Background Data

History

In 1929 the newly-incorporated Senior Canyon Mutual Water Company (SCMWC) began digging a horizontal well into the side of a mountain high up in Senior Canyon in the east end of the Ojai Valley. The beginning point of the drilling was picked by a Stanford geologist, Bailey Willis, and the project was managed by Arnold Long, who had run similar tunnel jobs in Montecito, a suburb of Santa Barbara about thirty-five miles from Ojai.

On December 9, 1929, at a tunnel depth of 1555 feet, the fissures in the fractured rock began to spout water at a rate of 50 miners' inches, or about 450 gallons per minute. Two days later the flow had increased to 75 miners' inches or about 675 gallons per minute. The water flowed out of the fissures in the ceiling, walls, and floor of the tunnel. Historical reports are lacking that describe how this original flow changed over time, but it is generally understood that the tunnel has never stopped producing water with the historical minimum being 60 gallons per minute. When there is sufficient rainfall, the tunnel production can increase to over 300 gallons per minute. The quality of this water over the years has been and still is outstanding with excellent taste and clarity.

In the late 1980s a cave in occurred at 2390 feet from the tunnel entrance. This cave in remains today, and obstructs the passage to the rest of the tunnel which is believed to be another 1100 feet in, making a total depth of 3500 feet.

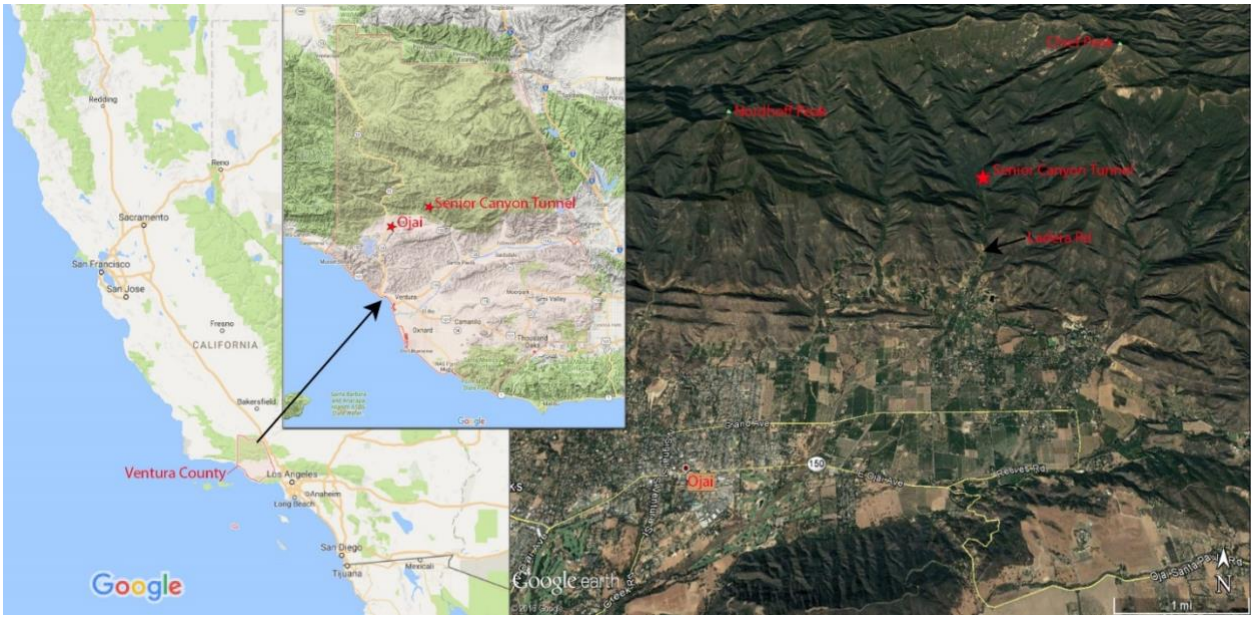
In the 1990s following another long drought, the SCMWC Board of Directors hired a renowned geologist and mining engineer, Dr. James J. Scott, to investigate the tunnel to hopefully increase production. Dr. Scott's opinion was that the tunnel was the Company's richest asset, and should be preserved as the valuable watershed that it had been for over sixty years. Dr. Scott proposed three strategies for increasing production: 1) sealing the tunnel floor, 2) descaling the water-producing areas, and drilling bore holes into the water-producing fracture zones. Scott believed that carrying out these tactics would result in a substantial increase in production.

