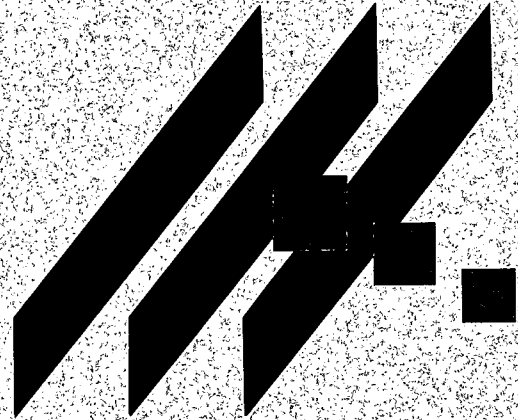


M K E C E N G I N E E R I N G C O N S U L T A N T S , I N C



**DRAINAGE REPORT**

FOR

**THE WATERFRONT FIFTH ADDITION**

**JULY 2004**

# Drainage Report for The Waterfront Fifth Addition Wichita, Kansas

## Location

The site is located in Wichita, Sedgwick County, Kansas, on the northeast corner of Webb Road and 13<sup>th</sup> Street North. It lies in the Southwest Quarter, Section 9, Township 27 South, Range 2 East. The total site area is approximately 13.3 acres. The site is bounded by the Waterfront 1<sup>st</sup> and 2<sup>nd</sup> Additions to the west, 13th Street to the south, and undeveloped meadow area to the north and east. The site is shown on the Andover, Kansas Quadrangle located in Appendix A.

## Soils

According to the NRCS (SCS) Sedgwick County Soil Survey (Appendix B), most of the site is in the Irwin Series (Ia: Irwin silty clay loam, with 1 to 3 percent slopes) and the Rose Hill Series (Rd: silty clay, 1 to 3 percent slopes). The Hydrological Soil Group (HSG) for the Irwin and Rose Hill series soils is D. The drainage calculations were based on soil group D.

## Pre-developed Conditions

### *Current Development*

The site is currently undeveloped pasture land. The site is being used as a recreational area.

### *Current Landform and Slope*

Slopes across the site range from 1-2%. A ridge runs north to south through the site. The site drains to the south through a 4'x5' reinforced concrete box (RCB) under 13<sup>th</sup> Street North. Elevations on the site range from 1385 ft. in the north to 1372 ft. at the RCB.

### *Current Drainage Conditions*

The entire site is in Zone C. The nearest Zone A is approximately 1100 feet west of the site surrounding the existing lake in The Waterfront Addition (FIRM Panel 150, Sedgwick County, June 3, 1986) (shown in Appendix C).

### *Upstream of Site*

Approximately 555 acres drain into the existing lake in the Waterfront Addition. Approximately 225 acres drains from the north to the Eastminster Addition, directly north of the site. This runoff passes through an existing detention facility east of the Eastminster Presbyterian Church, north of the railroad. An additional 105 acres drains to the existing 11'x9' reinforced concrete box (RCB) which passes under the railroad tracks. The runoff

then passes through an existing channel and into the silt pond on the site. An additional 28 acres drains to the silt pond. An existing earthen dam separates the silt pond from the lake. The runoff must pass around the dam to the west and into the lake. An additional 196 acres drains to the existing lake. This includes approximately 48 acres from the west side of Webb Road. This area drains through an existing RCB under Webb Road and into the lake. Most of the developable area upstream of the site is already developed, with the exception of the area just west of Webb Road, which is currently undeveloped pasture land.

*Current Runoff Characteristics*

The pre-developed watershed is divided into nine different sub-watersheds: 1 is the area North of Eastminster, 2 is the tributary from the west, 3 is the area draining to the railroad, 4 is the area draining to the silt pond, 5 is the area north and east of the site, 6 is the area directly east of the site, 7 includes part of the site, 8 is the area to the west of Webb Road, and 9 is the area draining to the lake south of Webb Road including a portion of the site. These areas have been shown on the Andover Quadrangle map in Appendix A. The TR-20 software model was used to calculate peak flows using the SCS 24-hour storm (results are shown in Appendix D). The curve numbers used for the sub-watersheds were calculated based on percentage of development within each sub-watershed. They range from 82 to 90.5. Peak discharge from the sub-watersheds and watershed for the 2, 5, 10, and 100-year return periods under existing conditions are shown in Table 1. Sub-watersheds 5, 6, 7, and 8 were modeled together for the existing conditions model. Both the Waterfront and Waterfront Second Additions were considered undeveloped for existing conditions.

**Table 1. Pre-developed runoff.**

Sub-Watershed	2-Year (cfs)	5-Year (cfs)	10-Year (cfs)	100-Year (cfs)
1	154	216	257	408
2	118	167	200	318
3	161	221	262	417
4	33	49	59	98
(5-8 Combined)	183	265	320	522
9	237	359	439	745
Total to Lake	740	1030	1185	1736
Total Exiting Lake	294	490	607	1091

Due to the complexity of modeling the lakes north and south of 13<sup>th</sup> Street North as separate reservoirs, the lakes were combined and modeled as one reservoir. The lakes were modeled based on an existing control structure and spillway at the south end of the south lake. The existing weir is a concrete structure with a 12' wide notch at elevation 1368.7', and an additional 70' of width at elevation 1369.7'. Currently, there is a wood plank covering the 12' wide notch. However, this wood plank is not bonded to the concrete with a watertight seal, and water leaks out along the seam between the wood and concrete. The owner of the Waterfront Addition has indicated that the wood plank will be removed from the weir prior to the subject development. The lake was modeled without this weir in place, for both existing and proposed conditions. Rating curves for the weir were developed using the HY-8 computer software program.

## Post-Developed Condition

### *Proposed Development*

The site will develop as three commercial lots with varying sizes. The anticipated use is retail.

### *Proposed Landform and Slope*

Proposed slopes are expected to range from 0.5% to 3%. Drainage will be conveyed under portions of the site through a storm water sewer system as shown on the Drainage & Utility Plan in Appendix E. An extension will be built onto the existing RCB to convey runoff to 13<sup>th</sup> Street. Runoff will continue to flow south through the existing RCB under 13<sup>th</sup> Street North.

