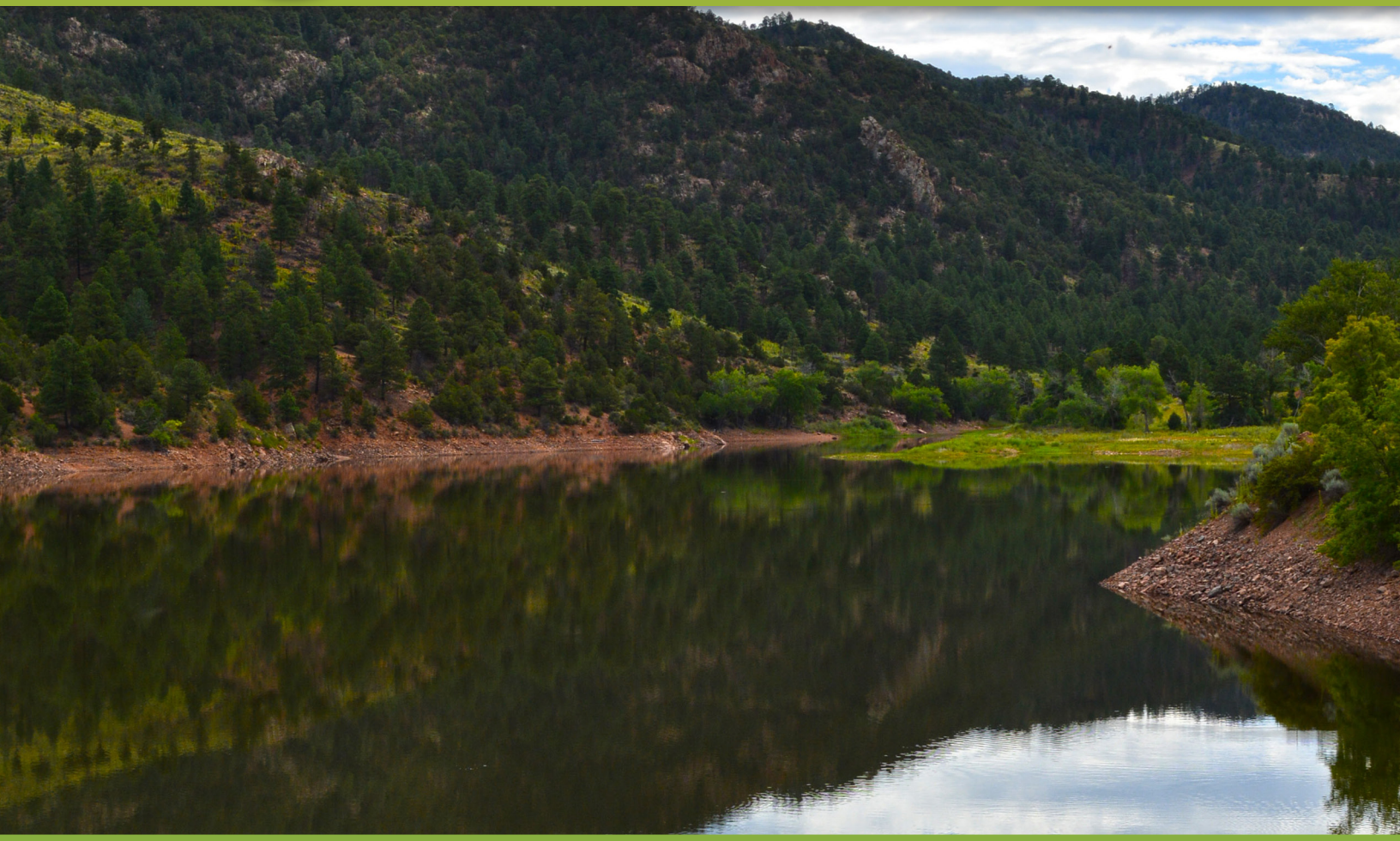
ANNUAL WATER REPORT



2015

City of Santa Fe ♦ Water Division

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Cover Photo: Nichols Reservoir in the Upper Santa Fe Municipal Watershed

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EXECUTIVE SUMMARY

The purpose of this report is to provide information about the state of the City of Santa Fe's Water Division and the water supplies we depend upon.

This report is submitted pursuant to City Code Section 25-9.6 SFCC 1987 and summarizes information about the City of Santa Fe's Water Division including water supply, water rights, water demand, types of water use, drought and precipitation, and water utility management information.

The City's surface water supply comes from the **Santa Fe River** and **Rio Grande**, both of which are treated through conventional and advanced treatment processes.

The **City Well Field** is mostly located in close proximity to the Santa Fe River and consists of 7 active wells located within the City limits of Santa Fe. The **Buckman Well Field** consists of 13 wells located near the Rio Grande, approximately 15 miles northwest of Santa Fe.

The Water Division supplied 8,062 acre-feet of water to its water utility customers and an additional 105 acre-feet to the Santa Fe County Water Utility, for a total production of 8,167 acre-feet for 2015. Also, the Water Division met its acequia irrigation deliveries and provided over 2,000 acre-feet of "Living River" flows to the Santa Fe River.

