

EXHIBIT A.

**STANDING INSTRUCTIONS TO PROJECT
OPERATOR (DAM TENDER)
FOR WATER CONTROL**

**STANDING INSTRUCTIONS TO THE
PROJECT OPERATORS (DAM TENDER)
FOR WATER CONTROL**

**SEVEN OAKS DAM
SANTA ANA RIVER
SAN BERNARDINO COUNTY, CALIFORNIA**

Los Angeles District Office
U.S. Army Corps of Engineers
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STANDING INSTRUCTIONS TO THE PROJECT OPERATORS
FOR WATER CONTROL

SEVEN OAKS DAM WATER CONTROL MANUAL

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Exhibit A

I – BACKGROUND AND RESPONSIBILITIES

1-01 General Information.

a. **General.** This exhibit is prepared in accordance with instructions contained in the Corps of Engineers, Engineering Manual, (EM) 1110-2-3600, paragraph 9-2, (Standing Instructions to Project Operators for Water Control), and Engineering Regulation, (ER) 1110-2-240. This exhibit outlines the duties and responsibilities of the project operators (dam tenders) in connection with the operation of Seven Oaks Dam and the reporting of required hydrologic data.

Operational instructions to the project operators are outlined with specific emphasis on flood emergencies when communications between the project operators and the Orange County Public Facilities & Resources Department (OCPF&RD), Storm Operation Center have been disrupted. This exhibit is to be used in conjunction with the rest of the Seven Oaks Dam Water Control Manual. Plate 7-01 of the Water Control Manual shows the approved water control plan for Seven Oaks Dam.

The project operators are required to have these standing instructions and the following two manuals available at the dam site: 1) the current year’s list of notifications for during normal and emergency operation; 2) the “Operation and Maintenance Manual for Seven Oaks Dam.”

b. **Project Purpose.** The overall objectives of the Seven Oaks Dam Water Control Plan are 1) to provide flood control, 2) dam safety, 3) mitigation of impacts to downstream water users, 4) environmental operation, and 5) the prototype testing program. The details of the water control plan is illustrated in Plate 7-01 and described in section 7-05. The flood control operation plan within the debris pool is designed to mitigate for project impacts upon downstream water users. In addition, when conditions

warrant, the plan also allows modifications of releases to support downstream environmental mitigation and enhancement plans and the prototype-testing program as described in section 7-05.i. and Exhibit F, respectively, of the Water Control Manual.

c. Reservoir Regulation. The OCPF&RD Storm Operation Center conducts regulation of Seven Oaks Dam. Figure 9-01 of the water control manual is an organizational chart depicting the chain of command for reservoir regulation decisions.

d. Project Location. Seven Oaks Dam is located on the Santa Ana River, in the upper Santa Ana Canyon about 8 miles (13 km) northeast of the City of Redlands, in San Bernardino County California. This project is planned to operate in conjunction with Prado Dam, which is located 40.3 miles (54.9 km) downstream. The Santa Ana River watershed has an area of 2,450 sq-mi. The upper Santa Ana River drainage area for Seven Oaks Dam is 177 sq-mi, excluding the 32 sq-mi tributary to Baldwin Lake, and has its headwaters in the San Bernardino Mountains. Plate 2-01 of the water control manual shows the Santa Ana River drainage basin and the location of Seven Oaks Dam.

e. Project Description. Seven Oaks Dam consists of an earth-filled embankment with a natural rock spillway, a multi-level withdrawal (MWS) structure, a main intake structure, a minimum discharge line, and gated outlet works. The general plan and elevation of the dam are shown on Plate 2-06 of the water control manual.