### *Proposed Runoff Characteristics*

The TR-20 software model calculated peak flows for the developed watersheds using the SCS 24-hour storm (results are shown in Appendix F). Sub-watersheds 4 and 7 were changed to reflect increased runoff curve numbers and decreased times of concentration due to development of the Waterfront Addition and the Waterfront Second Addition. Sub-watershed 9 is just over 220 acres. The area of sub-watershed 9 that is developing is 13 acres, which is 5.9% of the area of sub-watershed 9. Waterfront Fifth Addition is such a small portion of sub-watershed 9 that it has no effect on the watershed as a whole. The area of the watershed draining to the 4'x5' box under 13<sup>th</sup> Street is 50.6 acres. The developing area is 25% of the area draining to the box. A curve number of 95.0 was used for the proposed developed areas, with a time of concentration estimated at 20-25 minutes. Runoff under the developed conditions for the 2, 5, 10, and 100-year return periods are shown in Table 2.

**Table 2. Post-developed runoff.**

Sub-Watershed	2-Year (cfs)	5-Year (cfs)	10-Year (cfs)	100-Year (cfs)
1	154	216	257	408
2	118	167	200	318
3	161	221	262	417
4	63	85	100	153
5	34	53	66	117
6	55	84	104	180
Total to Prop. Pond	89	137	170	296
Total out of Prop. Pond	44	70	95	190
7	142	187	217	325
8	43	69	86	153
9	237	359	439	745
Total to Lake	769	1107	1333	2109
Total Exiting Lake	218	405	532	1098

The additional runoff due to development of the site will have minimal impact on the watershed as whole. The short time of concentration for the developed area will allow the additional runoff to pass through the lake prior to the peak runoff from upstream. The proposed detention pond in the Waterfront Addition will also help to reduce flows into the existing lake facilities. Discharge from the south lake will increase by 7 cfs (0.6%). Water surface elevations for the lakes will increase by 0.01' under proposed conditions. A HEC-RAS hydraulic model was prepared and indicates a 100-year water surface elevation of 1372.14 for the north lake, and 1371.92 for the south lake. This model will be revised as the lake improvement designs are completed.

Proposed on-site storm water sewer systems have been included on the Drainage and Utility plan in Appendix E. Final location of storm water sewer and pipe sizes will be determined as the site develops.

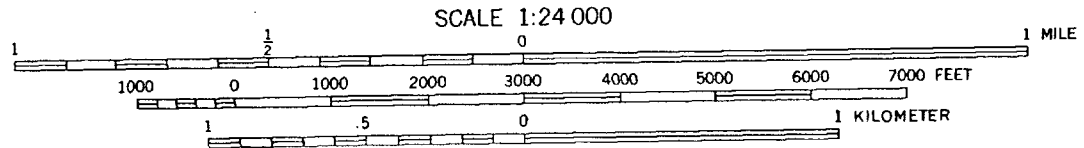
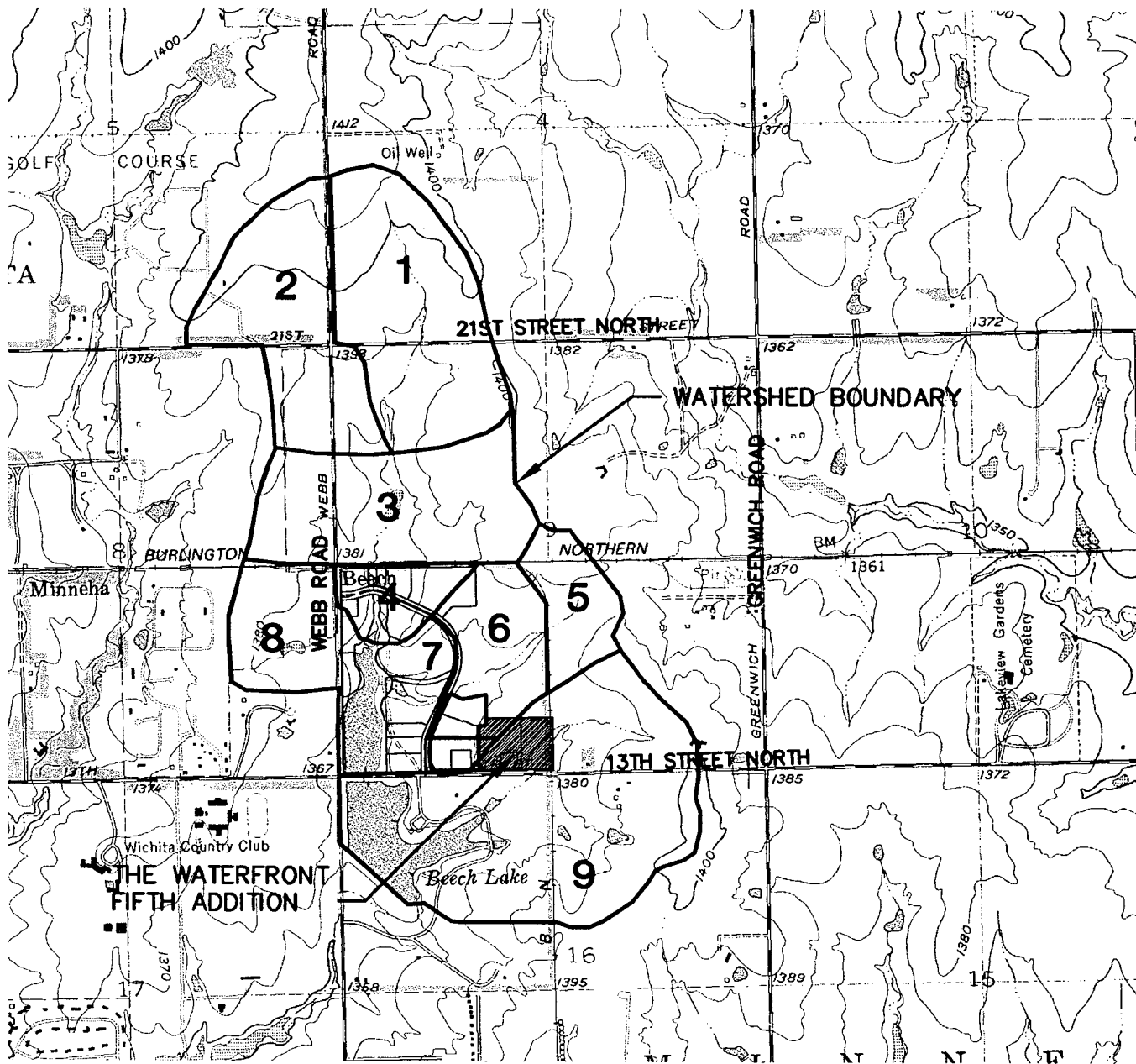
### **Summary**