The City of Santa Fe continued its water conservation efforts which, in part, contributed to a service-area gallons per capita per day (GPCD) demand of 90.

This report contains water data through December 2015 and anticicipated 2016 data projections.

The overall goal of the Water Division is to ensure that our water resources are managed and protected in an efficient and responsible manner to provide the Santa Fe community with clean, reliable and safe drinking water.

WATER SUPPLY SOURCES

The City of Santa Fe has four sources of water supply (see Figure 1):

- Santa Fe River
- San Juan-Chama surface water via the Rio Grande
- City well field
- Buckman well field

Also, the Water Division utilizes reclaimed wastewater and water conservation to reduce demand on the total supply of potable water.

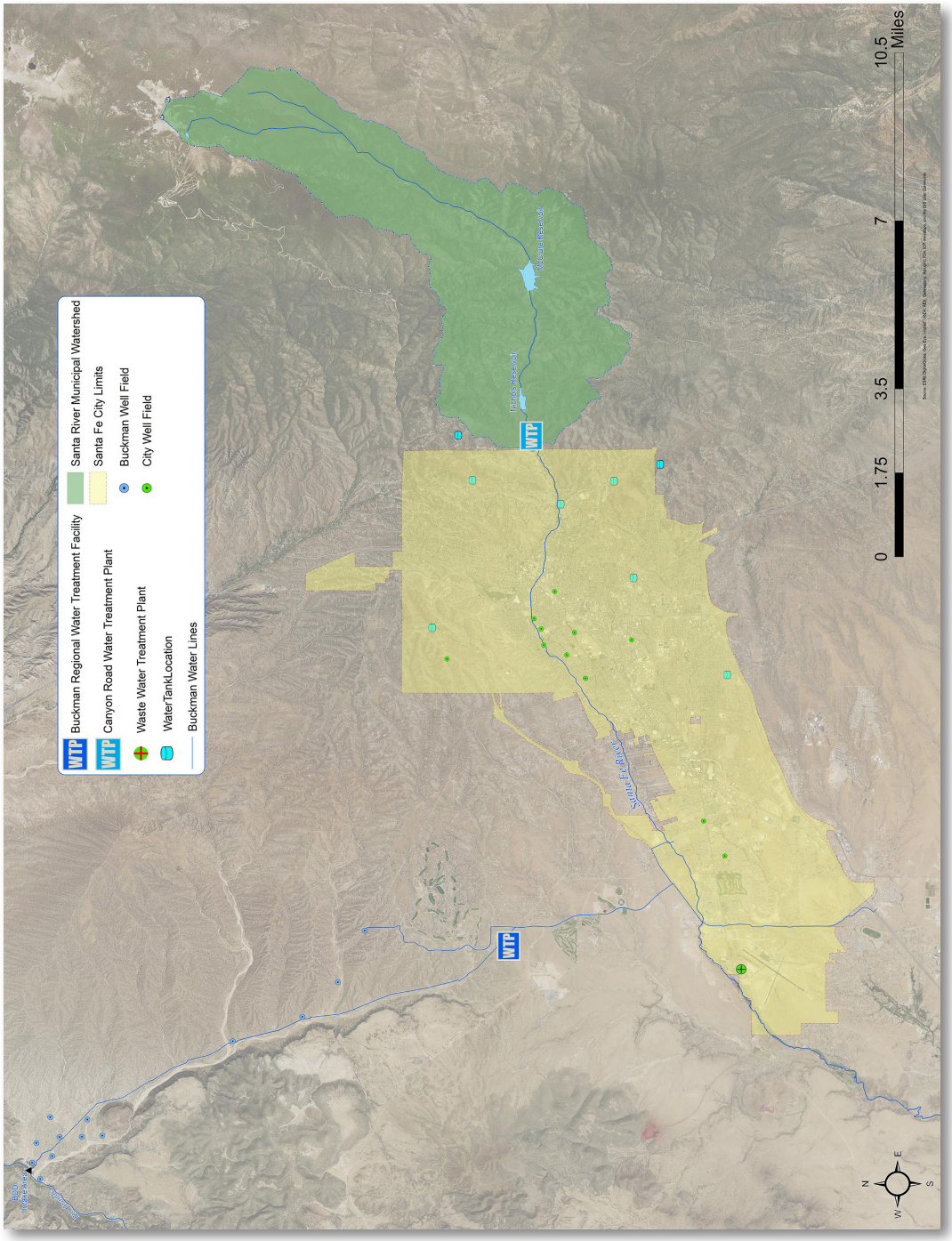

Figure 1. Map of the City of Santa Fe Water Supply Sources.

WATER RIGHTS

Surface Water

The City of Santa Fe has a license to store up to 3,985 acre-feet (combined) per year of Santa Fe River water in McClure and Nichols Reservoirs. Both municipal drinking water supply reservoirs are located east of the City within the closed upper Santa Fe River municipal watershed (see Figure 1). In 2015, reservoir improvements took place and were completed at McClure Reservoir (see Figure 2).