Seven Oaks Dam has three outlets: the main regulating outlet (RO) tunnel, a low flow bypass and a minimum discharge line. The RO tunnel is control by two 5'W X 9'H vertical slide gates, and the low flow bypass is controlled one 2'W X 3.5H vertical slide gate. The minimum discharge line (MDL), which is part of the MWS structure, equipped with a 14-inch and 8-inch cone valves. The invert elevation of all outlets is at 2,100 feet, NGVD. The spillway is a natural rock saddle structure located just east of the dam. The spillway crest elevation is at 2,580 feet, NGVD. The discharge rating curves for the outlet gates and the spillway are shown within the water control manual on Plates 7-02 to

7-07 and 2-25, respectively. The spillway general plan and profile is shown on Plate 2-25.

The reservoir capacity below the spillway crest is 147,969 ac-ft, which is designed for flood control. The area and gross capacity relationships of the Seven Oaks Flood Control Basin are shown on Plate 2-27. The area and gross capacity tables are provided in Exhibit B of the water control manual.

f. Downstream Channel Constraints. The maximum release capacity at Seven Oaks Dam is 8,000 cfs. The Water Control Plan allows a maximum release of 7,000 cfs. Currently, there are no identified channel constraints downstream of Seven Oaks Dam that would not allow these maximum release rates.

g. Ownership. Seven Oaks Dam is jointly owned and maintained by San Bernardino, Riverside, and Orange Counties. San Bernardino County Flood Control District (SBCFCD) is charged with the responsibility for physical operation of the dam. The OCPF&RD is charged with the reservoir regulation responsibilities of the dam.

1-02 Role of the Project Operators.

a. Normal Conditions. The project operators will be instructed by the Storm Operation Center, as necessary, for water control actions under normal hydrometeorological conditions.

The project operators are responsible for the physical operation of the project. This includes ensuring that all the equipment is in good operating condition, and that the gates and electrical facilities in the control house are periodically inspected and tested according to the pre-established schedule. A minimum of two project operators will be required for day-to-day operations of the dam.

b. Emergency Conditions . The project operators will be instructed by the Storm Operation Center regarding water control actions during flood events and other emergency conditions.

The Project Operators' responsibilities include:

- (1) Be present at the dam when rainfall or runoff is occurring or furnish the Storm Operation Center a telephone number through which he or she can be reached.
- (2) See that all equipment at the reservoir such as recorders, indicating gages, gate mechanisms, power units, radios, etc., is in operating conditions.
- (3) Operate gates in accordance with instructions from the Storm Operation Center.
- (4) Keep the Storm Operation Center notified of any unusual developments such as trash accumulation, power failure, mechanical difficulties, etc.
- (5) Follow the no-communication schedule shown in Plate A-01 during periods of no-communication with the Storm Operation Center.
- (6) Assist engineers dispatched by the Storm Operation Center during flood emergencies in every way possible.
- (7) Maintain routine records such as water surface elevations, outflow gage heights, precipitation amounts, gate openings and a daily log on prescribed forms.

(8) Notify local authorities and interested agencies of anticipated releases from the reservoir when instructed to do so by the Storm Operation Center or if communications are interrupted.

(9) Obtain hydrologic and hydraulic data from other agencies upon request of the Storm Operation Center.

II – DATA COLLECTION AND REPORTING

2-01 Normal Conditions During Flood Season. Normal operation during flood seasons, measurements are made daily by the project operators to determine the water surface elevation (staff and digital reading), the setting of each outlet gate (RO, LF and Cone Valves), the position of the sluice gate, and the times of these measurements. Normal conditions during non-flood seasons, measurements are made once a week.

The project operators maintain the records of measurements, and log all radio and telephone communication. The following forms are used by the Corps for reservoir operations, and may be used for the operation of Seven Oaks Dam, if desired: the Flood Control Basin Operation Report, SPL Form 19 (Plate A-03); Rainfall Record, SPL Form 31 (Plate A-04).

2-02 Emergency Conditions. During flood operations or emergency operations, the project operators should follow instructions, as issued by the Storm Operation Center. Measurements may be required at one-hour intervals from the staff gage, and other instruments as specified by the Storm Operation Center personnel.

