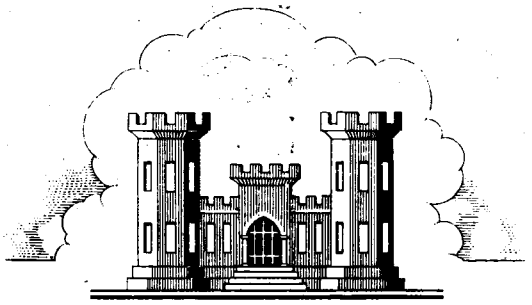
GILA RIVER BASIN
PHOENIX, ARIZONA AND VICINITY (INCLUDING NEW RIVER)

NEW RIVER DAM

MARICOPA COUNTY, ARIZONA

FLOOD EMERGENCY PLAN DURING CONSTRUCTION



U.S. ARMY ENGINEER DISTRICT, LOS ANGELES
CORPS OF ENGINEERS
APRIL 1984

NEW RIVER DAM
MARICOPA COUNTY, ARIZONA
FLOOD EMERGENCY PLAN
DURING CONSTRUCTION

CONTENTS

FLOOD EMERGENCY PLAN
FOR
NEW RIVER DAM DURING CONSTRUCTION

1. Introduction

The critical period regarding dam safety is generally during construction and initial storage of water in the reservoir. Therefore, an emergency plan is particularly important during this period.

a. Authorization

(1) SPDED/SPDCO letter dated 22 March 1984; Subject: Preparation of Emergency Plan for New River Dam.

(2) ER 1110-2-2901, Construction Cofferdams, 7 August 1972.

(3) General Heiberg's transmittal letter for HEC Flood Emergency Plans, Guidelines for Corps Dams, June 1980.

b. Purpose

The purpose of the Flood Emergency Plan during construction of New River Dam is to provide field personnel with plans to deal with potential emergencies caused by embankment failure during closure period (stage III fill) and initial storage of water in the reservoir.

c. References

Federal Guidelines for Dam Safety, June 1979.
Flood Emergency Plans - Guidelines for Corps Dams - June 1980.

d. Scope

This plan addresses emergencies related to unusually high water levels in the reservoir caused by extreme storms and rapid release of large volumes of water past the stage III fill. It covers identification of impending or existing emergencies, emergency operations and repairs, and notification of other parties concerning impending or existing emergencies. Areas potentially affected by emergencies are identified for the case of stage III fill failure at high water pool (elevation 1456.2).

2. Description of Project Area

a. Location

The New River Dam project is located in Maricopa County, Arizona. The dam is in New River, about 23 miles northwest of Phoenix and about 7 miles west of Black Canyon Highway.

b. Drainage Area

New River has its headwaters in the New River Mountains, roughly 40 miles north of Phoenix. New River flows generally southward for about 24 miles to New River Dam. The drainage area of New River above New River Dam site is 164 square miles, 41 percent of which are mountaineous. Elevation in the basin ranges from a little over 5,000 feet in the New River Mountains to about 1,040 feet at the confluence with the Agua Fria River. Stream gradients decrease from 370 feet per mile in the mountains to 10 feet per mile in the valley.

c. Topography

The project area is bounded to the southeast and southwest by low-lying East and West Wing Mountains, respectively, and to the east by an unnamed group of peaks. The damsite spans a narrow valley between the East and West Wing Mountains at the northern edge of Deer Valley. The main drainage from the project area is through Deer Valley to the Agua Fria River and then to the Gila River. The New River begins in the New River Mountains about 40 miles north of Phoenix and is approximately 40 miles long. The New River merges with Skunk Creek, approximately 8 miles below the damsite, then flows about 8 miles further downstream before merging with the Agua Fria River.

d. Geology

The damsite spans the New River between the West Wing Mountains, which form the right abutment, and Keefer Hill, a westward projection of the East Wing Mountains, which form the left abutment. The valley is approximately 2000 feet wide at the project site. The West Wing Mountains are composed of various Tertiary volcanic rocks described as felsite, flow breccia, tuff, and tuffaceous agglomerate. The valley floor consists of poorly to well-cemented Quaternary silts, sands, and gravels that are underlain by Tertiary volcanics near the right abutment and Precambrian granites near the left abutment. The thickness of this older alluvium at the site varies from a few feet near both abutments to an approximate depth of 136 feet near the center of the valley. The older alluvium is masked by shallow deposits of younger alluvium, consisting of loose sands, gravels, and cobbles with occasional boulders, which are generally found in the active stream channel and the smaller washes. The older alluvium includes slope wash and residual soil found on both abutments and the spillway sites. The East Wing Mountains, including Keefer Hill, are composed primarily of Precambrian granite and granodiorite with minor gneiss, vein quartz, and schist intrusives.

e. Climate

The climate of Phoenix and vicinity ranges from warm and arid over the desert floor to cool and moderately humid in the mountains. Mean annual precipitation ranges from around 7 inches in the area south and west of Phoenix to more than 22 inches in the New River Mountains. Most of the precipitation occurs in two distinct seasons, summer (June through September) and winter (December through March), and is about equally divided between

them. Much of the winter precipitation falls as snow at elevations above 6000 feet. Three basic types of storms can affect the Phoenix area, although some may consist of a combination of types.

1. General Winter Storms. Storms of this type normally move inland from the north Pacific Ocean, spreading light to moderate precipitation over large areas. Although they can occur any time from late October through May, they are most common and generally heaviest from December through early March. These storms frequently last several days and may occur in series with only slight breaks between storms. They usually reflect orographic effects (lifting by mountains) to a great degree, so the mountains of central Arizona often receive from four to ten times as much precipitation from winter storms as do the desert areas near Phoenix and south and west and of the city. Snow frequently falls in the mountains above 6000 feet and occasionally falls at elevations below 3000 feet. Despite the normally low intensities of precipitation during general winter storms, the large areal extent and the relatively long duration of these storms, sometimes combined with snowmelt from the mountains, can produce substantial volumes of runoff and high peak discharges on the large rivers of the region.

2. General Summer Storms. Storms of this type normally result from a flow of warm and very moist tropical air into the region from the southeast or south, including the Gulf of California (Sea of Cortez), the tropical Pacific Ocean south of Baja California, and, to a slight extent, the Gulf of Mexico. Such storms over Arizona are often associated with tropical storms or hurricanes. General summer storms can occur any time from late June through mid-October, but are most frequent from August through early October. They usually last from one to three days and generally consist of numerous locally heavy storm cells embedded in more widespread, light to moderate rain. Like their general winter counterparts they usually reflect orographic influence, with higher mountains often receiving from three to eight times as much precipitation as do most of the desert areas. Some of the late September and October general storms can show characteristics of both the summer and winter types. The areal extent and duration of general summer storms are usually somewhat less than those of general winter storms, but intensities may be higher. Because infiltration rates are normally higher during summer than during winter, runoff volumes are usually lower than from winter events, but the peak flows on intermediate-sized streams may be higher.

3. Local Storms. Local storms consist of heavy downpours of rain over relatively small areas (up to about 300 square miles) for short periods of time (up to about 7 hours). They are usually accompanied by lightning and thunder, and are often referred to as "thunderstorms" or "cloudbursts." They can occur any time of the year, but are most prevalent and most intense during the summer months, July to September, when tropical moisture frequently invades Arizona from out of the south or southeast. During the latter part of the summer season they are often larger, of longer duration, and more apt to be associated with general summer storms. Runoff from local storms is usually of a high-peak, low-volume type, affecting mostly the smaller creeks and washes, and is characterized by a rapidily rising and receding hydrograph. They can result in series flash floods, sometimes with loss of life and serious local property damage.

f. Principal streams between New River Dam and Gila River

The river reaches discussed in this section extend along the New River from the New River Dam to the Agua Fria River, a distance of about 16.1 miles, and along the Agua Fria River from the New River confluence to the Gila River, a distance of about 10.1 miles. The New River, between the dam and Skunk Creek (8.5 miles), has a nondamaging capacity greater than the 2665-ft^3/s discharge from New River Dam.

3. Description of Project Features

a. Main Embankment

The main embankment is a compacted-earthfill structure with a maximum height of about 104 feet above streambed. The crest of the embankment (el. 1486.7, exclusive of settlement allowance) is 2327 feet long.

b. Dike No. 1

An earthfill dike, about 7000 feet northwest of the right abutment of the main embankment, is required along the west edge of the detention basin area to confine the design flood. The dike has a crest length of 7475 feet and a maximum height of about 36 feet.

c. Spillway

An unlined spillway, 700 feet west of the right abutment of the main embankment, is trapezoidal in cross section and 75 feet wide at the crest (el. 1456.2). The spillway, in conjunction with the outlet works, will pass a peak discharge of 33,000 ft^3/s with 5.6 feet of freeboard.

d. Outlet Works

The outlet works consist of an inlet structure, conduit, and an energy dissipator. The rectangular (9.5-foot 6.25-foot) conduit, which has an inlet elevation of 1389.25 feet, is 433 feet long and capable of releasing up to 2665 ft^3/s when the water surface is at spillway crest. At the downstream end of the conduit, an energy dissipator is constructed to reduce the velocity of discharge prior to entering the natural stream.

e. Detention Basin

The detention basin will have a gross capacity of 43,520 acre-feet, of which 4920 acre-feet will be for the accumulation of sediment over a 100-year period and 38,600 acre-feet will be for flood control. The detention basin will reduce the SPF with a peak inflow of 45,000 ft^3/s to an outflow of 2665 ft^3/s.

4. Potential Causes of an Emergency

Potential causes of an emergency affecting the construction and safety of New River Dam are described in the following subparagraphs.

a. Extreme storm

Although the final closure (stage III) construction would be completed during the fall dry season (15 September-15 November) or spring dry season (1 April-30 June), an unexpected extreme storm is assumed to occur over the watershed upstream of the project area during the closure period. This extreme storm could result in large inflows to the reservoir, and could cause a rapid high reservoir level and high waves on the reservoir surface if the outlet is malfunctioning.

b. Slope failure

A sliding or sloughing of the stage III fill could occur. A slope failure that extended to the top of the fill could effectively lower the crest of the stage III fill. This could result in sudden release of a large volume of water if the reservoir water surface exceeds the elevation of the crest of the stage III fill.

