PAWTUCKAWAY RIVER

LAMPREY RIVER WATERSHED

NEW HAMPSHIRE

DOLLOFF DAM-BREAK FLOOD ANALYSIS

SEPTEMBER 1984

US Army Corps
of Engineers

DOLLOFF DAM

DAM-BREAK FLOOD

ANALYSIS

SUBMITTED TO:

DEPARTMENT OF THE ARMY

NEW ENGLAND DIVISION

WALTHAM, MASSACHUSETTS

SUBMITTED BY:

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DOLLOFF DAM

DAM-BREAK FLOOD ANALYSIS

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DOLLOFF DAM

DAM-BREAK FLOOD ANALYSIS

1. INTRODUCTION AND PURPOSE

This report presents the finding of a dam-break flood analysis performed for Dolloff Dam. The dam is owned, operated, and maintained by the Water Resources Board of New Hampshire. Included in this report is a description of the pertinent features of the dam, the procedure used for the analysis, the assumed dam-break conditions and resulting effects on downstream flooded areas. This study was not performed because of any known likelihood of a dam-break at Dolloff Dam. Its purpose is to provide quantitative information for emergency planning use.

2. DAM DESCRIPTION

Identification No.:	NH00134
Name of Dam:	Dolloff Dam
Town:	Nottingham
County and State:	Rockingham County, New Hampshire
Stream:	Tributary of Pawtuckaway River

Dolloff Dam is 27 feet high, 28 feet wide, and 414 feet long. It is an earthen embankment contained between vertical dry masonry (stone) walls. The downstream face has one berm. The upstream face and berm were refaced with concrete in 1964. Appurtenant structures include: an uncontrolled spillway, a stoplog spillway, and a low-level gated outlet with a mechanical lifting mechanism. Dolloff Dam, with Drown's Dam and Gove Dike, impound Pawtuckaway Pond. The pond now is used for recreation; it is 3 miles long, and has a 900-acre surface. Maximum storage is 11,700 acre-feet.

3. PERTINENT DATA

Data is taken from "Phase I Inspection Report" for Dolloff's Dam dated July 1978.

a. Drainage Area. The drainage area consists of 20.66 square miles (13,225 acres) of predominantly wooded terrain.

b. Discharge at Damsite.

(1) Outlet works (gated outlet) - 300 cfs @ maximum pool elevation (252.7' NGVD).

(2) Ungated spillway capacity at maximum pool elevation - 690 cfs @ elev. 252.7' NGVD.

(3) Stoplog spillway capacity at recreational pool elevation (250' NGVD) is estimated to be 1630 cfs (assuming removal of all stoplogs.)

(4) Stoplog spillway capacity at maximum pool elevation - 2210 cfs @ elev. 252.7' NGVD.

(5) Total spillway capacity at maximum pool elevation - 2900 cfs @ elev. 252.7' NGVD.

c. Elevation (ft. NGVD).

(1) Top of Dam - 252.7

(2) Recreation pool - 250

(3) Spillway crest (gated) - 238 (assuming all stoplogs removed).

(4) Upstream portal gated outlet - 237.2

(5) Stream bed at centerline of dam - 235 (downstream toe)

(6) Maximum tailwater - unknown

d. Reservoir (miles)

(1) Length of maximum pool - 3.0

(2) Length of recreation pool - 3.0

e. Storage (acre-feet)

(1) Recreation pool - 11,500

(2) Top of dam - (low point of embankment) - 11,700

f. Reservoir Surface (acres)

(1) Top of dam - 985

(2) Maximum pool - 975

(3) Recreation pool - 903

(4) Spillway crest - 210

g. Dam

(1) Type - earthen embankment with both upstream and downstream sides faced by nearly vertical dry masonry walls.

(2) Length - 414'

(3) Height - 27' (structural height)

(4) Top width - approximately 28'

h. Diversion and Regulating Tunnel - A slot through the dam, at the right one-third point, constructed with stone masonry forms the control shaft supporting the sluice gate. A 4-foot wide by 7-foot high portal on the downstream side provides access to the sluice gate and shaft, and releases the sluice discharge water. A shaft at about the middle of the dam's cross-section, covered by a locked housing contains the lifting mechanism for a sluice gate which is estimated to be 4 feet wide by 3 feet high.

i. Spillway

(1) Type - Ungated and stoplog

(2) Length of weir - 42' (ungated); 13' (stoplog)

(3) Crest elevation - 250' NGVD (ungated); 238 NGVD (all stoplogs removed)

(4) Gates - none

(5) U/S Channel - Pawtuckaway Pond

(6)) D/S Channel - The Channels downstream of both the concrete overflow spillway and the stoplog spillway appear to be in bedrock. The bottom of the channel downstream of the gated low-level outlet is covered with rocks

and it is not known whether the channel is immediately underlain by bedrock.

(7) General - 4' wide concrete slab access bridges over each spillway.

4. VALLEY DESCRIPTION

Dolloff Dam spans the Pawtuckaway River, a major tributary in the Lamprey River Basin. The dam is about 3 miles above the confluence with the Lamprey River, a major tributary in the Piscataqua River Basin.

The Pawtuckaway River valley below the Dolloff Dam is heavily wooded and has a steep slope the first 3 miles below the dam. From mile 3 to 8, the limit of study, the Lamprey River has a moderate slope. Two significant population centers are located in the study reach: West Epping at mile 3 and Epping at mile 8.

5. MODEL DESCRIPTION

The Dolloff Dam dam-break analysis was made using the HEC version of the "National Weather Service DAM-BREAK Flood Forecasting Computer Model", developed by D.L. Fread, Research Hydrologist, Office of Hydrology, National Weather Service, NOAA, Silver Spring, Maryland 20910. Input for the model consisted of: (a) Storage characteristics of the reservoir, (b) selected geometry and duration of the breach coefficients, and (e) active and inactive flow regions. Based on the input data, the model computes the dam-break outflow hydrograph and routes it downstream. Dynamic unsteady flow routing is performed by a "honing" iterative process governed by the requirements of both the principles of conservation of mass and momentum. The analysis provides output on the attentuation of the flood hydrograph, resulting flood stages, and timing of the flood wave as it progresses downstream.

6. ASSUMED DAM-BREAK CONDITIONS

The magnitude of a flood resulting from the hypothetical failure of Dolloff Dam is a function of many different parameters including size of breach, initial pool level and storage, rate of breach formation, channel and overbank roughness, and antecedent flow conditions. Engineering assumptions

of conditions which could be reasonably expected to exist prior to a failure of Dolloff Dam, were used in the base flood analysis as presented below:

(1) Initial Pool Level: 253.8 feet NGVD, 3.8 feet above top of flashboards

(2) Breach Invert: 240 feet NGVD.

(3) Breach Base Width: 60 feet, trapezodial side slopes 1V: 0.5H.

(4) Time to Complete Formation of Breach: 1 hour.

(5) Downstream Channel Roughness: Manning's "n" = .030 to .100

(6) Pre-Breach Flow: The pre-breach river flow was assumed equal to the flood of record which was estimated by using a cfs/sq. mi. value based upon similar drainage area. Inflow in to Pawtuckaway Pond was 2600 cfs, which was distributed equally between Dolloff Dam and Drown's Dam. Dolloff Dam's portion was 1300 cfs.

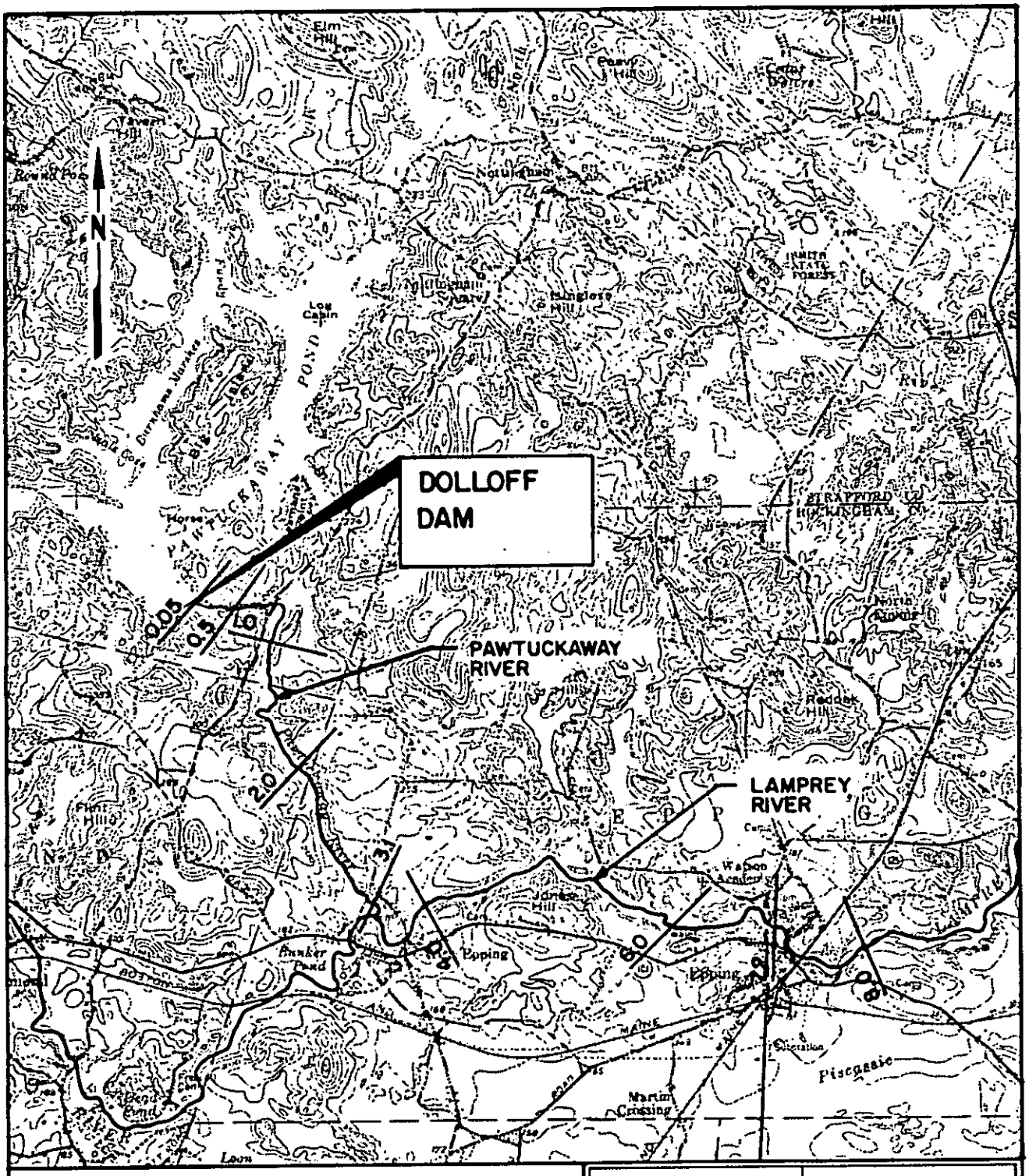
7. RESULTS

The resulting peak stage flood profiles are shown on plates 2 and 3. Timing of the peak stage and leading edge of the flood wave are also indicated on the profile. Because of the scarcity of good topographic mapping in the areas, profiles are shown in feet above normal summertime (July-August) low water (NLW). Users of the information can establish depth of flooding at particular properties by establishing its relative elevation with respect to the adjacent stream level. Variations in depth above NLW progressing downstream, is attributable to changes in natural stream hydraulic capacity as well as changes in peak discharge. Peak discharge throughout the study reach associated with the development of the peak stage profile along with the development of discharge and stage hydrographs for three stations downstream from Dolloff Dam are shown on plate 4. The three stations are located .05, 3.1, and 7.2 miles downstream of the dam.

