

## VII - WATER CONTROL PLAN

### 7-01. General Objectives

The objective of Brea Dam operations is flood control, specifically, minimization of flood damages along Brea Creek downstream from Brea Dam. For this purpose, water is temporarily stored behind Brea Dam during periods of high inflows and is released slowly through the downstream channel of Brea Creek.

The reduction of inundation damages to the improved reservoir lands by reservoir regulation is not considered. All usage of reservoir land is intended to have a purpose secondary to its role as the bottom of the flood control reservoir. All costs associated with reservoir inundation are intended to be routine maintenance costs associated with a clear understanding of risk and subsequent willingness to locate within the flood control reservoir.

### 7-02. Major Constraints

Because flood control is the sole purpose of Brea Dam, there are no conflicts between purposes. There are two ungated outlets at elevation 251.0 feet and the spillway crest is at elevation 279.0 feet; flows through the ungated outlet and overtopping the spillway cannot be controlled by gate operation.

Local runoff contributes a significant flow into Brea Creek between Brea Dam and its confluence with Coyote Creek during a storm event. The reservoir release should take into account this uncontrolled local runoff together with the channel capacity. The downstream Brea channel capacity varies along the length of the channel, as described in section 4-09. Considering the local runoff and channel capacity along Brea Creek, maximum reservoir release is limited to 1,500 cfs when spillway flow does not occur.

The trash rack occasionally becomes clogged from excess trash and debris accumulation. Photo 3-01 shows 8 feet of debris was built up during February 1986 and is a typical example of debris accumulation that requires periodic maintenance.

Minor constraints include the following: (i) Heavy vegetation grows inside the earthen channel near Hillcrest Park, which causes a reduction of the channel capacity (see Photo 4-02). (ii) A channel grade break at Basque Avenue, which causes a backwater effect upstream, has caused debris and sedimentation accumulation at this location (see Photo 3-02). (iii) The unlined reach (near Hillcrest Park, between Dale Street and Stanton Avenue, and downstream from Western Avenue to the confluence with Coyote Creek) is highly susceptible to bank erosion. These sites should be monitored by channel patrols during major flows.

### 7-03. Overall Plan for Water Control

Brea Dam is operated for flood control only. Plate 2-12, which depicts the storage allocations for Brea Reservoir, shows that the entire space of the reservoir below the elevation 279.0 feet (the spillway crest) is devoted to flood control. Between 279.0 and 292.2 feet (the level of Probable Maximum Flood impoundment),

the space is allocated to spillway surcharge, with flood control no longer the primary objective in deference to controlling the reservoir to assure the safety of the dam. The space between elevation 292.12 and 298 feet (the top of the parapet wall) is reserved for freeboard.

7-04. Standing Instructions to the Project Operator

A set of Standing Instructions to the Project Operator for Water Control have been compiled for Brea Dam. A copy of these instructions for Brea Dam are included in Exhibit A. This exhibit includes instructions to the Project Operator for normal conditions, during communication outages and unforeseen emergency events requiring deviation from the water control plan.

7-05. Flood Control

- a. General. The plan for controlling floods on Brea Creek below Brea Dam is presented in this section.

The objective of the water control plan is to maximize flood control benefits. Project releases will be regulated to protect downstream communities and to avoid spillway flow.

There are two ungated outlets located at elevation 251.0 feet and an emergency spillway with crest elevation at 279.0 feet. Flow through the two ungated outlets is unregulated, although the total downstream release can be regulated by adjusting the gated outlets. Once the spillway overflows occur, the gated outlets are completely closed and the flow cannot be controlled; flood control is no longer the primary objective in reservoir regulation.

b. Current Water Control Plan. Under the current water control plan, real-time precipitation data is utilized to determine gate settings. The project is regulated based on the reservoir water surface elevation and the total precipitation during the past 30 minutes at the dam. This schedule takes into account the downstream channel capacity and the downstream uncontrolled local runoff. The representative rainfall in the basin can be computed using observed measurements of rainfall utilizing either the glass tube rain gauge or the tipping bucket, which are both located inside the control house at Brea Dam, or the Friez dual transverse automatic rain gauges. located at the dam. The reservoir regulation schedule is shown in Exhibit A, Chart A-1. Initially, both gates are open 3.5 feet to pass the flow as rapidly as possible until the outflow reaches approximately 310 cfs at water surface elevation 213.0 feet. Then the gates will be operated to control the outflow according to the reservoir water surface elevation and the rainfall accumulated during the past 30 minutes.

