V - DATA COLLECTION AND COMMUNICATION NETWORKS

5-01 Hydrometeorological Stations.

a. Facilities. Hydrologic instrumentation installed at Fullerton Dam provides data on reservoir water surface elevation, downstream gauge height, precipitation, and the outlet gate heights. A list of the instrumentation and available data is provided on plate 5-01. Data collection facilities of interest in the vicinity of Fullerton Dam include Fullerton Creek gauging stations and nearby precipitation gauges. These facilities are detailed on plate 5-02 and all pertinent hydrometeorological instrumentation in the area is located on plate 5-03.

(1) Reservoir Water Surface Recording System. A tape-float-pulley assembly is used within a float well to measure water surface elevation. A Stevens A-71 strip-chart recorder and a digital recorder automatically record the float well water surface elevation. The digital recorder takes a reading every 15 minutes during the flood season and every hour the rest of the year.

(2) Reservoir Staff Gauges. A series of staff gauge boards are installed along the upstream face of the dam. The boards are graduated in 0.10 foot increments and are readable from the top of the dam.

(3) Outlet Gate Recorders. Each outlet service gate has a Leitz recorder that documents all gate movements. These recorders monitor gate settings and make a permanent paper record of them. These are strip chart recorders that provided continuous readings year round.

(4) Precipitation Measurement. A tipping bucket rain gauge is installed at the control house. The gauge is connected to a digital recorder by a magnetic sensor. Rainfall is also measured by a glass rain tube and a Belfort recording gauge. The paper charts from the Belfort gauge are sent to the National Weather Service for publication. The digital recorder takes a reading every 15 minutes during the flood season and every hour the rest of the year.

(5) Stream Gauging Stations. Hydrologic facilities for obtaining stream flow data include USGS gauge #11090000 below the dam and Orange County Environmental Agency (OCEMA) gauge #2 located downstream at Fullerton Creek at Richman Avenue. The USGS gauge uses a float-well system with a Stevens Digital Recorder. The OCEMA gauge uses a float-well system with a Stevens A-71 strip-chart recorder. Rating tables for both gauges are provided on plates 5-04 and 5-05, and rating curves are shown on plates 5-06 and 5-07. These gauges take readings every 15 minutes year round.

b. Reporting. Hydrologic data from Fullerton Dam are reported in three separate ways. Readings are made manually by the dam operator, recorded automatically by gauges, and reported in real-time by the telemetry system.

(1) Manual. The dam tender at Fullerton Dam reports via radio or telephone each morning between 15 November and 15 April to the Reservoir Regulation Unit. The report includes water surface elevation, downstream

stage, rainfall and gate settings. This report is made more frequently during periods of rain, as specified by the Reservoir Regulation Section. Between 15 April and 15 November, reports are made every Monday morning only.

(2) Recording Instrument. Records provided by automatic recording gauges are stored on paper punch tape or strip charts. These paper records are retrieved on a monthly basis in the rainy season, and on a quarterly basis the remainder of the year.

(3) Telemetry System. Hydrologic data measured at the dam and at other gauges are transmitted to the Los Angeles District Office by the Los Angeles Telemetry System. These gauges automatically transmit reports at predetermined 24-hour intervals. The event mode is the primary data source for the telemetry system. As a gauge registers an event, current data is radio-transmitted to a repeater from which it is sent via microwave to the LAD Office. Each gauge is programmed to trigger whenever .04 inches of precipitation, or a 0.25-foot change in water surface elevation, is recorded. Recording time intervals for each instrument are discussed in paragraph 5-01. All gauges can also be interrogated at any time for current data via polled mode.

(4) ALERT System. There is also an event reporting gauge system throughout southern California sponsored by the National Weather Service. This system is referred to as the ALERT system (Automatic Local Evaluation in Real Time). OCEMA maintains a network of these gauges in Orange County. Included in this network are two precipitation gauges that may be useful in determining rainfall at Fullerton Dam. These gauges are #265 in the City of Brea, and #241 located at Miller Basin on Carbon Canyon Creek. Access to this information can be obtained through the REPORT program on the Water Control Data System computer.

c. Maintenance. The Water Control Data Unit of the Reservoir Regulation Section, Engineering Division, LAD, is responsible for maintaining the instrumentation at Fullerton Dam, except for the U.S. Geological Survey (USGS) downstream gauge.

5-02 Sediment Stations. A sediment range exists in Fullerton Reservoir, but is no longer used for surveying reservoir capacities. Aerial photographic methods are currently used to determine elevation-capacity relationships.