The Buckman Regional Water Treatment Plant provides drinking water from the federal Bureau of Reclamation's San Juan-Chama Project's surface water supply via the Rio Grande. As a contractor of the San Juan-Chama Project, the City of Santa Fe can provide up to 5,230 acre-feet per year of drinking water supply from the Buckman Regional Water Treatment Plant directly to the City's water utility customers. The Buckman Regional Water Treatment Plant and the Buckman Direct Diversion Project facilities are governed by a joint City of Santa Fe and Santa Fe County board.

Figure 2. A new intake tower was installed at McClure Reservoir in 2015. In November 2014, McClure Reservoir was drained to repair the dam and install a new intake tower, replacing the old vertical tower that was built in the 1920s. Construction was completed in December 2015, at which time the City closed valves outlets to allow for snow runoff to fill the reservoir.

Groundwater

The City of Santa Fe has seven active groundwater wells within the City limits, most of which are focused near the Santa Fe River (see Figure 1). Combined, the wells can produce up to 4,865 acre feet per year of drinking water supply for Santa Fe.

The City also has thirteen groundwater wells in the Buckman well field, which is located near the Rio Grande, approximately 15 miles northwest of Santa Fe (Figure 1). The Buckman Wells are associated with several water rights, but are operated under one permit that allows the City of Santa Fe a maximum pumping rate of 10,000 acre-feet per year for drinking water supply. However, the City rarely pumps more than 1,000 acre-feet annually from these wells. The newest Buckman wells are about 2,000 feet deep and began producing water in 2003.

Water Rights Used for "Offsets"

In addition to water rights that the City of Santa Fe can directly divert for its water supply, Santa Fe maintains a portfolio of 'offset' surface water rights that are associated with the Buckman well field and the Northwest Well. The purpose of these acquired water rights is to keep the nearby stream systems 'whole' or unaffected by the impacts that pumping groundwater has on surface water.

The City of Santa Fe has acquired sufficient water rights to satisfy its current obligation on the Rio Grande, Rio Tesuque, and Rio Nambe/ Rio Pojoaque through a combination of acquired surface water rights and the City's San Juan-Chama surface water.

Source	Water Rights	Available Water
Santa Fe River	5,040	Up to 5,040 plus 1,000 to living river (when available)
City Wells	3,507/4,865	Sustainable use when needed
Buckman Wells	10,000	Sustainable use when needed
Buckman Direct Diversion	5,230*	Less water quality and/or NEPA permit restrictions

Table 1. Diversion Water Rights and Supply Portfolio (acre-feet)

*City of Santa Fe's San Juan-Chama Project water

Relinquishment Credits

New Mexico receives relinquishment credits when the quantity of Rio Grande water provided to Texas is above that required by the Rio Grande Compact. Relinquishment water allows the City to store relinquishment 'credit' water in the municipal reservoirs during times when the Rio Grande Compact would otherwise limit the City's right to store surface water.

The New Mexico State Engineer administers relinquishment credits to the City. As an alternative to using relinquishment credits, the City often releases its San Juan-Chama Project water into the Rio Grande in exchange for the permission to store Santa Fe River water, which would otherwise be prohibited by the Rio Grande Compact. The City has a current balance of 7,207 acre-feet in relinquishment credits.