The Waterfront Fifth Addition is a proposed 13-acre development at the north of 13<sup>th</sup> Street North near Webb Road in Wichita, Kansas. The site is to be developed as commercial land. Runoff will continue to drain into the existing Beech Lake to the south under 13<sup>th</sup> Street. The Waterfront Addition includes improvements to the lake north of 13<sup>th</sup> Street. Development of this site was taken into account when the Waterfront Addition was designed. An additional 4-acre detention pond was constructed in the Waterfront Addition, north of the Waterfront Second Addition. Hydrologic models for existing and proposed conditions with this report have shown that the development of this property will have minimal effects on properties downstream. Discharge from the

existing lake directly downstream of the site will increase by 0.6% as a result of this development and the Waterfront Addition.

Appendix A

Quadrangle



CONTOUR INTERVAL 10 FEET  
 NATIONAL GEODETIC VERTICAL DATUM OF 1929



**MKEC**  
 ENGINEERING  
 CONSULTANTS  
 411 N. WEBB ROAD  
 WICHITA, KS. 67208  
 316 - 694 - 9600

**THE WATERFRONT FIFTH ADDITION**  
 PROJECT NAME

**ANDOVER, KANSAS QUADRANGLE**  
 SHEET TITLE

<b>KLA</b> DESIGN BY:	<b>KLA</b> DRAWN BY:	<b>GM</b> CHECKED BY:
<b>JULY 2004</b> DATE	<b>02014</b> JOB NO.	<b>1 / 1</b> SHEET/OF