Since Dr. Scott's report, the SCMWC Board of Directors has regarded the upgrading of the Tunnel as a priority; however the necessary funds have not been available to carry out Scott's recommendations. With the recent extended drought as well as the Company being in a stronger financial position, the Company is now ready to begin efforts to carry out these measures to hopefully mitigate some of the effects that the drought has caused in Ojai Valley, and to provide this high quality water well into the future.

Tunnel Location

Senior Canyon Tunnel is located at the northeast end of the Ojai Valley, in Ventura County, California, at the end of Ladera Road, shown in the figure below. In 1929, the 3,000 foot long tunnel was driven into the east-west running Santa Ynez Mountains, specifically Chief Peak between Nordhoff Ridge Rd and the town of Ojai. The tunnel portal started at elevation 2,378 feet and was excavated on a northeasterly bearing with a more northerly bend at 1,575 feet into the tunnel drive. Periodic inspections have revealed substantial debris on the tunnel floor (also known as the invert), calcification scale on the tunnel walls. At a distance of 2,400 feet from the tunnel entrance, the entire cross-section of the tunnel is filled with a soil-like material and is

impassable beyond this point. The soil-like material appears to have unraveled from above the tunnel crown and is most likely from a rock shear.



Senior Canyon Tunnel Location, Ojai, California (Google Earth)

System Overview

Senior Canyon Mutual Water Company is a small, nonprofit mutual water company formed in 1928. SCMWC is a "public water system" water purveyor as defined in the California Waterworks Standards (CWS), California Administrative Code, Title 22, Division 4, Section 64555-23. As such, it is required to comply with both the CWS and that of the local code governing water systems in Ventura County, the Ventura County Waterworks Manual (VCWM) which includes fire flow and fire protection requirements.

Additionally, SCMWC is required to meet water quality requirements set out by the California drinking Water Act, and the Surface Water Treatment rule as detailed by the State California Department of Health Services, Office of Drinking Water.

Service Area

The SCMWC service area comprising about 3.5 square miles, is bounded by Senior Canyon in the eastern end, East Ojai Avenue on the south and by Carne Road on the west end of the Ojai Valley. The service area lies adjacent to, and outside City of Ojai limits in the unincorporated area of Ventura County. The service area is a mix of zoning; Agricultural, rural exclusive, and open space. See Appendix 1, Service Area Map showing Parcels, APNs, System Layout and Zoning.

Facility Description

SCMWC generates water from three wells and three surface sources. The three wells produce non-potable agricultural water, while the three surface sources supply potable water and, when available, agricultural water as well. The three surfaces sources are the West and North Forks of Senior Canyon Creek, and the Senior Canyon Tunnel, constructed in 1929.

During normal rainfall periods, the tunnel well at the head of Senior Canyon Creek is the primary water supply for the domestic system. Water from the tunnel well is conducted down through the canyon through the "tunnel line", mostly in above ground steel pipe.

Along the tunnel line, other sources of SCMWC surface water are "pick-up" boxes (diversions) at the North and West forks of Senior Canyon Creek that collect surface water from the creek. Water from the two pick-up boxes is transferred via 6 and 8-inch lines (the canyon line), intersecting with the tunnel line, where it is dosed with coagulant (alum) and chlorine, then conducted to a media filter and into the system.