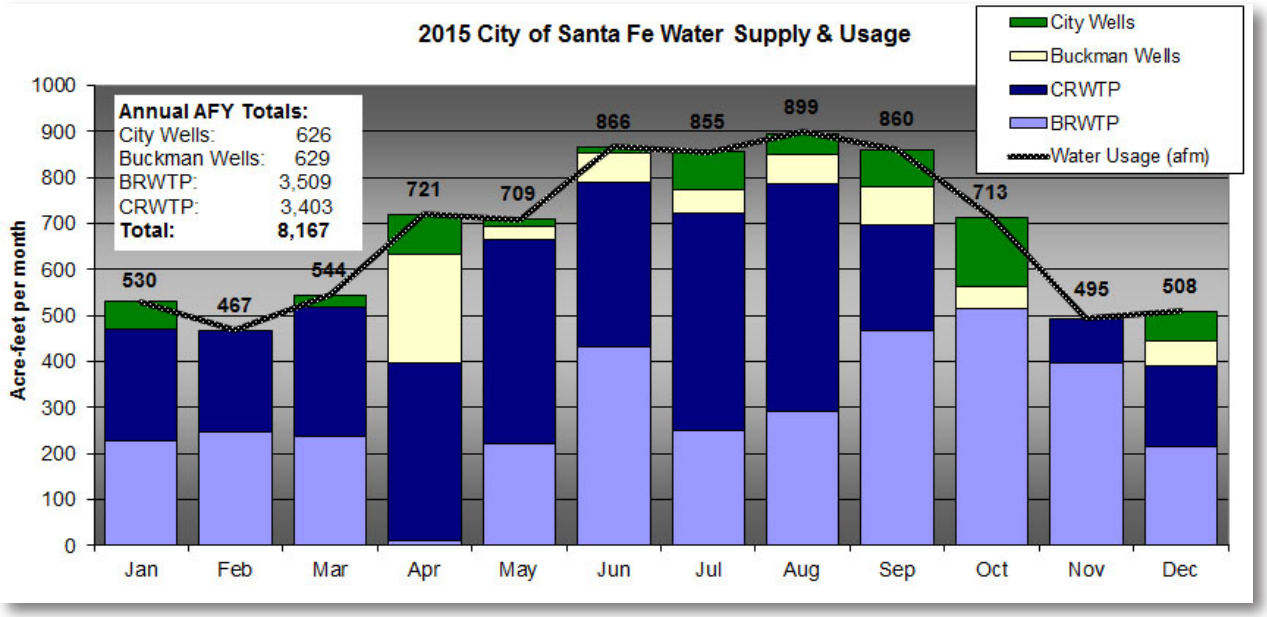

Figure 3. 2015 Monthly Production by Supply Source and Customer Usage

WATER PRODUCTION

Production by Supply Source

As shown in the Production by Source graph above (Figure 3.), the City has continued to take advantage of increased availability of surface water from the Buckman Regional Water Treatment Plant to decrease use of the City and Buckman well fields, allowing the wells to rest for use in drier years when surface water is not as readily available. In 2015, production for the City of Santa Fe's utiltiy customers was 8,062 acre-feet, with an additional 105 acre-feet of water produced for Santa Fe County Water Utility.

Figure 4. City of Santa Fe Wastewater Treatment Plant

Treated Effluent Water Deliveries

The City of Santa Fe's reclaimed wastewater (treated effluent) has many uses including irrigation to recreational fields and local golf courses; dust control at the regional landfill and for other construction projects; watering for livestock and wildlife on the Caja del Rio mesa; contributing to the

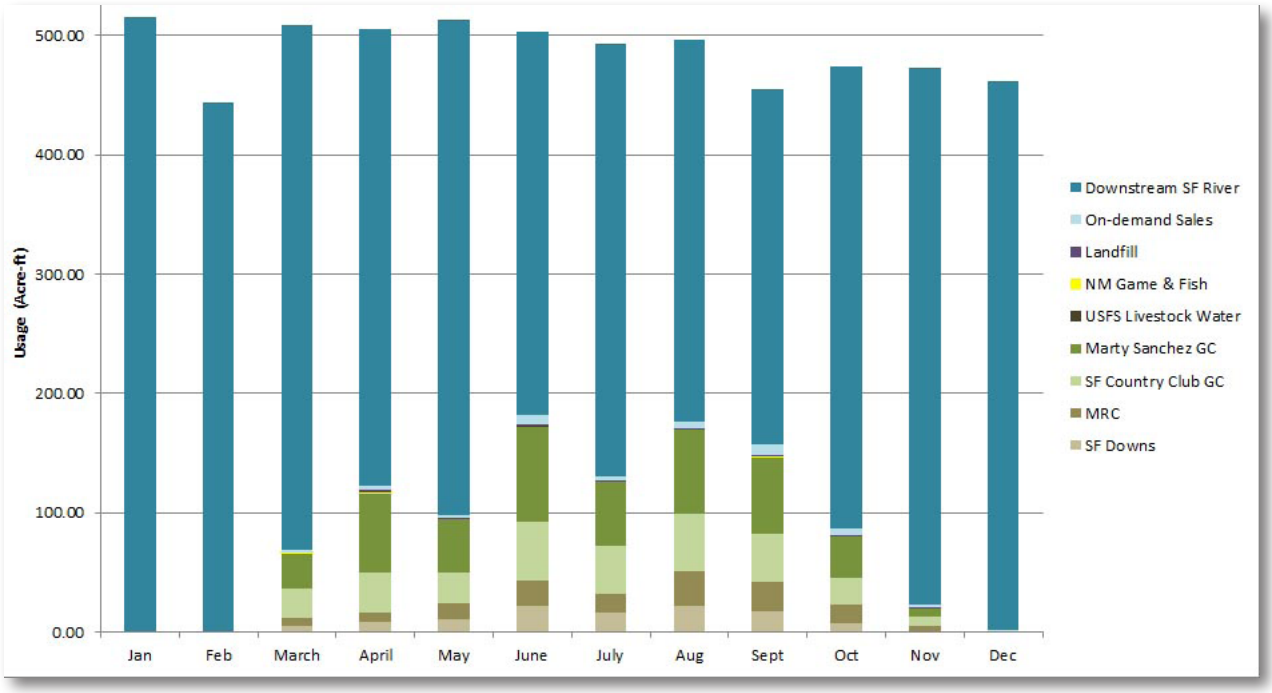

Figure 5. 2015 Treated Effluent Deliveries, by contractor

on-site, wildlife, educational pond at the NM Game & Fish facility; and enabling flow in the lower Santa Fe River downstream of the City's wastewater treatment plant which supports the riparian ecosystem and local agriculture in the La Cienega and La Bajada areas.