5. Inundation Map

Plate 4 shows the boundary of the area expected to be inundated by failure of the stage III fill at normal high pool level. Inundation flows immediately downstream of the dam are confined largely between the dam area and an area near the corporate boundary lines of Peoria and Sun City at about elevation of 1260. The flow would cover the flood plain with depths of 45 to 10 feet and velocities from 22.5 to 3.5 feet per second.

6. Affected Areas

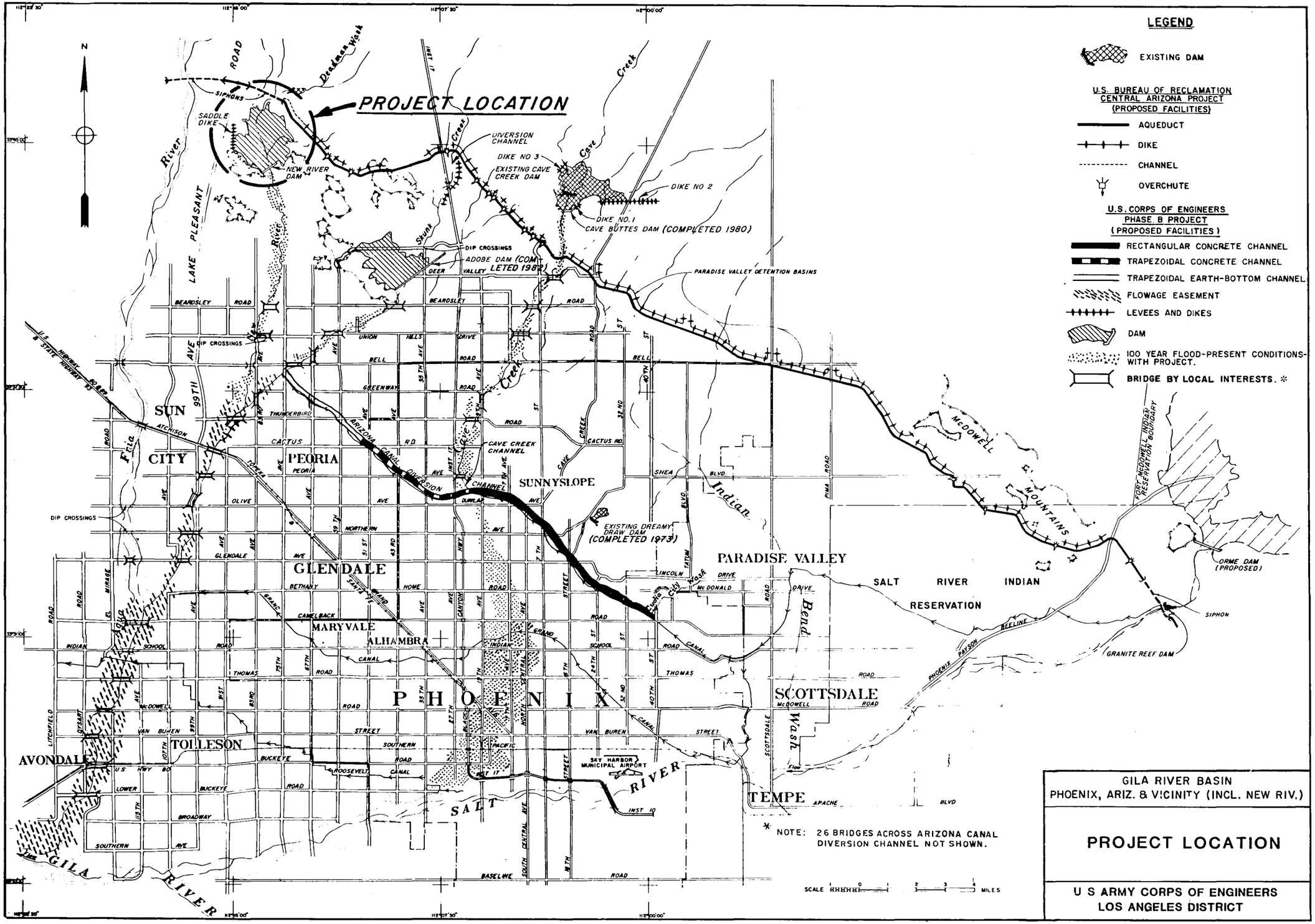
The areas affected by inundation are the northern portions of Sun City and Peoria just above the confluence of Skunk Creek with New River and between New River and Agua Fria River.

Where major flooding would occur in the northern portions if the flood waters were not absorbed by the Skunk Creek bank, residual ponding will be sustained from the sheet flows remaining from about 1 to 2 miles above the confluence of New River and Skunk Creek.

All existing bridges on this reach crossing at Beardsley Road, Union Hills Drive, Bell Road, A.T. and S.F.R.R., Peoria Avenue, Olive Avenue, and Glendale Avenue would be inundated.

Downstream from approximate Beardsley Road the floodwater would cover the flood plain throughout the northern portion of the valley. The floodwater would fan out into the Skunk Creek.

The approximate time of travel for the flood peak to reach populated areas are as follows: (a) to Peoria, 51 minutes, (b) to confluence with Skunk Creek, 2 hours and 25 minutes. It is estimated that significant flooding would occur at the most northern portions of Peoria within 30 minutes after the start of the dam failure and at Sun City within 2 hours.



LEGEND

- EXISTING DAM

U.S. BUREAU OF RECLAMATION CENTRAL ARIZONA PROJECT (PROPOSED FACILITIES)

- AQUEDUCT
- DIKE
- CHANNEL
- OVERCHUTE

U.S. CORPS OF ENGINEERS PHASE B PROJECT (PROPOSED FACILITIES)

- RECTANGULAR CONCRETE CHANNEL
- TRAPEZOIDAL CONCRETE CHANNEL
- TRAPEZOIDAL EARTH-BOTTOM CHANNEL
- FLOWAGE EASEMENT
- LEVEES AND DIKES
- DAM
- 100 YEAR FLOOD-PRESENT CONDITIONS-WITH PROJECT.
- BRIDGE BY LOCAL INTERESTS. *

* NOTE: 26 BRIDGES ACROSS ARIZONA CANAL DIVERSION CHANNEL NOT SHOWN.

SCALE 0 1 2 3 4 MILES

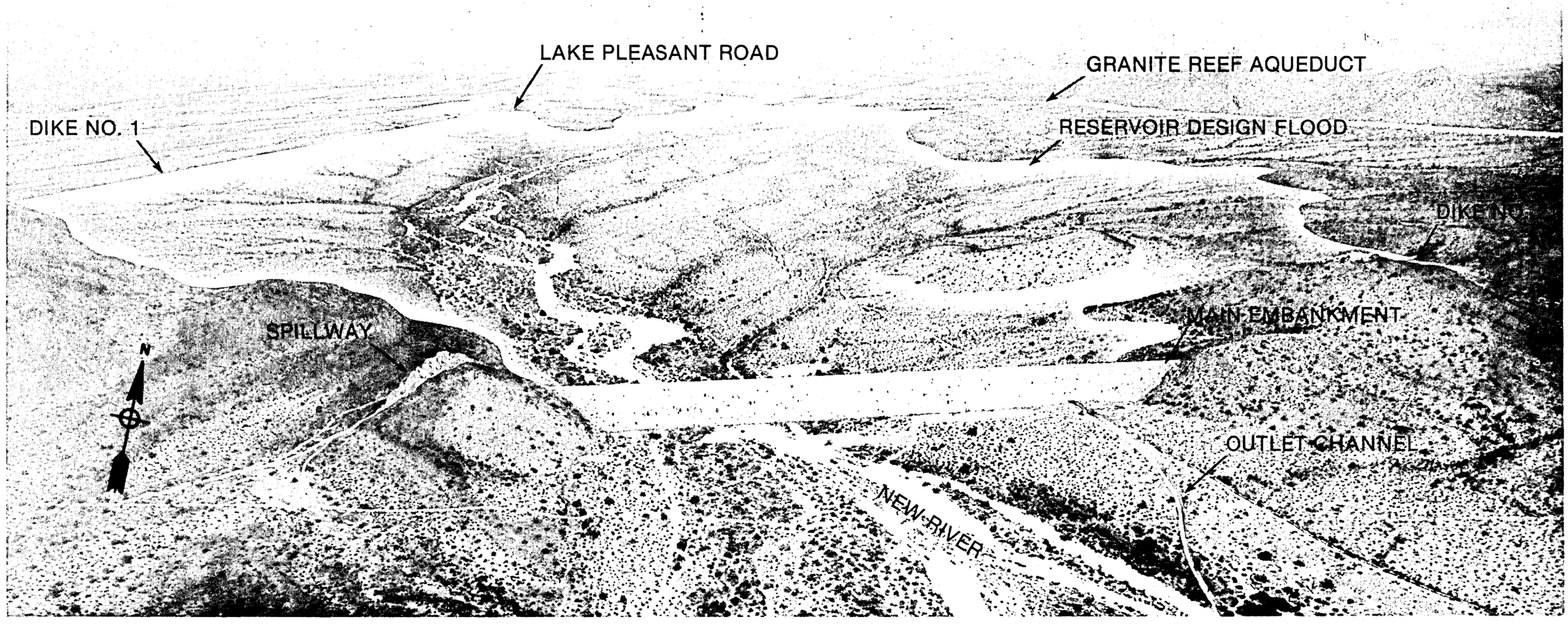
GILA RIVER BASIN
PHOENIX, ARIZ. & VICINITY (INCL. NEW RIV.)