This reservoir regulation schedule specifies the maximum release from Brea Dam that will not exceed the downstream channel capacities along Brea Creek for design inflows to the reservoir of 100-year frequency or less. It takes into account real-time precipitation during the past 30 minutes so that releases from the dam, combined with local inflow from downstream drainage areas, should remain within the channel. For floods larger than 100-year design flow, downstream channel capacities may be exceeded for a relatively short period of time.

7-06. Recreation

As mentioned previously, the sole purpose of Brea Dam is flood control. No water is impounded behind the dam for the purpose of recreation, however several facilities do exist, as described in section 2-06 and shown on plate 2-10 and in table 2-01.

The channel of Brea Creek downstream of Brea Dam is strictly a flood control channel and provides no water-oriented recreational use. Thus, no releases are made for recreational purposes.

7-07. Water Quality

Because Brea Dam is a single purpose flood control dam, it does not impound water for any significant length of time. Therefore, Brea Dam is not operated for water quality objectives. Because Brea Dam has two ungated outlets at elevation 251 feet, it cannot be operated to contain contaminant spills above this elevation.

7-08. Fish and Wildlife

Brea Dam is a single purpose flood control dam. There is no storage allocation for fish and wildlife purposes, nor is there any incidental storage that could be used for fish and wildlife purposes. Therefore, no Brea Dam water control objectives exist for fish and wildlife, either within the reservoir, or within the channel of Brea Creek downstream.

7-09. Channel Maintenance

Maintenance and construction on the downstream channel of Brea Creek normally occur during the dry season of late spring and summer. During such periods, the two Brea Dam gated outlets may be closed in order to reduce releases in support of such downstream activities.

There is a proposal by OCEMA to line the Brea Creek Channel with concrete between Dale Street and the confluence with Coyote Creek. The capacity of the lined channel will be 7,250 cfs between Dale Street and Western Avenue, and 7,600 cfs between Western Avenue and the confluence with Coyote Creek. The current channel capacities are 3,500-4,900 cfs between Dale Street and Western Avenue, and 4,000 cfs between Western Avenue and the Coyote Creek confluence.

7-10. Rate of Release Change

The gates are designed to open or close at one foot per minute under normal operating conditions. Unlined earthen channels may be subjected to bank erosion or sloughing. Channel observers may identify problems and would notify Reservoir Operations Center (ROC) as necessary. During emergencies, or when downstream inflow has filled the channel of Brea Creek, a gradual increase in gate opening at Brea Dam, based upon downstream reports, may be desired.

#### 7-11. Deviation from Normal Regulation

The normal regulation plan for Brea Dam is prescribed as discussed in sections 7-01 through 7-10 above. At times, however, it may be necessary to deviate from normal regulation. These deviations should be approved (except during emergencies) by management before implementation. The magnitude, duration, and impacts of the deviation should be used to determine the level of management approval required. Following is a discussion of the potential deviations that could be allowed.

a. Emergencies. In the event of a potential drowning, toxic spill, or other accident in which high flows on Brea Creek downstream of Brea Dam could prevent rescue or could cause further injury, the two gated outlets at Brea Dam could be temporarily, partially or totally closed. Such emergency action should be taken immediately, unless such action would likely result in worse conditions such as overtopping the dam. Notifications to all concerned agencies should be made as soon as possible.

b. Unplanned Minor Deviations. There are unplanned instances that create a temporary need for minor deviations from the normal regulation of the dam, although they are not considered emergencies. Construction accounts for the major portion of the incidents and includes utility stream crossings, bridge work, and major construction contracts. Changes in releases are sometimes necessary for maintenance and inspection. Requests for changes of release rates are generally for a few hours to a few days. Each request is analyzed on its own merits. Consideration is given to upstream watershed conditions, potential flood threat, conditions of the reservoir, and possible alternative measures. In the interest of maintaining good public relations, the requests are complied with, provided there are no adverse effects on the overall regulation of the project for the authorized purpose.

c. Planned Deviations. Each condition should be analyzed on its own merits. Sufficient data on flood potential, reservoir and watershed conditions, possible alternative measures, benefits to be expected, and probable effects on other authorized and useful purposes will be presented along with recommendations for review and approval.

#### 7-12. Drought Contingency Plan

Brea Dam and Reservoir does not contain any storage allocation for water supply or water conservation. Brea Creek downstream from the dam is mostly concrete lined and does not contain any ground water recharge facilities. However, in the event of a drought, the possibility of impounding water for water conservation would be considered. Any such plan would be evaluated to ensure that the flood control purpose of the project would not be compromised.