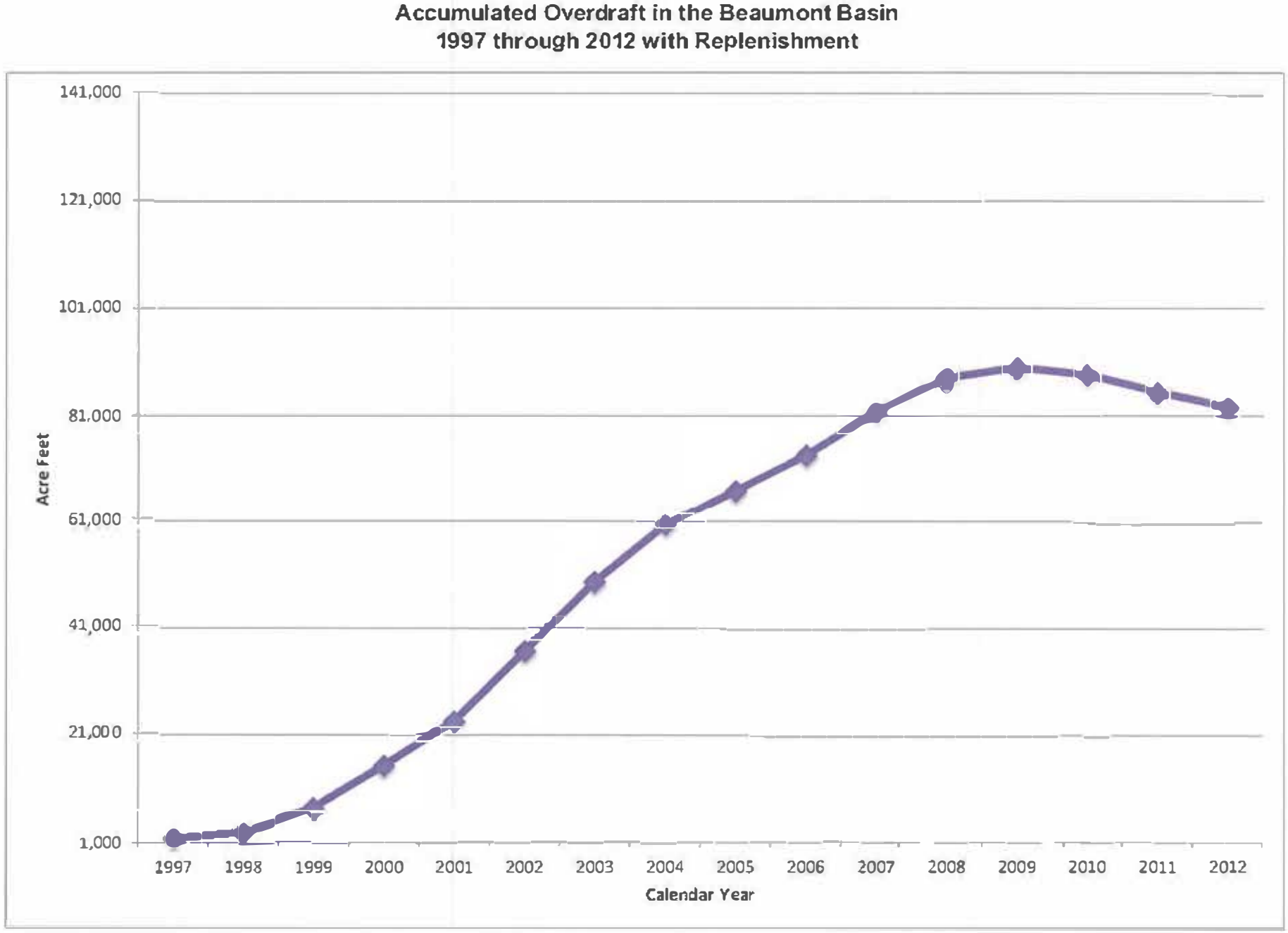



Figure 9b: Accumulated Overdraft in the Beaumont Basin 1997 through 2012 with Replenishment