PROJECT LOCATION

U S ARMY CORPS OF ENGINEERS
LOS ANGELES DISTRICT

PLATE 1

New River Dam



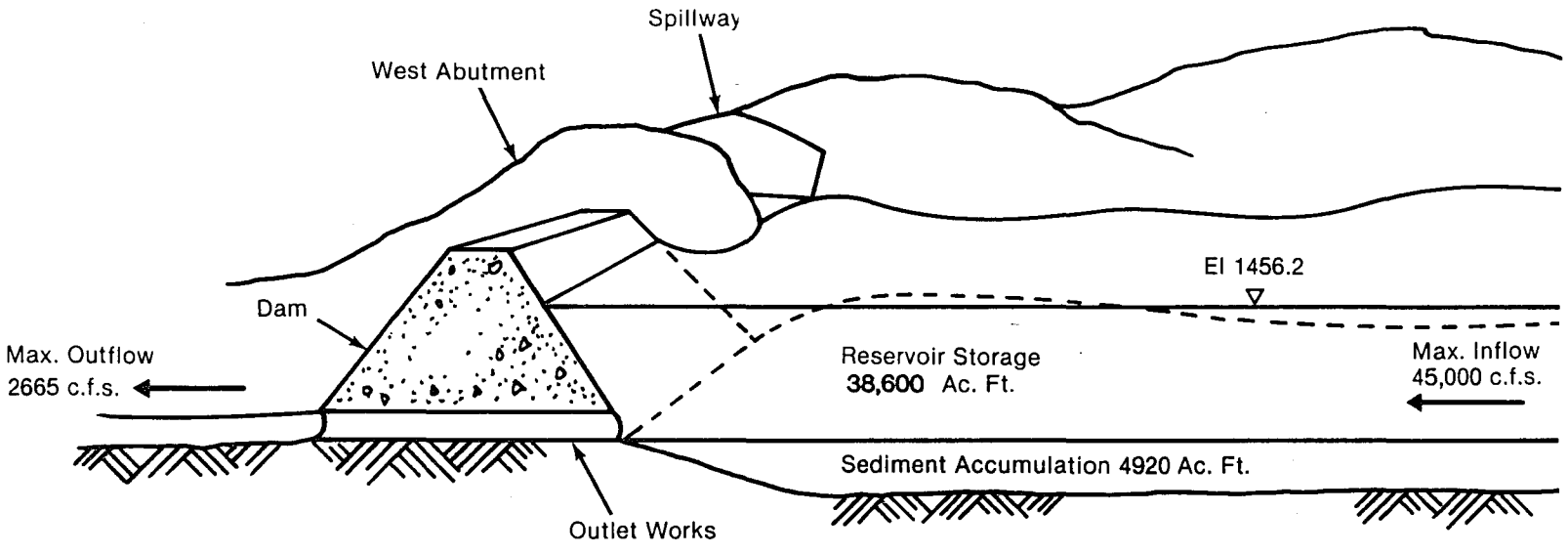
PERTINENT DATA

Drainage Area	164	sq. mi.
Type of Dam-Compacted Earth Filled		
Main Embankment		
Crest elevation	1486.7	ft., m.s.l.
Maximum height above streambed	104	ft.
Crest length	2320	ft.
Freeboard	5.6	ft.
Spillway		
Crest elevation	1456.2	ft., m.s.l.
Crest length	75	ft.

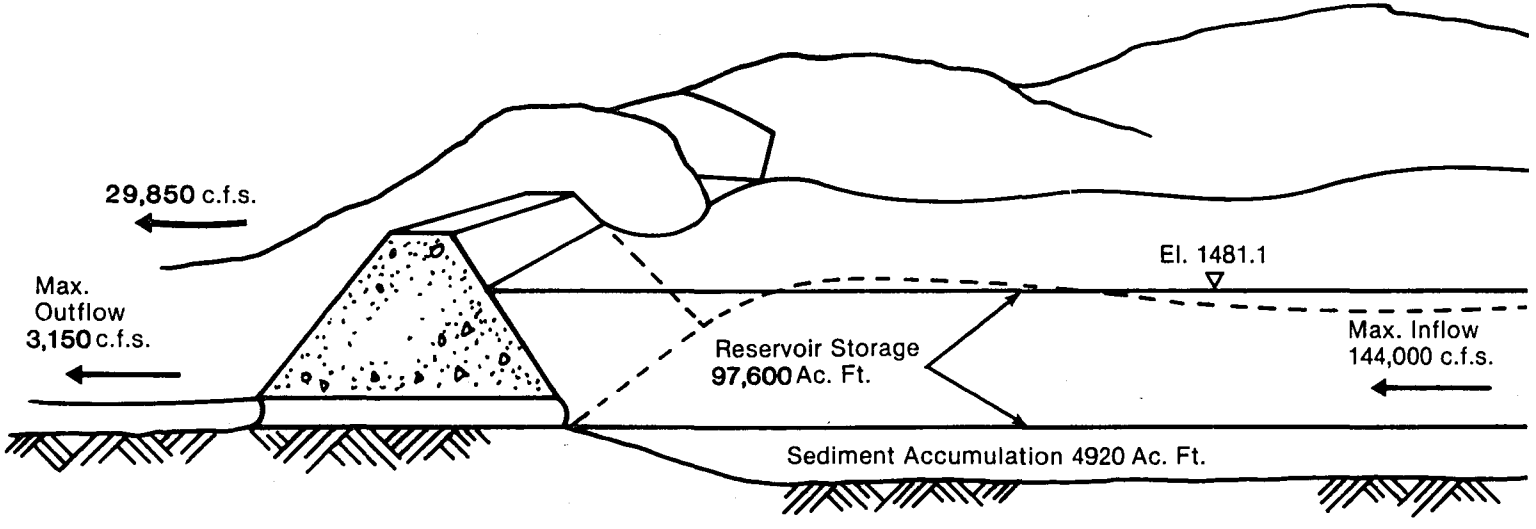
Max. water Surface elevation	1481.1	ft., m.s.l.
Outlet Conduit		
Interior dimension	9.5H x 6.25W	ft.
Length	433	ft.
Inlet elevation	1389.25	ft., m.s.l.
Outlet elevation	1386.31	ft., m.s.l.
Energy dissipator		
Length	60.98	ft.
Width	31.0	ft.
Floor elevation	1372.0	ft., m.s.l.
Wall height	22.0	ft.

Outlet Channel		
Base width	16.0	ft.
Side slope	2.5	H on 1V
Levee height	15.5 ft.-14.0	ft.
Length	730.32	ft.
Reservoir Area		
Spillway crest	1780	acres
Max. water surface	2900	acres
Capacity (Gross)		
Spillway crest	43,520	ac. ft.
Max. water surface	102,520	ac. ft.

Storage Allocation below spillway crest		
Flood control (net)	38,600	ac. ft.
Sedimentation	4,920	ac. ft.
Standard Project Flood		
Total volume	49,300	ac. ft.
Peak inflow	45,000	c.f.s.
Peak outflow	2,665	c.f.s.
Maximum Probable Flood		
Total volume	105,000	ac. ft.
Peak inflow	144,000	c.f.s.
Peak outflow	33,000	c.f.s.



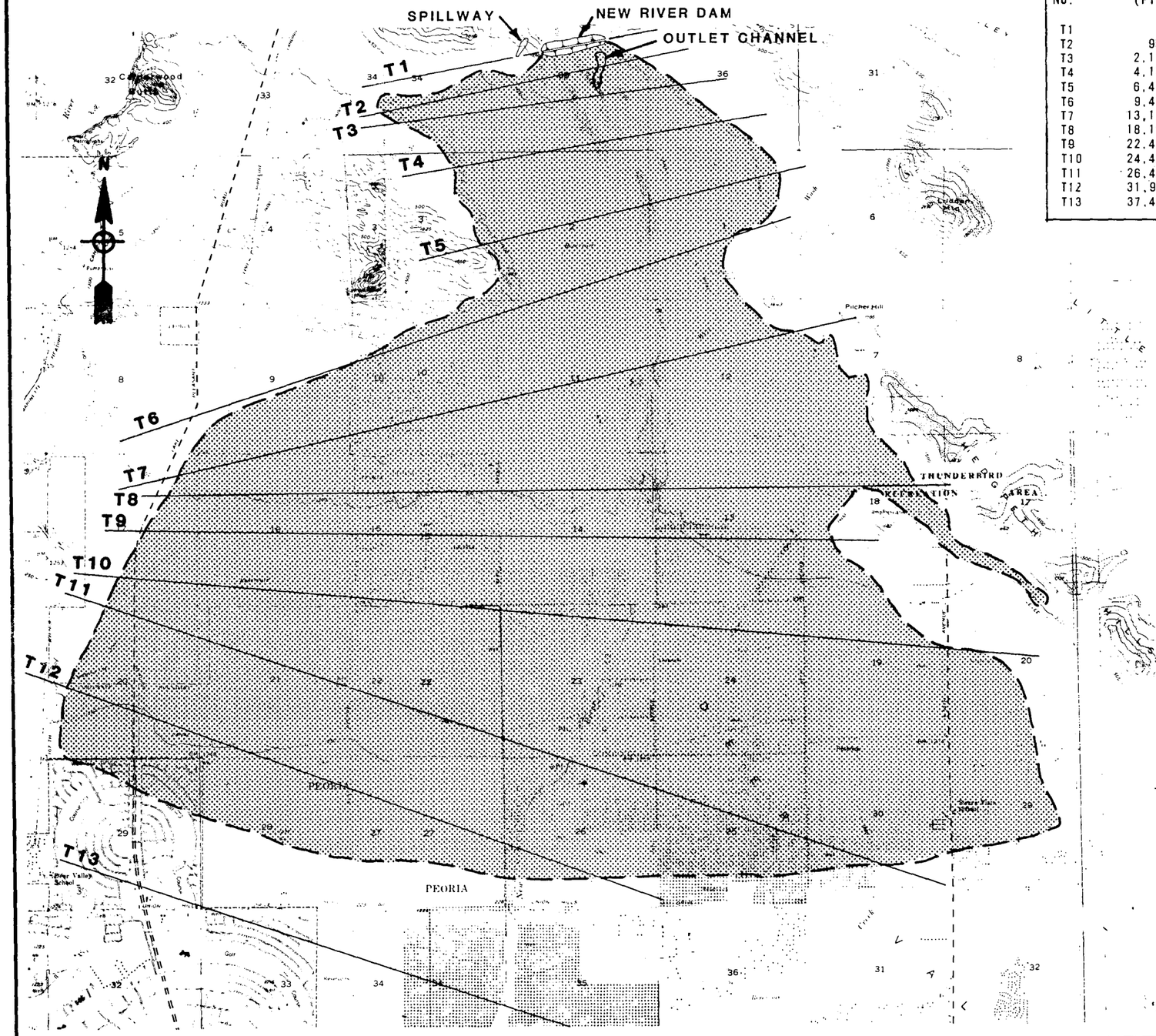
RESERVOIR DESIGN FLOOD



PROBABLE MAXIMUM FLOOD

Project Feature Interaction Under Design Conditions.

