V - DATA COLLECTION AND COMMUNICATION NETWORKS

5-01 Hydrometeorological Stations

a. Facilities. Hydrometeorological data is obtained in the San Antonio Creek drainage area that provide accurate real-time information required for the operation of the Dam as well as providing a historical data base for performing various types of studies. Instrumentation at the San Antonio Dam provide data on precipitation, water surface elevation, and outlet gate settings. In addition, precipitation is recorded at stations on Mt. Baldy and on Chino Creek near the San Antonio Creek confluence. There are no stream discharge gaging facilities located on San Antonio Creek. There is a stage recorder on Chino Creek near the location of the precipitation station. Instrumentation at the dam site, parameters measured, and mode of reporting are listed on plate 5-01.

Real-time data is available through two telemetry networks operating in the region: (1) The Los Angeles Telemetry System (LATS) is operated in the LAD in Los Angeles County and the Santa Ana River Basin; and (2) The Automatic Local Evaluation in Real Time (ALERT) system sponsored by the National Weather Service (NWS) operates throughout Southern California. The San Bernardino County Flood Control District (SBCFCD) maintains a network of gauges within the ALERT system.

Plate 5-02 shows LATS and ALERT precipitation stations located in the Santa Ana River Basin. Plate 5-03 shows the stream gauges and reservoir water surface elevation gauges operating in the Santa Ana River Basin. LATS stations are identified by a four (4) letter alphabetic code and the ALERT Stations by a three (3) digit numerical code.

Through the LATS network, precipitation is monitored at Mt. Baldy (MTBY) and at San Antonio Dam (SNTO). Water surface elevation at the Dam is also monitored (SNTO). Data from these stations are transmitted directly to the water control mini computer (Harris 800) located in the LAD office. Through the ALERT network, precipitation is monitored at the Dam (#828), gauge height on Chino Creek (#819) and precipitation (#820). Data from these stations are transmitted to the offices of the NWS in Los Angeles and the SBCFCD in San Bernardino. The LAD is able to receive ALERT transmissions, since its offices are within radio range of the NWS's office.

b. Reporting. The data from San Antonio Dam and drainage area is reported in three separate ways. Readings are made visually by the dam tender, recorded automatically by recording gauges, and/or reported in real-time by telemetry to the LAD office. The releases from the dam can be monitored by the dam tender by the use of the gauge height immediately below the dam. The downstream gauge is being moved farther downstream in summer of 1991 to increase accuracy of readings, some of which were abnormal in past years due to roller waves discussed in Section 7-02, c.

(1) Manual. The San Antonio Dam tender reports by radio or telephone each morning (Monday through Friday) between 15 November and 15 April to the Reservoir Operations Center (ROC) of the LAD. The report includes water surface elevation, precipitation, and gate settings. Reporting is more frequent during periods of rain, as specified by the ROC. Between 15 April and 15 November, reports are made on Monday mornings only.

(2) Recording Instruments. Precipitation and water surface elevation are recorded on paper strip charts and on punched tape. Outlet gate settings are recorded on paper charts. These paper records are retrieved on a monthly basis in the rainy season and on a quarterly basis during the remainder of the year.

(3) Telemetry. Data from the LATS stations are obtained in one of three modes: On an event basis; on an interrogation or polled basis; and on a self timed preset interval. Data on precipitation and water surface elevation are automatically transmitted at a 24-hour interval. The event mode provides the majority of the data from the LATS gauges. Precipitation gauges are programmed to trigger a transmission on a 0.04 inch increment of rainfall. Water surface elevation recorders trigger a transmission on each 0.25 foot of change.

ALERT data transmission to the NWS can be monitored by the LAD. Also access to the Chino Creek stage and precipitation data (Station #819 and #820) can be obtained through the REPORT program resident on the Water Control Data System Mini Computer.

c. Maintenance. The Water Control Data Unit of the Reservoir Regulation Section (RRS) of the LAD is responsible for maintaining the gauges and instrumentation at the San Antonio Dam. The ALERT stations are maintained by the SBCFCD and the Mt. Baldy precipitation station is maintained by the NWS.