P:\CIVIL\02014\3TH ADD\PROP.DWG 02014\_504.DWG

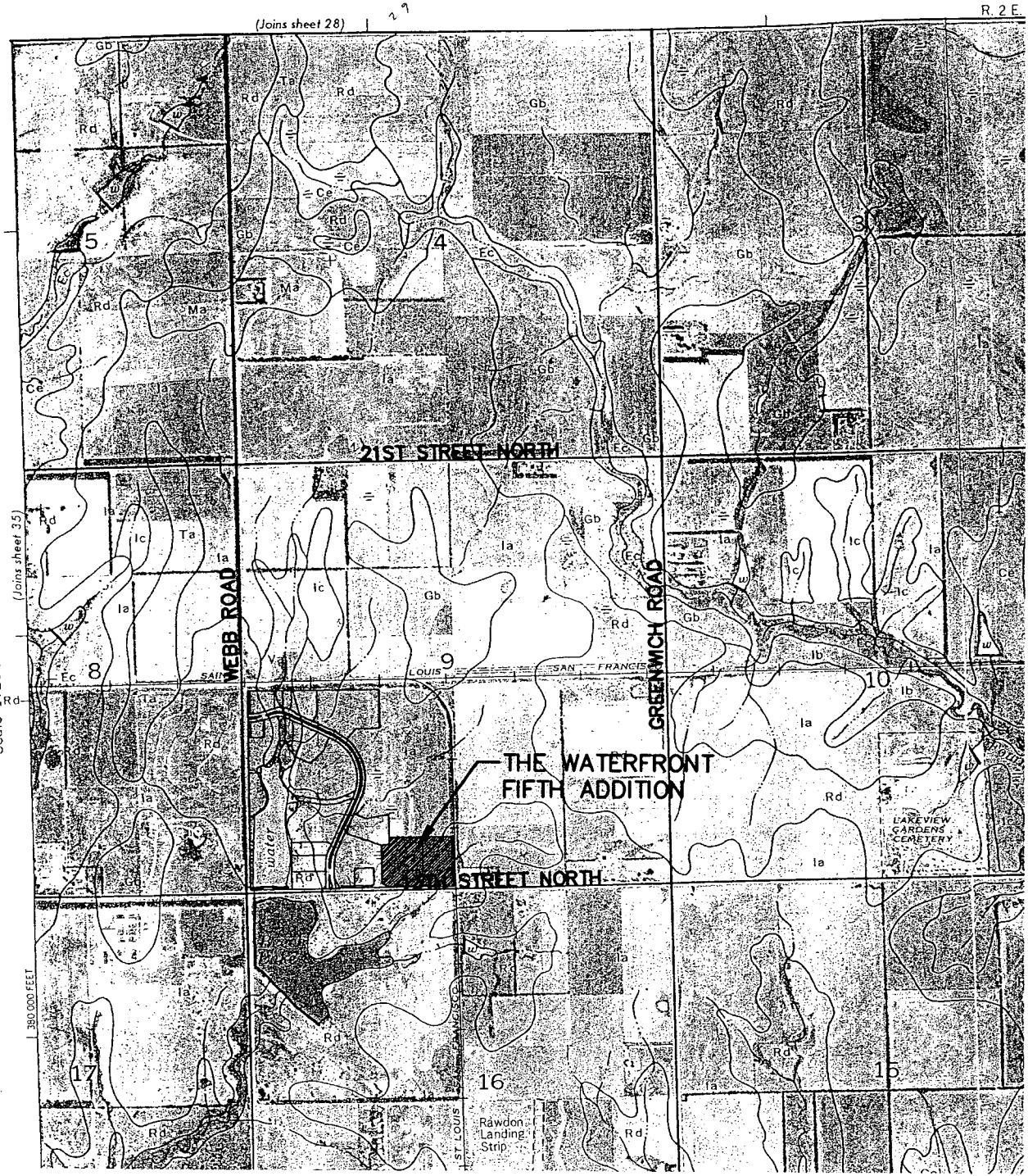
**Appendix B**

**Soil Survey**

36



1 Mile  
5000 Feet



R. 2 E.



**MKEC**  
ENGINEERING  
CONSULTANTS  
411 N. WEBB ROAD  
WICHITA, KS. 67206  
316 - 884 - 9600

**THE WATERFRONT FIFTH ADDITION**

PROJECT NAME  
**SOIL SURVEY OF  
SEDGWICK COUNTY, KANSAS**  
SHEET TITLE

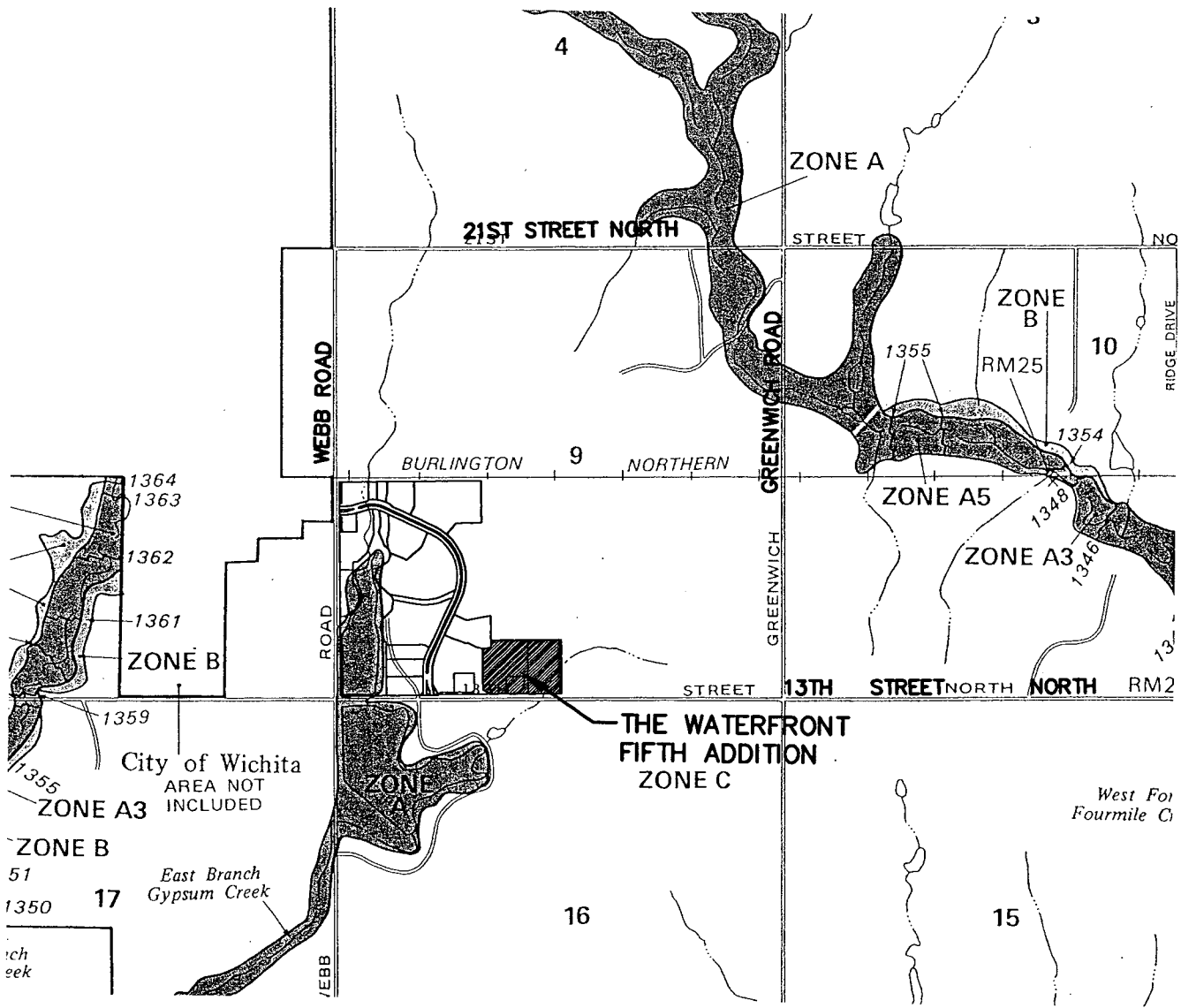
**KLA** DESIGN BY. **KLA** DRAWN BY. **GA** CHECKED BY.

**JULY 2004** DATE **02014** JOB NO. **1 / 1** SHEET/OT

F:\CIVIL\02014\3TH ADD\PROP\DRWG\02014\_550L.DWG

Appendix C

**FIRM**



NATIONAL FLOOD INSURANCE PROGRAM


**FIRM**  
FLOOD INSURANCE RATE MAP

SEDGWICK COUNTY,  
KANSAS  
(UNINCORPORATED AREAS)

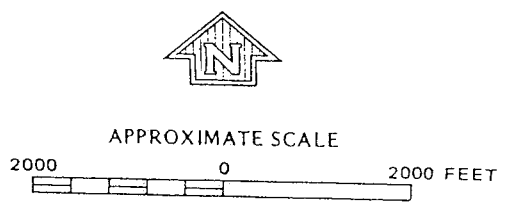

PANEL 150 OF 300

COMMUNITY-PANEL NUMBER  
200321 0150 A

EFFECTIVE DATE:  
JUNE 3, 1986



Federal Emergency Management Agency

**MKEC**  
ENGINEERING  
CONSULTANTS  
411 N. WEBB ROAD  
WICHITA, KS. 67206  
316 - 684 - 9600

**THE WATERFRONT FIFTH ADDITION**  
PROJECT NAME

**FIRM PANEL 150 OF 300**  
**SEDGWICK COUNTY, KANSAS**  
SHEET TITLE

<b>KLA</b> DESIGN BY.	<b>KLA</b> DRAWN BY.	<b>GM</b> CHECKED BY.
<b>JULY 2004</b> DATE	<b>02014</b> JOB NO.	<b>1 / 1</b> SHEET/OF