The reclaimed wastewater from the City's treatment plant is sold directly to contractors via an onsite stand pipe. The total production of reclaimed wastewater was 1,904 million gallons (5,844 acre-feet) in 2015, 18% of the treated wastewater was reused and the remaining 82% (1,562 million gallons) flowed into the lower Santa Fe River (see Figure 5 above).

DROUGHT & PRECIPITATION

Drought is a normal recurrent feature in the arid southwest. Santa Fe has a very dry, high desert climate with intense sunlight. On average, the city experiences more than 300 sunny days per year. The highest temperatures in July and August are 80-90 °F with only 3-6 days per year with 90+°F highs.

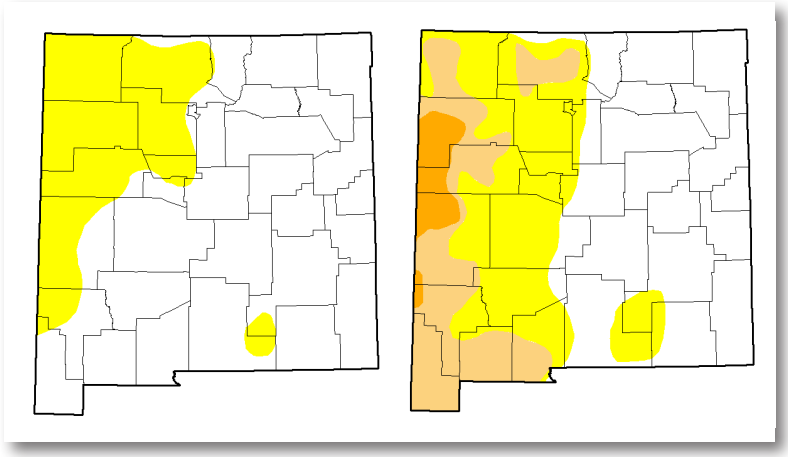

Figure 6. Drought comparisons for July 7, 2015 and December 29, 2015. The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. Data is mapped weekly by National Oceanic and Atmospheric Administration (NOAA), the U.S. Department of Agriculture (USDA), and the National Drought Mitigation Center (NDMC) at the University of Nebraska-Lincoln.

Overall, Santa Fe received ample moisture in 2015. Among other factors (see Water Demand section), the precipitation likely contributed to a reduced need for outdoor watering, which accounts for approximately 40 percent of Santa Fe's total water use.

In 2015, precipitation in New Mexico was near to above normal and was ranked as the 5th wettest year on record, and

the wettest since 1986. Spring 2015 snowmelt and subsequent runoff started early and was well below normal for the 5th year in a row. Well above normal temperatures in early spring quickly receeded the snowpack. But the early summer months produced scattered to numerous showers and thunderstorms and July saw the development of a strong monsoon pattern, which dimished in August and September. Moisture picked up again in October, which was 244 percent of normal. November was above normal, coming in at 121 percent. The first half of December 2015 started out dry, but by the end of the month a very active weather pattern returned to the state and the year ended with a historic blizzard event that buried much of east central and southeast New Mexico in 10 to 30 inches of snow.

SNOTEL Station	Elevation (Feet)	Accumulated Precipitation
Santa Fe	11,445	46.7 inches
Elk Cabin	8,210	36.3 inches

Table 2. 2015 NRCS SNOTEL Data, Santa Fe Watershed as of June 2015.

According to the Western Regional Climate Center, Santa Fe receives on average 13.84 inches annually of precipitation. National Resource Conservation Service (NRCS) 'SNOTEL' weather stations measure accumulated precipitation. There are two SNOTEL weather stations in the upper Santa Fe River municipal watershed (see Table 2).

Precipitation data is also gathered in two additional locations in Santa Fe. 'Santa Fe Watershed' which is located approximately 3 miles east of the Santa Fe plaza, reported 22.82 inches for the year of 2015. This was 60 percent of the annual precipitation of 13.70 inches for this location. Seton Village (approximately 4.5 miles south of downtown Santa Fe) reported 17.22 inches for the year 2015. This was 85 percent of the annual precipitation of 14.65 inches for this location.

Figure 7. Upper Santa Fe Municipal Watershed. In 2015, precipitation in New Mexico was near to above normal and was ranked as the 5th wettest year on record, and the wettest since 1986.

WATER DEMAND

Per Capita Consumption

A common metric for comparing annual water use and water conservation effectiveness is gallons per capita per day (gpcd). It's derived by dividing the amount of water supplied to the City of Santa Fe by the population of utility customers served. The calculated gpcd *does* include deliveries to wholesale customers, such as Santa Fe County. In 2015, the City's water customers decreased average daily water use from 95 gpcd in 2014 to 90 gpcd in 2015.