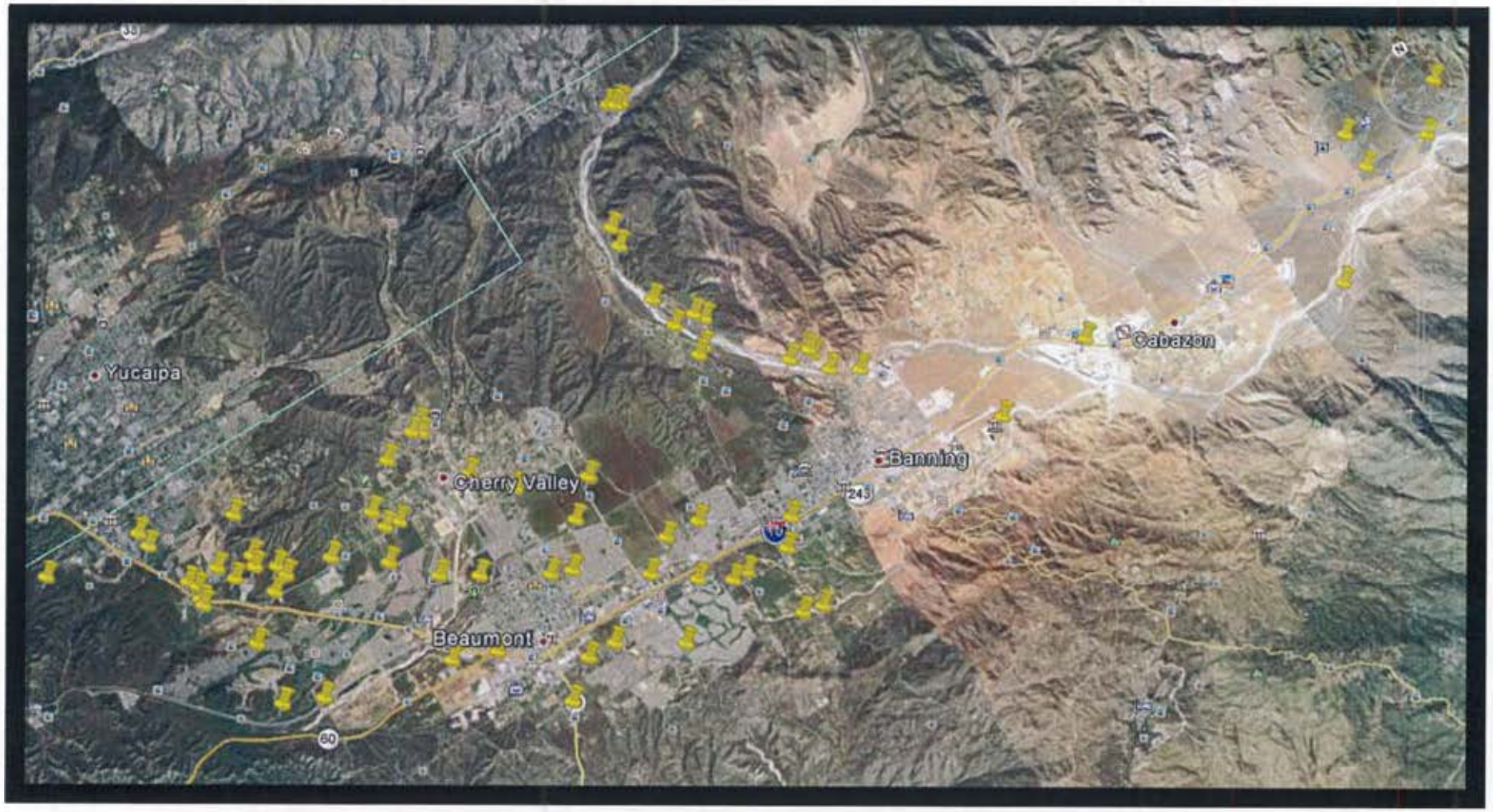
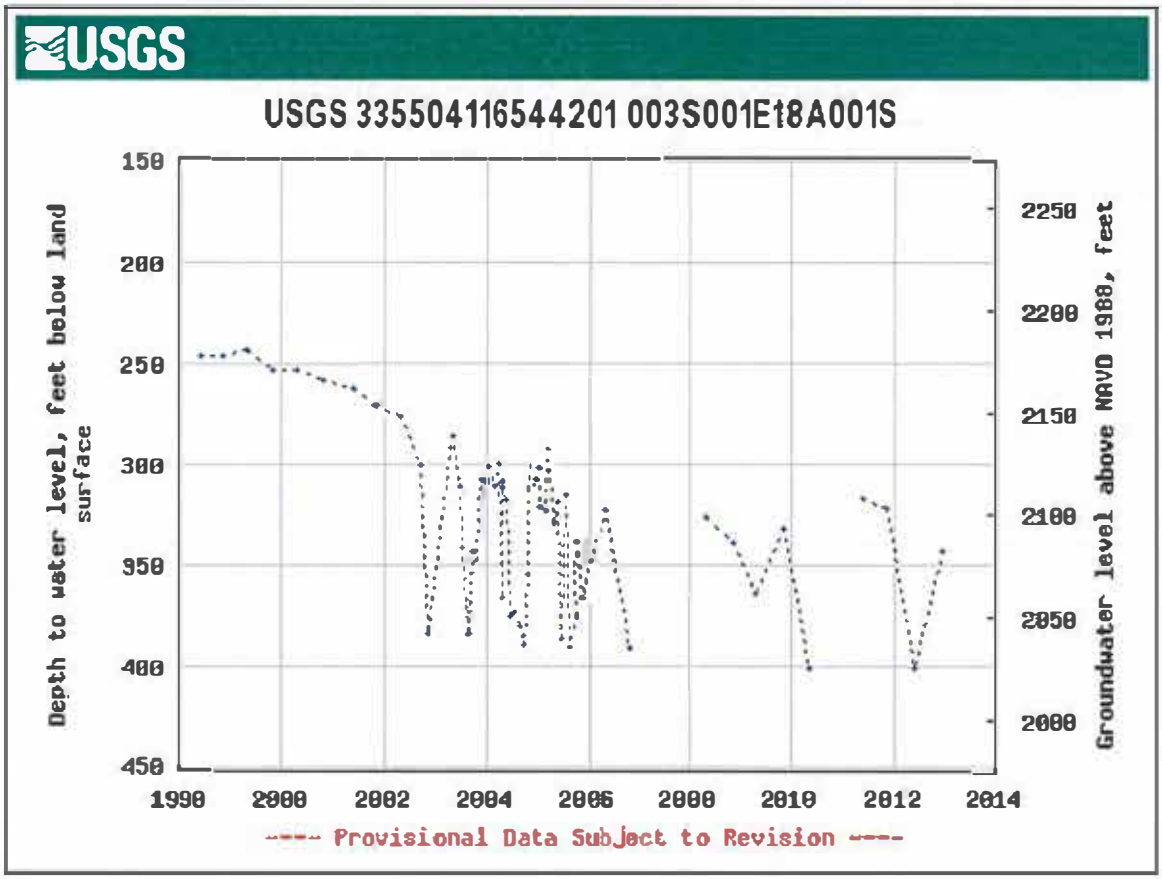