K:\CIVIL\02014\15TH ADD\PROFIT\DWG\02014\_59794.DWG

Appendix D  
Existing TR-20 Output

1

\*\*\*\*\*80-80 LIST OF INPUT DATA FOR TR-20 HYDROLOGY\*\*\*\*\*

JOB	TR-20	FULLPRINT	SUMMARY	NOPLOTS
TITLE	001	EASTMINSTER - BEECH LAKE - EAST BRANCH GYPSUM CREEK		
TITLE		BEECH2- W/O 2X12 16 AUG 2002	2,5,10,100-YR	24-HR STORM ZONE 5
4	DIMHYD	0.02		484
8		.000	.030	.100
8		.470	.660	.190
8		1.000	.990	.310
8		.680	.560	.930
8		.280	.241	.860
8		.126	.107	.780
8		.055	.047	.460
8		.025	.021	.390
8		.011	.009	.330
8		.005	.004	.207
8		.000	.000	.174
8				.147
8				.077
8				.066
8				.029
8				.013
8				.006
8				.001
8				.000
9	ENDTBL			
5	RAINFL 7	0.5		
8		.000	.002	.005
8		.018	.023	.029
8		.050	.059	.068
8		.101	.114	.128
8		.183	.208	.244
8		.773	.802	.825
8		.876	.890	.903
8		.934	.943	.951
8		.972	.977	.982
8		.993	.996	.998
8				1.000
9	ENDTBL			
3	STRUCT	10		
8		1369.4	0.0	0.0
8		1370.4	6.0	0.279
8		1371.4	14.0	1.093
8		1372.4	30.0	2.269
8		1373.4	60.0	3.606
8		1374.4	320.0	7.212
8		1375.4	580.0	11.361
8		1376.4	760.0	16.450
8		1377.4	925.0	23.036
8		1378.4	1085.0	31.035
8		1379.4	1240.0	40.834
9	ENDTBL			
3	STRUCT	14		
8		1369.0	0.0	0.0
8		1370.0	38.0	0.639
8		1371.0	45.0	1.96
8		1372.0	310.0	4.11

1

\*\*\*\*\*80-80 LIST OF INPUT DATA (CONTINUED)\*\*\*\*\*

8		1373.0	460.0	8.21
8		1374.0	522.0	15.16
8		1375.0	640.0	24.79
8		1376.0	1436.0	36.20
9	ENDTBL			
3	STRUCT	18		



EXECUTIVE CONTROL INCREM      MAIN TIME INCREMENT = .10 HOURS

EXECUTIVE CONTROL COMPUT      FROM XSECTION 1 TO STRUCTURE 18  
 STARTING TIME = .00      RAIN DEPTH = 3.50      RAIN DURATION= 1.00  
 ANT. MOIST. COND. = 2      MAIN TIME INCREMENT = .10 HOURS  
 ALTERNATE NO.=11      STORM NO.= 1      RAIN TABLE NO.= 7

OPERATION RUNOFF      XSECTION 1  
 OUTPUT HYDROGRAPH= 1      AREA= .12 SQ MI  
 INPUT RUNOFF CURVE= 89.      TIME OF CONCENTRATION= .91 HOURS  
 COMPUTED INTERNAL TIME INCREMENT = .0992 HOURS

PEAK TIME(HRS)      PEAK DISCHARGE(CFS)      PEAK ELEVATION(FEET)  
 12.33      103.6      (RUNOFF)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
 2.32 WATERSHED INCHES;      182 CFS-HRS;      15.0 ACRE-FEET.

OPERATION REACH      XSECTION 2  
 INPUT HYDROGRAPH 1      OUTPUT HYDROGRAPH 2  
 CHANNEL LENGTH 1500.00 FT  
 INPUT = COEFFICIENTS RELATED TO XSECTION AREA, X= .85, M= 1.30  
 MODIFIED ATT-KIN ROUTING COEFFICIENT = .57      PEAK TRAVEL TIME = .20 HOURS

PEAK TIME(HRS)      PEAK DISCHARGE(CFS)      PEAK ELEVATION(FEET)  
 12.50      99.5      (NULL)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
 2.32 WATERSHED INCHES;      182 CFS-HRS;      15.0 ACRE-FEET.

OPERATION RUNOFF      XSECTION 2  
 OUTPUT HYDROGRAPH= 1      AREA= .07 SQ MI  
 INPUT RUNOFF CURVE= 91.      TIME OF CONCENTRATION= .70 HOURS  
 COMPUTED INTERNAL TIME INCREMENT = .0937 HOURS

PEAK TIME(HRS)      PEAK DISCHARGE(CFS)      PEAK ELEVATION(FEET)  
 12.20      76.9      (RUNOFF)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
 2.49 WATERSHED INCHES;      118 CFS-HRS;      9.8 ACRE-FEET.

OPERATION ADDHYD      XSECTION 2  
 INPUT HYDROGRAPHS 1,2      OUTPUT HYDROGRAPH 3

1

PEAK TIME(HRS)      PEAK DISCHARGE(CFS)      PEAK ELEVATION(FEET)  
 12.35      162.1      (NULL)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
2.38 WATERSHED INCHES; 300 CFS-HRS; 24.8 ACRE-FEET.

OPERATION RUNOFF XSECTION 5  
OUTPUT HYDROGRAPH= 5 AREA= .20 SQ MI  
INPUT RUNOFF CURVE= 89. TIME OF CONCENTRATION= 1.10 HOURS  
COMPUTED INTERNAL TIME INCREMENT = .1012 HOURS

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.43 153.5 (RUNOFF)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
2.38 WATERSHED INCHES; 300 CFS-HRS; 24.8 ACRE-FEET.

OPERATION RUNOFF XSECTION 6  
OUTPUT HYDROGRAPH= 6 AREA= .16 SQ MI  
INPUT RUNOFF CURVE= 88. TIME OF CONCENTRATION= 1.11 HOURS  
COMPUTED INTERNAL TIME INCREMENT = .1026 HOURS

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.45 117.5 (RUNOFF)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
2.29 WATERSHED INCHES; 232 CFS-HRS; 19.2 ACRE-FEET.