5-02 Water Measurement Stations. There are no water quality monitoring or sampling stations operated or maintained by the Corps within the San Antonio Creek drainage area, however records of toe drain observation well depths are taken when the pool is above elevation 2175 to evaluate performance of toe drains installed in 1985 (See Sect. 3-06d.) The location of the toe drain observation wells are shown in figures 5-01 through 5-05.

5-03 Sediment Stations. There are no sediment sampling stations located within the San Antonio Creek drainage area. Periodic surveys are performed within the reservoir area in order to determine the elevation-capacity relationships. The 1990 survey data indicates reservoir storage is 11,992 acre-feet at the top of the dam elevation 2260 as compared to 12,719 acre-feet when it was completed in 1956.

5-04 Recording Hydrologic Data. In addition to the LATS and ALERT data storedin a data base on the Water Control System computer, several forms are utilized. 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. Data from these forms are manually entered in DSS files on the Water Control System Computer. The information transmitted by radio or telephone to the Reservoir Regulation Section is recorded on form SPL-424, Reservoir Operation Report. This information is entered into the RESCAL computer program which stores the recordin a computer data base and produces a "Daily Reservoir Report" that is

issued by the Reservoir Regulation Section. However, the SPL-30 form is the official record of the District. Observation well data is reported as shown on figure 9-07 and is evaluated by LAD Geotechnical Branch. Examples of these report forms are shown in figures 9-01 through 9-07.

The strip chart of precipitation from San Antonio Dam is sent to the National Climatic Center in Asheville, North Carolina, for publication in the NOAA monthly report Hourly Precipitation Data. ALERT telemetry data is published by the State of California, Department of Water Resources on a monthly basis. The SBCFCD archives their data and will furnish these data to other agencies upon request. See plate 5-01 for Methods of Reporting.

5-05 Communication Network. The LAD maintains a voice communication network connecting all of its operations. This F14 radio system uses repeaters on Mount Disappointment and/or Pleasants Peak. When Pleasants Peak fails, Mt. Disappointment can be used to contact all dams, although difficulties may be encountered receiving transmissions from San Antonio Dam. In this event, the dam operator should use his mobile unit through the Toro Peak repeater. This network is backed up by a second, parallel radio system and by local telephone systems.

Power at the LAD office, and San Antonio Dam is backed up by emergency generators. If all systems fail at the LAD office, there is a complete radio system installed at the LAD Base Yard in South El Monte, eleven (11) miles to the east of the downtown office, that can be used to relay instructions to San Antonio Dam tender.

5-06 Communication With Project.

a. Between the ROC and San Antonio Dam. During the flood season (15 November through 15 April), a routine radio call is made at least once each day from the ROC to the San Antonio dam tender. 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 ROC 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 San Antonio Dam is included in Exhibit A of this manual.

b. Between San Antonio Dam and Others. No routine communication exists between San Antonio Dam and other agencies.

c. Between ROC and Others. Before and during the earliest stage of any reservoir releases, the LAD notifies officials of some eight (8) different agencies. 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 plate 9-02.

5-07 Project Reporting Instructions. Through the utilization of data obtained through the LATS and possibly the ALERT network, the Reservoir Regulation Section regularly monitors rainfall and water surface elevations. The LAD maintains contact with the Dam tender on a regular basis. If a gate change is required, the Reservoir Regulation Section transmits a change order to the dam tender via radio. When the gate change is completed, the dam tender calls back to the LAD radio operator to confirm the change.

Other special instructions to the dam tender are conducted in similar fashion. Radio communication is used by the dam tender to report any malfunction of machinery or equipment or any other unusual conditions at the dam site.

5-08 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. LAD is responsible for providing these officials with current information, and when possible, forecasts of water elevations within San Antonio Reservoir, and release rates to San Antonio Creek downstream of the dam.