The peak dam-break discharge from Dolloff Dam is 11,380 cfs producing a rise of 13 feet above the NLW stage at a point 0.05 miles downstream from the dam.

The peak discharge decreases to 14,900 cfs with an attendant rise of stage of 17.8 feet at a mile 3.1 below dam just upstream of the confluence with the Lamprey River. At mile 7.7 below the dam the discharge is 19,287 cfs producing a rise of 12 feet over NLW stage.

Because of the large reservoir capacity of Pawtuckaway Pond, a large outflow is maintained from the breached Dolloff Dam. The natural valley storage of the river valley is expended and high flows occur in the river 8.0 miles downstream. It is, therefore, recommended that relative depth of flooding above MLW at the end of the study reach be used in estimating flood potentials further downstream on the Lamprey River.



MAP BASED UPON U.S.G.S
MT. PAWTUCKAWAY, N.H QUADRANGLE
1957

CROSS-SECTION LOCATION IN
MILES BELOW DAM

SCALE IN MILES

1 0 1

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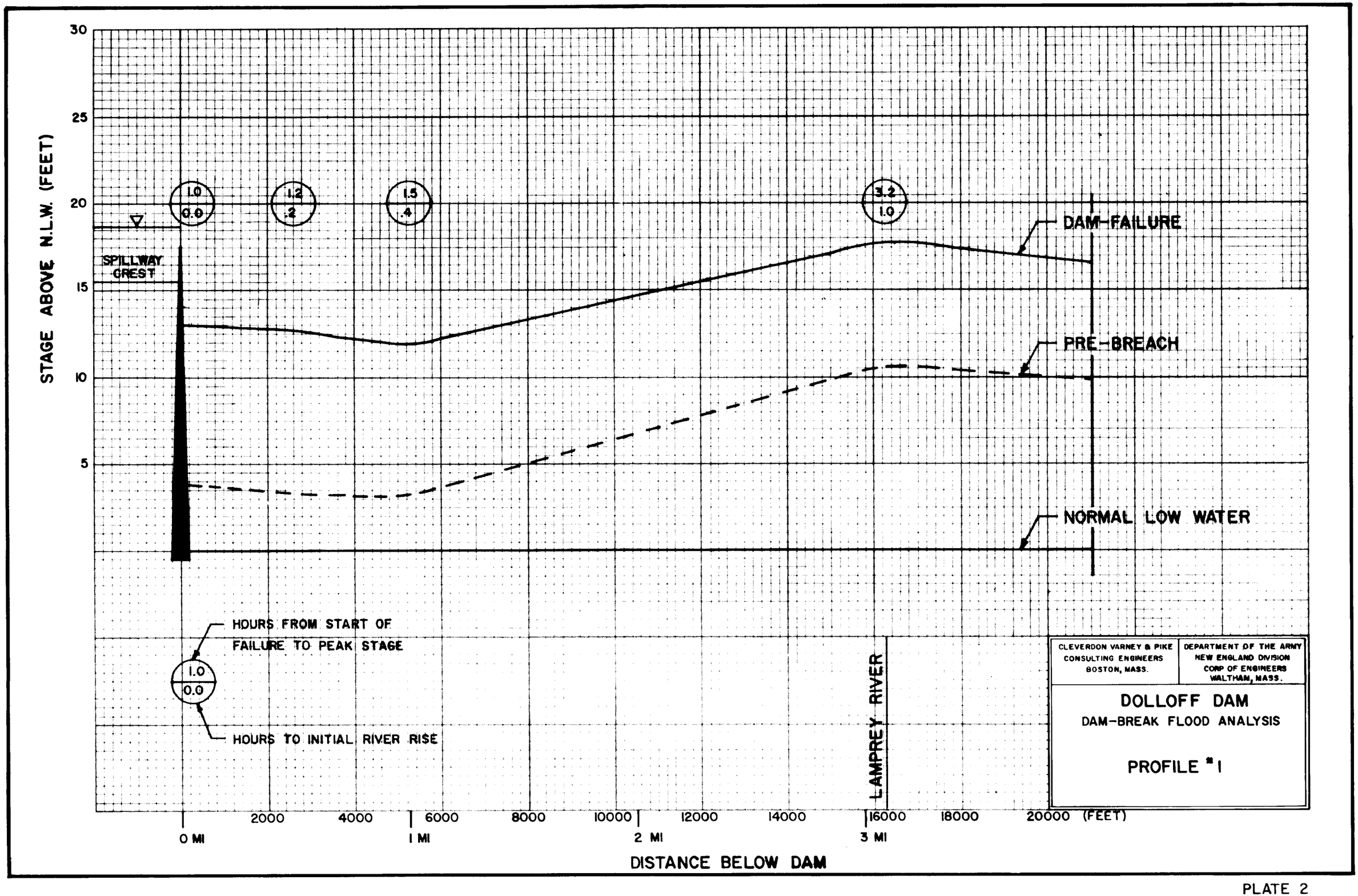
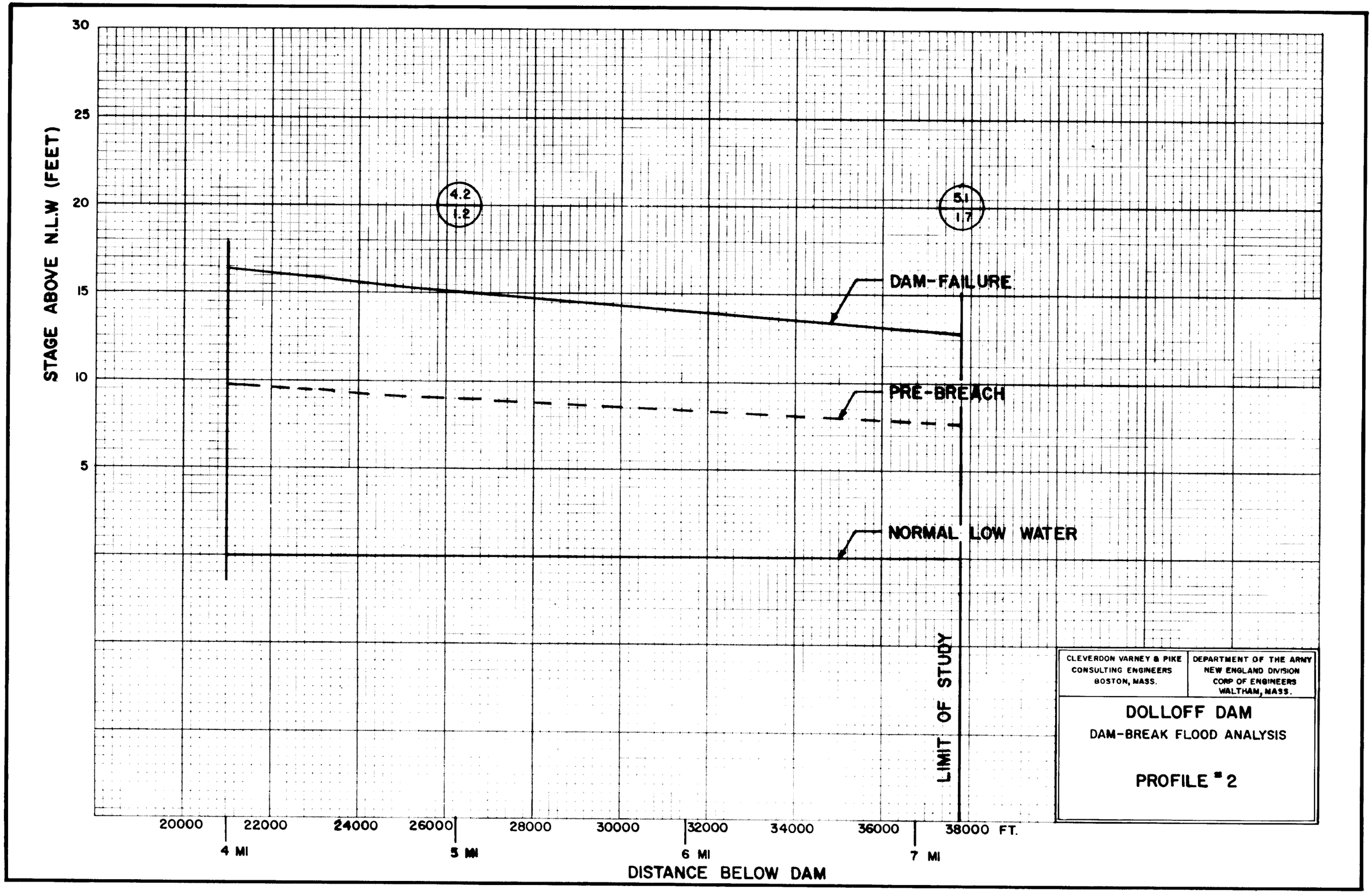
DOLLOFF DAM

DAM BREAK FLOOD ANALYSIS

INDEX MAP

PLATE I


STAGE ABOVE N.L.W. (FEET)
30
25
20
15
10
5
SPILLWAY CREST
1.0
0.0
1.2
.2
1.5
.4
3.2
1.0
DAM-FAILURE
PRE-BREACH
NORMAL LOW WATER
HOURS FROM START OF FAILURE TO PEAK STAGE
HOURS TO INITIAL RIVER RISE
LAMPREY RIVER
2000
4000
6000
8000
10000
12000
14000
16000
18000
20000 (FEET)
0 MI
1 MI
2 MI
3 MI
DISTANCE BELOW DAM
CLEVERDON VARNEY & PIKE
CONSULTING ENGINEERS
BOSTON, MASS.
DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION
CORP OF ENGINEERS
WALTHAM, MASS.
DOLLOFF DAM
DAM-BREAK FLOOD ANALYSIS
PROFILE #1


