

II - DESCRIPTION OF PROJECT

2-01 Location

The Santa Fe Dam is located near the northern edge of the San Gabriel Valley on the San Gabriel River about four miles below the mouth of San Gabriel Canyon, about 16 miles east-northeast of the Los Angeles Civic Center, and about 3 miles west-southwest of the town of Azusa (see pl. 1-1). The drainage area is almost entirely in the San Gabriel Mountains. A small portion of the total drainage area lies on the alluvial fan between the San Gabriel Canyon mouth and the dam. Drainage area boundaries are shown on plate 2-1.

2-02 Purpose

The primary purpose of Santa Fe Dam is to provide flood protection for the densely populated area lying downstream of the dam. Santa Fe Dam, in conjunction with Whittier Narrows Dam, provides vital flood protection for the San Gabriel Valley and lower portions of the entire Los Angeles County Drainage Area (LACDA). Regulation of storage in these two flood control reservoirs complements the conveyance capacity of the San Gabriel, Rio Hondo, and Los Angeles River Channels. The storage allocation for Santa Fe Dam is shown on plate 2-2.

Currently, no facilities for the generation of hydroelectric power at Santa Fe Dam exist, nor are any contemplated. Furthermore, no navigation of any sort is possible or allowed in Santa Fe Reservoir or in the San Gabriel River or Rio Hondo, either upstream or downstream of Santa Fe Dam.

2-03 Physical Components

a. Embankment. The embankment is a zoned earthfill structure with a crest length of 23,800 feet at the top of the dam (elevation 513 feet National Geodetic Vertical Datum (NGVD)) and a crest width of 30 feet. The height above the original San Gabriel Rive streambed is 92 feet. The upstream face of the dam has a slope of 1 on 3.1, and the downstream slope varies from 1 on 3 at the top to 1 on 5.5 at the toe. Both faces are covered with cobbles 6 inches or larger in diameter. The embankment general plan and real estate limits (taking line) are shown on plate 2-3. Typical embankment sections are shown on plate 2-4. Photographs of the embankment are shown in figure 2-1.

b. Spillway. The spillway structure, with a crest elevation of 496 feet NGVD, is located in the right or northwestern abutment of the dam. Immediately downstream of the overflow section, is a concrete lined stilling basin with a minimum elevation of 460 feet NGVD. Riprap for the first 100 feet of spillway channel beyond the downstream end of the stilling basin prevents scour below the end sill. The spillway channel is 1200-foot wide and extends approximately 5000 feet from the end of the stilling basin. The spillway channel invert slope is 0.011039. Spillway outflow was originally designed to be directed downstream toward the point of "El Monte Island", lying between the Rio Hondo and San Gabriel Rivers. The purpose of this alignment was to split flow between the two river channels; however, it was recognized that it is impossible to predict the actual path of spillway flow. A series of gravel pits downstream of the spillway has been created or enlarged considerably during the time since spillway construction (pl. 2-5). These pits will intercept a significant volume of spillway flow. However, it is not certain the direction that large flows would take. The most likely scenario would involve spillway flow initially filling the Santa Fe Diversion and Buena Vista Channels to capacity, followed by spillway flow overwhelming

the Santa Fe Diversion and crossing the channel perpendicularly to enter the Blue Diamond-Santa Fe gravel pit immediately downstream of the spillway (approx. storage volume = 6900 ac-ft). Storage volumes in the gravel pits were determined in a study performed for the city of Irwindale (Report No. 15 of Table 1-1). Once this pit was filled to capacity, flow would most likely overtop both Buena Rio Drive and Arrow Highway at their intersection and enter the Blue Diamond-#2 pit (approx. storage volume = 12,600 ac-ft) and Blue Diamond -#1 pit (approx. storage volume = 8600 ac-ft), respectively. There is no certainty that both pits would fill equally, or that breakout to or from one pit would occur sooner than at another. Most likely, once flow has filled Blue Diamond pits #1 and #2, flow would head west from pit #2 into the Owl Rock pit (approx. storage volume = 2700 ac-ft) and enter Sawpit Wash and then Rio Hondo. Flow from pit #1 would most likely cross Live Oak Avenue near its intersection with Arrow Highway and enter the Pacific Rock Quarry (approx. storage volume = 9500 ac-ft), the Blue Diamond-Sierra pit (approx. storage volume = 8600 ac-ft), and finally the Livingston Graham-El Monte pit (approx. storage volume = 40,800 ac-ft) before entering the San Gabriel River west of the San Gabriel Freeway. The path of spillway flow, therefore, is highly dependent on flow rate, storage volume and filling time of each pit, and local variations in flow paths and topography. However, it is certain that the gravel pits will absorb a considerable portion of the total volume of spillway flow during all but the smallest (in which flow would remain predominantly confined to the Santa Fe Diversion and Buena Vista Channel) or largest spill events.