The gpcd calculation is based upon the New Mexico Office of the State Engineer's (NM OSE) methodology*, which bases the population served upon the number of water division residential customers multiplied by 2014 American Community Survey (ACS)-derived vacancy rate, and an ACS-based residents per occupied household value. The submittal of the NM OSE gpcd fulfills a compliance requirement with the NM OSE's diversion permit for surface water to the Buckman Direct Diversion facility.

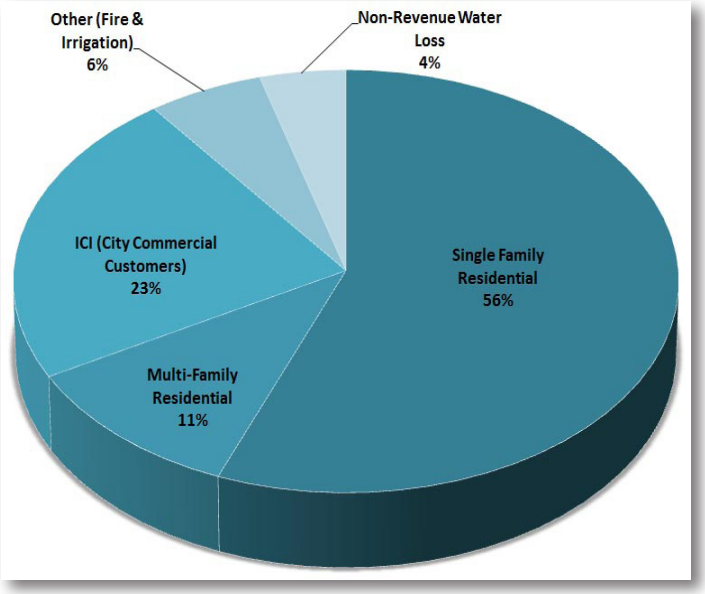

Figure 8. City of Santa Fe 2015 Gallons per Capita per Day. Demand by Sector

Although water conservation outreach and education programs contribute to the overall decrease in water consumption, there are several other factors to take into account. The city experienced a net loss in water customers after annexation to the county in which the typically high water use communities of La Tierra and La Campanas were transferred to Santa Fe County. Additionally, outdoor watering accounts for about 40 percent of the City's total annual water use, and as a result of ample precipitation during the monsoon season in 2015, the need for outdoor watering was reduced (see Drought & Precipitation on page 5).

*Prior to utilizing the NM OSE gpcd methodology, the City of Santa Fe Water Division gpcd method, used for the previous seventeen years, determined the population served upon the most recent (2010) U.S. Census population data (adjusted for households that rely solely on domestic well water) and updated it annually utilizing growth rates from annual housing permits.

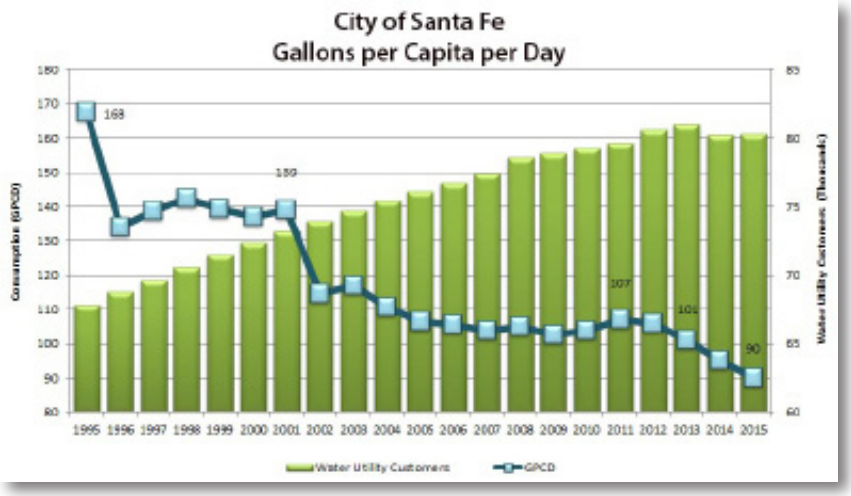

Figure 9. City of Santa Fe gpcd with population, 1995-2015

Contractual & Other Water Demands

Santa Fe River

As directed by ordinance, in mid-April of each year the annual target flow allocation is determined based upon projections for the year's anticipated watershed yield. The 2015 flow target was set at 600 acre-feet based upon moisture content in the upper Santa Fe watershed snowpack, with total flows to the Living River amounting to over 2,000 acre-feet in 2015 (see the 2015-16 Santa Fe River Target Flow Hydrograph in Figure 10 on following page).