STAGE ABOVE N.L.W (FEET)
30
25
20
15
10
5
4.2
1.2
5.1
1.7
DAM-FAILURE
PRE-BREACH
NORMAL LOW WATER
LIMIT OF STUDY
20000
22000
24000
26000
28000
30000
32000
34000
36000
38000 FT.
4 MI
5 MI
6 MI
7 MI
DISTANCE BELOW DAM
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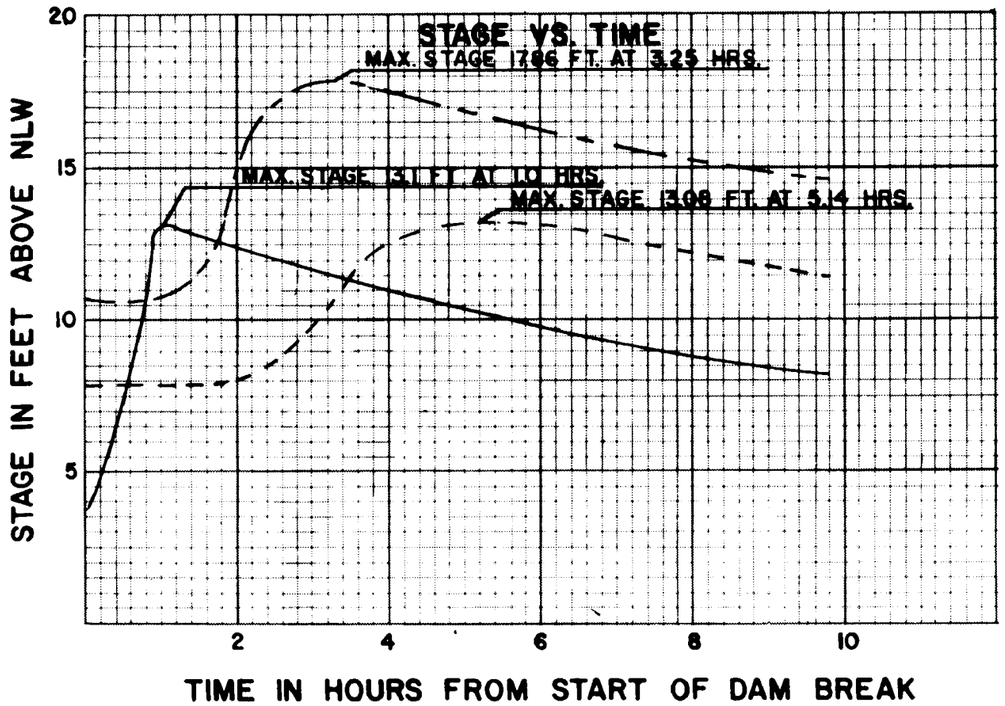
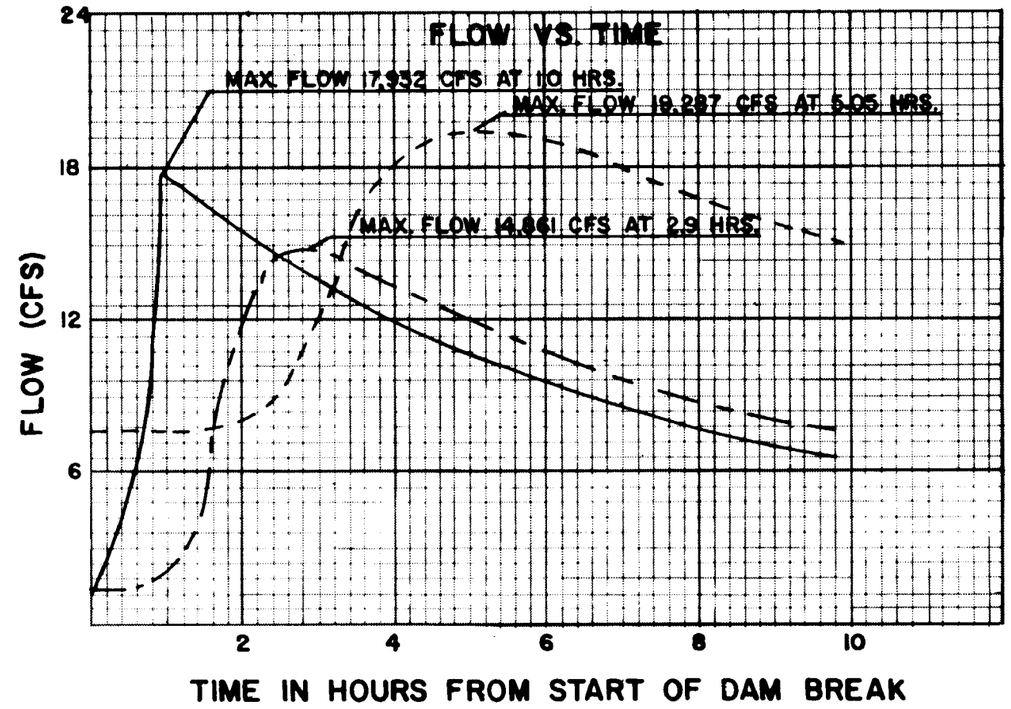
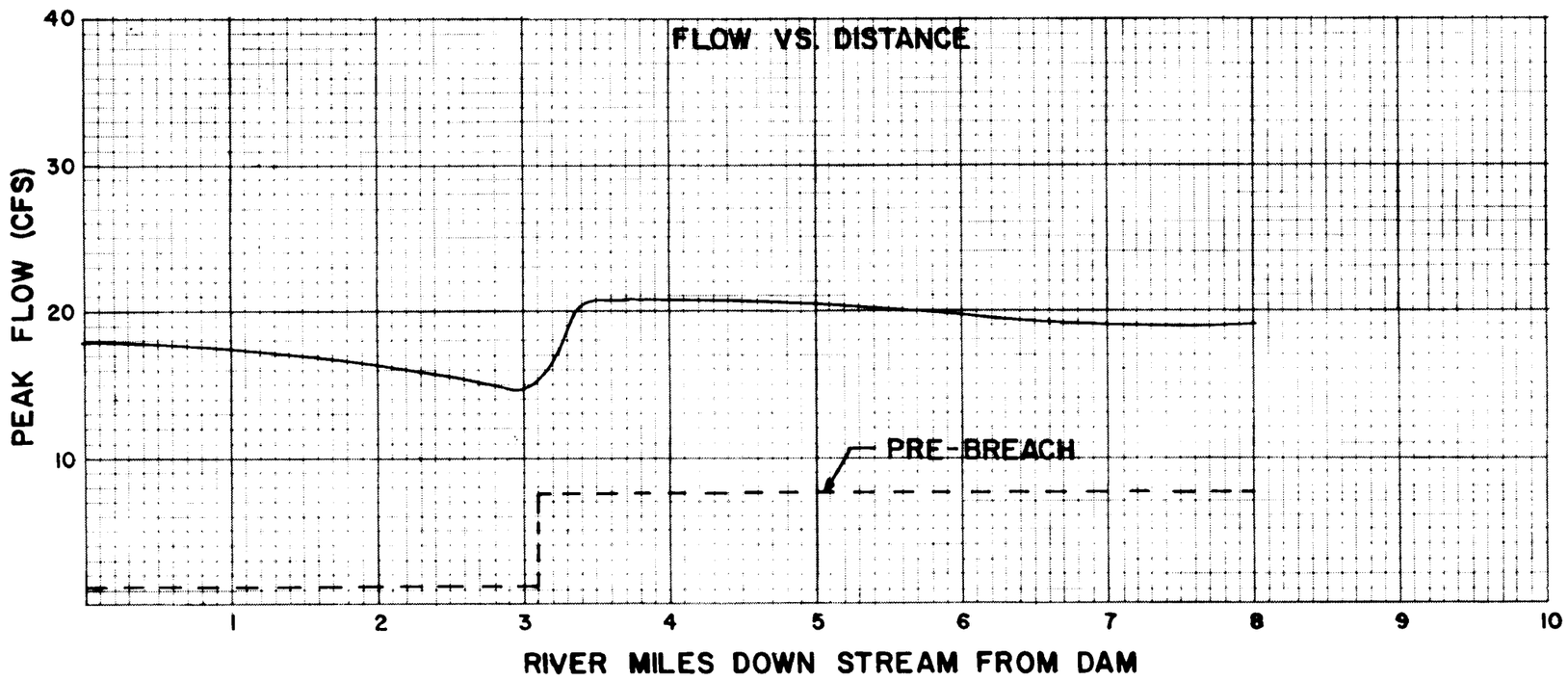
CONSULTING ENGINEERS
BOSTON, MASS.
DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION
CORP OF ENGINEERS
WALTHAM, MASS.
DOLLOFF DAM
DAM-BREAK FLOOD ANALYSIS
PROFILE # 2

PLATE 3







NLW DATUM (FT. NGVD)

STA. 1 RM. .05 = ~~178.0~~ 205.0 CORRECTED 3/86 ———

STA. 2 RM. 3.1 = 128.0 — — —

STA. 3 RM. 7.2 = 103.0 - - - -

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DOLLOFF DAM

DAM-BREAK FLOOD ANALYSIS

BASE FLOOD DISCHARGES STAGES & TIMING

```
*HECFORMAT
*ECHO
*FORMATTED
*10FIELDS
*COMPOSITE
ID DOLLOFF DAM
ID PAWTUCKAWAY POND
ID G. MERCER
ID C.V.&P ENGS.
ID BOSTON,MA
IO     1       10       10
IP     3        1
QI  1300
SN PAWTUCKAWAY POND
SE 252.7      250      241      240      235
SA   985      903      422      280        0
DN DOLLOFF DAM
DD 252.7      250        0    253.8       20      .06      235
DB     1    253.8       60      235       .5
DO     0      200        0       10
RN REACH 1
RG     1        2        3        5        7        9
RC   0.0        0      0.0      0.0
XI  0.05                                                   .10
XE   178      181      186      191      196      206      216      221
XC    30      122      313      351      371      507      543      613
NC  .045     .060     .070     .080     .090     .100     .110     .120
XI   0.5                                                  0.15
XE   168      176      181      187      193      197      204      210
XC    50      259      407      585      761      876     1077     1250
NC  .045     .060     .070     .080     .090     .100     .110     .120
XI   1.0                                                  0.15
XE   158      164      168      174      181      187      194      200
XC    50      300      544      637      797     1202     1675     2080
XO     0      135        0        0        0        0        0        0
NC  .045     .060     .070     .080     .090     .100     .110     .120
XI   2.0                                                  0.15
XE   140      152      160      168      176      184      192      200
XC    50      300      600      947     1009     1124     1292     1460
XO     0      167      285        0        0        0        0        0
NC  .045     .060     .070     .080     .090     .100     .110     .120
XI   3.1                                                  0.15
XE   127      132      137      143      150      156      163      170
XC    30      300      548      952     1300     1510     1780     1920
XO     0      100        0        0        0        0        0        0
NC  .045     .060     .070     .080     .090     .100     .110     .120
QN   3.1              LAMPERY RIVER
QL  6225
XI   4.0                                                  0.20
XE   123      131      139      147      156      164      172      180
XC   100      224      348      600      904     1532     2516     3500
NC  .035     .045     .050     .060     .070     .080     .090     .100
XI   5.0                                                  0.15
XE   110      117      124      131      139      146      153      160
XC   100      247      342      398      462      641      840     1040
```

APPENDIX A

INPUT DATA FILE

NC	.035	.045	.050	.060	.070	.080	.090	.100
XI	6.0						0.10	
XE	104	112	120	128	136	144	152	160
XC	100	300	600	900	1050	1300	1500	1700
XO	0	270	440	204	118	0	0	0
NC	.035	.045	.050	.060	.070	.080	.090	.100
XI	7.2						0.15	
XE	102	107	112	117	122	126	131	137
XC	100	262	390	442	517	544	578	676
NC	.035	.045	.050	.060	.070	.080	.090	.100
XI	8.0							
XE	97	103	109	115	122	128	134	140
XC	100	343	405	468	572	728	884	1040
NC	.035	.045	.050	.060	.070	.080	.090	.100
ZZ								