The plan, profile, and details of the spillway, and other information related to the spillway were shown on plate 2-6. Figure 2-2 shows photographs of the spillway.

c. Reservoir Outlet. The outlet structures are located in line with the San Gabriel River channel within the northwest-southeast trending face of the

embankment near the center of the dam (see pl. 2-3). The outlet structures include an approach channel with grouted stone paving at the entrance to the intake structure; an intake structure containing four groups of four gates each, with separate trash racks on each group; sixteen slide-gated, bell-mouthed outlets 6 feet wide and 9 feet high; a 30 foot long transition section; sixteen 7.33 feet square conduits; a service house and float recorder house; and a large stilling basin below the conduit exits. The sixteen outlet gates are hydraulically operated, and open or close about one foot per minute. Gates 3, 7, 10, and 14 may be locked in any position, while other gates can be locked only in open or close position. The combined maximum capacity of the sixteen outlets is 41,000 ft³/s with a reservoir water surface elevation of 496 feet (spillway crest). Plate 2-7 shows the outlet works general plan and longitudinal section. Figure 2-3 is a photograph of the Santa Fe Dam outlet works.

2-04 Related Control Facilities

Cogswell and San Gabriel Dams, which are upstream of Santa Fe Dam, are operated by LACDP as flood control and water conservation reservoirs. Morris Dam, which is also upstream of Santa Fe Dam, is owned by the Metropolitan Water District (MWD) for water conservation, and operated by LACDPW. Whittier Narrows Dam, which is downstream of Santa Fe Dam, is owned and operated by LAD as a flood control facility. Some Santa Fe Dam outflow is diverted via the Santa Fe Diversion into the Buena Vista Channel and percolated at the downstream spreading grounds (Buena Vista or Peck Road Spreading Basins), which are owned and operated by LACDPW.

2-05 Real Estate Acquisition

Santa Fe Dam and Reservoir project lands comprise 1840 acres as shown on plate 2-3.

2-06 Public Facilities

Santa Fe Reservoir has minimal uses other than flood control operations until 1976, when the first stages of recreation development began. By 1987, five stages of development had taken place, encompassing 250 acres. These facilities are managed by the County of Los Angeles through a fifty year lease agreement with the Corps of Engineers. At present, the total area under lease is 836 acres. The lease area also includes 350 acres of wildlife management area with 50 acres of native vegetation set aside as a natural area which has restricted access. Currently, 136 acres of the leased area is underdeveloped.

The existing recreation facilities at the Santa Fe Dam include extensive park landscaping and a fishing pier, group tent camping areas, a wildlife interpretive center, general parking area and park maintenance facilities as well as an equestrian/bicycle staging area with access to the Larrío/San Gabriel River Trail System. The Los Angeles County Department of Parks and Recreation operates and maintains the federally constructed recreational facilities. Plate 2-8 shows the recreation facilities within the reservoir. Table 2-1 lists facilities with the reservoir and their corresponding elevations.

TABLE 2-1. PUBLIC FACILITIES AND THEIR ELEVATIONS.
 SANTA FE DAM AND RESERVOIR

Elevation (Feet, NGVD)	Facility in Basin
421.0	Invert Outlet Works
455.0	Access Road
456.5-458.0	Circuit Box near Picnic B
456.6	Picnic Area B
460.0	Picnic Area C
467.0	Recreation Lake Water Surface
475-520	Spreading Grounds
475	Equestrian Area
485	Water Conservation Ponds and Dikes
488	Picnic Area A
496	Spillway Crest
516.7	Group Camping Area

Figure 2-1. Photographs of the Santa Fe Dam embankment.