Figure 10: San Gorgonio Pass Weter Agency Monitoring Wells



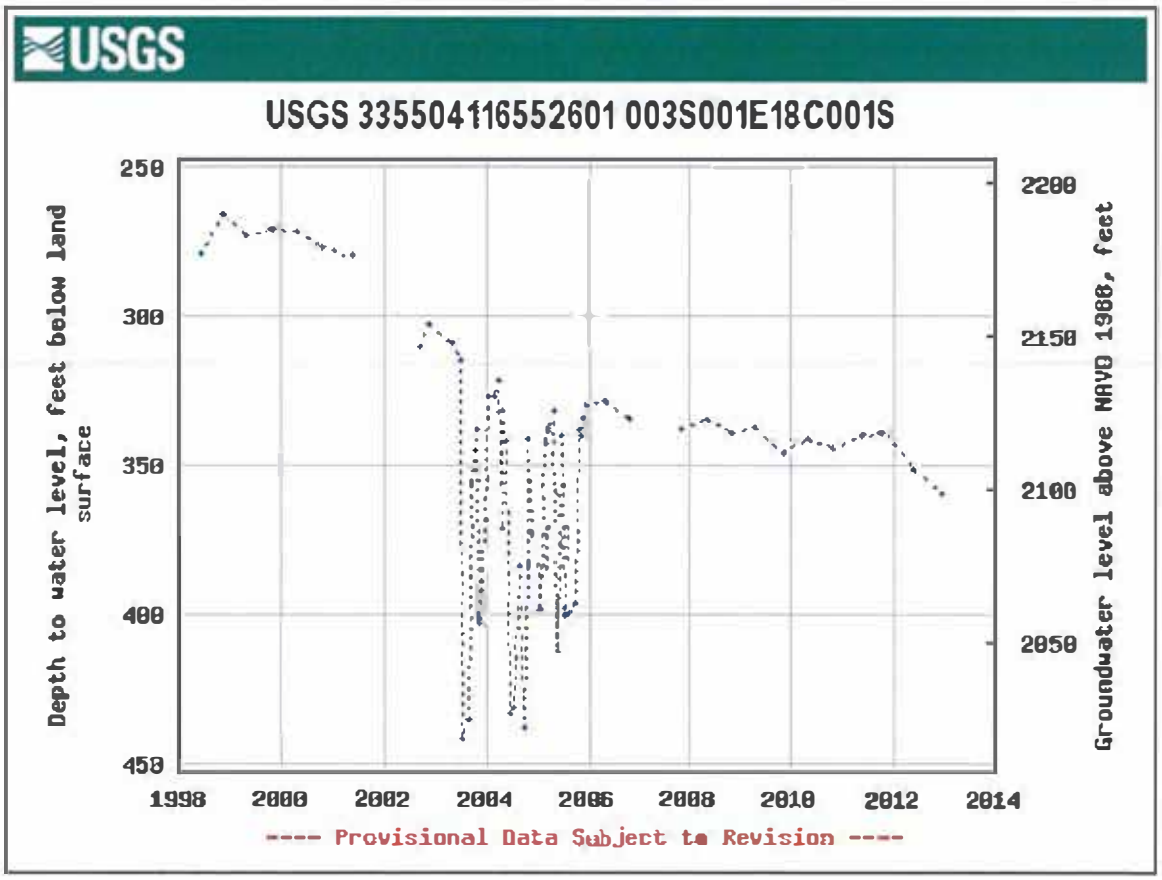
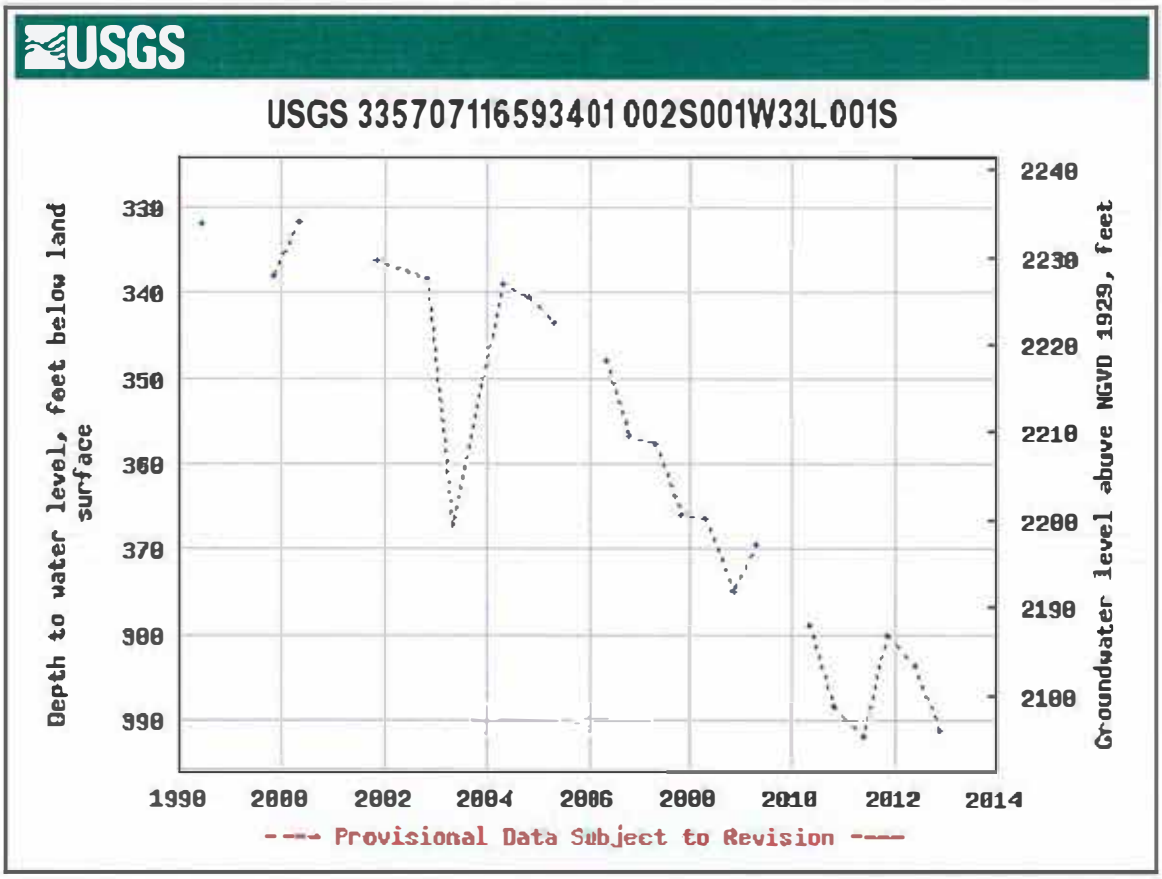