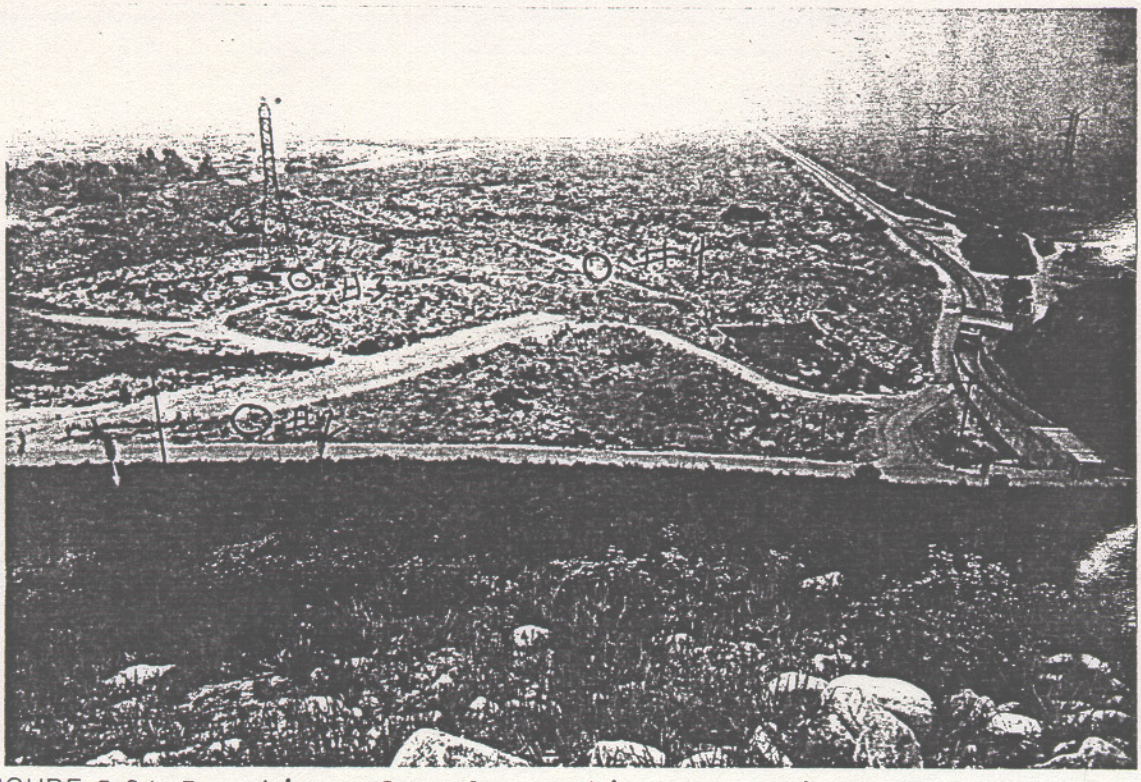

FIGURE 5-01 Location of 4 observation wells installed in 1959

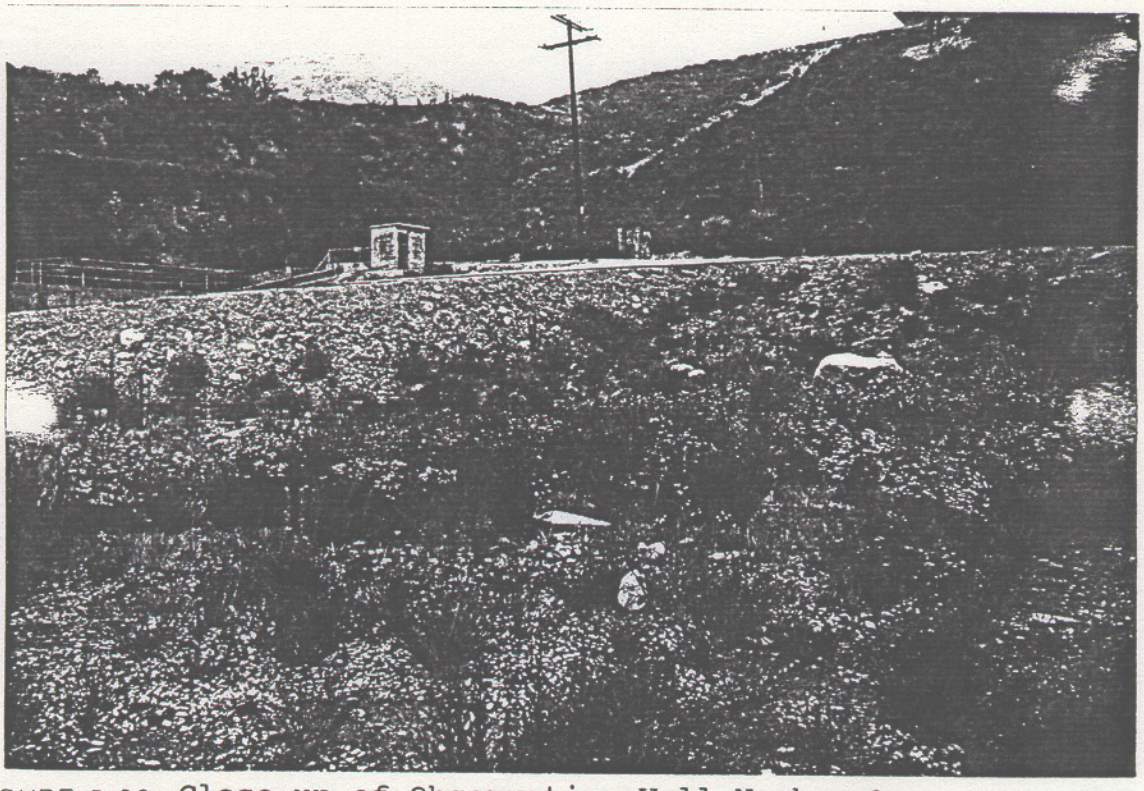