PLATE 3



CROSS SECTION NO.	DOWNSTREAM DISTANCE FROM DAM (FT)	NEW RIVER MILEAGE STATIONING ABOVE AGUA FRIA CONF. (MI)	APPROXIMATE INCREMENTAL TRAVEL TIME BETWEEN EACH CROSS SECT. (MIN)	APPROXIMATE CUMULATIVE TRAVEL TIME OF FLOOD PEAK (MIN)	AVERAGE FLOOD PEAK HIGHT ABOVE STREAMBED (FT)	STREETS AFFECTED BY FLOODING	CITY OR CREEK LIMITS
T1	0	17.51					
T2	950	17.33	0.35	0.5	45		
T3	2,110	17.11	1.07	2	36		
T4	4,120	16.73	1.85	3	25		
T5	6,420	16.29	3.83	7	18		
T6	9,420	15.72	6.25	13	15		
T7	13,160	15.01	9.60	23	13		
T8	18,160	14.06	15.92	39	8	BEARDSLEY RD.	
T9	22,460	13.05	23.88	62	6	DEER VALLEY DR.	PEORIA
T10	24,460	12.30	11.10	74	4		
T11	26,460	11.25	11.10	85	4	UNION HILLS DR.	PEORIA
T12	31,960	10.21	30.55	116	3	UNION HILLS DR.	SUN CITY
T13	37,460	9.17	30.55	145	2	GREENWAY RD.	SKUNK CR.

LEGEND:

- BOUNDARY OF INUNDATED AREA
- AREA AFFECTED BY INUNDATION
- T ——— CROSS SECTION

NOTE:

1. BOUNDARIES SHOWN ARE APPROXIMATE
2. WATER SURFACE CONDITION AT NORMAL HIGH POOL LEVEL (SPILLWAY CREST) WITH FAILURE (APPROXIMATELY 904,000 CFS)

SOURCES OF BASE MAPS: U.S. GEOLOGICAL SURVEY 7.5 MINUTES SERIES, 1957 PHOTO REVISED 1982

1000 0 2000 4000

GILA RIVER BASIN
PHOENIX, ARIZ. & VICINITY (INCL. NEW RIV.)

NEW RIVER DAM INUNDATION MAP

U.S. ARMY CORPS OF ENGINNEERS
LOS ANGELES DISTRICT

PLATE 4

EMERGENCY IDENTIFICATION SUBPLAN

APPENDIX 1

TO

FLOOD EMERGENCY PLAN

FOR

NEW RIVER DAM DURING CONSTRUCTION

EMERGENCY IDENTIFICATION SUBPLAN
APPENDIX 1
TO
FLOOD EMERGENCY PLAN
FOR
NEW RIVER DAM DURING CONSTRUCTION

1. Introduction

Conditions affecting construction of New River Dam during closure period could result in a hazard to life and/or property due to sudden release of large volumes of water. Early identification of the existence or potential for occurrence of such condition is essential as a basis for initiating emergency operations and/or repairs and for issuing appropriate notifications to higher authority and potentially affected parties.

a. Purpose

This subplan implements a portion of the Corps Program to prepare emergency plans for all Corps dams. It establishes procedures for identifying impending and existing emergencies affecting the construction of New River Dam.

b. Scope

This subplan deals with identification of impending or existing emergencies related to unusually high water levels in the reservoir caused by extreme storm, and slope failure. Instructions are included concerning:

(1) Monitoring and reporting of conditions.

(2) Communications between the New River Dam project office, L.A. District office and Arizona-Nevada Area Office.

(3) Criteria for action including declaration of a Pre-Emergency or Emergency condition and activation of the Notification Subplan and/or Emergency Operations and Repair Subplan.

c. Applicability

This subplan is applicable to all Corps elements and field offices concerned with construction of New River Dam.

2. Definitions

a. Pre-Emergency

A "Pre-Emergency" condition is one in which some impending or existing threat to the safe construction of the dam is identified but no significant hazard to life or property is expected to occur. Declaration of a Pre-Emergency condition is internal to the Corps of Engineers and does not require notification of other parties or warnings to evacuate.

b. Emergency

An "Emergency" condition is one in which the occurrence of a significant hazard to life and/or property is possible or certain to occur. Conditions justifying declaration of an Emergency condition may be imminent or longer term. Declaration of an Emergency condition requires notification to others and issuance of warnings to evacuate potentially hazardous areas.

c. Project Engineer

The term "Project Engineer" means the individual in charge of the New River Dam project site.

d. District

The term "District" means one of the following as appropriate for the situation at hand.

(1) Hydrology and Hydraulics Branch (for matters involving flood forecasting and flood inflows).

(2) Geotechnical Branch (for matters involving structural integrity of dam).

(3) Emergency Operations Center.

e. Arizona-Nevada Area Office

The term "Arizona-Nevada Area Office" means the person in charge of the Arizona-Nevada Area Office.

3. Responsibility for Conduct

a. Project Engineer

(1) Carrying out routine surveillance (paragraph 4.a.).

(2) Carrying out non-routine observations and measurements directed by District (paragraph 4.b.).

(3) Advising District of potentially hazardous situations (paragraph 4.c.).

(4) Maintaining proper records of communications (paragraph 5).

(5) Acting independently, when required by disruption of communications or the urgency of the circumstances, to declare a Pre-Emergency or Emergency condition (paragraph 8) and to activate the Notification Subplan and/or Emergency Operations and Repair Subplan as appropriate.

b. Arizona-Nevada Area Office.

(1) Providing assistance to Project Engineer and District as requested.

(2) Assuming responsibilities of District in event of disruption of communications between the project area and District office.

c. District

(1) Carrying out routine monitoring of conditions potentially affecting construction of New River Dam (paragraph 6.a.) and alerting the Project Engineer and Arizona-Nevada Area Office of situations requiring increased readiness and/or 24 hour supervision.

(2) Providing guidance to the Project Engineer on all potentially hazardous situations which arise and directing any non-routine observations and measurements needed to assist in identification, confirmation or analysis of existing or impending threats to safe construction of the dam (paragraph 6.b.).

(3) Providing personnel for on-site evaluation of potentially hazardous conditions relating to geology, soils and other aspects requiring expert analysis.

(4) Declaring the existence of Pre-Emergency and Emergency conditions and directing activation of the Notification Subplan and/or Emergency Operations and Repair Subplan.

(5) Maintenance of the subplan (paragraph 9).

4. Observations, Tests and Reports by Project Engineer

a. Routine Observations and Tests

(1) Daily

(a) Local precipitation.

Find information from DATACOL-National Weather Service (Direction for access to the computer will be given separately).

(b) Local runoff (inflow and stream gages).

Find information from Maricopa County Flood Control District, Telemetry System (Direction for access to the computer will be given separately).

(c) Visual inspection of outlet works, abutment areas, and valley floor immediately downstream of dam.

(d) Check weather forecasts (weather radios to be in standby mode at all times when not in use).

(e) Visual inspection for slope movement of both faces of all embankments which are in contact with standing water.

(2) Weekly

(a) Test radio, and other communications equipment.

b. Non-Routine Observation and Tests

(1) Examine all areas of embankment hourly if evidence of significant slope failure is found (to be continued until directed by District to cease).

(2) Perform other observations and tests as directed by District.

c. Reports

(1) To the Chief, Hydrology and Hydraulics Branch

Reports or predictions of precipitation of 2.0 inches or more in 12 hours or less in the vicinity of the dam.

(2) To the Chief, Geotechnical Branch

(a) Any conditions indicating distress of an embankment.

(b) Occurrence of earthquake or landslide into reservoir.

5. Records

The Project Engineer will keep a log of all telephone, radio or other communications received from or sent to District and National Weather Service. This log should be in a bound ledger or notebook used only as an official diary. Each communciation will be described including:

a. Date.

b. Time.

c. Person called or calling.

d. Information transmitted.

e. Action requested by the District.

f. Action taken in response to request.

g. Result of action.

h. Remarks.

i. Initials of persons receiving communications.

6. Observations, Tests and Alerts by District

a. Routine Observations and Tests

(1) Daily

(a) Check weather forecasts for areas affecting runoff into New River Dam site.

(b) Check existing and predicted flows in New River Basin.

b. Non-Routine Observations and Tests

Specify additional observations and tests to be performed by the designated personnel and make additional observations and tests as necessary to assist in identification, confirmation or analysis of existing or impending threats to the dam embankment.

c. Alerts

Provide alerts to Project Engineer, appropriate District personnel and Arizona-Nevada Area Office when:

(1) Weather or other conditions require heightened readiness, increased surveillance or the possible need for activation of the Emergency Operations Center.

(2) Consideration is being given to declaration of a Pre-Emergency or Emergency Condition.

7. Communications

a. Normal

Communications between the District, Project Engineer and Arizona Nevada Area Office will normally be by telephone. Telephones at the project administration office, Arizona-Nevada Area Office and District's Emergency Operations Center will be manned on a 24-hour basis whenever a Pre-Emergency or Emergency condition is in effect at New River Dam. Office and home phone numbers of key District, New River Dam Project Office, Arizona-Nevada Area Office and other personnel are listed in Table 1-1.

b. Back-Up

The radio communications network between the District Office, project administration office and Northern Area Office will be used to back up telephone communications. Radios at the New River Dam project office, Arizona-Nevada Area Office and District's Emergency Operations Center will be

manned on a 24-hour basis whenever telephone service is disrupted while a Pre-Emergency or Emergency condition is in effect at New River Dam. Radio frequencies and call letters for pertinent parties are listed in Table 1-1.

c. Emergency

During a situation when both radio and telephone communications between the District Office and project area are lost, others equipped with radio or telephone facilities will be called on for assistance. Those to whom application for assistance may be made are listed in Table 1-1 along with information for telephone and radio contacts.

8. Declaration of Pre-Emergency and Emergency Conditions

a. Responsibility

The District is responsible for the declaration of "Pre-Emergency" or "Emergency" conditions in all but extreme cases where the loss of communications or the speed of onset of a situation prevents the Project Engineer from conferring with the District.

Pre-Emergency and Emergency declarations will be made by the Commander/ District Engineer. The Chief of Engineering Division, members of Hydrology and Hydraulics Branch, Geotechnical Branch, and the Emergency Operations Center will provide input in the decision making process.

b. Conditions Warranting Declaration

Not every situation requiring declaration of a Pre-Emergency or an Emergency condition can be specified. Initiative must be excercised by all involved personnel and each situation judged individually on the basis of all relevant factors.