Figure 11: Groundwater Hydrographs – Banning Basin
3S/1E-18A01 and 3S/1E-18C01



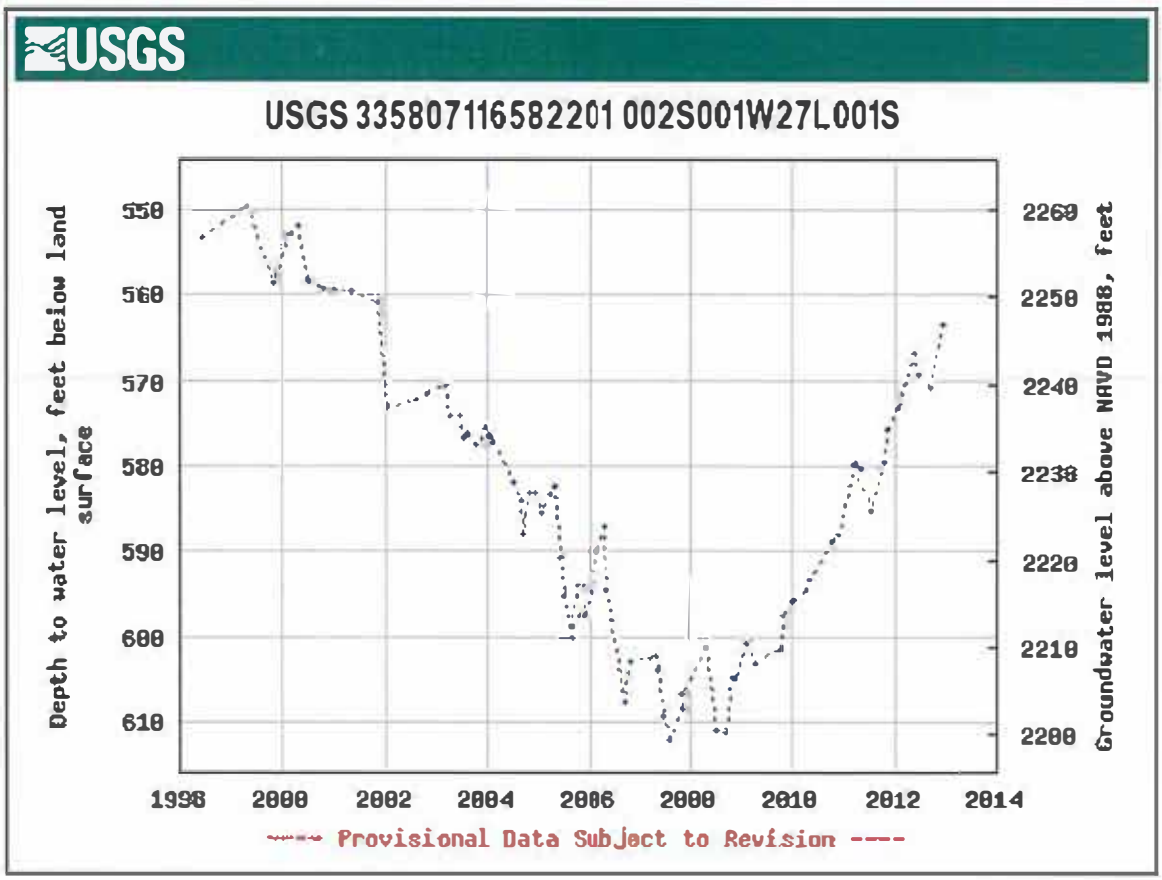




Figure 12: Groundwater Hydrographs – Beaumont Basin
2S/1W-33L01 and 2S/1W-27L01

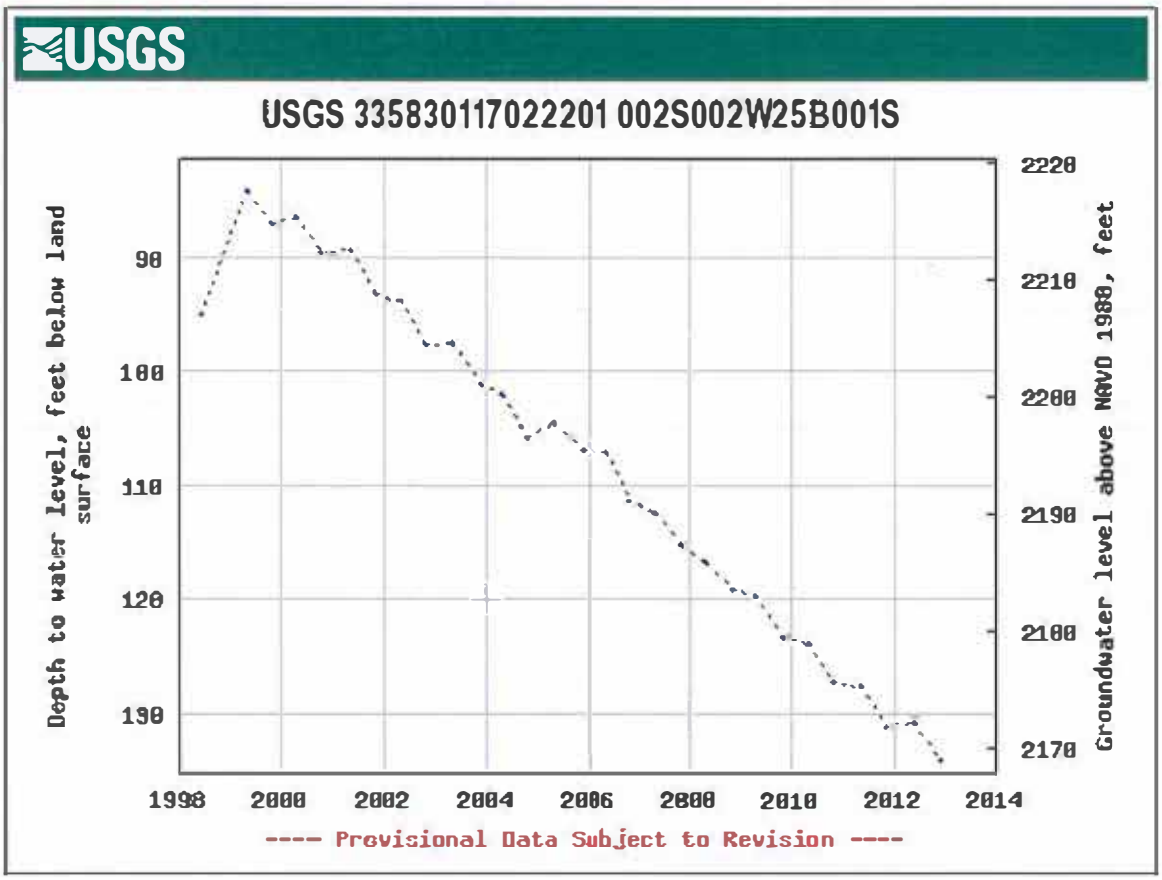
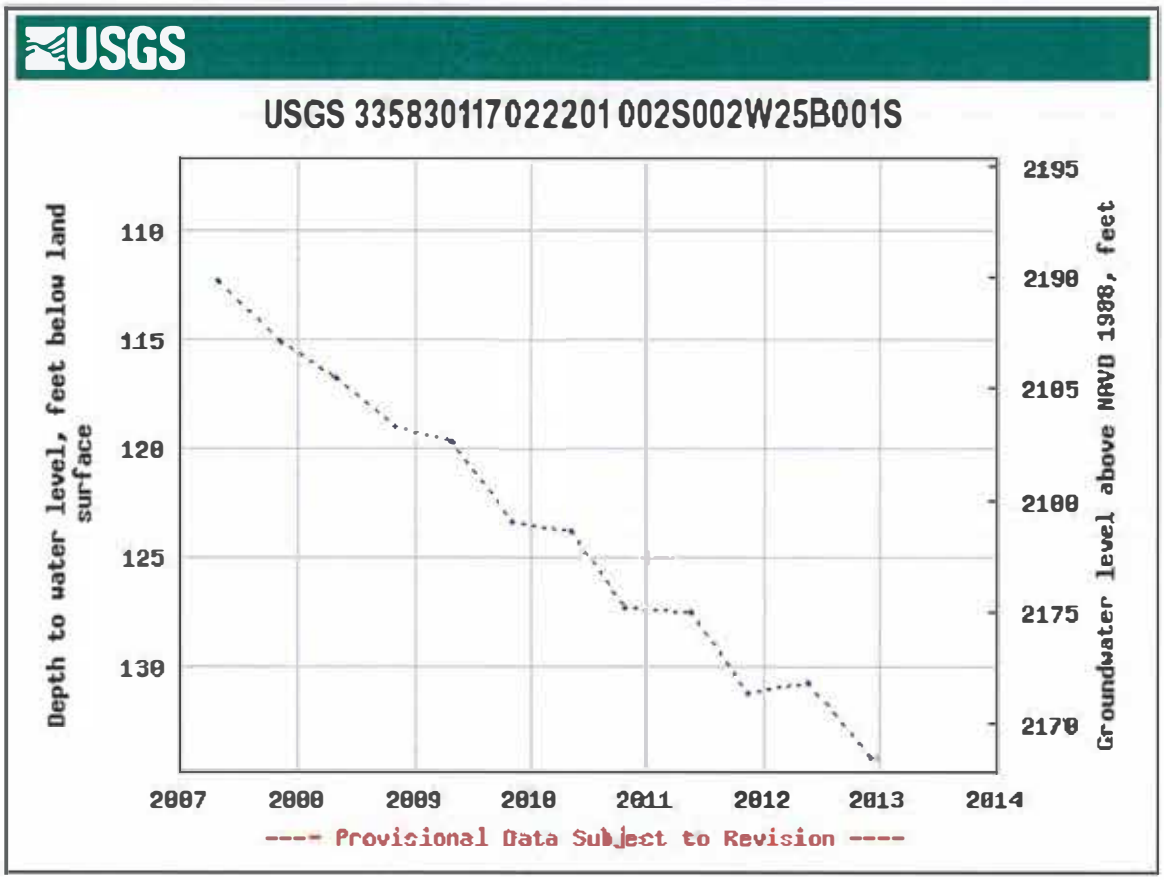