FIGURE 5-02 Close up of Observation Well Number 1

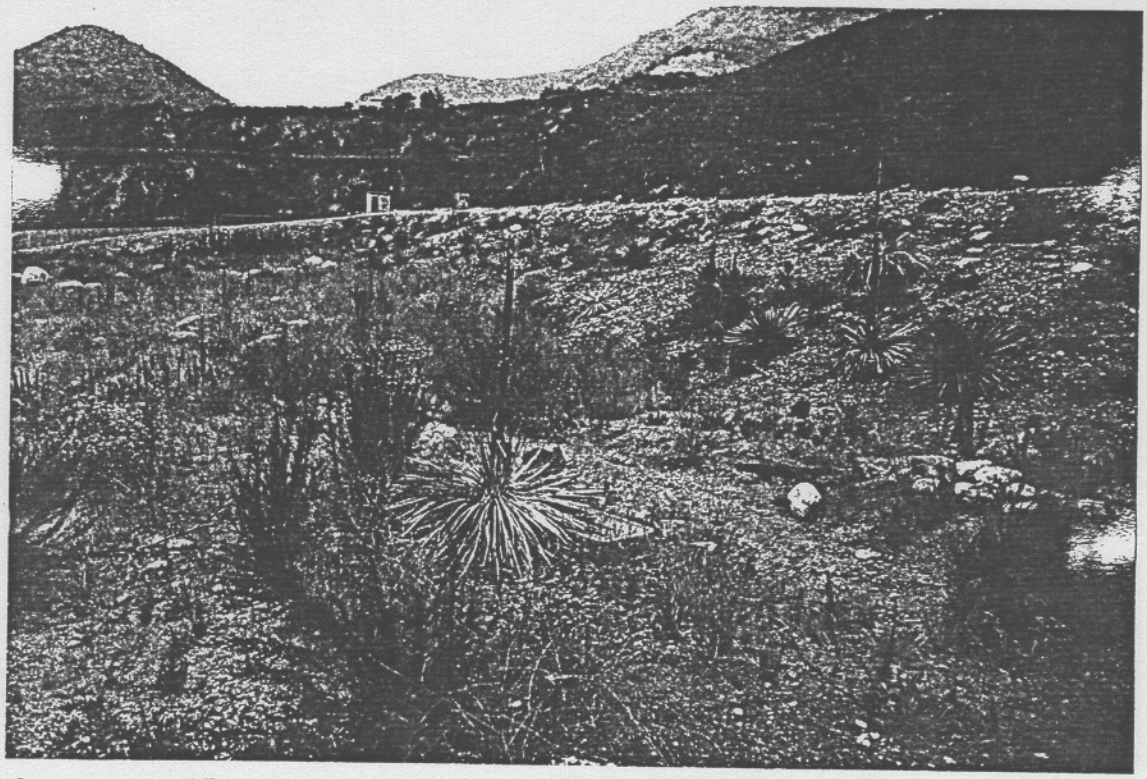

FIGURE 5-03 CLose up of Observation Well Number 2