OPERATION ADDHYD XSECTION 7  
INPUT HYDROGRAPHS 5,6 OUTPUT HYDROGRAPH 7

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.44 271.1 (NULL)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
2.34 WATERSHED INCHES; 532 CFS-HRS; 44.0 ACRE-FEET.

OPERATION RUNOFF XSECTION 10  
OUTPUT HYDROGRAPH= 6 AREA= .16 SQ MI  
INPUT RUNOFF CURVE= 90. TIME OF CONCENTRATION= .77 HOURS  
COMPUTED INTERNAL TIME INCREMENT = .1033 HOURS

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.24 161.3 (RUNOFF)

1

TR20

-----  
EASTMINSTER - BEECH LAKE - EAST BRANCH GYPSUM CREEK VERSION  
09/27/\*\* BEECH2- W/O 2X12 16 AUG 2002 2,5,10,100-YR 24-HR STORM ZONE 510/01/90  
13:35:38 PASS 1 PAGE 4

RUNOFF ABOVE BASEFLOW OF .00 CFS  
2.45 WATERSHED INCHES; 260 CFS-HRS; 21.4 ACRE-FEET.

OPERATION ADDHYD XSECTION 10  
INPUT HYDROGRAPHS 7,6 OUTPUT HYDROGRAPH 5

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.35 418.8 (NULL)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
2.38 WATERSHED INCHES; 792 CFS-HRS; 65.4 ACRE-FEET.

OPERATION RESVOR STRUCTURE 10  
INPUT HYDROGRAPH 5 OUTPUT HYDROGRAPH 7  
SURFACE ELEVATION= 1369.40

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.53 386.3 1374.66

RUNOFF ABOVE BASEFLOW OF .00 CFS  
2.38 WATERSHED INCHES; 791 CFS-HRS; 65.4 ACRE-FEET.

OPERATION RUNOFF XSECTION 14  
OUTPUT HYDROGRAPH= 6 AREA= .04 SQ MI  
INPUT RUNOFF CURVE= 84. TIME OF CONCENTRATION= .81 HOURS  
COMPUTED INTERNAL TIME INCREMENT = .1082 HOURS

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.28 33.3 (RUNOFF)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
1.96 WATERSHED INCHES; 55 CFS-HRS; 4.5 ACRE-FEET.

OPERATION ADDHYD XSECTION 14  
INPUT HYDROGRAPHS 7,6 OUTPUT HYDROGRAPH 5

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.50 413.5 (NULL)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
2.35 WATERSHED INCHES; 846 CFS-HRS; 69.9 ACRE-FEET.

1

TR20 -----  
EASTMINSTER - BEECH LAKE - EAST BRANCH GYPSUM CREEK VERSION  
09/27/\*\* BEECH2- W/O 2X12 16 AUG 2002 2,5,10,100-YR 24-HR STORM ZONE 510/01/90  
13:35:38 PASS 1 PAGE 5

OPERATION RESVOR STRUCTURE 14  
INPUT HYDROGRAPH 5 OUTPUT HYDROGRAPH 7  
SURFACE ELEVATION= 1369.00

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.73 375.7 1372.44

RUNOFF ABOVE BASEFLOW OF .00 CFS  
2.34 WATERSHED INCHES; 846 CFS-HRS; 69.9 ACRE-FEET.

OPERATION RUNOFF XSECTION 16  
OUTPUT HYDROGRAPH= 6 AREA= .31 SQ MI  
INPUT RUNOFF CURVE= 86. TIME OF CONCENTRATION= 1.43 HOURS  
COMPUTED INTERNAL TIME INCREMENT = .1012 HOURS

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.64 183.2 (RUNOFF)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
2.13 WATERSHED INCHES; 422 CFS-HRS; 34.9 ACRE-FEET.

OPERATION ADDHYD XSECTION 16  
INPUT HYDROGRAPHS 7,6 OUTPUT HYDROGRAPH 5

PEAK TIME (HRS) 12.69 PEAK DISCHARGE (CFS) 557.6 PEAK ELEVATION (FEET) (NULL)  
RUNOFF ABOVE BASEFLOW OF .00 CFS  
2.27 WATERSHED INCHES; 1268 CFS-HRS; 104.8 ACRE-FEET.

OPERATION RUNOFF XSECTION 18  
OUTPUT HYDROGRAPH= 6 AREA= .35 SQ MI  
INPUT RUNOFF CURVE= 82. TIME OF CONCENTRATION= .87 HOURS  
COMPUTED INTERNAL TIME INCREMENT = .0945 HOURS

PEAK TIME (HRS) 12.31 PEAK DISCHARGE (CFS) 236.8 PEAK ELEVATION (FEET) (RUNOFF)  
RUNOFF ABOVE BASEFLOW OF .00 CFS  
1.78 WATERSHED INCHES; 400 CFS-HRS; 33.1 ACRE-FEET.

OPERATION ADDHYD XSECTION 18  
INPUT HYDROGRAPHS 5,6 OUTPUT HYDROGRAPH 7

1  
TR20 -----  
EASTMINSTER - BEECH LAKE - EAST BRANCH GYPSUM CREEK VERSION  
09/27/\*\* BEECH2- W/O 2X12 16 AUG 2002 2,5,10,100-YR 24-HR STORM ZONE 510/01/90  
13:35:38 PASS 1 PAGE 6

PEAK TIME (HRS) 12.51 PEAK DISCHARGE (CFS) 739.9 PEAK ELEVATION (FEET) (NULL)  
RUNOFF ABOVE BASEFLOW OF .00 CFS  
2.13 WATERSHED INCHES; 1668 CFS-HRS; 137.9 ACRE-FEET.

OPERATION RESVOR STRUCTURE 18  
INPUT HYDROGRAPH 7 OUTPUT HYDROGRAPH 5  
SURFACE ELEVATION= 1368.70

PEAK TIME (HRS) 13.49 PEAK DISCHARGE (CFS) 294.1 PEAK ELEVATION (FEET) 1370.20  
RUNOFF ABOVE BASEFLOW OF .00 CFS  
2.13 WATERSHED INCHES; 1665 CFS-HRS; 137.6 ACRE-FEET.