PROGRAM DAMBRK---VERSION-A-01/30/82

ANALYSIS OF THE DOWNSTREAM FLOOD HYDROGRAPH

PRODUCED BY THE DAM BREAK OF

DOLLOFF DAM

ON

PAWTUCKAWAY POND

ANALYSIS BY

G. MERCER
C.V.&P ENGS.
BOSTON,MA

BASED ON PROCEDURE DEVELOPED BY

DANNY L. FREAD, PH.D., RESEARCH HYDROLOGIST
HYDROLOGIC RESEARCH LABORATORY

W23, OFFICE OF HYDROLOGY
NOAA, NATIONAL WEATHER SERVICE
SILVER SPRING, MARYLAND 20910

OUTPUT DATA FILE
APPENDIX B

```
*****************************
*****************************
***                       ***
***  SUMMARY OF INPUT DATA  ***
***                       ***
*****************************
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```

INPUT CONTROL PARAMETERS FOR DOLLOFF DAM

PARAMETER	VARIABLE	VALUE
NUMBER OF DYNAMIC ROUTING REACHES	KKN	1
TYPE OF RESERVOIR ROUTING	KUI	0
MULTIPLE DAM INDICATOR	MULDAM	0
PRINTING INSTRUCTIONS FOR INPUT SUMMARY	KDMP	3
NO. OF RESERVOIR INFLOW HYDROGRAPH POINTS	ITEH	1
INTERVAL OF CROSS-SECTION INFO PRINTED OUT WHEN JNK=9	NPRT	0
FLOOD-PLAIN MODEL PARAMETER	KFLP	0
LANDSLIDE PARAMETER	KSL	0

DOLLOFF DAM RESERVOIR

TABLE OF ELEVATION VS SURFACE AREA

SURFACE AREA (ACRES) SA(K),	ELEVATION (FT) HSA(K)
985.0	252.70
903.0	250.00
422.0	241.00
280.0	240.00
0.0	235.00
0.0	0.00
0.0	0.00
0.0	0.00

DOLLOFF DAM RESERVOIR AND BREACH PARAMETERS

PARAMETER	UNITS	VARIABLE	VALUE

PARAMETER	UNITS	VARIABLE	VALUE
LENGTH OF RESERVOIR	MI	RLM	0.00
ELEVATION OF WATER SURFACE	FT	YO	253.80
SIDE SLOPE OF BREACH		Z	.50
ELEVATION OF BOTTOM OF BREACH	FT	YBMIN	235.00
WIDTH OF BASE OF BREACH	FT	BB	60.00
TIME TO MAXIMUM BREACH SIZE	HR	TFH	1.00
ELEVATION (MSL) OF BOTTOM OF DAM	FT	DATUM	235.00
VOLUME-SURFACE AREA PARAMETER		VOL	0.00
ELEVATION OF WATER WHEN BREACHED	FT	HF	253.80
ELEVATION OF TOP OF DAM	FT	HD	252.70
ELEVATION OF UNCONTROLLED SPILLWAY CREST	FT	HSP	250.00
ELEVATION OF CENTER OF GATE OPENINGS	FT	HGT	0.00
DISCHARGE COEF. FOR UNCONTROLLED SPILLWAY		CS	200.00
DISCHARGE COEF. FOR GATE FLOW		CG	0.00
DISCHARGE COEF. FOR UNCONTROLLED WEIR FLOW		CDO	10.00
DISCHARGE THRU TURBINES	CFS	QT	0.00

DHF(INTERVAL BETWEEN INPUT HYDROGRAPH ORDINATES) = 10.00 HRS.

TEH(TIME AT WHICH COMPUTATIONS TERMINATE) = 10.0000 HRS.

INFLOW HYDROGRAPH TO DOLLOFF DAM

1300.00

TIME OF INFLOW HYDROGRAPH ORDINATES

0.0000

CROSS-SECTIONAL PARAMETERS FOR PAWTUCKAWAY POND
BELOW DOLLOFF DAM

PARAMETER	VARIABLE	VALUE
NUMBER OF CROSS-SECTIONS	NS	10
MAXIMUM NUMBER OF TOP WIDTHS	NCS	8
NUMBER OF CROSS-SECTIONAL HYDROGRAPHS TO PLOT	NTT	6
TYPE OF OUTPUT OTHER THAN HYDROGRAPH PLOTS	INK	1
CROSS-SECTIONAL SMOOTHING PARAMETER	KSA	0
DOWNSTREAM SUPERCRITICAL OR NOT	KSUPC	0
NO. OF LATERAL INFLOW HYDROGRAPHS	LQ	1
NO. OF POINTS IN GATE CONTROL CURVE	KCG	0

NUMBER OF CROSS-SECTION WHERE HYDROGRAPH DESIRED
(MAX NUMBER OF HYDROGRAPHS = 6)

1 2 3 5 7 9

CROSS-SECTIONAL VARIABLES FOR PAWTUCKAWAY POND
BELOW DOLLOFF DAM

PARAMETER	UNITS	VARIABLE
LOCATION OF CROSS-SECTION	MI	XS(I)
ELEVATION (MSL) OF FLOODING AT CROSS-SECTION	FT	FSTG(I)
ELEV CORRESPONDING TO EACH TOP WIDTH	FT	HS(K,I)
TOP WIDTH CORRESPONDING TO EACH ELEV (ACTIVE FLOW PORTION)	FT	BS(K,I)
TOP WIDTH CORRESPONDING TO EACH ELEV (OFF-CHANNEL PORTION)	FT	BSS(K,I)
SURFACE AREA CORRESPONDING TO EACH ELEV (ACTIVE FLOW PORTION)	ACRES	DSA(K,I)
SURFACE AREA CORRESPONDING TO EACH ELEV (OFF-CHANNEL PORTION)	ACRES	SSA(K,I)
NUMBER OF CROSS-SECTION		I
NUMBER OF ELEVATION LEVEL		K

CROSS-SECTION NUMBER 1
****

XS(I) = .050 FSTG(I) = 0.00 XSL(I) = 0.0 XSR(I) = 0.0

HS ...	178.0	181.0	186.0	191.0	196.0	206.0	216.0	221.0
BS ...	30.0	122.0	313.0	351.0	371.0	507.0	543.0	613.0
BSS ...	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

CROSS-SECTION NUMBER 2
****

XS(I) = .500 FSTG(I) = 0.00 XSL(I) = 0.0 XSR(I) = 0.0

HS ...	168.0	176.0	181.0	187.0	193.0	197.0	204.0	210.0
BS ...	50.0	259.0	407.0	585.0	761.0	876.0	1077.0	1250.0
BSS ...	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

CROSS-SECTION NUMBER 3
****

XS(I) = 1.000 FSTG(I) = 0.00 XSL(I) = 0.0 XSR(I) = 0.0

HS ...	158.0	164.0	168.0	174.0	181.0	187.0	194.0	200.0
BS ...	50.0	300.0	544.0	637.0	797.0	1202.0	1675.0	2080.0
BSS ...	0.0	135.0	0.0	0.0	0.0	0.0	0.0	0.0

CROSS-SECTION NUMBER 4
****

XS(I) = 2.000 FSTG(I) = 0.00 XSL(I) = 0.0 XSR(I) = 0.0

HS ...	140.0	152.0	160.0	168.0	176.0	184.0	192.0	200.0
BS ...	50.0	300.0	600.0	947.0	1009.0	1124.0	1292.0	1460.0
BSS ...	0.0	167.0	285.0	0.0	0.0	0.0	0.0	0.0

CROSS-SECTION NUMBER 5
****

XS(I) = 3.100 FSTG(I) = 0.00 XSL(I) = 0.0 XSR(I) = 0.0

HS ...	127.0	132.0	137.0	143.0	150.0	156.0	163.0	170.0
BS ...	30.0	300.0	548.0	952.0	1300.0	1510.0	1780.0	1920.0
BSS ...	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0

CROSS-SECTION NUMBER 6
****

XS(I) = 4.000 FSTG(I) = 0.00 XSL(I) = 0.0 XSR(I) = 0.0

HS ...	123.0	131.0	139.0	147.0	156.0	164.0	172.0	180.0
BS ...	100.0	224.0	348.0	600.0	904.0	1532.0	2516.0	3500.0
BSS ...	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

CROSS-SECTION NUMBER 7
****

XS(I) = 5.000 FSTG(I) = 0.00 XSL(I) = 0.0 XSR(I) = 0.0

HS ...	110.0	117.0	124.0	131.0	139.0	146.0	153.0	160.0
BS ...	100.0	247.0	342.0	398.0	462.0	641.0	840.0	1040.0
BSS ...	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

CROSS-SECTION NUMBER 8

CROSS-SECTION NUMBER 8
****

XS(I) = 6.000 FSTG(I) = 0.00 XSL(I) = 0.0 XSR(I) = 0.0

HS ...	104.0	112.0	120.0	128.0	136.0	144.0	152.0	160.0
BS ...	100.0	300.0	600.0	900.0	1050.0	1300.0	1500.0	1700.0
BSS ...	0.0	270.0	440.0	204.0	118.0	0.0	0.0	0.0

CROSS-SECTION NUMBER 9
****

XS(I) = 7.200 FSTG(I) = 0.00 XSL(I) = 0.0 XSR(I) = 0.0

HS ...	102.0	107.0	112.0	117.0	122.0	126.0	131.0	137.0
BS ...	100.0	262.0	390.0	442.0	517.0	544.0	578.0	676.0
BSS ...	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

CROSS-SECTION NUMBER 10
****

XS(I) = 8.000 FSTG(I) = 0.00 XSL(I) = 0.0 XSR(I) = 0.0

HS ...	97.0	103.0	109.0	115.0	122.0	128.0	134.0	140.0
BS ...	100.0	343.0	405.0	468.0	572.0	728.0	884.0	1040.0
BSS ...	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

MANNING N ROUGHNESS COEFFICIENTS FOR THE GIVEN REACHES
(CM(K,I),K=1,NCS) WHERE I = REACH NUMBER
****

REACH 1 ...	.045	.060	.070	.080	.090	.100	.110	.120
REACH 2 ...	.045	.060	.070	.080	.090	.100	.110	.120

REACH 3 ...	.045	.060	.070	.080	.090	.100	.110	.120
REACH 4 ...	.045	.060	.070	.080	.090	.100	.110	.120
REACH 5 ...	.045	.060	.070	.080	.090	.100	.110	.120
REACH 6 ...	.035	.045	.050	.060	.070	.080	.090	.100
REACH 7 ...	.035	.045	.050	.060	.070	.080	.090	.100
REACH 8 ...	.035	.045	.050	.060	.070	.080	.090	.100
REACH 9 ...	.035	.045	.050	.060	.070	.080	.090	.100

CROSS-SECTIONAL VARIABLES FOR PAWTUCKAWAY POND
BELOW DOLLOFF DAM

PARAMETER	UNITS	VARIABLE
MINIMUM COMPUTATIONAL DISTANCE USED BETWEEN CROSS-SECTIONS	MI	DXM(I)
CONTRACTION - EXPANSION COEFFICIENTS BETWEEN CROSS-SECTIONS		FKC(I)

REACH NUMBER	DXM(I)	FKC(I)
1	.100	0.000
2	.150	0.000
3	.150	0.000
4	.150	0.000
5	.150	0.000

5	[illegible]	[illegible]
6	.200	0.000
7	.150	0.000
8	.100	0.000
9	.150	0.000

DOWNSTREAM FLOW PARAMETERS FOR PAWTUCKAWAY POND
BELOW DOLLOFF DAM

PARAMETER	UNITS	VARIABLE	VALUE
MAX DISCHARGE AT DOWNSTREAM EXTREMITY	CFS	QMAXD	0.0
MAX LATERAL OUTFLOW PRODUCING LOSSES	CFS/FT	QLL	0.000
INITIAL SIZE OF TIME STEP	HR	DTHM	0.0000
INITIAL WATER SURFACE ELEVATION DOWNSTREAM	FT	YDN	0.00
SLOPE OF CHANNEL DOWNSTREAM OF DAM	FT/MI	SOM	20.00
THETA WEIGHTING FACTOR		THETA	0.00
CONVERGENCE CRITERION FOR STAGE	FT	EPSY	0.000
TIME AT WHICH DAM STARTS TO FAIL	HR	TFI	0.00

LATERAL INFLOW REACH NUMBER

LQX(I)

5

(QL(L, I),L=1,ITEH)
6225.

****
****
*** ***
*** SUMMARY OF OUTPUT DATA ***

SLOPE PROFILE

MILES

ELEVATION FEET	.1	.8	1.6	2.4	3.2	4.0	4.8	5.6	6.4	7.2	8.0	ELEV FEET	MILE
0													
178.00	*											178.0	.1
168.00		*										168.0	.5
158.00			*									158.0	1.0
140.00				*								140.0	2.0
127.00					*							127.0	3.1
123.00						*						123.0	4.0
110.00							*					110.0	5.0