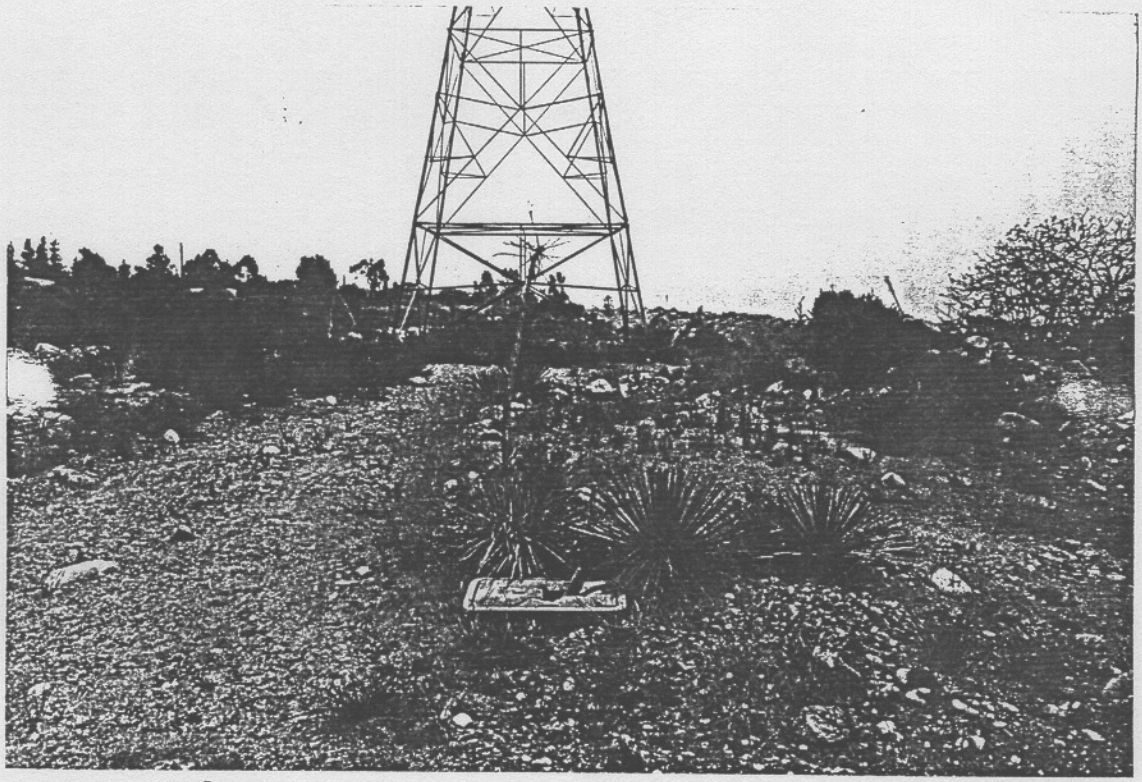

FIGURE 5-04 Close up of Observation Well Number 3

FIGURE 5-05 Close up of Observation Well Number 4