EXECUTIVE CONTROL ENDCMP COMPUTATIONS COMPLETED FOR PASS 1

1  
TR20 -----  
EASTMINSTER - BEECH LAKE - EAST BRANCH GYPSUM CREEK VERSION  
09/27/\*\* BEECH2- W/O 2X12 16 AUG 2002 2,5,10,100-YR 24-HR STORM ZONE 510/01/90  
13:35:38 PASS 2 PAGE 7

EXECUTIVE CONTROL COMPUT FROM XSECTION 1 TO STRUCTURE 18  
STARTING TIME = .00 RAIN DEPTH = 4.55 RAIN DURATION= 1.00  
ANT. MOIST. COND. = 2 MAIN TIME INCREMENT = .10 HOURS  
ALTERNATE NO.=12 STORM NO.= 2 RAIN TABLE NO.= 7

OPERATION RUNOFF XSECTION 1  
OUTPUT HYDROGRAPH= 1 AREA= .12 SQ MI  
INPUT RUNOFF CURVE= 89. TIME OF CONCENTRATION= .91 HOURS  
COMPUTED INTERNAL TIME INCREMENT = .0992 HOURS

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.32 146.0 (RUNOFF)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
3.30 WATERSHED INCHES; 259 CFS-HRS; 21.4 ACRE-FEET.

OPERATION REACH XSECTION 2  
INPUT HYDROGRAPH 1 OUTPUT HYDROGRAPH 2  
CHANNEL LENGTH 1500.00 FT  
INPUT = COEFFICIENTS RELATED TO XSECTION AREA, X= .85, M= 1.30  
MODIFIED ATT-KIN ROUTING COEFFICIENT = .61 PEAK TRAVEL TIME = .20 HOURS

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.49 141.1 (NULL)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
3.30 WATERSHED INCHES; 259 CFS-HRS; 21.4 ACRE-FEET.

OPERATION RUNOFF XSECTION 2  
OUTPUT HYDROGRAPH= 1 AREA= .07 SQ MI  
INPUT RUNOFF CURVE= 91. TIME OF CONCENTRATION= .70 HOURS  
COMPUTED INTERNAL TIME INCREMENT = .0937 HOURS

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.20 107.0 (RUNOFF)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
3.49 WATERSHED INCHES; 166 CFS-HRS; 13.7 ACRE-FEET.

OPERATION ADDHYD XSECTION 2  
INPUT HYDROGRAPHS 1,2 OUTPUT HYDROGRAPH 3

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.34 229.1 (NULL)

1  
TR20 -----  
EASTMINSTER - BEECH LAKE - EAST BRANCH GYPSUM CREEK VERSION  
09/27/\*\* BEECH2- W/O 2X12 16 AUG 2002 2,5,10,100-YR 24-HR STORM ZONE 510/01/90  
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RUNOFF ABOVE BASEFLOW OF .00 CFS  
3.37 WATERSHED INCHES; 425 CFS-HRS; 35.1 ACRE-FEET.

OPERATION RUNOFF XSECTION 5  
OUTPUT HYDROGRAPH= 5 AREA= .20 SQ MI  
INPUT RUNOFF CURVE= 89. TIME OF CONCENTRATION= 1.10 HOURS  
COMPUTED INTERNAL TIME INCREMENT = .1012 HOURS

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.43 215.6 (RUNOFF)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
3.37 WATERSHED INCHES; 425 CFS-HRS; 35.1 ACRE-FEET.

OPERATION RUNOFF XSECTION 6  
OUTPUT HYDROGRAPH= 6 AREA= .16 SQ MI  
INPUT RUNOFF CURVE= 88. TIME OF CONCENTRATION= 1.11 HOURS  
COMPUTED INTERNAL TIME INCREMENT = .1026 HOURS

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.44 167.0 (RUNOFF)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
3.27 WATERSHED INCHES; 331 CFS-HRS; 27.3 ACRE-FEET.

OPERATION ADDHYD XSECTION 7  
INPUT HYDROGRAPHS 5,6 OUTPUT HYDROGRAPH 7

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.43 382.6 (NULL)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
3.33 WATERSHED INCHES; 756 CFS-HRS; 62.4 ACRE-FEET.

OPERATION RUNOFF XSECTION 10  
OUTPUT HYDROGRAPH= 6 AREA= .16 SQ MI  
INPUT RUNOFF CURVE= 90. TIME OF CONCENTRATION= .77 HOURS  
COMPUTED INTERNAL TIME INCREMENT = .1033 HOURS

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.24 220.9 (RUNOFF)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
3.45 WATERSHED INCHES; 365 CFS-HRS; 30.1 ACRE-FEET.

1

TR20 -----  
EASTMINSTER - BEECH LAKE - EAST BRANCH GYPSUM CREEK VERSION  
09/27/\*\* BEECH2- W/O 2X12 16 AUG 2002 2,5,10,100-YR 24-HR STORM ZONE 510/01/90  
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OPERATION ADDHYD XSECTION 10  
INPUT HYDROGRAPHS 7,6 OUTPUT HYDROGRAPH 5

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.35 586.5 (NULL)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
3.37 WATERSHED INCHES; 1120 CFS-HRS; 92.6 ACRE-FEET.

OPERATION RESVOR STRUCTURE 10  
INPUT HYDROGRAPH 5 OUTPUT HYDROGRAPH 7  
SURFACE ELEVATION= 1369.40

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.53 539.6 1375.24

RUNOFF ABOVE BASEFLOW OF .00 CFS  
3.37 WATERSHED INCHES; 1120 CFS-HRS; 92.6 ACRE-FEET.

OPERATION RUNOFF XSECTION 14  
OUTPUT HYDROGRAPH= 6 AREA= .04 SQ MI

INPUT RUNOFF CURVE= 84. TIME OF CONCENTRATION= .81 HOURS  
COMPUTED INTERNAL TIME INCREMENT = .1082 HOURS

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.27 48.9 (RUNOFF)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
2.89 WATERSHED INCHES; 81 CFS-HRS; 6.7 ACRE-FEET.