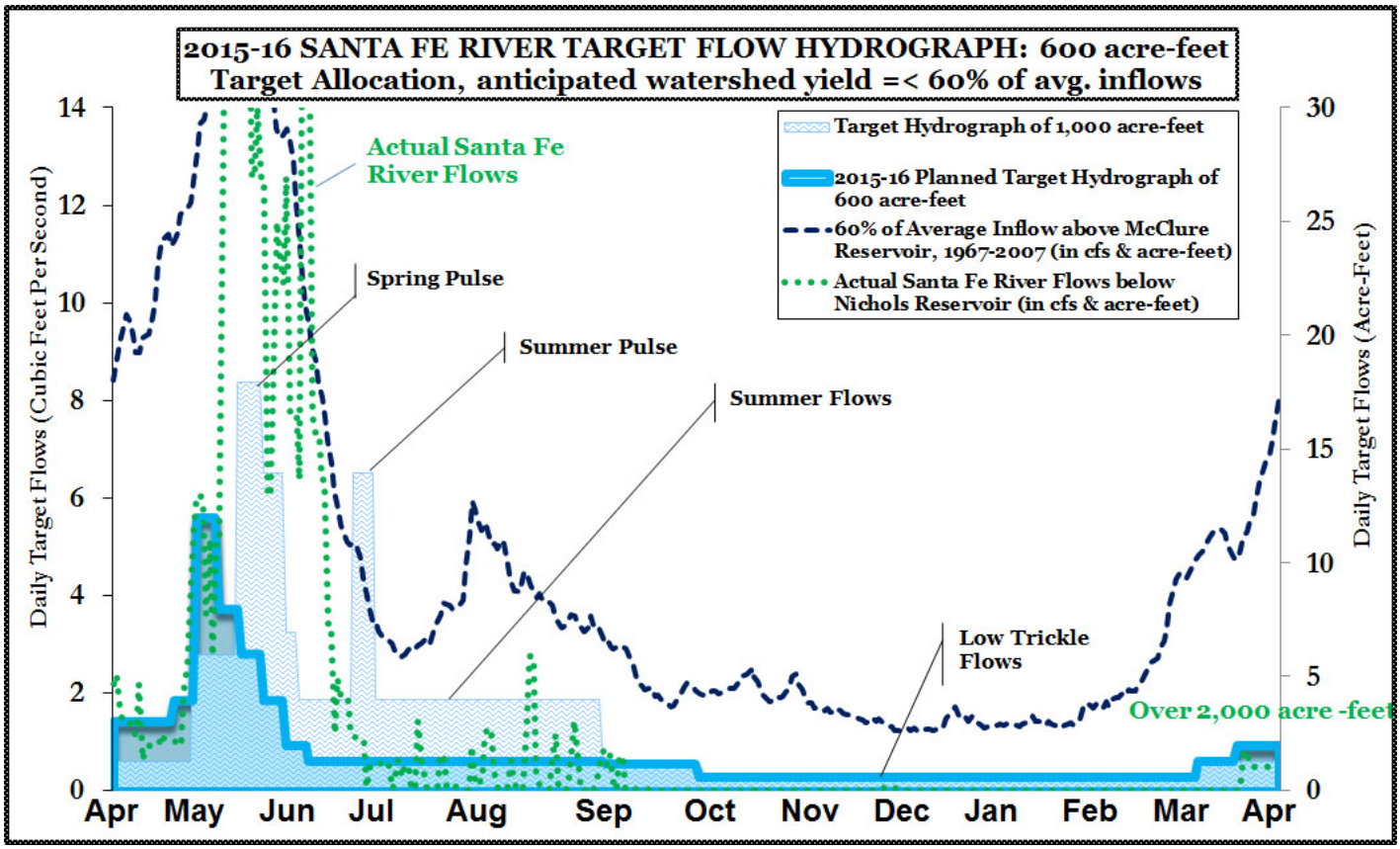

Figure 10. Santa Fe River Target Flow Hydrograph, 2015-16.

Wholesale Water Deliveries

The City has contracts to deliver wholesale water to the Santa Fe County Water Utility. Since 2011 the Buckman Direct Diversion (BDD) has become the primary source of water for Santa Fe County's water utility. Las Campanas' potable water needs are being met by Santa Fe County's Water Utility under the terms stipulated in a bulk water agreement between Santa Fe County and Las Campanas. The 2005 City/County Water Resources Agreement provides Santa Fe County with up to 500 acre-feet per year of wholesale delivery water from the City of Santa Fe, with an additional 850 acre-feet available under drought and emergency conditions.

The Santa Fe County Water Utility typically is delivered potable water from the City of Santa Fe when the BDD facility is not producing drinking water due to poor water quality conditions in the Rio Grande. Under the water resources agreement with the City of Santa Fe, Santa Fe County Water Utility took delivery of 105 acre-feet of water in 2015.

Water Bank

New water demand on the City water system requires a water credit from the Water Bank in an equal amount, with the goal being no "net" increase in demand on the water system. The City has a series of ordinances* that require all new projects to offset their water demand to the City of Santa Fe Water Division supply, the options of which include water rights acquisition and water conservation in existing development. By the end of 2015, 214 acre-feet of water was available for allocation to the City's needs or City supported efforts (e.g. new parks, municipal buildings, convention centers, affordable housing dwelling units, and the Santa Fe River). An additional 77 acre-feet was available for sale to small developers. In 2015, 1.8 acre-feet was allocated to affordable housing units, leaving an ending balance of 21 acre-feet. The private developers held a total of 573 acre-feet of water rights and 185 acre-feet of toilet retrofit credits.