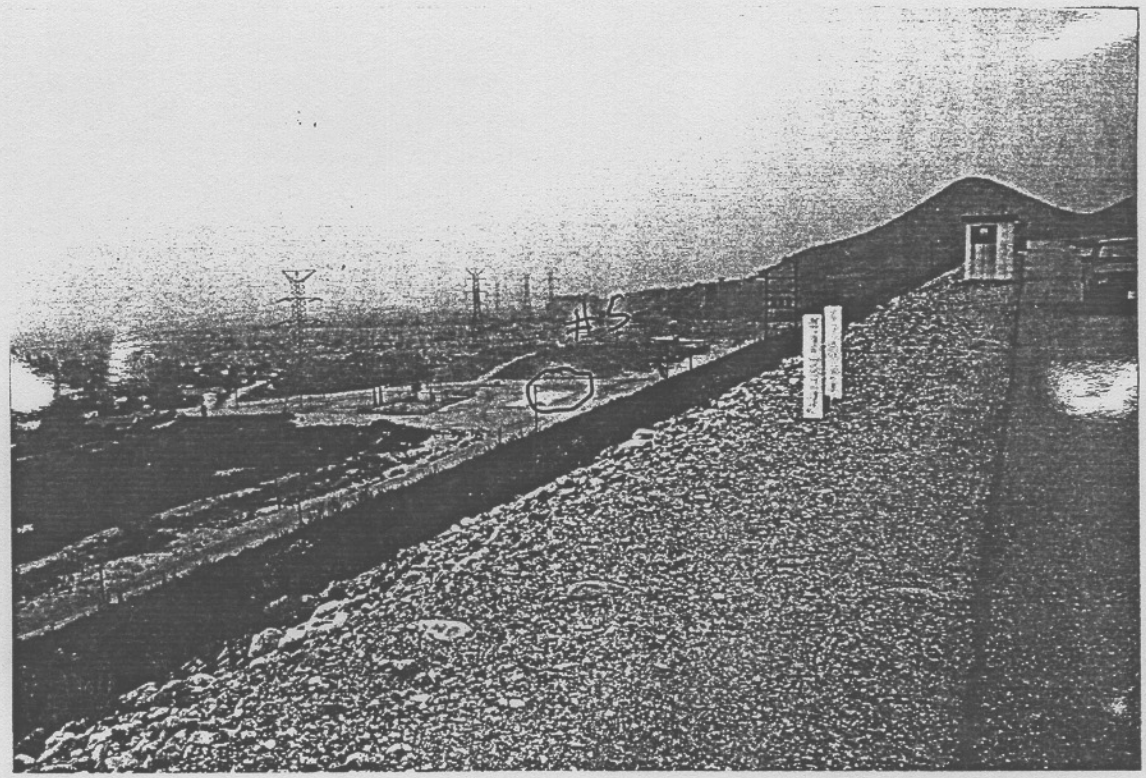

FIGURE 5-06 Location of Oberservation Well Number 5

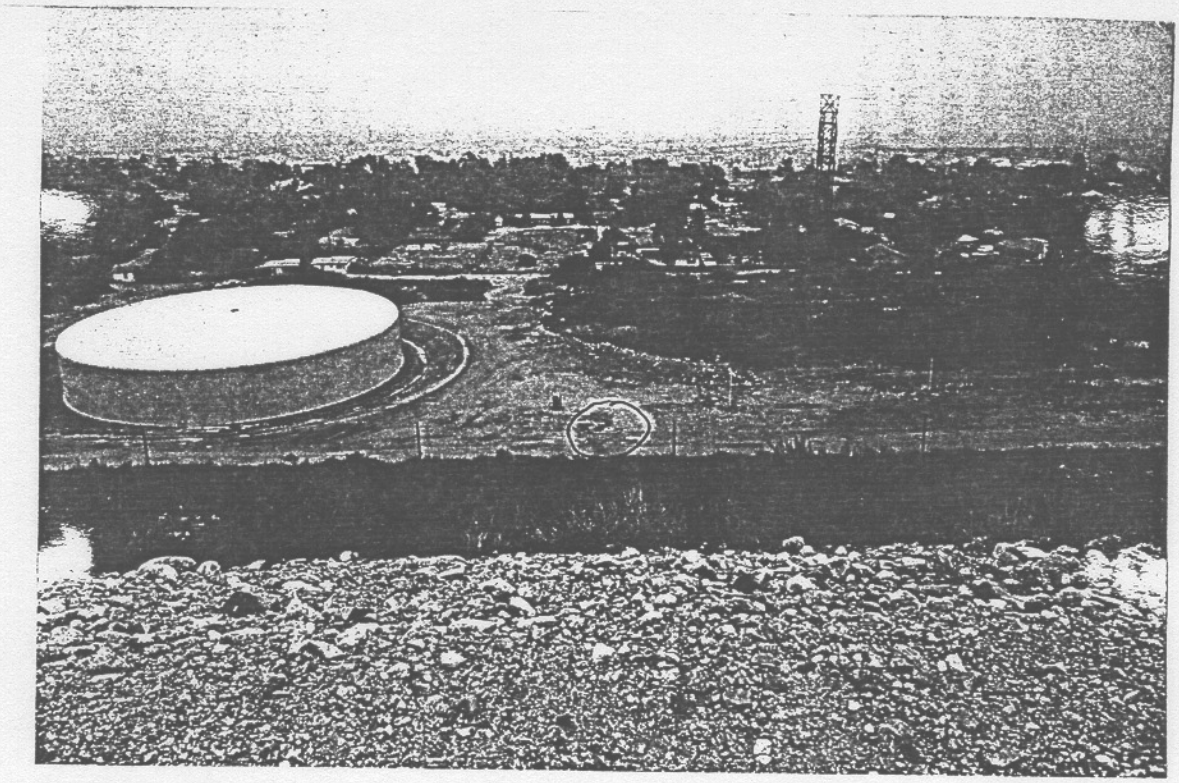

