The El Rio fire station went into service in November of 1954 as part of Battalion One at 680 El Rio Drive, later becoming part of Battalion Five. It was located at the County Yard in El Rio. The station was a combination of an engine room with small living quarters and two houses. The houses were used in the early years as homes for the captains and battalion chiefs and their families.

On January 5, 1973, the station was closed and personnel and equipment moved into the new Oxnard City Fire Station 4, on Vineyard Ave. They were co-located there until April 1987. Personnel and equipment then moved back into their first station on El Rio Drive, displacing the county radio repair shop that was using the station.

In 2006 a new Fire Station 51 was built in the River Park development north of Highway 101, at 3302 Turnout Park Circle, next to new Oxnard City Station 7. The old station was demolished to make room for a new freeway interchange and development in the area.