```
        .         .         .         .         .         .         .         .         .         .         .
        I         I         I         I         I         I         I         I         I         I         I
        I         I         I         I         I         I         I         I         I         I         I
  104.00I         I         I         I         I         I         I         I    *    I         I         I  104.0    6.0
        I         I         I         I         I         I         I         I         I         I         I
  102.00I         I         I         I         I         I         I         I         I        *I         I  102.0    7.2
        I         I         I         I         I         I         I         I         I         I         I
        I         I         I         I         I         I         I         I         I         I         I
   97.00I         I         I         I         I         I         I         I         I         I        *I   97.0    8.0
       .1        .8       1.6       2.4       3.2       4.0       4.8       5.6       6.4       7.2       8.0
                                              MILES
```

CROSS-SECTION NO.	MILE	BOTTOM ELEVATION FEET	REACH NO.	REACH LENGTH MILES	SLOPE FT/MI
1	.05	178.00			
2	.50	168.00	1	.45	22.22
3	1.00	158.00	2	.50	20.00
4	2.00	140.00	3	1.00	18.00
5	3.10	127.00	4	1.10	11.82
6	4.00	123.00	5	.90	4.44
7	5.00	110.00	6	1.00	13.00
8	6.00	104.00	7	1.00	6.00
9	7.20	102.00	8	1.20	1.67
10	8.00	97.00	9	.80	6.25

MESAGE

TOTAL NUMBER OF CROSS SECTIONS (ORIGINAL+INTERPOLATED) (N) = 55 (MAXIMUM ALLOWABLE = 200

TOTAL VOLUME IN RESERVOIR BEHIND
DOLLOFF DAM = 9562.3 ACRE-FEET

DEFINITION OF VARIABLES IN RESERVOIR DEPLETION TABLE

PARAMETER	UNITS	VARIABLE
TIME STEP FROM START OF ANALYSIS		I
ITERATIONS NECESSARY TO SOLVE FLOW EQUATIONS		K
ELAPSED TIME FROM START OF ANALYSIS	HRS	TTP(I)
TOTAL OUTFLOW FROM DAM	CFS	Q(I)
ELEVATION OF WATER SURFACE AT DAM	FT	H2

ELEVATION OF BOTTOM OF BREACH FT YB

EST DEPTH OF FLOW IMMEDIATELY DOWNSTREAM FT D

SUBMERGENCE COEFFICIENT SUB

VELOCITY CORRECTION VCOR

TOTAL VOLUME DISCHARGED FROM TIME OF BREACH AC-FT OUTVOL

BREACH WIDTH FT BB

RECTANGULAR BREACH DISCHARGE COEFFICIENT COFR

INFLOW TO RESERVOIR CFS QI(I)

BREACH OUTFLOW CFS QBRECH

SPILLWAY OUTFLOW CFS QSPIL

1

RESERVOIR DEPLETION TABLE

I	K	TTP(I)	Q(I)	H2	YB	D	SUB	VCOR	OUTVOL	BB	COFR	QI(I)	QBRECH	QSPIL
***	**	******	********	*******	*******	*******	****	****	*********	****	****	*****	******	*****
1	0	0.000	1493	253.80	252.70	182.97	1.00	1.00	0.0	0.0	3.10	1300.	0.	1493.
2	1	.020	1497	253.80	252.35	182.97	1.00	1.00	2.5	1.2	3.10	1300.	10.	1487.
3	1	.040	1505	253.80	251.99	182.98	1.00	1.00	5.0	2.4	3.10	1300.	23.	1482.
4	1	.060	1524	253.80	251.64	183.01	1.00	1.00	7.5	3.6	3.10	1300.	44.	1481.
5	1	.080	1552	253.80	251.28	183.05	1.00	1.00	10.0	4.8	3.10	1300.	72.	1481.
6	1	.100	1587	253.80	250.93	183.10	1.00	1.00	12.6	6.0	3.10	1300.	108.	1480.
7	1	.120	1632	253.80	250.58	183.16	1.00	1.00	15.3	7.2	3.10	1300.	152.	1480.
8	1	.140	1685	253.80	250.22	183.24	1.00	1.00	18.0	8.4	3.10	1300.	206.	1480.
9	1	.160	1748	253.80	249.87	183.33	1.00	1.00	20.8	9.6	3.10	1300.	269.	1479.
10	1	.180	1822	253.80	249.51	183.43	1.00	1.00	23.8	10.8	3.10	1300.	343.	1479.
11	1	.200	1906	253.79	249.16	183.54	1.00	1.00	26.9	12.0	3.10	1300.	428.	1478.
12	1	.220	2002	253.79	248.81	183.66	1.00	1.00	30.1	13.2	3.10	1300.	524.	1478.
13	1	.240	2109	253.79	248.45	183.79	1.00	1.00	33.5	14.4	3.10	1300.	632.	1477.
14	1	.260	2228	253.79	248.10	183.93	1.00	1.00	37.1	15.6	3.10	1300.	752.	1476.
15	1	.280	2360	253.79	247.74	184.08	1.00	1.00	40.9	16.8	3.10	1300.	885.	1475.
16	1	.300	2504	253.79	247.39	184.25	1.00	1.00	44.9	18.0	3.10	1300.	1031.	1474.
17	1	.320	2662	253.79	247.04	184.42	1.00	1.00	49.2	19.2	3.10	1300.	1190.	1473.
18	1	.340	2834	253.78	246.68	184.59	1.00	1.00	53.7	20.4	3.10	1300.	1363.	1472.
19	1	.360	3019	253.78	246.33	184.78	1.00	1.00	58.5	21.6	3.10	1300.	1550.	1470.
20	1	.380	3219	253.78	245.97	184.97	1.00	1.00	63.7	22.8	3.10	1300.	1751.	1468.
21	1	.400	3433	253.77	245.62	185.17	1.00	1.00	69.2	24.0	3.10	1300.	1967.	1466.
22	1	.420	3663	253.77	245.27	185.38	1.00	1.00	75.1	25.2	3.10	1300.	2199.	1464.
23	1	.440	3907	253.77	244.91	185.59	1.00	1.00	81.3	26.4	3.10	1300.	2446.	1462.
24	1	.460	4167	253.76	244.56	185.80	1.00	1.00	88.0	27.6	3.10	1300.	2708.	1459.
25	1	.480	4443	253.76	244.20	186.02	1.00	1.00	95.1	28.8	3.10	1300.	2987.	1457.
26	1	.500	4735	253.75	243.85	186.20	1.00	1.00	102.7	30.0	3.10	1300.	3282.	1453.
27	1	.520	5043	253.75	243.50	186.40	1.00	1.00	110.8	31.2	3.10	1300.	3593.	1450.
28	1	.540	5368	253.74	243.14	186.59	1.00	1.00	119.4	32.4	3.10	1300.	3922.	1446.
29	1	.560	5709	253.73	242.79	186.80	1.00	1.00	128.5	33.6	3.10	1300.	4267.	1442.
30	1	.580	6068	253.73	242.43	187.01	1.00	1.00	138.3	34.8	3.10	1300.	4630.	1438.
31	1	.600	6444	253.72	242.08	187.22	1.00	1.00	148.6	36.0	3.10	1300.	5011.	1433.

30	1	.580	6068	253.73	242.43	187.01	1.00	1.00	136.3	34.8	3.10	1300.	4630.	1436.
31	1	.600	6444	253.72	242.08	187.22	1.00	1.00	148.6	36.0	3.10	1300.	5011.	1433.
32	1	.620	6837	253.71	241.73	187.44	1.00	1.00	159.6	37.2	3.10	1300.	5410.	1428.
33	1	.640	7249	253.70	241.37	187.67	1.00	1.00	171.2	38.4	3.10	1300.	5826.	1423.
34	1	.660	7678	253.69	241.02	187.90	1.00	1.00	183.6	39.6	3.10	1300.	6261.	1417.
35	1	.680	8125	253.68	240.66	188.14	1.00	1.00	196.6	40.8	3.10	1300.	6715.	1411.
36	1	.700	8591	253.67	240.31	188.39	1.00	1.01	210.5	42.0	3.10	1300.	7187.	1404.
37	1	.720	9076	253.65	239.96	188.64	1.00	1.01	225.1	43.2	3.10	1300.	7679.	1397.
38	1	.740	9579	253.64	239.60	188.89	1.00	1.01	240.5	44.4	3.10	1300.	8190.	1390.
39	1	.760	10102	253.63	239.25	189.15	1.00	1.01	256.7	45.6	3.10	1300.	8720.	1382.
40	1	.780	10643	253.61	238.89	189.42	1.00	1.01	273.9	46.8	3.10	1300.	9270.	1373.
41	1	.800	11204	253.60	238.54	189.69	1.00	1.01	291.9	48.0	3.10	1300.	9841.	1364.
42	1	.820	11785	253.58	238.19	189.97	1.00	1.01	310.9	49.2	3.10	1300.	10431.	1355.
43	1	.840	12386	253.56	237.83	190.25	1.00	1.01	330.9	50.4	3.10	1300.	11041.	1345.
44	1	.860	13007	253.54	237.48	190.54	1.00	1.01	351.9	51.6	3.10	1300.	11673.	1334.
45	1	.880	13648	253.52	237.12	190.83	1.00	1.01	373.9	52.8	3.10	1300.	12325.	1323.
46	1	.900	14309	253.50	236.77	191.13	1.00	1.01	397.0	54.0	3.10	1300.	12998.	1312.
47	1	.920	14991	253.48	236.42	191.42	1.00	1.01	421.3	55.2	3.10	1300.	13692.	1299.
48	1	.940	15694	253.46	236.06	191.71	1.00	1.01	446.6	56.4	3.10	1300.	14408.	1287.
49	1	.960	16419	253.43	235.71	192.02	1.00	1.01	473.2	57.6	3.10	1300.	15146.	1273.
50	1	.980	17164	253.41	235.35	192.33	1.00	1.02	500.9	58.8	3.10	1300.	15906.	1259.

RESERVOIR DEPLETION TABLE

I	K	TTP(I)	Q(I)	H2	YB	D	SUB	VCOR	OUTVOL	BB	COFR	QI(I)	QBRECH	QSPIL
***	**	******	********	*******	*******	*******	****	****	*********	****	****	*****	******	*****
51	1	1.000	17932	253.38	235.00	192.64	1.00	1.02	529.9	60.0	3.10	1300.	16688.	1244.
52	1	1.020	17896	253.36	235.00	192.63	1.00	1.02	559.5	60.0	3.10	1300.	16667.	1229.
53	1	1.040	17842	253.33	235.00	192.60	1.00	1.02	589.1	60.0	3.10	1300.	16628.	1214.
54	1	1.060	17787	253.30	235.00	192.58	1.00	1.02	618.5	60.0	3.10	1300.	16588.	1199.
55	1	1.080	17733	253.27	235.00	192.56	1.00	1.02	647.9	60.0	3.10	1300.	16549.	1185.
56	1	1.100	17678	253.25	235.00	192.54	1.00	1.02	677.1	60.0	3.10	1300.	16509.	1170.
57	1	1.120	17625	253.22	235.00	192.51	1.00	1.02	706.3	60.0	3.10	1300.	16470.	1155.
58	1	1.140	17571	253.19	235.00	192.49	1.00	1.02	735.4	60.0	3.10	1300.	16430.	1141.
59	1	1.160	17517	253.17	235.00	192.47	1.00	1.02	764.4	60.0	3.10	1300.	16391.	1127.
60	1	1.180	17464	253.14	235.00	192.45	1.00	1.02	793.3	60.0	3.10	1300.	16352.	1112.
61	1	1.200	17411	253.11	235.00	192.43	1.00	1.02	822.1	60.0	3.10	1300.	16314.	1098.
62	1	1.220	17358	253.09	235.00	192.40	1.00	1.02	850.9	60.0	3.10	1300.	16275.	1084.
63	1	1.240	17306	253.06	235.00	192.38	1.00	1.02	879.5	60.0	3.10	1300.	16236.	1070.
64	1	1.260	17254	253.03	235.00	192.36	1.00	1.02	908.1	60.0	3.10	1300.	16198.	1056.
65	1	1.280	17201	253.01	235.00	192.34	1.00	1.02	936.6	60.0	3.10	1300.	16160.	1042.
66	1	1.300	17150	252.98	235.00	192.32	1.00	1.02	964.9	60.0	3.10	1300.	16121.	1029.
67	1	1.320	17098	252.95	235.00	192.30	1.00	1.02	993.2	60.0	3.10	1300.	16083.	1015.
68	1	1.340	17047	252.93	235.00	192.28	1.00	1.02	1021.5	60.0	3.10	1300.	16046.	1002.
69	1	1.360	16995	252.90	235.00	192.26	1.00	1.02	1049.6	60.0	3.10	1300.	16008.	988.
70	1	1.380	16944	252.87	235.00	192.23	1.00	1.02	1077.7	60.0	3.10	1300.	15970.	975.
71	1	1.400	16894	252.85	235.00	192.21	1.00	1.02	1105.6	60.0	3.10	1300.	15933.	962.
72	1	1.420	16843	252.82	235.00	192.19	1.00	1.02	1133.5	60.0	3.10	1300.	15895.	948.
73	1	1.440	16793	252.80	235.00	192.17	1.00	1.02	1161.3	60.0	3.10	1300.	15858.	935.
74	1	1.460	16743	252.77	235.00	192.15	1.00	1.02	1189.0	60.0	3.10	1300.	15821.	922.
75	1	1.480	16693	252.74	235.00	192.13	1.00	1.02	1216.6	60.0	3.10	1300.	15784.	910.
76	1	1.500	16643	252.72	235.00	192.11	1.00	1.02	1244.2	60.0	3.10	1300.	15747.	897.
77	1	1.520	16594	252.69	235.00	192.09	1.00	1.02	1271.7	60.0	3.10	1300.	15710.	884.
78	1	1.540	16545	252.67	235.00	192.07	1.00	1.02	1299.1	60.0	3.10	1300.	15674.	871.
79	1	1.560	16496	252.64	235.00	192.05	1.00	1.02	1326.4	60.0	3.10	1300.	15637.	859.
80	1	1.580	16447	252.62	235.00	192.03	1.00	1.02	1353.6	60.0	3.10	1300.	15601.	847.

81	1	1.600	16398	252.59	235.00	192.01	1.00	1.02	1380.7	60.0	3.10	1300.	15565.	834.
82	1	1.620	16350	252.57	235.00	191.99	1.00	1.02	1407.8	60.0	3.10	1300.	15528.	822.
83	1	1.640	16302	252.54	235.00	191.97	1.00	1.02	1434.8	60.0	3.10	1300.	15492.	810.
84	1	1.660	16254	252.52	235.00	191.95	1.00	1.02	1461.7	60.0	3.10	1300.	15457.	798.
85	1	1.680	16206	252.49	235.00	191.93	1.00	1.02	1488.5	60.0	3.10	1300.	15421.	786.
86	1	1.700	16159	252.46	235.00	191.91	1.00	1.02	1515.3	60.0	3.10	1300.	15385.	774.
87	1	1.720	16111	252.44	235.00	191.89	1.00	1.02	1541.9	60.0	3.10	1300.	15350.	762.
88	1	1.740	16064	252.41	235.00	191.87	1.00	1.02	1568.5	60.0	3.10	1300.	15314.	750.
89	1	1.760	16017	252.39	235.00	191.85	1.00	1.02	1595.0	60.0	3.10	1300.	15279.	739.
90	1	1.780	15971	252.36	235.00	191.83	1.00	1.02	1621.5	60.0	3.10	1300.	15244.	727.
91	1	1.800	15924	252.34	235.00	191.81	1.00	1.02	1647.8	60.0	3.10	1300.	15209.	716.
92	1	1.820	15878	252.32	235.00	191.79	1.00	1.02	1674.1	60.0	3.10	1300.	15174.	705.
93	1	1.840	15832	252.29	235.00	191.77	1.00	1.02	1700.3	60.0	3.10	1300.	15139.	693.
94	1	1.860	15786	252.27	235.00	191.75	1.00	1.02	1726.5	60.0	3.10	1300.	15104.	682.
95	1	1.880	15740	252.24	235.00	191.73	1.00	1.02	1752.5	60.0	3.10	1300.	15070.	671.
96	1	1.900	15695	252.22	235.00	191.71	1.00	1.02	1778.5	60.0	3.10	1300.	15035.	660.
97	1	1.920	15650	252.19	235.00	191.70	1.00	1.02	1804.4	60.0	3.10	1300.	15001.	649.
98	1	1.940	15605	252.17	235.00	191.68	1.00	1.02	1830.2	60.0	3.10	1300.	14967.	638.
99	1	1.960	15560	252.14	235.00	191.66	1.00	1.02	1856.0	60.0	3.10	1300.	14933.	628.
100	1	1.980	15515	252.12	235.00	191.64	1.00	1.02	1881.7	60.0	3.10	1300.	14899.	617.

RESERVOIR DEPLETION TABLE

I	K	TTP(I)	Q(I)	H2	YB	D	SUB	VCOR	OUTVOL	BB	COFR	QI(I)	QBRECH	QSPIL
***	**	******	********	*******	*******	*******	****	****	*********	****	****	*****	******	*****
101	1	2.000	15471	252.09	235.00	191.62	1.00	1.02	1907.3	60.0	3.10	1300.	14865.	606.
102	1	2.020	15427	252.07	235.00	191.60	1.00	1.02	1932.8	60.0	3.10	1300.	14831.	596.
103	1	2.042	15378	252.04	235.00	191.58	1.00	1.02	1960.8	60.0	3.10	1300.	14794.	584.
104	1	2.066	15325	252.01	235.00	191.56	1.00	1.02	1991.5	60.0	3.10	1300.	14754.	572.
105	1	2.093	15267	251.98	235.00	191.54	1.00	1.02	2025.2	60.0	3.10	1300.	14709.	558.
106	1	2.122	15204	251.95	235.00	191.51	1.00	1.02	2062.1	60.0	3.10	1300.	14661.	544.
107	1	2.154	15135	251.91	235.00	191.48	1.00	1.02	2102.4	60.0	3.10	1300.	14607.	528.
108	1	2.190	15059	251.87	235.00	191.45	1.00	1.02	2146.6	60.0	3.10	1300.	14549.	510.
109	1	2.229	14977	251.82	235.00	191.41	1.00	1.02	2195.0	60.0	3.10	1300.	14486.	492.
110	1	2.272	14887	251.77	235.00	191.38	1.00	1.02	2247.9	60.0	3.10	1300.	14416.	471.
111	1	2.319	14789	251.72	235.00	1911.33	1.00	1.02	2305.8	60.0	3.10	1300.	14340.	449.