FIGURE 5-07 Location of Observation Well Number 6

FIGURE 5-08 Close up of Observation Well Number 6

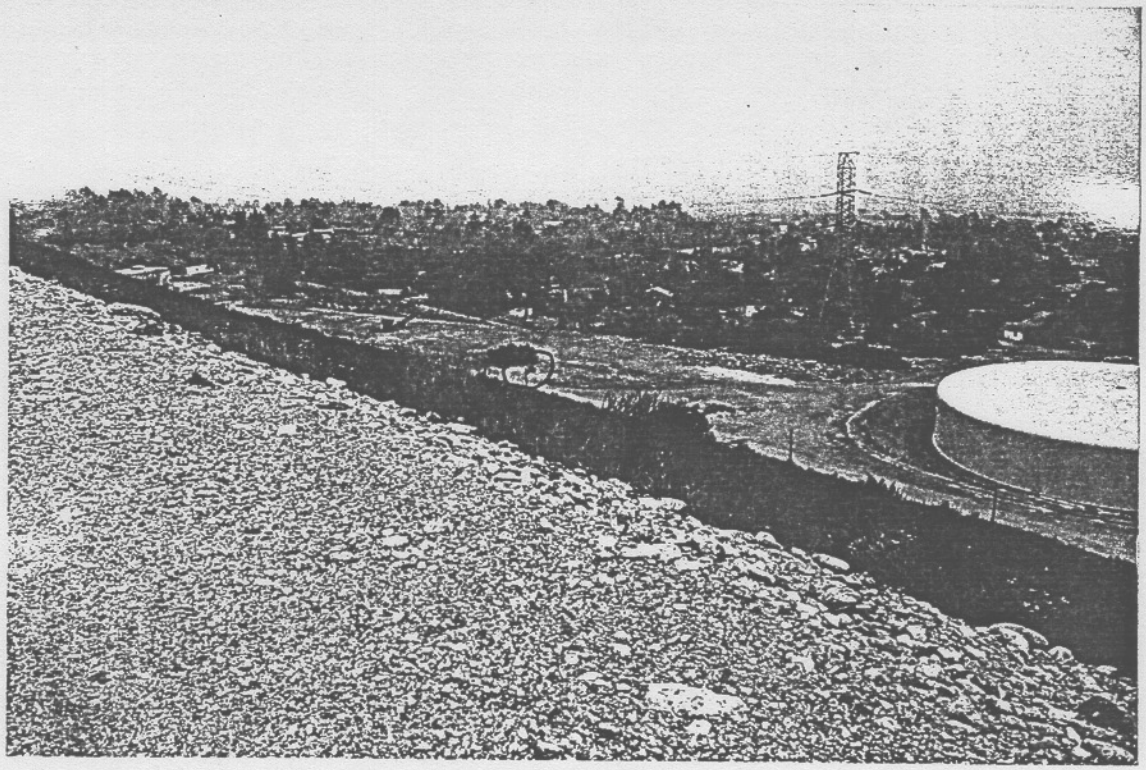