When reporting to the Storm Operation Center the project operators should clearly describe any silt and debris situation at the intake structure, gates and downstream gages. When instruments are not working, or are stuck in silt, the project operators should not report the erroneous reading, but should state the instrument or staff problem. Care should be taken to avoid issuing misleading reports due to siltation at the reservoir staff boards. When debris or silt cause the flow to be deceptively perched above the invert, or cause a loss of contact with the staff board, the project operators should report a descriptive message identifying the limitations, and quantifying the estimated reservoir depth.

If the radio system fails, the project operators should try to re-establish communication via telephone.

2-03 Regional Hydrometeorological Conditions. The project operators will be informed by the Storm Operation Center of regional hydrometeorological conditions that may impact the project.

III – WATER CONTROL ACTION AND REPORTING

3-01 Normal Conditions. During normal hydrometeorological conditions, the project operators will be instructed by the Storm Operation Center for the appropriate water control action. A minimum of two project operators will be required during operation of the dam. The project operators should:

1. Establish communication with the Storm Operation Center.
2. Implement instructions.
3. Notify the Storm Operation Center on the status of the water control action.

The project operators should not implement any gate change, even if the change will have no effect on the reservoir operation, without first obtaining approval from the Storm Operation Center. The project operators may request gate-setting changes for reasons of maintenance etc., and the request must first be approved by the Storm Operation Center.

3-02 Emergency Conditions. During emergency conditions, the project operators will be instructed by the Storm Operation Center regarding any necessary water control action. During flood conditions, the project operators will be instructed according to the approved water control plan and will be required to notify the Storm Operation Center for upcoming gate changes. The project operators should:

1. Establish communication with the Storm Operation Center.
2. Implement the instructions.
3. Notify the Storm Operation Center on the status of the water control action.

3-03 Inquiries. All significant inquiries received by the project operators from citizens, constituents, or interested groups regarding water control procedures or actions must be referred directly to the Storm Operation Center.

3-04 Water Control Problems. The Storm Operation Center must be contacted immediately by the most rapid means available in the event that an operational malfunction, erosion, or other incident occurs that could impact project integrity in general or water control capability, in particular.

Emergency departures from the regulation instructions issued by the Storm Operation Center may be required, because of water control equipment failures, accidents, or other emergencies requiring immediate action. Under these situations, the project operators should contact the Storm Operation Center via radio for instructions. When communications are broken, or the situation demands immediate action, the project operators may proceed independently. The Storm Operation Center should be notified of such action as soon as possible. All other non-emergency deviations from normal procedures should be approved in advance through the Corps of Engineers, Los Angeles District. Permanent changes to the water control plan are subject to approval by the Division Engineer, South Pacific Division of the U.S. Army Corps of Engineers.

The project operators should immediately alert the Storm Operation Center (call via radio or telephone, whenever the requested gate change cannot be fully implemented due to mechanical or physical problems. For example, debris could prevent total gate closure. The Storm Operation Center will evaluate the problem and provide further instructions to the Project operators.

3-05 Communication Outage. The Storm Operation Center maintains close contact with the project operators at Seven Oaks Dam. During flood periods, communication between the project operators and Storm Operation Center may be broken. The project operators should try to re-establish communication with the Storm Operation Center at the project first by telephone, and if contact is not successful, then contact the San

Bernardino County Flood Control District at (909) 387-7995. The project operators should **not** leave the immediate vicinity of the project.

During the rising stages of the flood, the project operators should maintain the last gate setting as instructed by the Storm Operation Center and try to re-establish communication with the Storm Operation Center. Reservoir water surface elevation staff readings should be obtained hourly and logged. If communication cannot be re-established while inflow is still high and the reservoir pool is continuously rising, the dam tenders should not make any attempt to move the gates in order to increase or decrease the releases, unless there is an emergency that requires such gate change. If reservoir water surface elevation drops for 8 consecutive hours or more, and communication with the storm operation center is still not available, project operators should follow the schedule under “falling pool in the “no communication” plan as outlined on Plate A-01. Adhere to the rate of change of release limitations give in Table 2 of Plate 7-01 when increasing releases.