112	1	2.371	14683	251.66	235.00	191.29	1.00	1.02	2368.9	60.0	3.10	1300.	14257.	426.
113	1	2.428	14567	251.59	235.00	191.24	1.00	1.02	2437.9	60.0	3.10	1300.	14167.	401.
114	1	2.490	14442	251.52	235.00	191.19	1.00	1.02	2513.2	60.0	3.10	1300.	14069.	374.
115	1	2.559	14306	251.44	235.00	191.13	1.00	1.02	2595.2	60.0	3.10	1300.	13961.	345.
116	1	2.635	14159	251.35	235.00	191.07	1.00	1.02	2684.5	60.0	3.10	1300.	13845.	315.
117	1	2.719	14001	251.26	235.00	191.00	1.00	1.02	2781.7	60.0	3.10	1300.	13719.	283.
118	1	2.811	13830	251.16	235.00	190.92	1.00	1.02	2887.4	60.0	3.10	1300.	13581.	249.
119	1	2.912	13646	251.05	235.00	190.84	1.00	1.02	3002.2	60.0	3.10	1300.	13433.	214.
120	1	3.023	13450	250.93	235.00	190.75	1.00	1.02	3126.7	60.0	3.10	1300.	13272.	178.
121	2	3.145	13239	250.79	235.00	190.65	1.00	1.02	3261.6	60.0	3.10	1300.	13098.	142.
122	2	3.280	13016	250.65	235.00	190.54	1.00	1.02	3407.6	60.0	3.10	1300.	12911.	105.
123	2	3.428	12779	250.50	235.00	190.43	1.00	1.02	3565.4	60.0	3.10	1300.	12709.	70.
124	2	3.591	12530	250.33	235.00	190.32	1.00	1.02	3735.6	60.0	3.10	1300.	12492.	38.
125	2	3.770	12271	250.15	235.00	190.20	1.00	1.02	3919.2	60.0	3.10	1300.	12260.	12.
126	2	3.967	12010	249.96	235.00	190.07	1.00	1.02	4116.8	60.0	3.10	1300.	12010.	0.
127	2	4.184	11742	249.74	235.00	189.95	1.00	1.02	4329.5	60.0	3.10	1300.	11743.	0.
128	2	4.422	11455	249.51	235.00	189.81	1.00	1.02	4558.0	60.0	3.10	1300.	11456.	0.
129	2	4.684	11147	249.27	235.00	189.66	1.00	1.02	4803.0	60.0	3.10	1300.	11148.	0.
130	2	4.973	10818	249.00	235.00	189.50	1.00	1.02	5064.7	60.0	3.10	1300.	10818.	0.
131	2	5.290	10467	248.70	235.00	189.33	1.00	1.02	5343.8	60.0	[illegible]	1300.	10467.	0.

131	2	5.290	10467	248.70	235.00	189.33	1.00	1.02	5343.8	60.0	3.10	1300.	10467.	0.
132	2	5.639	10093	248.39	235.00	189.15	1.00	1.02	5640.3	60.0	3.10	1300.	10094.	0.
133	2	6.023	9698	248.05	235.00	188.95	1.00	1.02	5954.3	60.0	3.10	1300.	9698.	0.
134	2	6.445	9280	247.69	235.00	188.74	1.00	1.02	6285.4	60.0	3.10	1300.	9281.	0.
135	2	6.910	8842	247.30	235.00	188.52	1.00	1.02	6633.3	60.0	3.10	1300.	8843.	0.
136	2	7.420	8384	246.89	235.00	188.28	1.00	1.02	6997.0	60.0	3.10	1300.	8385.	0.
137	2	7.983	7909	246.45	235.00	188.03	1.00	1.02	7375.5	60.0	3.10	1300.	7909.	0.
138	2	3.601	7418	245.99	235.00	187.76	1.00	1.02	7767.1	60.0	3.10	1300.	7419.	0.
139	2	9.281	6915	245.50	235.00	187.49	1.00	1.02	8169.9	60.0	3.10	1300.	6916.	0.
140	2	10.029	6404	244.99	235.00	187.20	1.00	1.02	8581.7	60.0	3.10	1300.	6405.	0.

PARAMETER	UNITS	VARIABLE	VALUE
INITIAL FLOW	CFS	Q(1)	1493.
MAX FLOW	CFS	QM	17932.
FINAL FLOW	CFS	Q(NU)	6405.
TIME TO MAX FLOW	HRS	TP	1.00
NUMBER OF TIME STEPS		NNU	140
TOTAL VOLUME DISCHARGED FROM RESERVOIR	AC-FT	DISVOL	8582.
NUMBER OF INTERMEDIATE STATIONS		NN(NS)	55
NUMBER OF TIME STEPS		NNU	140

TIME PARAMETERS OF OUTFLOW HYDROGRAPH IMMEDIATELY DOWNSTREAM OF DAM

PARAMETER	UNITS	VARIABLE	VALUE
TIME TO FAILURE	HR	TFH	1.000
TIME TO START OF RISING LIMB OF HYDROGRAPH	HR	TFO	0.000
TIME TO PEAK	HR	TP	1.000
TIME STEP SIZE	HR	DTHI	.050

ROUTING COMPLETED.

KTIME=145 ALLOWABLE KTIME= 698 TT= 10.1

PROFILE OF CRESTS AND TIMES FOR PAWTUCKAWAY POND
BELOW DOLLOFF DAM

RVR MILE FROM DAM	MAX ELEV (FT)	MAX FLOW (CFS)	TIME MAX ELEV(HR)	MAX VEL (FT/SEC)	MAX VEL (MI/HR)	FLOOD ELEV (FT)	TIME FLOOD ELEV (HR)
.050	192.11	17932	1.100	5.46	3.72	0.00	0.00
.163	189.63	17744	1.150	5.23	3.57	0.00	0.00
.275	187.09	17500	1.200	5.17	3.53	0.00	0.00
.388	184.47	17423	1.200	5.21	3.55	0.00	0.00
.500	181.73	17440	1.250	5.46	3.73	0.00	0.00
.667	177.68	17351	1.300	5.19	3.54	0.00	0.00
.833	173.72	17284	1.400	4.90	3.34	0.00	0.00
1.000	170.84	17138	1.500	3.97	2.71	0.00	0.00
1.167	168.42	16972	1.650	4.05	2.76	0.00	0.00
1.333	165.90	16781	1.750	4.24	2.89	0.00	0.00
1.500	163.26	16585	1.900	4.44	3.02	0.00	0.00
1.667	160.60	16395	2.000	4.65	3.17	0.00	0.00
1.833	157.98	16229	2.100	4.76	3.25	0.00	0.00
2.000	155.52	16097	2.200	4.78	3.26	0.00	0.00
2.157	153.31	15988	2.350	4.61	3.14	0.00	0.00
2.314	151.17	15874	2.500	4.39	2.99	0.00	0.00
2.471	149.27	15713	2.800	4.07	2.78	0.00	0.00
2.629	147.80	15488	2.950	3.48	2.37	0.00	0.00
2.786	146.79	15228	3.150	2.79	1.90	0.00	0.00
2.943	146.19	14935	3.200	2.01	1.37	0.00	0.00
3.100	145.86	14860	3.250	1.45	.99	0.00	0.00
3.250	145.37	20854	3.250	2.29	1.56	0.00	0.00
3.400	144.63	20758	3.307	2.64	1.80	0.00	0.00
3.550	143.66	20946	3.307	3.23	2.20	0.00	0.00
3.700	142.34	20691	3.365	3.79	2.58	0.00	0.00
3.850	140.45	20679	3.365	4.84	3.30	0.00	0.00
4.000	137.25	20672	3.422	6.89	4.70	0.00	0.00
4.200	134.54	20660	3.537	6.81	4.64	0.00	0.00
4.400	131.95	20641	3.652	6.65	4.54	0.00	0.00
4.600	129.62	20611	3.825	6.34	4.32	0.00	0.00
4.800	127.72	20564	4.067	5.79	3.95	0.00	0.00
5.000	126.32	20501	4.188	5.09	3.47	0.00	0.00
5.167	125.33	20427	4.248	4.78	3.26	0.00	0.00
5.333	124.41	20320	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

5.167	125.33	20427	4.248	4.78	3.26	0.00	0.00
5.333	124.41	20320	4.369	4.49	3.06	0.00	0.00
5.500	123.59	20182	4.611	4.18	2.85	0.00	0.00
5.667	122.87	20019	4.732	3.86	2.63	0.00	0.00
5.833	122.24	19847	4.793	3.51	2.39	0.00	0.00
6.000	121.71	19682	4.853	3.18	2.17	0.00	0.00
6.100	121.40	19591	4.914	3.19	2.18	0.00	0.00
6.200	121.07	19511	4.914	3.21	2.19	0.00	0.00
6.300	120.72	19444	4.974	3.24	2.21	0.00	0.00
6.400	120.36	19396	4.974	3.27	2.23	0.00	0.00
6.500	119.98	19364	4.974	3.33	2.27	0.00	0.00
6.600	119.57	19341	5.055	3.40	2.32	0.00	0.00
6.700	119.14	19324	5.055	3.49	2.38	0.00	0.00
6.800	118.66	19311	5.055	3.62	2.47	0.00	0.00
6.900	118.14	19302	5.055	3.77	2.57	0.00	0.00
7.000	117.55	19296	5.055	3.97	2.71	0.00	0.00

PROFILE OF CRESTS AND TIMES FOR PAWTUCKAWAY POND
BELOW DOLLOFF DAM

RVR MILE FROM DAM	MAX ELEV (FT)	MAX FLOW (CFS)	TIME MAX ELEV(HR)	MAX VEL (FT/SEC)	MAX VEL (MI/HR)	FLOOD ELEV (FT)	TIME FLOOD ELEV (HR)
7.100	116.88	19290	5.137	4.23	2.88	0.00	0.00
7.200	116.08	19287	5.137	4.58	3.12	0.00	0.00
7.360	114.76	19282	5.137	4.70	3.20	0.00	0.00
7.520	113.41	19279	5.137	4.82	3.29	0.00	0.00
7.680	112.04	19278	5.137	4.96	3.38	0.00	0.00
7.840	110.63	19277	5.137	5.11	3.49	0.00	0.00
8.000	109.17	19280	5.137	5.29	3.61	0.00	0.00

PEAK ELEVATION PROFILE

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                                   MILES                                                                  ELEV
                                                                                                          FEET   MILE
      .1        .8       1.6       2.4       3.2       4.0       4.8       5.6       6.4       7.2       8.0
192.11+         I         I         I         I         I         I         I         I         I         I  192.1    .1
      I         I         I         I         I         I         I         I         I         I         I
      I         I         I         I         I         I         I         I         I         I         I
      I+        I         I         I         I         I         I         I         I         I         I  189.6    .2
      I         I         I         I         I         I         I         I         I         I         I
      I         I         I         I         I         I         I         I         I         I         I
      I         I         I         I         I         I         I         I         I         I         I
      I  +      I         I         I         I         I         I         I         I         I         I  187.1    .3
      I         I         I         I         I         I         I         I         I         I         I
      I         I         I         I         I         I         I         I         I         I         I
      I         I         I         I         I         I         I         I         I         I         I
      I    +    I         I         I         I         I         I         I         I         I         I  184.5    .4
      I         I         I         I         I         I         I         I         I         I         I


      I         I         I         I         I         I         I         I         I         I         I
      I         I         I         I         I         I         I         I         I         I         I
      I    +    I         I         I         I         I         I         I         I         I         I  181.7    .5
      I         I         I         I         I         I         I         I         I         I         I
```

```
6
          I         I   *     I         I         I         I         I         I         I         I         I   1.7   1.2
+                                                                                                                          168.
4
          I            I      I         I         I         I         I         I   I         I         I
          I         I         I         I         I         I         I         I         I         I         I
          I         I*        I         I         I         I         I         I         I         I         I   1.5   1.0
+                                                                                                                          170.
8
     I         I               I         I   1.4    .8
+                                                                                                                          173.
7
          I         I        I         I         I         I         I         I         I
          I      *  I         I         I         I         I         I         I         I         I         I   1.3    .7
+                                                                                                                          177.
7
+         I    *    I         I         I         I         I         I         I         I
          I   *     I         I         I         I         I         I              I         I         I   1.2    .4
+                                                                                                                          184.
5
+         I *       I         I         I         I         I         I      I         I
          I*        I         I         I         I         I         I         I         I         I         I   1.2    .2
+
  I
          *         I         I         I         I I         I         I         I         I         I  1.1    .1
+                                                                                                                          192.
1 3.2     4.0    .1  1.6   .2 2 4   2.
  4 0
.6              6 . 428.0

ML
ES

   I E

SC H ARGE H Y
DRO
GRA         A
TUC K W Y P
          DISARPH FOR  U K WAY P B L.W  TOTLOFN         ELOW  DOLO F   D A M  S 0   . SMX
ELE V  TION REA
CHE D B   LAOE ZARE =  178.01
 M A X   E E    T I O N   R E A C E    Y FLOOD WAVE =  19
AB
                          FAX STAGE =    14.11      AT TIM0 HOURS
                     MAX FLOW =     17932    AT TIME =     1.000 HOURS

     HR   STAGE      FLOW  0      5000      10000     15000     20000     25000
     0.0    4.8      1493  I  *      I         I         I         I         I
      .2    5.2      1907  I   *     I         I         I         I         I
      .4    6.8      3434  I      *  I         I         I         I         I
      .6    8.9      6444  I         I  *      I         I         I         I
      .8   11.2     11205  I         I         I *       I         I         I
     1.0   13.9     17932  I         I         I         I     *   I         I



     1.2   14.1     17412  I         I         I         I    *    I         I
     1.4   13.9     16894  I         I         I         I   *     I         I
     1.6   13.7     16399  I         I         I         I  *      I         I
     1.8   13.5     15925  I         I         I         I *       I         I
     2.0   13.3     15471  I         I         I         I*        I         I
     2.2   13.2     15038  I         I         I         *         I         I
     2.4   13.0     14624  I         I         I        *I         I         I
```