5-03 Recording Hydrologic Data. Hydrologic data from Fullerton Dam is recorded and stored in several forms within the communication network. A report of daily observations is made at the dam and this record, form SPL-19, Flood Control Basin Operation Report, is stored by the Water Control Data Unit of the Reservoir Regulation Section in the District's Base Yard Office. Using this report and strip charts from the reservoir water surface recorder, reservoir computations are made by the Water Control Data Unit on form SPL-30, Reservoir Computations. The information transmitted by radio or telephone to the Reservoir Regulation Unit is recorded on form SPL-424, Reservoir Operation Report. This information is entered into the RESCAL computer program which stores the record in a computer database and produces a "Daily Reservoir

Report" that is issued by the Reservoir Regulation Unit. However, the SPL-30 form is the official record of the District. Examples of these report forms are shown in figures 5-01 through 5-07.

The telemetry system also stores its data in a computer database file. Paper punch tapes retrieved from recording instruments at Fullerton Dam are stored in the District's Base Yard Office.

The USGS publishes daily mean streamflow recorded on Fullerton Creek in the yearly publication Water Resources Data for California, Volume 1. The paper punch tapes for this gauge are archived by the USGS. The strip chart of precipitation at Fullerton Dam is sent to the National Climatic Center in Asheville, NC for publication in the NOAA monthly report Hourly Precipitation Data.

The State of California, Department of Water Resources, publishes data from the ALERT telemetry gauge network on a monthly basis. The Orange County Department of Public Works and the adjacent Ventura County Flood Control District and Los Angeles County Department of Public Works archive their recording and non-recording data and furnish these data to other agencies upon request.

5-04 Communications Network. The LAD maintains a voice radio communication network connecting all of its operations. This FM radio system uses repeaters on Mount Disappointment or, alternately, Pleasants Peak to communicate between the District Office and Fullerton Dam. This radio network is backed up by a second, parallel radio system.

Power at the District Office, as well as at each dam, is backed up by an emergency generator system. If all systems fail at the District Office there is a complete radio system at the District's Base Yard in El Monte, eleven miles east of the downtown District Office.

5-05 Communication with Project.

a. Regulating Office with Control House. During the flood season (15 November through 15 April), a routine radio call is made at least once each weekday from the Reservoir Regulation Unit to each dam tender, including Fullerton Dam. This Reservoir Operation Report (or "morning report") is usually made at 0800 hours, Monday through Friday. During flood events the reporting interval is usually reduced to one hour, with the Reservoir Regulation Unit originating the radio call. Other routine or non-routine radio or telephone calls are made as needed.

In the event that all communications with the District Office, including the Base Yard, should be interrupted, a set of "Standing Instructions to the Project Operator for Water Control" have been compiled for each dam. A copy of these instructions for Fullerton Dam is included in Exhibit A of this manual.

b. Between Control House and Others. No routine communication exists between Fullerton Dam and other agencies.

c. Between Regulating Office and Others. Before and during the earliest stage of any reservoir releases, the LAD notifies officials of Orange County and the City of Fullerton. A list of agencies to be notified, with applicable office and home telephone numbers, is published annually in the LAD's Instructions for Reservoir Operations Center Personnel (the "Orange Book"). The current notifications list is provided in table 5-08.

The District's Reservoir Operations Center (ROC) communicates with Orange County and City of Fullerton officials by telephone during major runoff events. The ROC is also in direct radio contact with channel observers dispatched to patrol the downstream channel during significant floods.

5-06 Project Reporting Instructions. During periods of dam operation, communications between the ROC and each affected dam tender are made on a frequent basis, normally once each hour. A more frequent interval of communications may be required. If a gate change is required, the ROC broadcasts the gate change instructions to the dam tender. When the gate change is completed, the dam tender calls back to the ROC with information on the change. Other special instructions to dam tenders are conducted in a similar manner. This network of radio communications is also used by the dam tender to report any mechanical failures or other problems at the dam.

5-07 Warnings. The responsibility for issuing all weather watches and warnings and all flood and flash flood watches and warnings rests with the National Weather Service. Local emergency officials of cities and counties are responsible for issuing any public warnings regarding unusual overflows, evacuations, unsafe roads or bridges, toxic spills, etc. The U.S. Army Corps of Engineers is responsible for providing these officials with current information, and when possible, forecasts of water elevations within Fullerton Reservoir, and flow rates in Fullerton Creek downstream of Fullerton Dam. If an uncontrolled spillway flow or dam break were imminent, the ROC should notify the OCEMA Communications Center so they could initiate evacuations.