(1) Pre-Emergency

Examples of circumstances warranting declaration of a Pre-Emergency condition include:

(a) Reservoir level at elevation 1456.2 or higher with either inflow exceeding outlet capacity or a forecast of significant inflows from precipitation.

(b) Malfunction of outlet works during flood operations which impedes release of water and creates potential for spillway flow.

(c) Minor seepage problems including: unexplained increases or decreases in amount, cloudy appearance of seepage or presence of fines, development of new seepage areas as indicated by soft boggy areas.

(d) Minor slope failures including: tension cracks at crest or in slopes of embankment, small bulges in slopes or in foundation near toe of slope, small depressions or sags in crest or slopes, changes in horizontal crest alinement, and gullies forming in or near embankment or junction of the embankment and abutments.

(2) Emergency

Examples of conditions warranting declaration of an Emergency condition include:

(a) Imminent or occurring spillway flow including: reservoir at elevation 1456.2 with forecast of significant inflows from precipitation.

(b) Major slope failures including: appreciable depressions or sloughs in the crest or slopes of the dam or bulges in the slopes or foundation, large gullies developing and continuing to erode in the embankment or at the junction of the embankment and abutments, displacement of structures or instrumentation on the dam and continuing expansion of tension cracks after their appearance on the dam crest or slope.

c. Action Upon Declaration

(1) Project Engineer

(a) Monitor telephones on 24-hour basis.

(b) Activate appropriate portions of Notification Subplan and Emergency Operations and Repair Subplan.

(c) Maintain 24-hour monitoring/surveillance of situation responsible for declaration.

(d) Perform non-routine observations and tasks as directed by District.

(e) Test radio communications.

(f) Request assistance needed from District to perform (a) through (e) above.

(2) Arizona-Nevada Area Office

(a) Monitor telephones on 24-hour basis.

(b) Place all personnel on standby for emergency duty.

(c) Test radio communications.

(3) District

(a) Activate Emergency Operations Center.

(b) Monitor telephones on 24-hour basis.

(c) Test radio communications.

(d) Place key staff on standby for emergency duty.

(e) Provide detailed instructions to Project Engineer for any needed non-routine observations and tests.

(f) Dispatch personnel to dam site as required to provide expert evaluation of situation and to assist Project Engineer as needed.

(g) Activate appropriate portions of Notification Subplan and Emergency Operations and Repair Subplan.

9. Familiarization of Subplan

The Chief, Engineering Division, shall ensure that all pertinent Corps personnel are aware of and familiar with this subplan including:

(1) Circulation of each updated version for review and signature by pertinent District staff, Arizona-Nevada Area Office and the Project Engineer.

(2) Briefing, within two weeks of assuming duties, of all pertinent Engineering Division staff.

TABLE 1-1
INFORMATION ON KEY CONTACTS

Party	Telephone		Radio	
L.A. DISTRICT PERSONNEL	Office	Residence	Freq.	Call Letter
COL. PAUL W. TAYLOR (Commander)	(213) 688-5300 FTS: 798-5300	(213) 539-4148	-----	--------
LTC ROGER C. HIGBEE (Deputy Commander)	(213) 688-5328 FTS: 798-5328	(714) 968-0345	-----	--------
JAMES P. FAST (Chief, CON-OP. Div.)	(213) 688-5600 FTS: 798-5600	(213) 316-4369	4	WUK 4443
WILLIAM H. MAHONEY (Asst. Chief, CON-OP. Div.)	(213) 688-5600 FTS: 798-5600	(213) 581-3946	4	WUK 4446
NORMAN L. ARNO (Chief, Engineering Div.)	(213) 688-5470 FTS: 798-5470	(818) 957-6444	4	WUK 4014
ROBERT E. KOPLAN (Asst. Chief, Engineering Div.)	(213) 688-5470 FTS: 798-5470	(818) 982-2765	4	WUK 4463
ALFONSO ROBLES, Jr. (Hydraulic-Hydorlogy)	(214) 688-5520 FTS: 798-5520	(213) 696-2833	4	WUK 4464
LAURENCE J. LAURO (Geotechnical Branch)	(213) 688-5477 FTS: 798-5477	----------	-----	--------
ROBERT L. HALL (Design Branch)	(213) 688-5466 FTS: 798-5466	(213) 394-6839	-----	--------
ROBERT R. DOUGLAS, Jr. (Emergency Mgt. Branch)	(213) 688-3440 FTS: 798-3440	(818) 446-0538 or (818) 285-9045	4 4	WUK 4492 or WUK 4454

TABLE 1-1 (Con't)

Party	Telephone	
	Office	Residence
MAURICE A. PERRENBOOM, JR. (Public Affairs Officer)	(213) 688-5320 FTS: 798-5320	(213) 446-0538
ARIZONA-NEVADA AREA OFFICE		
CHARLES K. HOOPPAW	(602) 241-2000 FTS: 261-2000	(602) 996-1870
NON-DISTRICT CONTACTS		
PHOENIX AREA POLICE DEPT.	(602) 262-6151	----------
HIGHWAY PATROL	(602) 262-8011	----------
CIVIL DEFENSE AND EMERGENCY (Maricopa County)	(602) 273-1411	(602) 937-6066
M.M. SOUNDT CONSTRUCTION CO.		
JIM ANDERSON (Deer Valley)	----------	(602) 582-1528
MIKE SMITH (Glendale)	----------	(602) 938-6750
MIKE MURPHY (Glendale)	----------	(602) 979-4134
ROY WEISER	----------	(602) 942-7478

EMERGENCY OPERATIONS AND REPAIR SUBPLAN

APPENDIX 2

TO

FLOOD EMERGENCY PLAN

FOR

NEW RIVER DAM DURING CONSTRUCTION

EMERGENCY OPERATIONS AND REPAIR SUBPLAN
APPENDIX 2
TO
FLOOD EMERGENCY PLAN
FOR
NEW RIVER DAM DURING CONSTRUCTION

1. Introduction

Conditions affecting construction of New River Dam could result in a hazard to life and/or property due to sudden release of large volumes of water. Prompt conduct of emergency operations and repairs is essential for minimizing hazards of life and property.

a. Purpose

This subplan implements a portion of the Corps program to prepare emergency plans for all Corps dams. It establishes procedures for emergency operations and repairs to deal with impending and existing emergencies affecting the operation and safety of New River Dam during closure period.

b. Scope

This subplan describes a reservoir dewatering plan and other emergency operations and repairs to be implemented upon declaration of a Pre-Emergency or Emergency condition. Operations and repairs are described for cases of:

(1) Malfunctioning of the dam's outlet works.

(2) Wave erosion and/or erosion of downstream face of embankment.

(3) High reservoir level.

(4) Slope failure.

c. Applicability

This subplan is applicable to all Corps elements and field offices concerned with construction of New River Dam.

2. Definitions

a. Pre-Emergency

A "Pre-Emergency" condition is one in which some impending or existing threat to the safe construction of the dam or reservoir is identified but no significant hazard to life or property is expected to occur.

b. Emergency

An "Emergency" condition is one in which the occurrence of a significant hazard to life and/or property is possible or certain to occur. Conditions justifying declaration of an Emergency condition may be imminent or longer term.

c. Project Engineer

The term "Project Engineer" means the individual in charge at the New River Dam project site.

d. District

The term "District" identifies one of the following elements as appropriate for the situation at hand.

(1) Hydrology and Hydraulics Branch (for matters involving reservoir inflows and reservoir dewatering).

(2) Geotechnical Branch (for matters involving structural integrity of dam).

(3) Emergency Operations Center.

e. Arizona-Nevada Office

Means the person in charge of the Arizona-Nevada Area Office.

3. Basis of Activition

This subplan is to be activated immediately upon declaration of a Pre-Emergency or Emergency Condition. (See Appendix 1, Emergency Identification Subplan for procedure of declaring a Pre-Emergency or Emergency Condition.)

4. Responsibilities

a. Project Engineer

(1) Provide information to District on existing severity and rate of change of problem.

(2) Request provision by District of needed assistance including:

(a) Personnel, including expert supervision.

(b) Equipment.

(c) Materials.

(3) Carry out operations and repairs as directed by District.

(4) Act independently to implement emergency operations and repairs in the event communications with the District and Arizona-Nevada Area Office are disrupted or immediate action is required including:

(a) Deciding the urgency of correction.

(b) Carrying out appropriate emergency operations and repairs for the type of emergency.

(c) Obtaining needed personnel, equipment and materials (see paragraph 12).

b. Arizona-Nevada Area Office

(1) Provide personnel, equipment and materials to Project Engineer as directed by District.

(2) Direct emergency operations and repairs in the event communications between the Project Engineer and District are disrupted.

c. District

(1) Assess problem and Project Engineer's request for assistance with respect to:

(a) Urgency for correction.

(b) Type of corrective actions required.

(c) Personnel required for corrective actions including requirements for expert advice and/or on-site supervision.

(d) Equipment and materials required for corrective actions.

(2) Provide direction to the Project Engineer on emergency operations and repairs to be carried out.

(3) Dispatch needed personnel, equipment and materials to the project from the District and Arizona-Nevada Area Office (see paragraph 12).

(4) Arrange for needed personnel, equipment and materials from sources other than District and Arizona-Nevada Area Office.

5. Reservoir Dewatering Plan

The objective of the reservoir dewatering plan is to rapidly lower the water level of New River Dam reservoir. Dewatering is accomplished by opening a portion of Stage III fill, depending on the speed of dewatering that is required. The speed of dewatering required depends on the reason for dewatering.

Too rapid lowering of the New River Reservoir level may have adverse effects on the strength and stability of New River Dam embankment. Specified rates of drawdown must be observed unless embankment failure is occurring or imminent.

Dewatering of the reservoir by opening the Stage III fill will not be undertaken unless directed by District or Arizona-Nevada Area Office, as long as communications between the Project Engineer and one of these offices are intact. Dewatering by opening the Stage III fill, may be undertaken on the Project Engineers initiative if communications with both the District and Arizona-Nevada Area Office are disrupted.

a. Procedure for Dewatering

(1) Determine dewatering rate required.