2.6	12.8	14228
2.8	12.7	13851
3.0	12.5	13491
3.2	12.4	13149
3.4	12.2	12824
3.6	12.1	12517
3.8	12.0	12232
4.0	11.9	11970
4.2	11.8	11723
4.4	11.6	11482
4.6	11.5	11247
4.8	11.4	11016
5.0	11.3	10788
5.2	11.2	10567
5.4	11.1	10349
5.6	11.0	10135
5.8	10.9	9928
6.0	10.8	9721
6.2	10.7	9523
6.4	10.6	9326
6.6	10.5	9135
6.8	10.5	8946
7.0	10.4	8762
7.2	10.3	8582
7.4	10.2	8404
7.6	10.1	8233
7.8	10.0	8064
8.0	9.9	7896
8.2	9.8	7737
8.4	9.7	7578
8.6	9.7	7420
8.8	9.6	7271
9.0	9.5	7123
9.2	9.4	6976
9.4	9.4	6834
9.6	9.3	6698
9.8	9.2	6561

DISCHARGE HYDROGRAPH FOR PAWTUCKAWAY POND ... STATION NUMBER 5
BELOW DOLLOFF DAM AT MILE .50
GAGE ZERO = 168.00 MAX ELEVATION REACHED BY FLOOD WAVE = 181.73
FLOOD STAGE NOT AVAILABLE
MAX STAGE = 13.73 AT TIME = 1.250 HOURS
MAX FLOW = 17441 AT TIME = 1.200 HOURS