Figure 13: Groundwater Hydrographs – Beaumont Basin
2S/2W-25B01



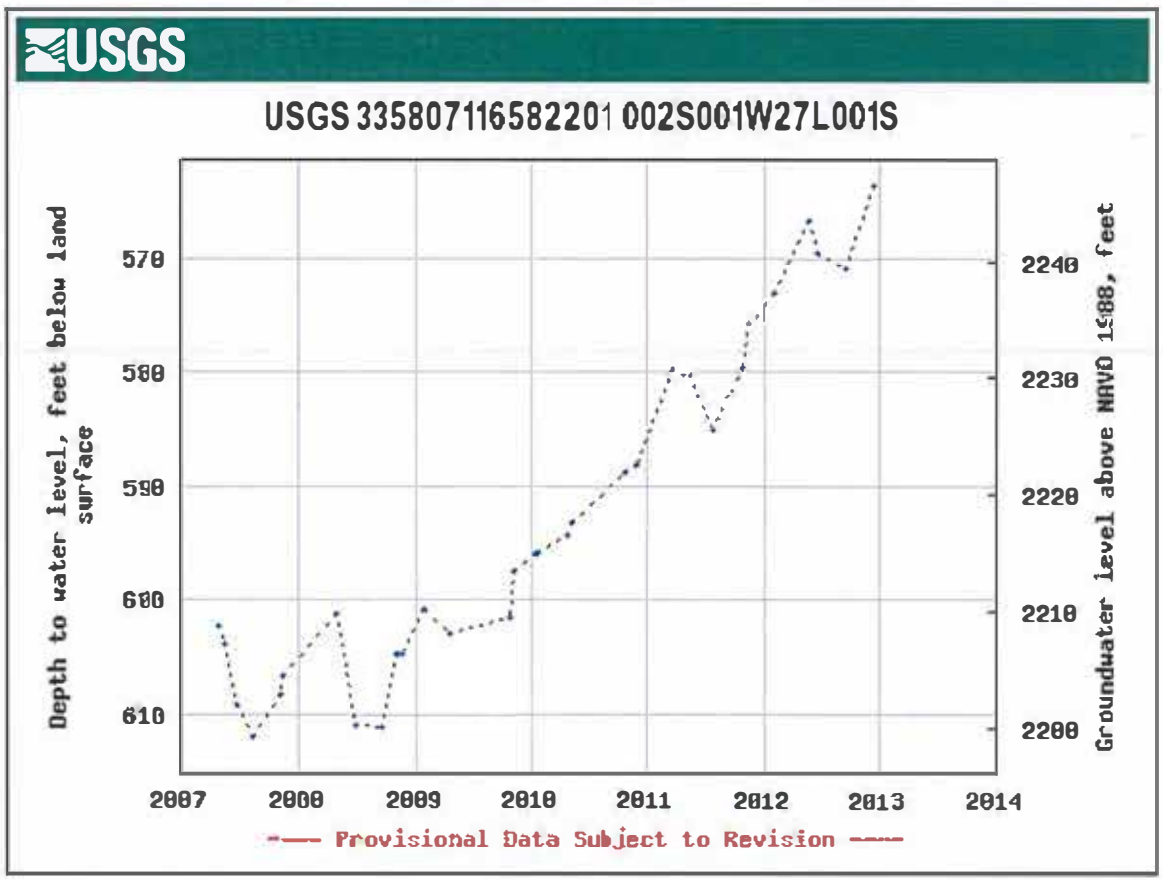
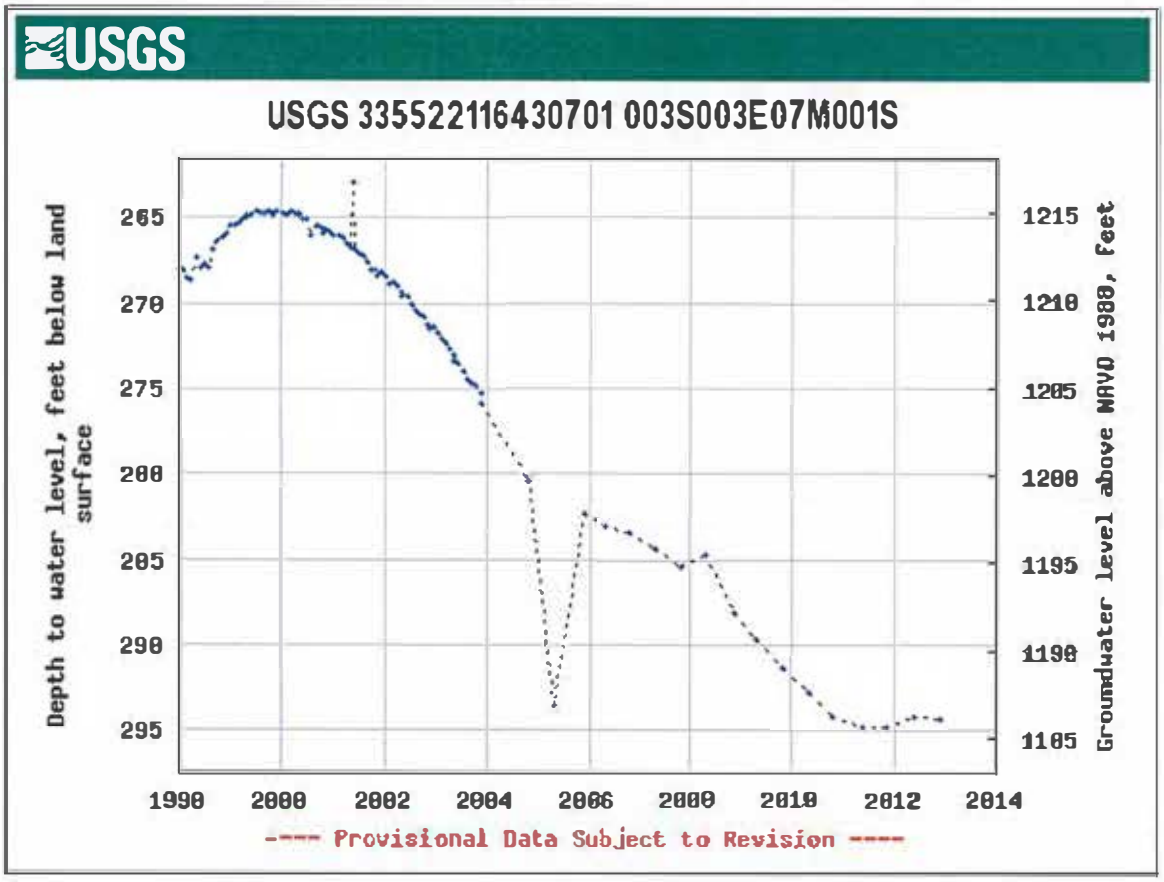