(2) Determine duration of releases required for dewatering.

(3) Formulate and issue warning message for downstream areas along New River (See Notification Subplan).

b. Specified Discharge Rates

The maximum flow capable of being conveyed without damage by New River, between dam and Skunk Creek, is 2665-ft^3/s. Dewatering discharges will be limited to that amount unless an Emergency condition has been declared and/or dam failure is imminent.

c. Stage III Fill Opening Schedules

Outlet works shall be used for dewatering, unless embankment failure has occurred or is imminent.

In the event of an existing or imminent failure of the embankment, cut the Stage III fill in accordance with flow rate vs Depth of beach shown in Figure 2-1.

6. Emergency Operations and Repairs - Wave Damage and/or Erosion of Downstream Face of Embankment

a. Potential Problems

Wave damage may occur during periods of high southerly winds. Damage may include erosion of the underlying materials causing collapse of the stone protection. Wave damage is particularly serious during abnormally high reservoir pool levels when serious erosion can cause a sudden collapse of the crest with subse uent overtopping of the embankment. The downstream face of the embankment is also subject to erosion due to runoff from heavy rains and waves breaking over the top of the embankment.

b. Corrective Action

The type of corrective action that is appropriate depends on the severity of damage, rate of progression of damage, and urgency of action. Temporary protection above and within 10-12 feet below the waterline can be provided quickly by use of plywood sheets, prefabricated panels or canvas as shown in figure 2-2 or by filling eroded areas with sandbags. Tables 2-1

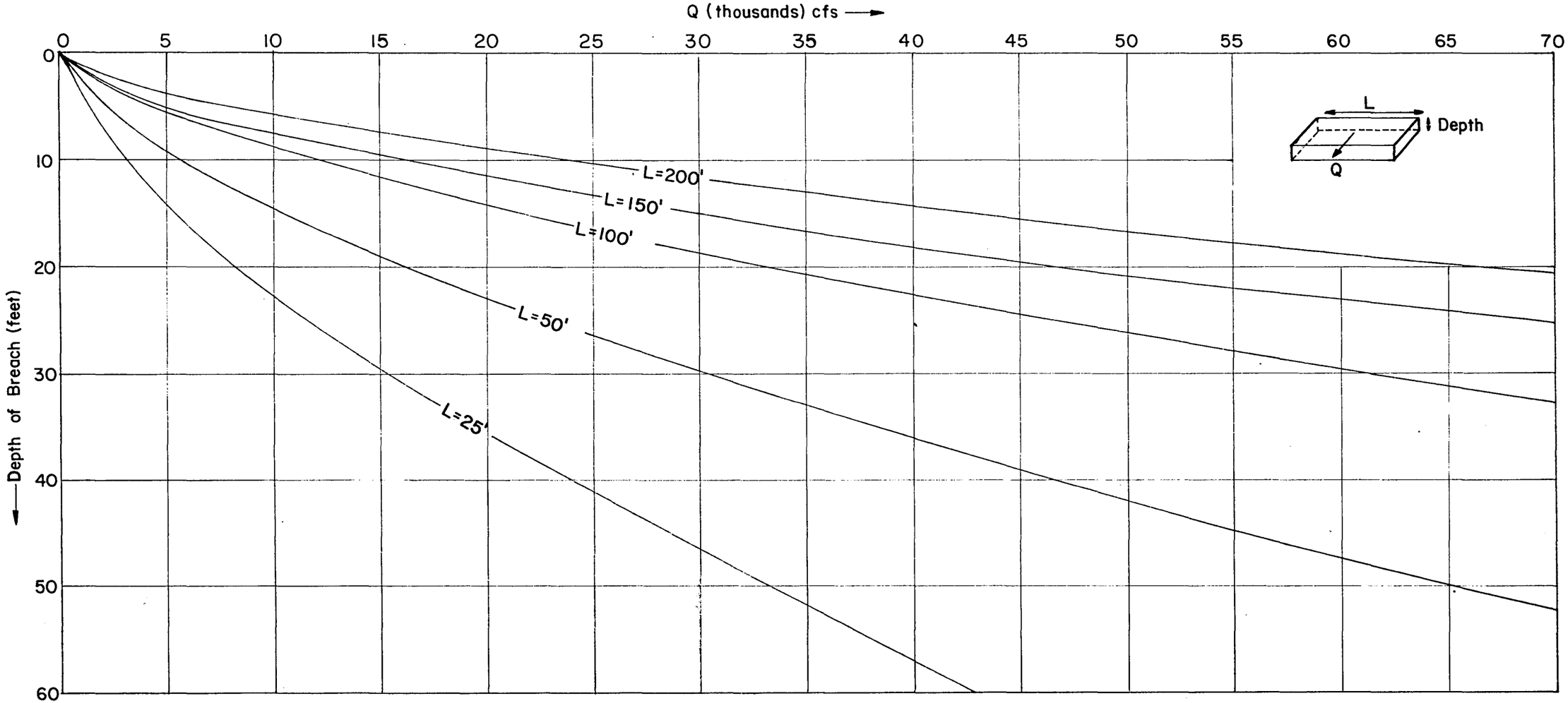
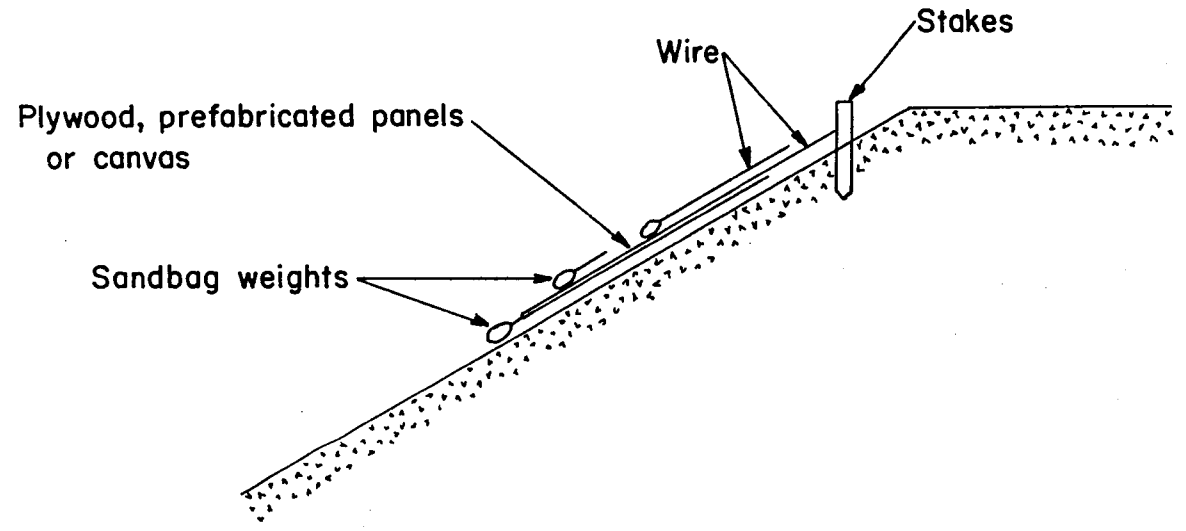


FIGURE 2-1 RESERVOIR DEWATERING
Discharge vs Depth of breach
for Various Lengths

through 2-4 provide information useful in estimating the amount of personnel and materials required. Protection further below the water level can be provided by dumping stone protection in the affected area. In cases of severe erosion, lowering of the reservoir pool level can shift wave forces to a lower elevation (See dewatering plan, paragraph 5). Repairs normally require reconstruction of the eroded slope and replacement of both bedding materials and stone protection. Lowering of the pool level is usually required prior to making permanent repairs on the upstream face of the dam.

TABLE 2-1
APPROXIMATE REQUIREMENTS
FOR
EROSION PROTECTION WITH PLYWOOD

Length To Be Protected	No. Plywood Sheets Req'd.	No. Stakes Req'd.	No. Sandbags Req'd	Personnel Req'd	Hours To Complete
10	3	8	15	6	1.5
20	5	13	25	6	2.5
30	8	20	40	6	3.0
40	10	25	50	6	3.5
50	13	33	65	6	4.0
60	15	38	75	6	5.0
70	18	45	90	10	3.5
80	20	50	100	10	3.5
90	23	58	115	10	4.0
100	25	63	125	10	4.5
150	38	95	190	16	5.0
200	50	125	250	16	4.0
300	75	188	375	20	6.0
400	100	250	500	24	6.0