HR	STAGE	FLOW
0.0	4.1	1493
.2	4.2	1551
.4	5.0	2266
.6	6.9	4334
.8	9.4	8223
1.0	12.2	14254
1.2	13.7	17441
1.4	13.7	17124
1.6	13.5	16643
1.8	13.3	16163
2.0	13.2	15701

1.6	13.3	16163	
2.0	13.2	15701	
2.2	13.0	15259	
2.4	12.9	14836	
2.6	12.7	14433	
2.8	12.6	14048	
3.0	12.4	13654	
3.2	12.3	13327	
3.4	12.1	13000	
3.6	12.0	12684	
3.8	11.8	12400	
4.0	11.7	12110	
4.2	11.6	11861	
4.4		11618	
4.6	11.4	11380	
4.8	11.3	11146	
5.0	11.2	10917	
5.2	11.1	10693	
5.4	10.9	10473	
5.6	10.8	10259	
5.8	10.7	10048	
6.0	10.6	9841	
6.2	10.5	9639	
6.4	10.4	9441	
6.6	10.3	9247	
6.8	10.2	9054	
7.0	10.1	8877	
7.2	10.0	8695	
7.4	9.9	8515	
7.6	9.8	8339	
7.8	9.7	8169	
8.0	9.6	8000	
8.2	9.5	7836	
8.4	9.4	7677	
8.6	9.3	7519	
8.8	9.2	7365	
9.0	9.1	7217	
9.2	9.0	7069	
9.4	9.0	6924	
9.6	8.9	6785	
9.8	8.8	6649	

DISCHARGE HYDROGRAPH FOR PAWTUCKAWAY POND ... STATION NUMBER 8
BELOW DOLLOFF DAM AT MILE 1.00

GAGE ZERO = 158.00 MAX ELEVATION REACHED BY FLOOD WAVE = 170.84
FLOOD STAGE NOT AVAILABLE
MAX STAGE = 12.84 AT TIME = 1.500 HOURS
MAX FLOW = 17139 AT TIME = 1.400 HOURS

HR	STAGE	FLOW	
0.0	4.0	1493	
.2	4.0	1493	
.4	4.1	1604	
.6	4.9	2449	
.8	6.7	4797	
1.0	9.4	9595	
1.2	12.2	16360	
1.4	12.8	17139	

1.6	12.8	16863	
1.8	12.7	16422	
2.0	12.6	15964	
2.2	12.5	15517	
2.4	12.3	15085	
2.6	12.2	14673	
2.8	12.0	14279	
3.0	11.8	13719	
3.2	11.8	13517	
3.4	11.6	13204	
3.6	11.5	12883	
3.8	11.3	12290	
4.0	11.3	12254	
4.2	11.2	12027	
4.4	11.1	11783	
4.6	11.0	11545	
4.8	10.9	11310	
5.0	10.8	11079	
5.2	10.7	10852	
5.4	10.6	10632	
5.6	10.5	10415	
5.8	10.4	10202	
6.0	10.3	9993	
6.2	10.3	9788	
6.4	10.2	9588	
6.6	10.1	9391	
6.8	9.7	8811	
7.0	9.8	8977	
7.2	9.8	8830	
7.4	9.7	8657	
7.6	9.6	8481	
7.8	9.5	8309	
8.0	9.4	8139	
8.2	9.3	7973	
8.4	9.2	7811	
8.6	9.1	7653	
8.8	9.0	7496	
9.0	9.0	7345	
9.2	8.9	7197	
9.4	8.8	7050	
9.6	8.7	6907	
9.8	8.6	6769	

DISCHARGE HYDROGRAPH FOR PAWTUCKAWAY POND ... STATION NUMBER 21
BELOW DOLLOFF DAM AT MILE 3.10

GAGE ZERO = 127.00 MAX ELEVATION REACHED BY FLOOD WAVE = 145.86
FLOOD STAGE NOT AVAILABLE
MAX STAGE = 18.86 AT TIME = 3.250 HOURS
MAX FLOW = 14861 AT TIME = 2.900 HOURS

HR	STAGE	FLOW
0.0	11.7	1493
.2	11.7	1493
.4	11.7	1493
.6	11.7	1493
.8	11.7	1493

.6	11.7	1493	
1.0	11.7	1525	
1.2	11.8	1766	
1.4	12.2	2834	
1.6	13.2	5609	
1.8	14.7	9039	
2.0	16.3	11830	
2.2	17.2	13276	
2.4	17.9	14088	
2.6	18.4	14536	
2.8	18.7	14392	
3.0	18.8	14713	
3.2	18.9	14575	
3.4	18.8	14352	
3.6	18.8	14117	
3.8	18.7	13873	
4.0	18.6	13577	
4.2	18.5	13510	
4.4	18.4	12958	
4.6	18.3	12690	
4.8	18.1	12463	
5.0	18.0	12231	
5.2	17.9	12001	
5.4	17.8	11771	
5.6	17.7	11544	
5.8	17.6	11319	
6.0	17.5	11098	
6.2	17.4	10880	
6.4	17.3	10666	
6.6	17.2	10455	
6.8	17.1	10452	
7.0	17.0	9891	
7.2	16.9	9691	
7.4	16.7	9480	
7.6	16.6	9311	
7.8	16.6	9156	
8.0	16.5	8999	
8.2	16.4	8838	
8.4	16.3	8675	
8.6	16.2	8512	
8.8	16.1	8349	
9.0	16.1	8186	
9.2	15.9	7	
9.4	15.8	7823	
9.6	15.8	7668	
9.8	15.7	7524	

DISCHARGE HYDROGRAPH FOR PAWTUCKAWAY POND ... STATION NUMBER 32
BELOW DOLLOFF DAM AT MILE 5.00

GAGE ZERO = 110.00 MAX ELEVATION REACHED BY FLOOD WAVE = 126.32

FLOOD STAGE NOT AVAILABLE
MAX STAGE = 16.32 AT TIME = 4.188 HOURS
MAX FLOW = 20502 AT TIME = 3.595 HOURS

HR	STAGE	FLOW	0	5000	10000	15000	20000	25000
0.0	10.1	7718						
.2	10.1	7718						

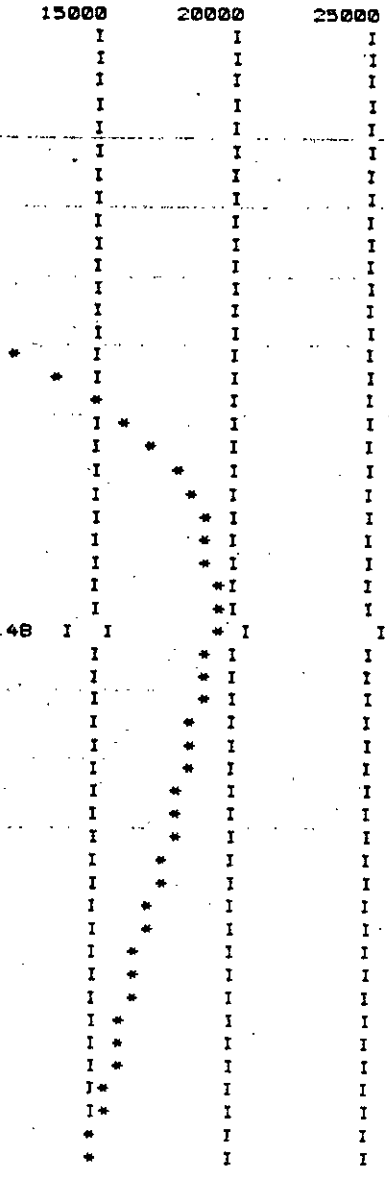
.4	10.1	7718	I
.6	10.1	7718	I
.8	10.1	7718	I
1.0	10.1	7718	I
1.2	10.1	7721	I
1.4	10.1	7763	I
1.6	10.2	7993	I
1.8	10.5	8832	I
2.0	11.3	10658	I
2.2	12.3	13190	I
2.4	13.4	15663	I
2.6	14.3	17533	I
2.8	14.9	18787	I
3.0	15.4	19730	I
3.2	15.8	20211	I
3.4	16.0	20444	I
3.6	16.1	20501	I
3.8	16.2	20445	I
4.0	16.3	20320	I
4.2	16.3	20129	I
4.4	16.3	19797	I
4.6	16.2	19569	I
4.8	16.2	19341	I
5.0	16.1	19115	I
5.2	16.1	18890	I
5.4	16.0	18665	I
5.6	15.9	18440	I
5.8	15.8	18216	I
6.0	15.7	17993	I
6.2	15.6	17771	I
6.4	15.5	17552	I
6.6	15.4	17334	I
6.8	15.3	17115	I
7.0	15.2	16837	I
7.2	15.1	16583	I
7.4	15.0	16370	I
7.6	14.9	16148	I
7.8	14.8	15936	I
8.0	14.7	15745	I
8.2	14.6	15568	I
8.4	14.5	15399	I
8.6	14.4	15233	I
8.8	14.3	15068	I
9.0	14.3	14904	I
9.2	14.2	14721	I
9.4	14.1	14481	I
9.6	14.0	14305	I
9.8	13.9	14172	I

DISCHARGE HYDROGRAPH FOR PAWTUCKAWAY POND ... STATION NUMBER 50

BELOW DOLLOFF DAM AT MILE 7.20

GAGE ZERO = 102.00 MAX ELEVATION REACHED BY FLOOD WAVE = 116.08
FLOOD STAGE NOT AVAILABLE
MAX STAGE = 14.08 AT TIME = 5.137 HOURS
MAX FLOW = 19287 AT TIME = 5.055 HOURS

HR	STAGE	FLOW
.1	8.9	7718
.3	8.9	7718
.5	8.9	7718
.7	8.9	7718
.9	8.9	7718
1.1	8.9	7718
1.3	8.9	7718
1.5	8.9	7718
1.7	8.9	7724
1.9	8.9	7769
2.1	8.9	7937
2.3	9.1	8377
2.5	9.5	9224
2.7	10.1	10481
2.9	10.7	11977
3.1	11.4	13493
3.3	12.0	14883
3.5	12.6	16067
3.7	13.0	17032
3.9	13.4	17791
4.1	13.6	18365
4.3	13.8	18782
4.5	14.0	19059
4.7	14.0	19213
4.9	14.1	19279
5.1	14.1	19281
5.3	14.1	19233
5.5	14.0	19148
5.7	14.0	19034
5.9	14.0	18896
6.1	13.9	18741
6.3	13.8	18572
6.5	13.8	18393
6.7	13.7	18204
6.9	13.6	18010
7.1	13.5	17808
7.3	13.4	17592
7.5	13.4	17373
7.7	13.3	17154
7.9	13.2	16936
8.1	13.1	16721
8.3	13.0	16513
8.5	12.9	16313
8.7	12.9	16121
8.9	12.8	15934
9.1	12.7	15752
9.3	12.6	15572
9.5	12.5	15390
9.7	12.5	15202
9.9	12.4	15016



1
READY.

LOGOUT

B3846BB LOG OFF 09.04.06.
SBU = 1.521
TIO = 229203

Time 52 min