Figure 14: Groundwater Hydrographs – Beaumont Basin 2007 - 2012
2S/2W-25B01 and 2S/1W-27L01



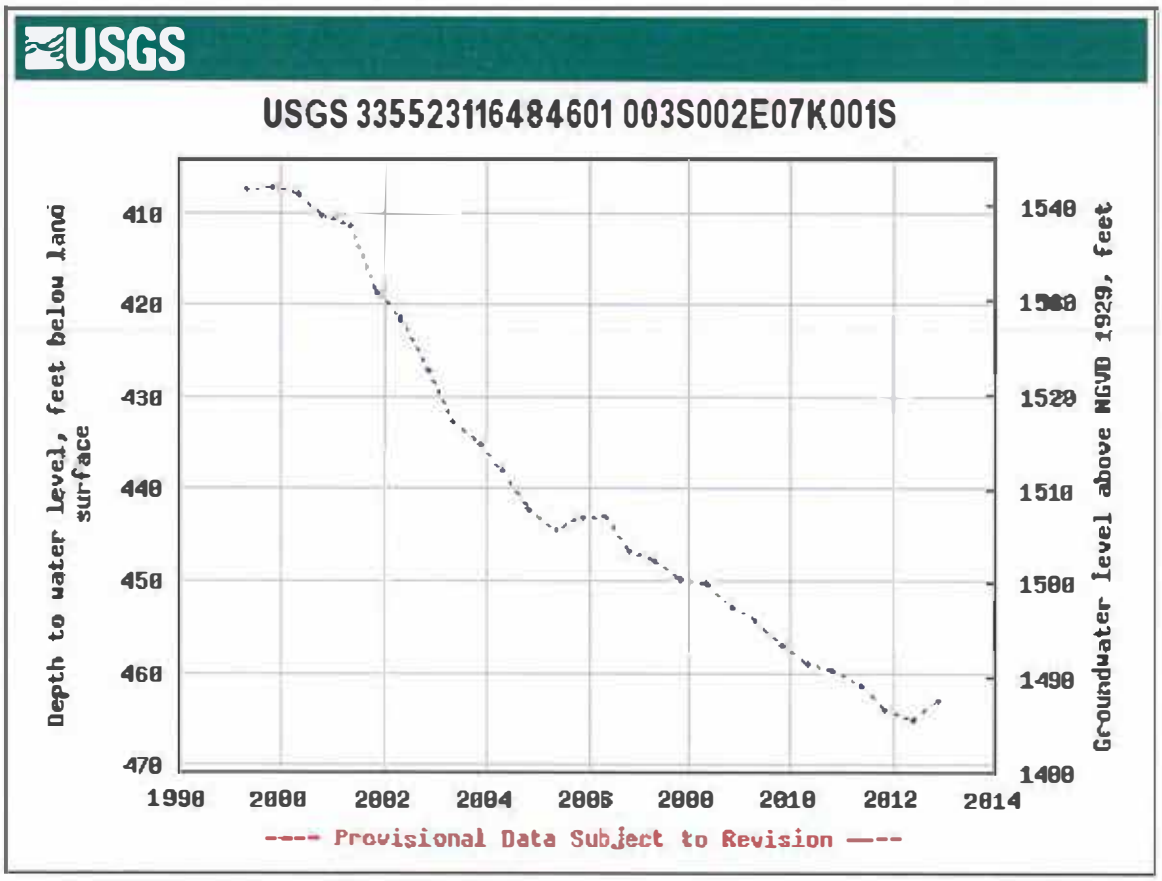
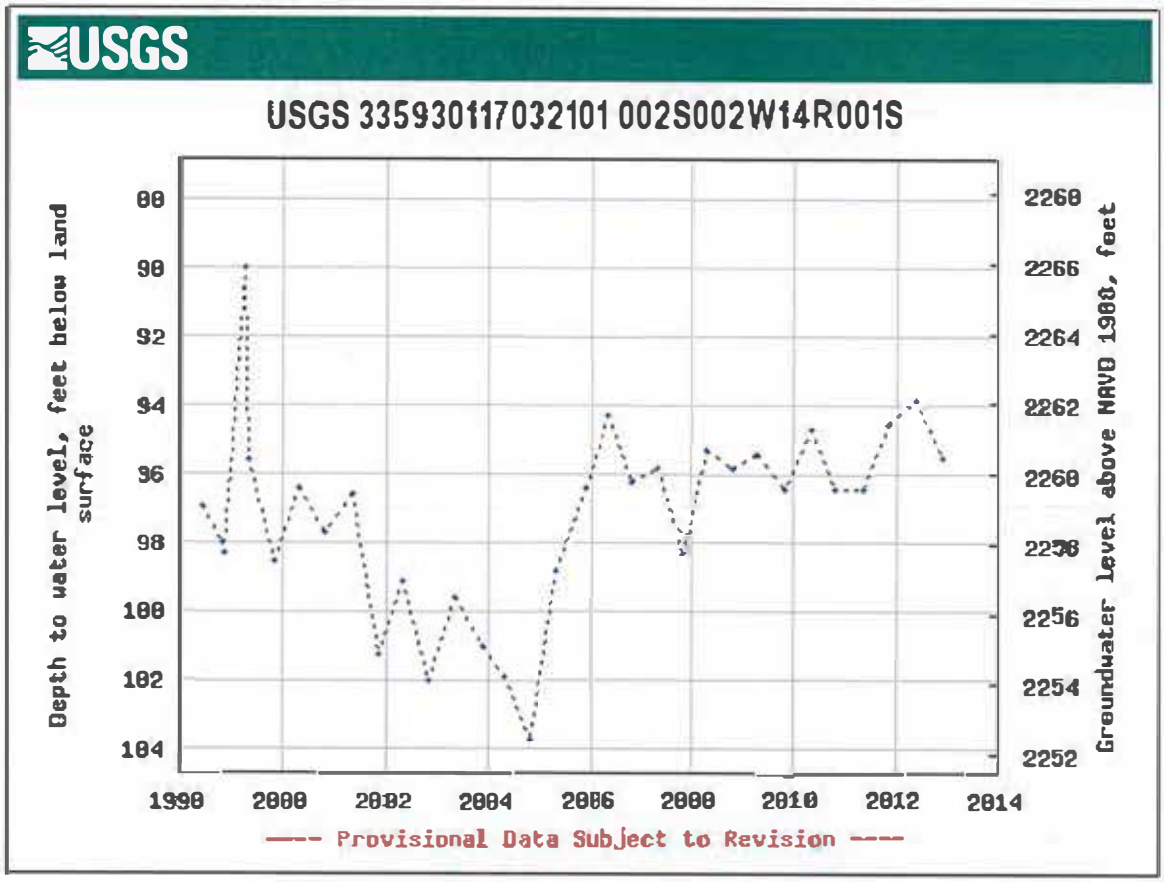