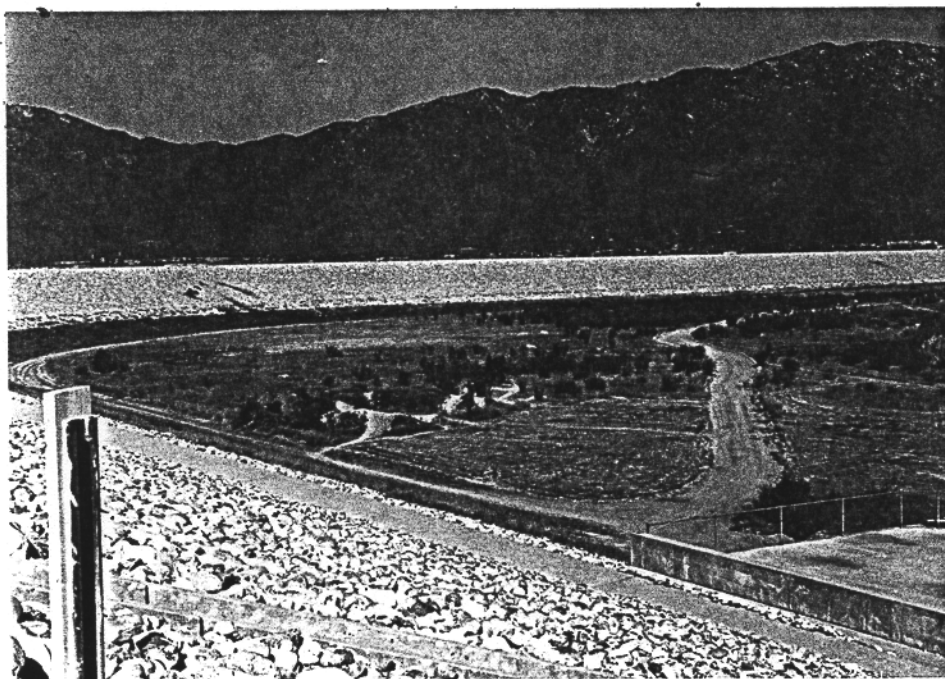
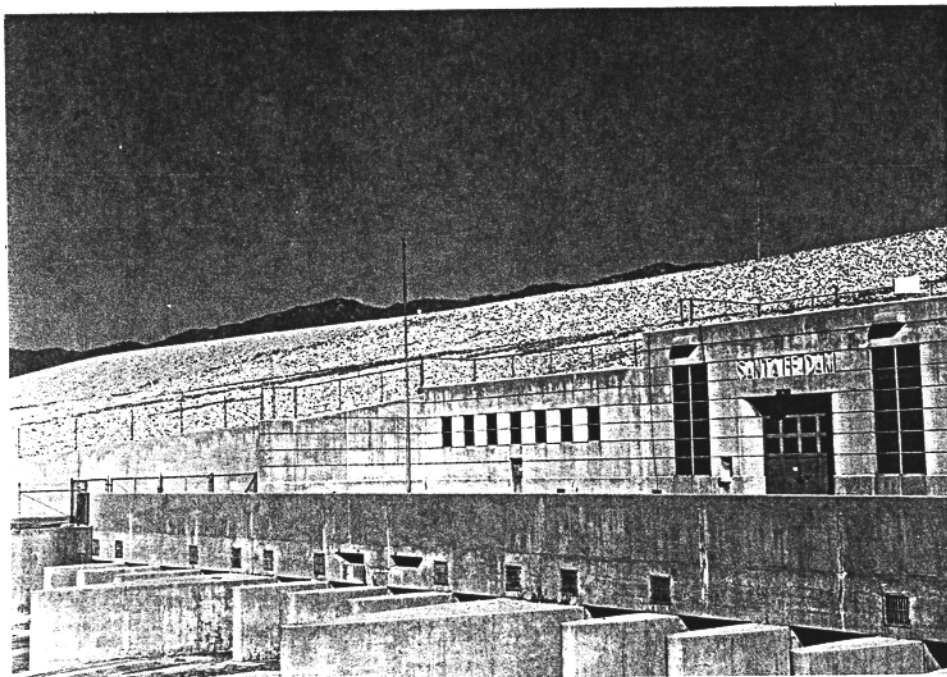


Figure 2-2. Photographs of the Santa Fe Dam spillway.

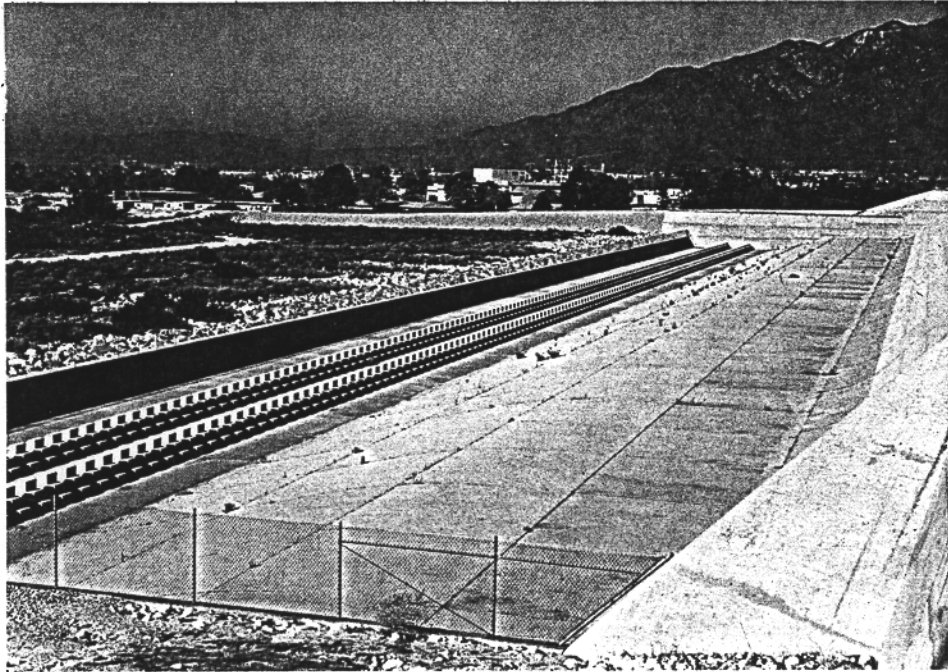


Figure 2-3. Photographs of the Santa Fe Dam outlet works.