GENERAL SCHEME FOR
TEMPORARY EROSION PROTECTION

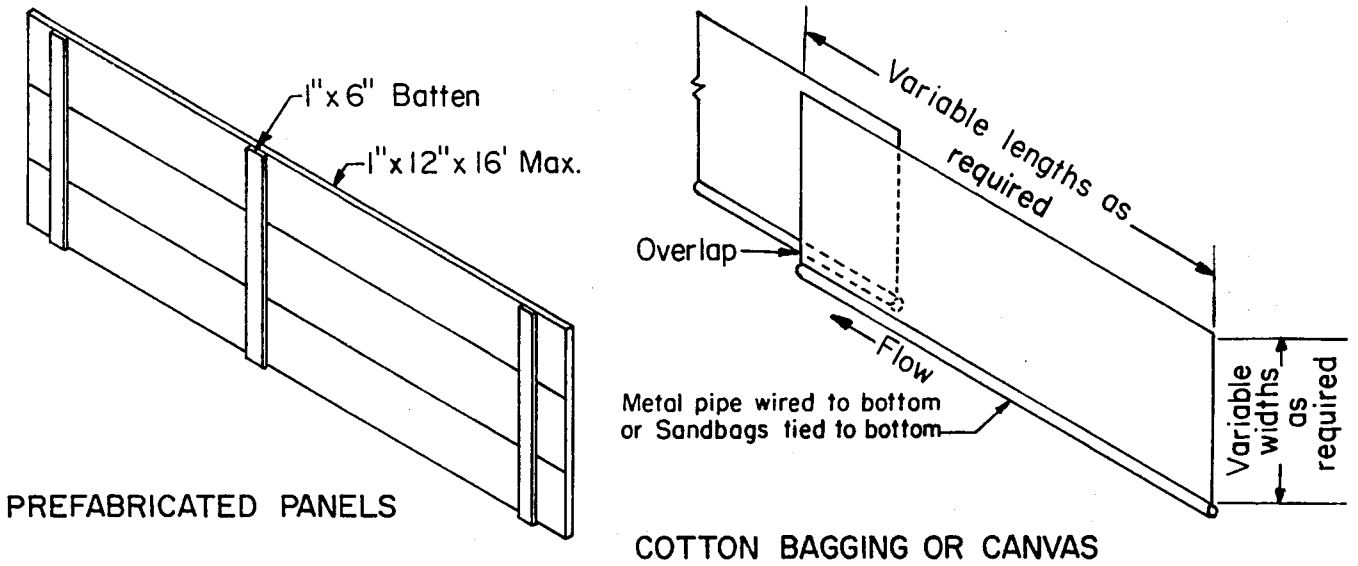


FIGURE 2-2. TEMPORARY EROSION PROTECTION

TABLE 2-2
APPROXIMATE REQUIREMENTS
FOR
EROSION PROTECTION WITH PREFABRICATED PANELS

Length to Protect (ft)	100		200		300		400		500		1000	
No. Panels Req'd/ (@ 16' ft)	7		13		19		25		32		63	
Panel Width (ft)	3	5	3	5	3	5	3	5	3	5	3	5
Length 1" X 12" Req'd. (ft)	340	360	625	1170	900	1700	1200	2250	1500	2900	3000	5700
Length 1" X 6" Req'd. (ft)	80	140	160	260	230	380	300	500	400	640	750	1300
Stakes Req'd.	30	30	60	60	90	90	115	115	150	150	300	300
Sandbags Req'd.	35	60	70	100	100	150	125	200	160	250	320	500
Time to Complete	3	4.3	4.3	5.3	2.9	3.6	3.6	4.7	4.5	5.8	5.6	7.3
No. Personnel	8	8	8	8	16	16	16	16	16	16	24	24

TABLE 2-3
APPROXIMATE REQUIREMENTS
FOR
EROSION PROTECTION WITH CANVAS

Length To Be Protected	Length Canvas Req'd.	No. Stakes Req'd.	No. Sandbags Req'd	Personnel Req'd	Hours To Complete
10	35	15	30	6	1
20	50	20	40	6	1.5
30	80	35	60	6	2.0
40	100	40	70	6	2.5
50	130	55	100	6	3.0
60	150	65	110	6	3.5
70	160	70	120	6	4.0
80	190	85	150	6	4.5
90	210	90	160	10	3.3
100	350	100	180	10	3.5
150	400	150	275	10	4.8
200	500	200	350	16	4.3
300	700	300	520	20	4.8
400	1000	400	700	24	5.0

TABLE 2-4
APPROXIMATE REQUIREMENTS
FOR
FILLING AREAS WITH SANDBAGS

Volume (ft^3)	No. Bags Req'd	Personnel Req'd	Hours to Complete
100	250	6	1.5
200	500	6	3
300	700	6	4
500	1500	10	3.5
1000	2500	10	6.5
2000	4700	14	8.5
3000	7000	24	8
4000	9500	34	7.5
5000	11,700	38	8

7. High Reservoir Level

a. Potential Problems

High reservoir levels cause large hdyrostatic forces on the dam, reduce freeboard available to contain wave action and reduce the capability of the dam to impound major inflows without overtopping or uncontrolled spillway flow. High reservoir levels contribute to wave erosion and other safety problems. Sufficiently high water levels will overtop the Stage III fill.

b. Corrective Action

The only corrective action for high water levels is increasing releases. When necessary, this should be done in accordance with the dewatering plan (paragraph 5).

8. Slope Failure

a. Potential Problems

Slope failure may occur as the mass movement of a portion of the embankment. Such failures weaken the dam and, if located sufficiently high on the embankment, may cause a breach or lead to collapse of the dam crest. Slope failures of any significant magnitude are serious and require immediate corrective action.

b. Corrective Action

(1) Dewatering of the reservoir (paragraph 5) should be started in the event of any slope failure that is sufficiently serious to threaten the safety of the dam and which is located below the existing reservoir level. Dewatering should be continued until the reservoir level is equal to or lower than the bottom of the area of slope failure.

(2) Dewatering of the reservoir (paragraph 5) should be started in the event of any slope failure intersecting the crest or which could lead to collapse of the crest. Dewatering should be continued until sufficient capacity exists below the bottom of the slope failure to impound all inflows anticipated in the coming 24 hours, assuming continuing discharges at a rate of 2665 c.f.s.

(3) Immediate treatment of slope failures consists of filling slide areas with stone protection, sandbags or a granular blanket. The preferred method depends on materials and labor available and the urgency of action. When the urgency of the situation permits, filling of slide areas will be carried out under supervision of District staff and constitute rebuilding of the affected portion of the embankment. Immediate treatment in urgent situations will consist of filling slide areas with sandbags, stone protection or other available materials.

9. Inventory of Resources

Resources available for carrying out emergency operations and repairs are listed in Table 2-5.

TABLE 2-5
RESOURCES AVAILABLE AT PROJECT SITE

Item	Number Available
Tractor With Dozer	7
SEMI Tractor	8
Loader	4
Loader Backhoe	1
Trailer Bottom DMP	8
Forklift	1
Roller Sheepsfoot	3
Roller Vibratory	1
SP60 Roller	1
Motor Grader	3
Rock Truck	9
Power Scraper	10
Water Tanker	2
Compressor	3
Compressor, portable	2
Drill/Compressor	2
Drill Motor	3
Vibrator	7
Pump	8
Generator	4

EMERGENCY NOTICATION SUBPLAN

APPENDIX 3

TO

FLOOD EMERGENCY PLAN

FOR

NEW RIVER DAM DURING CONSTRUCTION

EMERGENCY NOTIFICATION SUBPLAN

APPENDIX 3
TO
FLOOD EMERGENCY PLAN
FOR
NEW RIVER DAM DURING CONSTRUCTION

1. Introduction

Conditions affecting operation of New River Dam during construction could result in a hazard to life and/or property due to high reservoir levels or sudden release of large volumes of water. Prompt issuance of appropriate notifications is essential for minimizing hazards to life and property.

a. Purpose

This subplan implements a portion of the Corps program to prepare emergency plans for all Corps dams. It establishes procedures for issuing notifications of impending and existing emergencies affecting the operation and safety of New River Dam during construction.

b. Scope

This subplan specifies notifications and other actions to be taken upon declaration of a Pre-Emergency or Emergency conditions. Notifications and actions specified are those necessary for:

(1) Ensuring safety.

(2) Vacating project areas where emergency operations and repairs may be conducted.

(3) Internal coordination of Corps of Engineers activities.

(4) Coordination with non-Federal units of government and other Federal agencies.

c. Applicability

This subplan is applicable to all Corps elements and field offices concerned with construction of New River Dam.

2. Definitions

a. Pre-Emergency

A "Pre-Emergency" condition is one in which some impending or existing threat to the safe operation of the dam or lake is identified but no significant hazard to life or property is expected to occur.

b. Emergency

An "Emergency" condition is one in which the occurrence of a significant hazard to life and/or property is possible or certain to occur. Conditions justifying declaration of an Emergency condition may be imminent or longer term.

c. Project Engineer

The term "Project Engineer" means the individual in charge at the New River Dam project site.

d. District

The term "District" identifies one of the following elements as appropriate for the situation at hand.

(1) Hydrology and Hydraulics Branch (for matters involving flood inflows to the dam site).

(2) Foundation and Materials Section (for matters involving structural integrity of dam).

(3) Emergency Operations Center.

e. Arizona-Nevada Area Office

Means the person in charge of the Arizona-Nevada Area Office.

3. Basis of Activation

This subplan is to be activated immediately upon declaration of a Pre-Emergency or Emergency Condition.

4. Parties to be Notified

a. Corps Offices

Corps Offices to be notified of all Pre-Emergency or Emergency conditions that are declared are listed in table 3-1.

b. Other Parties

Other parties to be notified according to the nature of an Emergency or Pre-Emergency condition are listed in table 3-2.

TABLE 3-1
CORPS OFFICES NOTIFICATION LIST
FOR ALL DECLARED EMERGENCIES AND PRE-EMERGENCIES

Office[1]	Telephone Number Office	Residence	Radio Freq.	Call Letters
New River Dam Project Office				
NEIL ERWIN (Resident Engineer)	(602) 582-0653	(602) 996-1696	4	WUK 4002
CPT. ROBERT DUNNE (Project Engineer)	(602) 582-0653	(602) 867-8634	------	--------
JOE SALINAZ (Asst. Project Engineer)	(602) 582-0653	(602) 442-0767	4	WUK 4044
MIKE TERNAK (Office Engineer)	(602) 582-0653	(602) 993-4124	4	WUK 4049
Arizona-Nevada Area Office				
CHARLES K. HOOPPAW (Az. - Nv. Area Engineer)	(602) 241-2014	(602) 992-6674	4	WUK 4017
TERRY BUCKLEY (Assist. Area Engineer)	(602) 241-2014	(602) 843-2122	------	--------
Los Angeles District				
JAMES P. FAST (Chief, CON-OP. Div)	(213) 688-5600	(213) 316-4369	4	WUK 4443
WILLIAM H. MAHONEY (Assist. Chief, CON-OP)	(213) 688-5600 FTS: 798-5600	(213) 581-3946	4	WUK 4446
NORMAN L. ARNO (Chief, Engineering Div.)	(818) 688-5470 FTS: 688-5470	(213) 957-6444	4	WUK 4014
ROBERT E. KOPLIN (Assist. Chief, Engineering)	(213) 688-5470 FTS: 798-5470	(818) 982-2765	4	WUK 4463
ALFONSO ROBLES, JR. (Hydraulic-Hydrology)	(213) 688-5520	(213) 696-2833	4	WUK 4464
LAURENCE J. LAURO (Geotechnical Branch)	(213) 688-5477 FTS: 798-5477	----------	------	--------
ROBERT L. HALL (Design Branch)	(213) 688-5466 FTS: 798-5466	(213) 394-6839	------	--------
ROBERT R. DOUGLAS, JR. (Emergency Mgt. Branch)	(213) 688-3440 FTS: 798-3440	(818) 446-0538 or (818) 285-9045	4 4	WUK 4492 or WUK 4454

Where engineering evaluation of the evidence of distress indicates the need for immediate remedial action or the potential of failure, the District Commander will immediately report such conditions through command channels to the HQUSACE Dam Safety Officer who is the Deputy Director of the Engineering and Construction Directorate (DAEN-ECZ-B).