Figure 15: Groundwater Hydrographs – Cabazon Basin
3S/3E-07M01 and 3S/2E-07K01



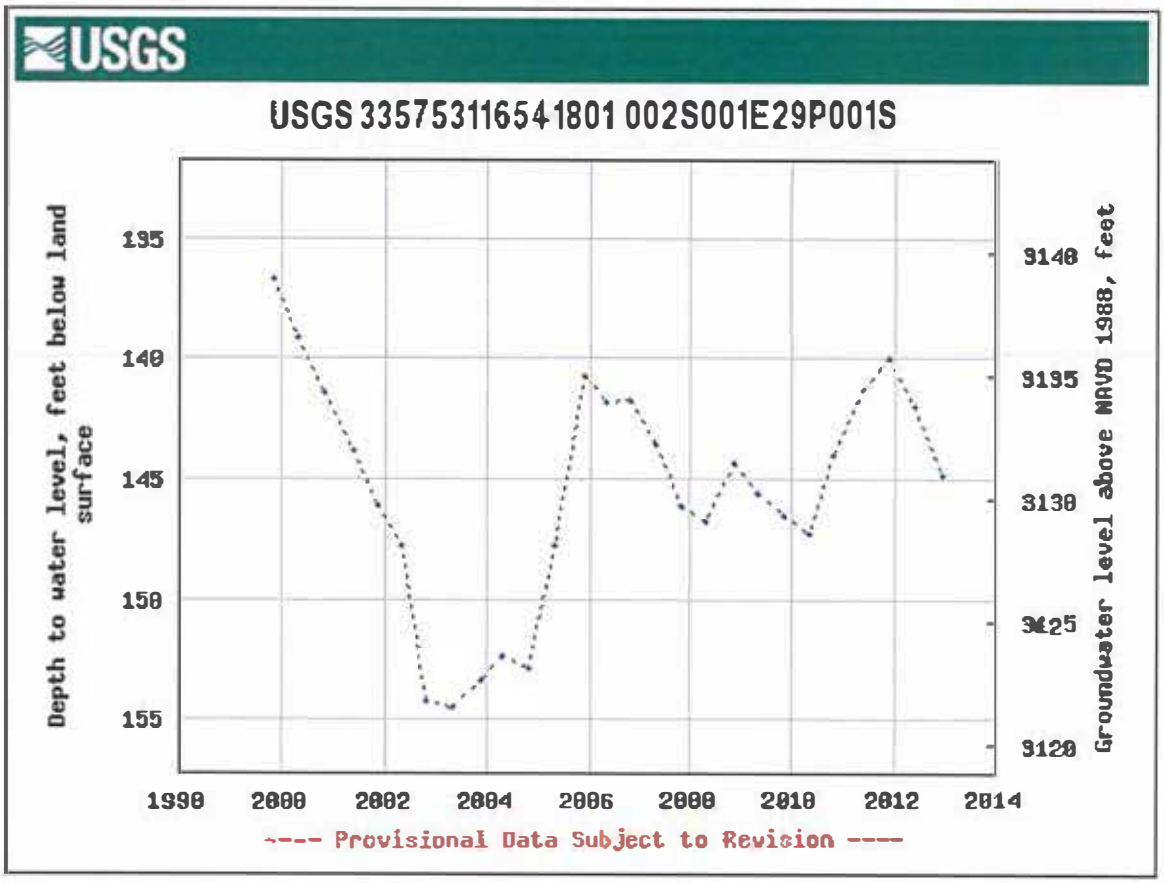




Figure 16: Groundwater Hydrographs – Calimesa and Banning Canyon Basins
2S/2W-14R01 and 2S/1E-29P01