Emergency notifications are normally made by the Storm Operation Center. However, if the project operators lose communication with the Storm Operation Center and an emergency notification situation arises, such as an imminent dam failure or uncontrolled spillway flow (water surface elevation above 2,580 feet), the project operators should make the necessary notifications. The notification list is updated each year by the Storm Operation Center personnel and should be made available at the dam site.

The notifications should include: (a) description of the type and extent of existing or impending emergency; (b) advisement for evacuation from the flood plain; (c) information on the estimated time of initial release of hazardous amounts of water; (d) the depth of water behind the dam; and (e) the project operators’ name and telephone number.

Upon completing the above notifications, attempt to re-establish communications with the Storm Operation Center. Document all notifications made on SPL Form 188 (Plate A-02). The project operators should not leave the dam unless their safety is in jeopardy.

Seven Oaks Dam Standing Instructions No-Communication Schedule

(To be Used by the Dam Operators Only If the Communication with the Storm Operation Center is Disrupted)

RISING POOL (If Seven Oaks Dam Elevation is Rising)	WSE RANGE (Feet, NGVD)	FALLING POOL (If Seven Oaks Dam Elevation is Falling)			Approximate Discharge (cfs)
MAINTAIN CURRENT GATE SETTING; DO NOT MAKE GATE CHANGES UNTIL COMMUNICATION WITH THE STORM OPERATION CENTER IS ESTABLISHED.	2100 – 2200	Maintain gate setting; Do not make adjustments			VARIES
		Gate Setting (Opening in Feet)			
		ROG1	LF	ROG2	
	2200 - 2265	0	2.8	0	500
	2265 - 2267	0	2.8	0.75	750
	2267 - 2269	.75	2.8	0.75	1000
	2269 – 2273	1.2	2.8	1.2	1500
	2273 - 2298	1.8	2.8	1.8	2000
	2298 - 2325	2.2	2.8	2.2	2500
	2325 - 2350	2.6	2.8	2.6	3000
	2350 - 2375	3.0	2.8	3.0	3500
	2375 – 2400	3.3	2.8	3.3	4000
	2400 - 2433	4.0	2.8	4.0	5000
	2433 - 2466	4.8	2.8	4.8	6000
	2466 – 2500	5.1	2.8	5.1	6500
2500 – 2585	5.0	2.8	5.0	7000	
>2585	0	0	0	SPILLWAY FLOW	

RECORD OF CALLS					<input type="checkbox"/> Radio <input type="checkbox"/> Telephone		Date
Local Time	From		To		Check Repeatable calls	Message or Remarks	
	Person and/or Call Sign	Telephone and City	Person and/or Call Sign	Telephone and City			

*Reportable telephone calls include collect calls, charge calls and long distance calls that can not be dialed without a code number.

RAINFALL RECORD

STATION						<input type="checkbox"/> HOURLY <input type="checkbox"/> DAILY		DATE
HR	DA	TIME OF READING	GAGE READING	STORM TOTAL	SEASON TOTAL	OBSERVER	REMARKS (SNOW, TEMP., ETC.)	
0000	1							
0100	2							
0200	3							
0300	4							
0400	5							
0500	6							
0600	7							
0700	8							
0800	9							
0900	10							
1000	11							
1100	12							
1200	13							
1300	14							
1400	15							
1500	16							
1600	17							
1700	18							
1800	19							
1900	20							
2000	21							
2100	22							
2200	23							
2300	24							
2400	25							
	26							
	27							
	28							
	29							
	30							
	31							
TOTAL								

SPL FORM OCT 55 31

PREV. ED. OF THIS FORM MAY BE USED
REPLACES SPL FORM 32 WHICH MAY BE USED