[1]Call personnel listed for each office in order until contact is made.
[2]First to be called depends on nature of problem.

TABLE 3-2
KEY CONTACTS FOR EMERGENCY NOTIFICATIONS

	Telephone Number	
	Office	Residence
ARIZONA STATE AGENCIES		
Division of Emergency Services (Col. Richard A. Colson)	(602) 231-6244	(602) 955-2049
John S. Kyle (Asst. Director for Plans)	(602) 244-0504	(602) 978-9273
Dept. of Water Resources[1] (Frank M. Barrias)	(602) 255-1566	(602) 266-9630
Dan Lawrence (Chief of Dam Safety Division)	(602) 255-1541	(602) 838-5884
Dept of Public Safety		
Emergency Number	(602) 262-8209	----------
Communication Supervisors Desk (Manned 24 Hours)	(602) 262-8212	----------
Dept. of Transportation[1,2]		
Traffic Engineering	(602) 255-7371	----------
W. OWEN FORD (Deputy State Engineer)	(602) 255-7473	(602) 841-1271
H. MARTIN OSMUS (Maintenance/Emergency)	(602) 255-7410	(602) 246-0649
CITIES		
Sun City		
Sheriff Substation[1,2]	(602) 933-0153	----------
ERWIN W. ZUMACH (Civil Defense Director)	----------	(602) 977-5549
DEL E. WEBB CORP. (Public Affairs)	(602) 264-8482	----------

TABLE 3-2 (Cont'd)
KEY CONTACTS FOR EMERGENCY NOTIFICATIONS

	Telephone Number	
	Office	Residence
Peoria		
ROY FOLTZ, Director Emergency Services	----------	(602) 973-9279
Police Dept.[1,2]	(602) 979-4222	----------
Fire Dept.[1,2]	(602) 979-7067	----------
COUNTY		
Maricopa		
ROY B. BLUHM, Director Emergency Operations Center	(602) 273-1411	(602) 937-6566
DAN E. SAGRAMOSO Chief Eng., Flood Control Dist.	(602) 262-1501	(602) 864-1543
Sheriff's Department[1,2]	(602) 256-1000	----------
FEDERAL AGENCIES		
National Weather Service Meteorologist in charge (Claire D. Jensen)	(602) 261-4000	----------
Lead Forecaster (Manned 24 hours)	(602) 261-3500	----------
Flood Warning Office Federal Hydrologist (Thomas A. Zichusl)	(602) 261-6000 (602) 255-1548	---------- ----------
State Hydrologist (Rob Emmett)		
FEDERAL EMERGENCY MANAGEMENT AGENCY		
Region 9 (San Francisco)	(415) 556-9830 FTS: 8-556-9830	

[1]Can provide assistance in communications.

[2]Can provide assistance in evacuation and traffic control on project lands.

5. Responsibility for Notification

Notifications listed in tables 3-1 and 3-2 are the responsibility of the New River Dam Project Office making the declaration of a Pre-Emergency or Emergency Condition. Assistance in making notifications may be requested from other Corps offices and/or other parties. In the event all communications between offices are disrupted after declaration of a Pre-Emergency or Emergency declaration, each office will assume responsibility for making all notifications.

6. Communications

a. Normal

Notifications will normally be by telephone. Telephones at the project administration office, Arizona-Nevada Area Office and District's Emergency Operating Center will be manned on a 24-hour basis whenever a Pre-Emergency or Emergency condition is in effect at New River Dam. Office and home phone numbers of parties to be notified are listed in tables 3-1 and 3-2.

b. Back Up

The radio communications network between the District Office, project administration office and Arizona-Nevada Area Office will be used to back-up telephone communications. Radios at each office will be manned on a 24 hour basis whenever telephone service is disrupted while a Pre-Emergency or Emergency condition is in effect at New River Dam. Radio frequencies and call letters for parties to be notified are listed in tables 3-1 and 3-2.

c. Emergency

During a situation when both radio and telephone communications between the District Office and project administration office are disrupted, others equipped with radio or telephone facilities will be called on for assistance. Those most likely to be capable of providing assistance are identified in table 3-1 (see footnote 1).

7. Timing of Notifications

Parties listed in table 3-1 are to be notified as soon as possible after declaration of a Pre-Emergency condition. Notifications listed in table 3-2 are dependent on reservoir water elevation and other conditions and should be made as soon as a high probability of the eventual need for notification is predicted.

8. Content of Notification Messages

a. Corps Offices

Notications to other Corps offices are to include the key information needed as a basis for decision making and/or action including, as appropriate and to the extent possible, the following:

(1) Description of Situation

(a) Nature and severity of problem(s).

(b) Current and predicted reservoir conditions including water elevation, inflow and discharge.

(c) Current and forecasted weather conditions.

(2) Action Planned or Underway

(a) Type of corrective actions.

(b) Estimated time to complete corrective actions.

(c) Outlook for success.

(d) Assistance required/being furnished.

(e) Potential complications.

(f) Recommended evacuation.

(3) Other

(a) Staff at dam site.

(b) Visitors at project.

(c) Road conditions.

b. Other Parties

Notification messages to other parties are to include a description of the nature of impending or existing hazard, potential timing of its occurrence, and recommendations for evacuation and other action. Paragraph 10 contains example notification messages which can be adapted for use in various circumstances.

9. Additional Actions

The following additional actions will be taken upon declaration of an Emergency condition:

a. Project Engineer

(1) Cancel normal work schedule and provide for 24-hour duty.

(2) Assess project areas which are or may become unsafe including but not limited to areas within project boundaries.

(3) Identify areas required for conduct of emergency operations and repairs including any necessary access routes.

(4) Take action to notify and evacuate areas which are unsafe, potentially unsafe, or where emergency operations and repair work may be carried out including, as appropriate:

(a) Directing evacuation of affected project areas managed by the Corps.

(b) Closing project roads to incoming traffic.

(c) Moving equipment to safe areas.

(5) Request assistance as needed in carrying out items (4)(a) and (4)(b) from agencies listed in table 3-2 (see footnote 2).

(6) Verify that appropriate warnings are announced over local radio and television.

b. Arizona-Nevada Area Office

(1) Cancel normal work schedule and provide for 24-hour availability of key staff.

c. District

(1) Cancel normal work schedule and provide for 24-hour availability of key staff.

(2) Determine potential inundation and need for evacuation.

(3) Determine need for warning of high reservoir levels.

(4) Verify that appropriate warnings are released over local radio and television.

10. Example Messages

Preparation of warning messages should be started as soon as their potential need is apparent so that they can be issued promptly upon declaration of an Emergency condition. Where time is available for their preparation, the initial message should contain all pertinent information. However, in some cases, an Emergency condition may be declared with little or no advance notice. The following example messages provide a model for the first announcements in such cases. Subsequent announcements should provide additional details.

a. Announcement for Slowly Developing Conditions

THE ARMY CORPS OF ENGINEERS AT PHOENIX ANNOUNCED AT (time) TODAY THAT AN EMERGENCY CONDITION EXISTED AT NEW RIVER DAM DUE TO (general description of problem). THE DAM IS LOCATED ABOUT 23 MILES NORTHWEST OF PHOENIX AND ABOUT 7 MILES WEST OF BLACK CANYON HIGHWAY.

A CORPS SPOKESMAN SAID THAT THE WATER LEVEL OF NEW RIVER DAM WAS BEING LOWERED (as a precautionary measure/to reduce pressure on the dam/to enable repair work).

THE SPOKESMAN EMPHASIZED THAT THE DRAWDOWN OF THE LAKE WAS BEING CARRIED OUT UNDER CONTROLLED CONDITIONS AND THERE IS NO IMMEDIATE DANGER OF THE DAM FAILING. HOWEVER, THE LARGE RELEASES OF WATER THAT ARE BEING MADE MAY CAUSE FLOODING ALONG NEW RIVER. RESIDENTS OF LOW LYING AREAS ALONG NEW RIVER SHOULD (evacuate/be alert for high water and prepare to evacuate).

ADDITIONAL INFORMATION WILL BE RELEASED AS PROMPTLY AS POSSIBLE.

b. Announcement for Rapidly Developing Conditions

URGENT: THE ARMY CORPS OF ENGINEERS HAS ANNOUNCED THAT NEW RIVER DAM IS IN IMMINENT DANGER OF FAILURE. THE DAM IS LOCATED ABOUT 23 MILES NORTHWEST OF PHOENIX AND ABOUT 7 MILES WEST OF BLACK CANYON HIGHWAY.

ATTEMPTS TO SAVE THE DAM ARE UNDERWAY BUT THEIR SUCCESS CANNOT BE DETERMINED AS YET. RESIDENTS ALONG NEW RIVER SHOULD EVACUATE TO HIGH GROUND IMMEDIATELY.

IF THE DAM FAILS, WATER WILL TAKE APPROXIMATELY FOUR HOURS TO REACH THE GILA RIVER. AREAS CLOSER TO THE DAM WILL BE FLOODED SOONER.

ADDITIONAL INFORMATION WILL BE RELEASED AS PROMPTLY AS POSSIBLE.

c. Announcement for Major Failure

URGENT: NEW RIVER DAM ON NEW RIVER HAS FAILED. A LARGE FLOOD WAVE IS NOW MOVING DOWN THE RIVER AT A HIGH RATE OF SPEED. RESIDENTS ALONG NEW RIVER SHOULD MOVE TO HIGH GROUND IMMEDIATELY. REPEAT, RESIDENTS ALONG NEW RIVER SHOULD MOVE TO HIGH GROUND IMMEDIATELY.

WATER FROM THE DAM IS EXPECTED TO CAUSE FLOODING ALONG THE NEW RIVER AT SUN CITY AND ADJACENT COMMUNITIES BEGINNING AT APPROXIMATELY (time). LOW LYING AREAS SHOULD BE EVACUATED WELL IN ADVANCE OF THIS TIME.

STAY ALERT FOR FURTHER ANNOUNCEMENTS. ADDITIONAL INFORMATION ON ESTIMATED DEPTH AND TIME OF FLOODING WILL BE RELEASED AS SOON AS POSSIBLE.