Two service connections to Casitas Municipal Water District (CMWD), one on the east[1] and one on the west[2] side of the service area, provide additional supply to the system when required, particularly during increased demand in summer months and low rainfall periods.

Water is distributed via 1-inch to 8-inch steel (approximately xx miles in total length) and PVC pipes mostly located along the public and private streets within the service area.

Storage facilities consist of two tanks; 130,000-gallon tank (a.k.a. the Thacher Tank) located in the northerly section of east service area and a 210,000-gallon storage tank (a.k.a. Nightingale Tank) located in the southerly section of east service area, an 80-acre-foot reservoir[3]. SCMWC are currently planning a new tank that will add 750,000-gallons of stored water to the system. The proposed tank will provide added security for fire protection, energy conservation with capacity to allow for off-peak pumping.

The system also includes three wells that are used exclusively for agricultural irrigation.
Additional system appurtenances include:

- A coagulant (alum) feed system located in a block building (Chlorinator Building) on the tunnel line for SWTR compliance.
- A sodium hypochlorite feed system located in a block building (Chlorinator Building) on the tunnel line for SWTR compliance.
- A two-stage media filter for SWTR compliance.
- A booster pump station (a.k.a. McAndrew Pump Station) to introduce CMWD water into the SCMWC system (located in the southern service area on McAndrew Road) and to fill the Nightingale Tank.
- A pipe bridge suspending the canyon line over Senior Canyon Creek.
- Pressure Reducing Valves to reduce higher zone (Thacher Tank) to lower zone (Nightingale Tank) hydraulic grade line.

In addition, SCMWC is in the final stages of completing a SCADA system which will replace their automated control and provide real-time monitoring, controlling and system alarms.

[1] Comprised of 2-3" and 1-4" meters manifolded together for a total maximum flow rate of 1,700 GPM.
[2] Comprised of 1-4" meter, total maximum flow 1,000 GPM.
[3] The reservoir holds untreated water for agricultural irrigation.

Operation Description

During normal rainfall periods, when water is available from the tunnel well and/or the two pick-up boxes, water is carried down the canyon in the tunnel line, to the canyon line, through the hypochlorinator, across the pipe bridge, through the media filter and into the two storage tanks. The storage tanks are filled entirely by gravity from the canyon line.

Pumps at McAndrew Pump Station are supplied from the connection to CMWD through the three meters manifolded together. The pumps can lift water to both the Thacher and Nightingale Tanks, as well as the system high point.

The tanks act as balancing mechanisms for the system feeding demands below each tank. The gravity feed from the Thacher tank provides the pressure for system operation for higher services within the system, and feeds minor demand to distribution submains downstream of and adjacent to the media filter.

In the event that the supply from the canyon cannot keep up with SCMWC demand, the east and west CMWD connections introduce water to the system. The west CMWD connection is monitored by a pressure reducing/sustaining valve and has a "Normally Open" connection through a backflow prevention assembly. As previously stated, the east connection utilizes booster pumps (McAndrew pump station) consisting of two automated primary 75-HP pumps and one 25-HP pump. The CMWD meters supply water to the suction side manifold of the pump station. The two 75-HP pumps are energized and de-energized based on the Thacher Tank water level. The CMWD connections are "Normally Open" to the SCMWC system and can be opened and closed by operating the gate valves at the connection.

Number of Services

A count by SCMWC staff resulted in 279 parcels currently served with service meters and 32 have existing secondary dwellings. Of those, 28 are agricultural services (meters).

There are 609.5 acres of zoned agriculture[4] with roughly 360 acres planted (most of the difference is land too steep for commercial agriculture.) Agricultural customers follow a strict, six-day rotational irrigation schedule.