*The City's water bank tracks the inflows (credits), allocations (debits), ownership, and designated use. For detailed information, please refer to the following ordinances and city code: 2005 Water Transfer Ordinance, 2009-38 Water Budget Requirements (effective January 1, 2010), and Water Conservation provisions in City Code Chapter 25.

WATER RESOURCES PLANNING

The overall goal of water resources planning is to ensure that our water supplies are managed and protected in an efficient and responsible manner so that the City of Santa Fe's drinking water supply is safe, reliable, and sustainable. Ongoing planning necessitates the management of a suite of water rights purchasing, leasing, and permit compliance efforts.

The management role of water resources planning involves administration of the City's "water bank," which seeks to tie land use development with the availability of requisite water rights (see Water Bank section on page 8).

The other management responsibility is source water protection and watershed management under the City of Santa Fe's Municipal Watershed Management Program, protecting 40% of the City's drinking water supply. Water resources planning and management efforts cover a broad range of duties, including being a good steward of the precious and finite resource: water.

Fiscal Responsibility

The Water Division is committed to managing the water utility to maintain fiscal responsibility to its customers. This is achieved by an annual review of the finance plan and the capital improvement plan (CIP) with the goal of maintaining a high level of service while increasing effectiveness and efficiency. In early 2009, the City Governing Body approved a water rate increase in the amount of 8.2% for five consecutive years. The water utility rate increase was needed to pay for the Buckman Direct Diversion Project, a key component in providing the community with a safe and reliable supply of drinking water, and approximately $100 million of infrastructure improvements. The last rate increase went into effect July 1, 2013 and the City does not project another increase to take place until 2021.

2016 Water Demand and Supply Picture

In the chart below, the 2016 projected demand (black line) is approximately 9,547 acre-feet over the 12 month period. The BDD annual production is projected to be 4,576 acre-feet, Canyon Road Water Treatment Plant is projected to produce 3,200 acre-feet, the City Wells are projected to produce 1,133 acre-feet, and Buckman Wells are projected to produce 638 acre-feet over the 12 month period.

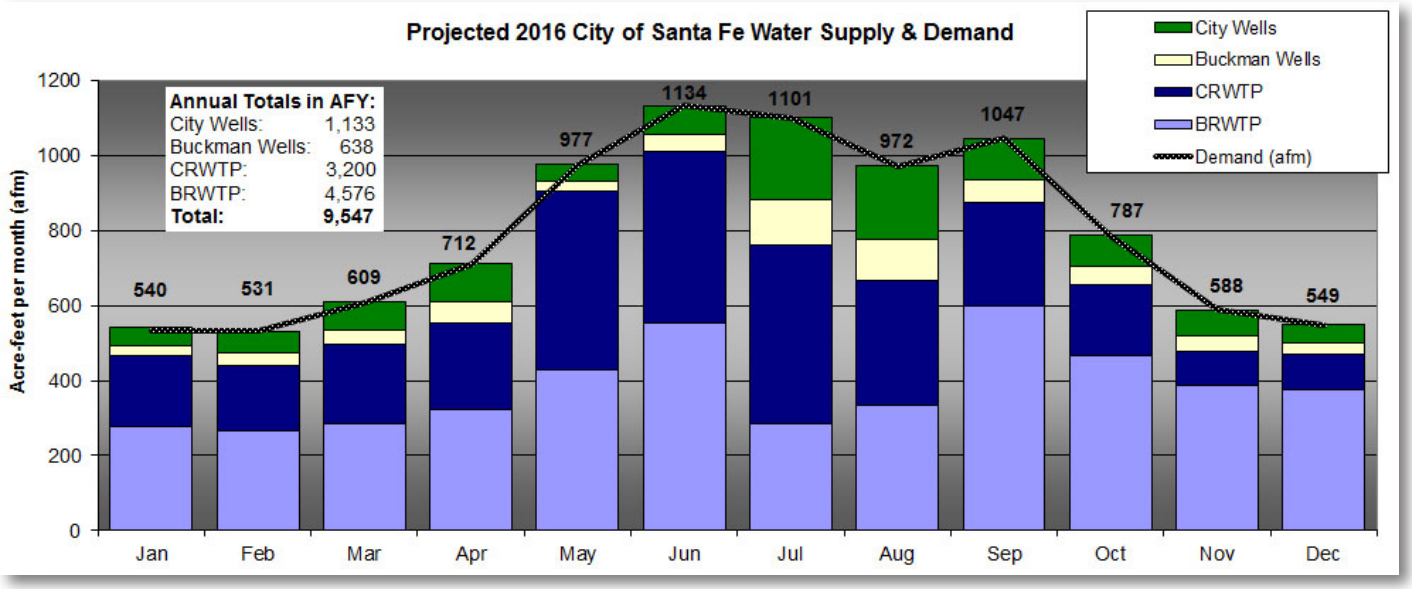

Figure 11. 2016 Projected Monthly Production by Supply Source