FIGURE 5-09 Location of Observation Well Number 7

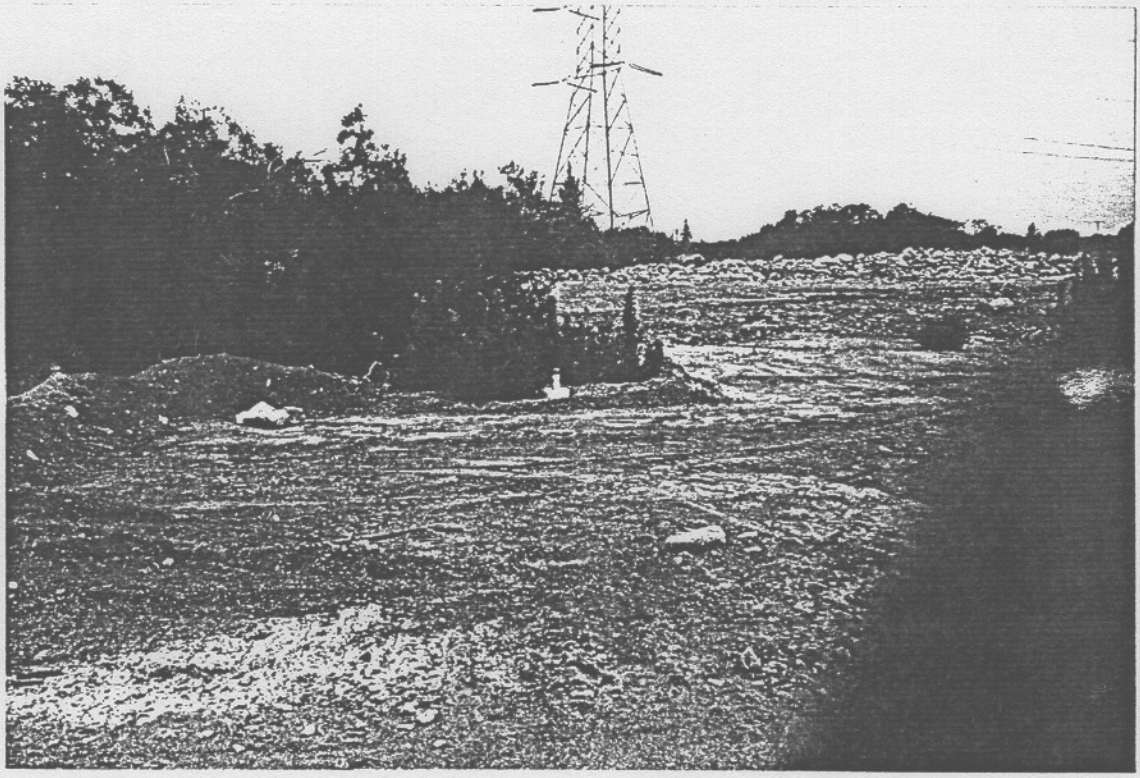

FIGURE 5-10 Close up of Observation Well Number 7