Water Rights

The water rights to these surface sources were granted in 1903 and are on file. These rights were challenged in court by the City of Ventura in the early 2000s, and the court ruled in favor of SCMWC, reaffirming the Company's right to this water. These sources are high up in Senior Canyon, with the Tunnel and North Fork being at about 2330 feet in altitude, and the West Fork a little lower. After treatment at a facility in the Canyon, this water is filtered and then flows to a 125,000 gallon storage tank that is located above Thacher School. From this tank the water flows, again by gravity, down into the homes, schools, and ranches of Ojai Valley. When the Canyon cannot supply necessary potable water, SCMWC purchases water from Casitas Municipal Water District (CMWD), the agency that manages Lake Casitas, and this purchased water is pumped from the SCMWC McAndrew Pump Station to satisfy local demand and also to

[4] During normal rainfall periods, the agricultural system supplies approximately 110 acres of this total.

fill the Thacher Tank. SCMWC has not produced its own potable water since the Spring, 2015, due to the severe drought that has afflicted this area. However, the North Fork and Tunnel have continued to produce water and historically have never stopped; the volume of water from these two sources has not been ample enough to undergo treatment, and instead has been diverted into an 80 acre foot reservoir to be used for agriculture.

Water Usage

Historically, the Company has annually sold 550-750 acre feet of potable water, of which 73% is for domestic and institutional users, and 27% for agriculture. Of the 254 active meters in the Company, 219 are domestic, 31 are agricultural, and 4 are institutional.

Beginning in 2015 SCMWC, following the State mandate, asked domestic users to voluntarily reduce their usage by 25%. On July 1, 2016, SCMWC implemented a conservation strategy that called for a 30% reduction in usage from the 2013 usage levels. In addition, a surcharge of $1.00/unit (1 unit = 750 cu. ft.) was imposed for shareholders who exceeded this 2013 allocation number. The agricultural users were mandated to reduce their consumption by 10% of the 2013 usage, with the same penalty, or surcharge, imposed.

At this point in time, the Company anticipates lowering our annual sold volume of potable water to 475 acre feet. We anticipate that this number will either stay the same or go lower as long as the drought continues. The shareholders in SCMWC have made a tremendous effort in conserving their water usage and are bracing for more restrictions should rain not come. Once the effects of the drought are mitigated, the Company anticipates that the annual consumption of potable water will rise to 550 acre feet, the historical low end usage.

The agricultural water provided is primarily used for citrus and avocado orchards, the signature crops of the Ojai Valley. SCMWC strongly supports the continuation of our ability to provide the local growers with water, though we will insist that all the agricultural users modernize their irrigation systems to maximize the use of the water.

USBR Relationship

Lake Casitas is a man-made lake in the Los Padres National Forest of Ventura County, California, created by the construction of Casitas Dam on Coyote Creek, two miles (3 km) before it joins the Ventura River. Santa Ana Creek and North Fork Coyote Creek also flow into the lake. The dam was constructed of earth-fill and was completed in 1959. It is 279 ft. (85 m) and was built by the United States Bureau of Reclamation. The lake has a capacity of 254,000 acre ft. (313,000,000 m^3). The dam was built as part of the Ventura River Project and was strengthened in June–December 2000 as a seismic improvement to help withstand earthquakes greater than 6.5. The project provides drinking water and water for irrigation. A secondary benefit is flood control. In the center of Lake Casitas is 2 km Main Island, whose peak rises more than 500 feet (150 m) from the lake surface.

Currently, Lake Casitas is 36.7% full, and had dropped to 35.2% full before recent rains. When and if the Lake drops to 20% capacity, the Ojai Valley will essentially move into a health and safety mode, with no available water for irrigation of any kind. At this time there is no back up

for Lake Casitas: no desalination option, no connection with State water, no unused wells to reactivate. The thinking of SCMWC is that we must do everything possible to increase our own supply and to maximize the water that we do have by continuing our conservation efforts. The upgrade of our Tunnel is intended to increase our supply and conservative estimates are that we can increase our production from 100 acre feet per year to 400 acre feet per year by implementing the strategies outlined in the application.