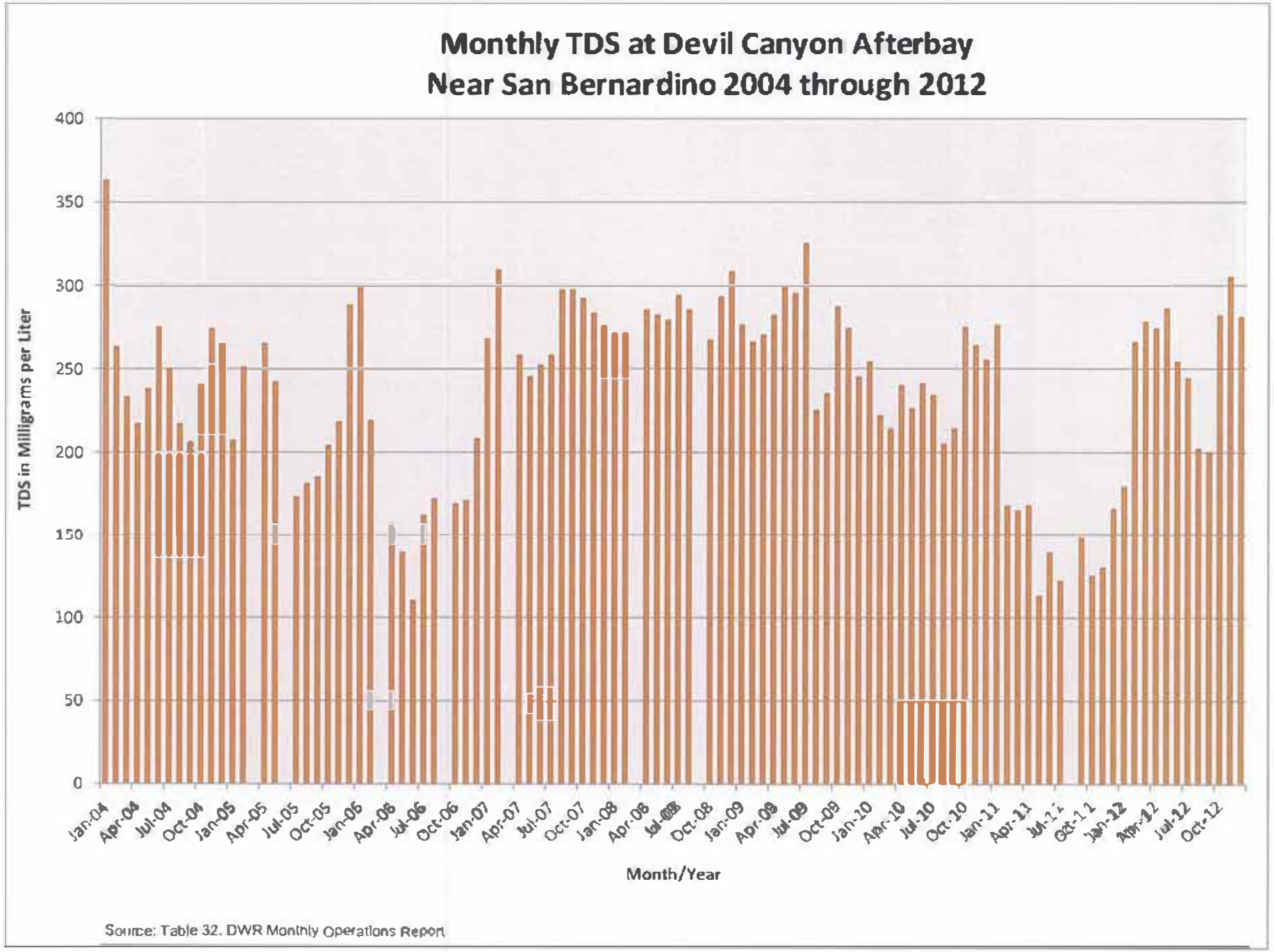



Figure 17: Monthly TDS at Devil Canyon Afterbay near San Bernardino 2004 through 2012

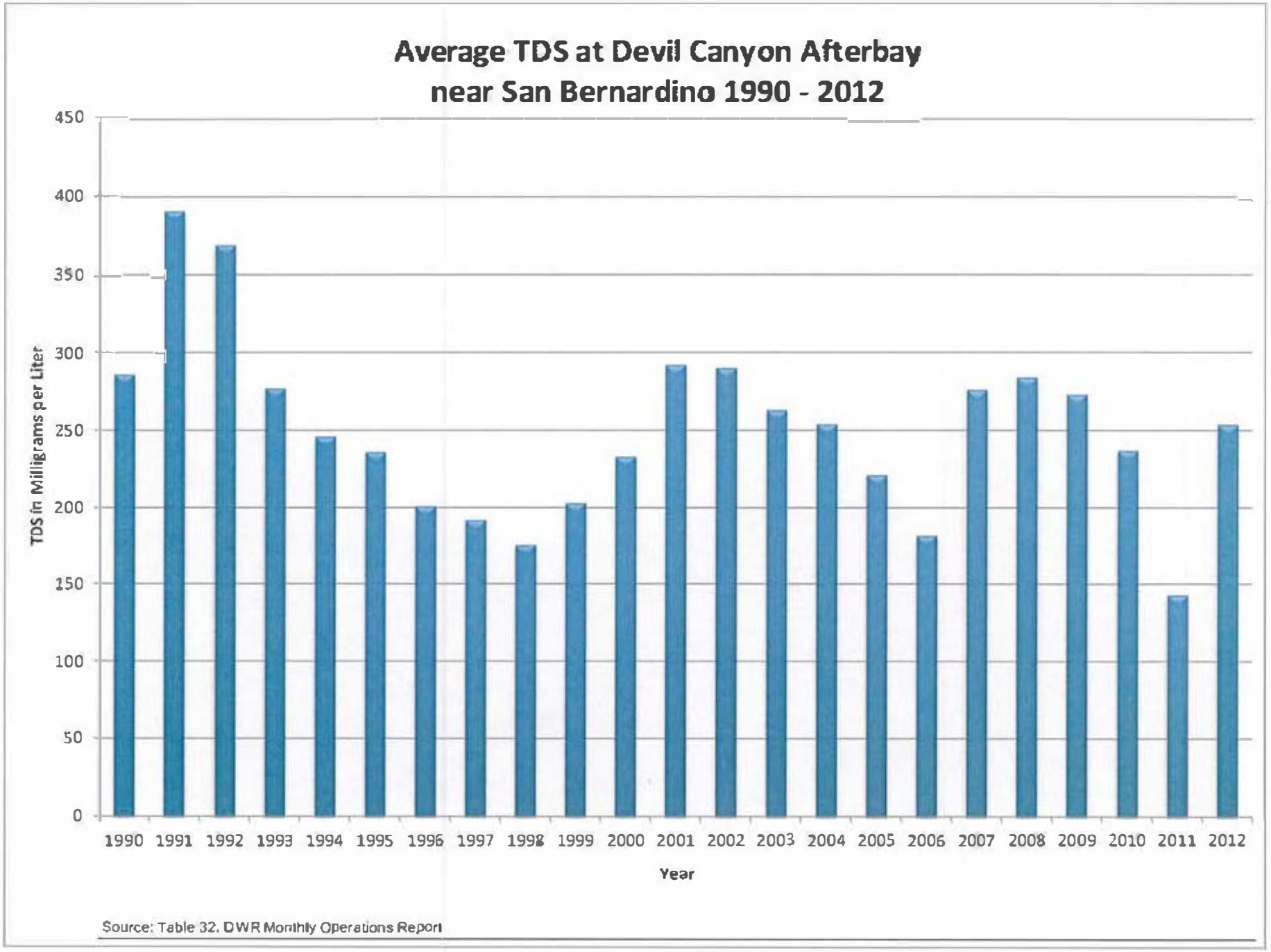



Figure 18: Average TDS at Devil Danyon Afterbay near San Bernardino 1990 through 2012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