OPERATION ADDHYD XSECTION 14  
INPUT HYDROGRAPHS 7,6 OUTPUT HYDROGRAPH 5

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.51 579.0 (NULL)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
3.33 WATERSHED INCHES; 1201 CFS-HRS; 99.2 ACRE-FEET.

OPERATION RESVOR STRUCTURE 14  
INPUT HYDROGRAPH 5 OUTPUT HYDROGRAPH 7  
SURFACE ELEVATION= 1369.00

1

TR20 -----  
EASTMINSTER - BEECH LAKE - EAST BRANCH GYPSUM CREEK VERSION  
09/27/\*\* BEECH2- W/O 2X12 16 AUG 2002 2,5,10,100-YR 24-HR STORM ZONE 510/01/90  
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PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.83 477.5 1373.28

RUNOFF ABOVE BASEFLOW OF .00 CFS  
3.33 WATERSHED INCHES; 1200 CFS-HRS; 99.1 ACRE-FEET.

OPERATION RUNOFF XSECTION 16  
OUTPUT HYDROGRAPH= 6 AREA= .31 SQ MI  
INPUT RUNOFF CURVE= 86. TIME OF CONCENTRATION= 1.43 HOURS  
COMPUTED INTERNAL TIME INCREMENT = .1012 HOURS

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.63 264.7 (RUNOFF)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
3.09 WATERSHED INCHES; 612 CFS-HRS; 50.6 ACRE-FEET.

OPERATION ADDHYD XSECTION 16  
INPUT HYDROGRAPHS 7,6 OUTPUT HYDROGRAPH 5

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.69 737.1 (NULL)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
3.24 WATERSHED INCHES; 1812 CFS-HRS; 149.7 ACRE-FEET.

OPERATION RUNOFF XSECTION 18  
OUTPUT HYDROGRAPH= 6 AREA= .35 SQ MI  
INPUT RUNOFF CURVE= 82. TIME OF CONCENTRATION= .87 HOURS  
COMPUTED INTERNAL TIME INCREMENT = .0945 HOURS

PEAK TIME(HRS) 12.30 PEAK DISCHARGE(CFS) 359.1 PEAK ELEVATION(FEET) (RUNOFF)

RUNOFF ABOVE BASEFLOW OF .00 CFS 2.68 WATERSHED INCHES; 603 CFS-HRS; 49.8 ACRE-FEET.

OPERATION ADDHYD XSECTION 18 INPUT HYDROGRAPHS 5,6 OUTPUT HYDROGRAPH 7

PEAK TIME(HRS) 12.50 PEAK DISCHARGE(CFS) 1029.7 PEAK ELEVATION(FEET) (NULL)

1

TR20 ----- EASTMINSTER - BEECH LAKE - EAST BRANCH GYPSUM CREEK VERSION 09/27/\*\* BEECH2- W/O 2X12 16 AUG 2002 2,5,10,100-YR 24-HR STORM ZONE 510/01/90 13:35:38 PASS 2 PAGE 11

RUNOFF ABOVE BASEFLOW OF .00 CFS 3.08 WATERSHED INCHES; 2414 CFS-HRS; 199.5 ACRE-FEET.

OPERATION RESVOR STRUCTURE 18 INPUT HYDROGRAPH 7 OUTPUT HYDROGRAPH 5 SURFACE ELEVATION= 1368.70

PEAK TIME(HRS) 13.50 PEAK DISCHARGE(CFS) 490.1 PEAK ELEVATION(FEET) 1370.64

RUNOFF ABOVE BASEFLOW OF .00 CFS 2.94 WATERSHED INCHES; 2307 CFS-HRS; 190.6 ACRE-FEET.

EXECUTIVE CONTROL ENDCMP COMPUTATIONS COMPLETED FOR PASS 2

1

TR20 ----- EASTMINSTER - BEECH LAKE - EAST BRANCH GYPSUM CREEK VERSION 09/27/\*\* BEECH2- W/O 2X12 16 AUG 2002 2,5,10,100-YR 24-HR STORM ZONE 510/01/90 13:35:38 PASS 3 PAGE 12

EXECUTIVE CONTROL COMPUT FROM XSECTION 1 TO STRUCTURE 18 STARTING TIME = .00 RAIN DEPTH = 5.25 RAIN DURATION= 1.00 ANT. MOIST. COND. = 2 MAIN TIME INCREMENT = .10 HOURS ALTERNATE NO.=13 STORM NO.= 3 RAIN TABLE NO.= 7

OPERATION RUNOFF XSECTION 1 OUTPUT HYDROGRAPH= 1 AREA= .12 SQ MI INPUT RUNOFF CURVE= 89. TIME OF CONCENTRATION= .91 HOURS COMPUTED INTERNAL TIME INCREMENT = .0992 HOURS

PEAK TIME(HRS) 12.32 PEAK DISCHARGE(CFS) 174.3 PEAK ELEVATION(FEET) (RUNOFF)

RUNOFF ABOVE BASEFLOW OF .00 CFS 3.97 WATERSHED INCHES; 311 CFS-HRS; 25.7 ACRE-FEET.

OPERATION REACH XSECTION 2 INPUT HYDROGRAPH 1 OUTPUT HYDROGRAPH 2 CHANNEL LENGTH 1500.00 FT

INPUT = COEFFICIENTS RELATED TO XSECTION AREA, X= .85, M= 1.30  
MODIFIED ATT-KIN ROUTING COEFFICIENT = .62 PEAK TRAVEL TIME = .20 HOURS

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.48 169.0 (NULL)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
3.97 WATERSHED INCHES; 311 CFS-HRS; 25.7 ACRE-FEET.

OPERATION RUNOFF XSECTION 2  
OUTPUT HYDROGRAPH= 1 AREA= .07 SQ MI  
INPUT RUNOFF CURVE= 91. TIME OF CONCENTRATION= .70 HOURS  
COMPUTED INTERNAL TIME INCREMENT = .0937 HOURS

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.20 125.6 (RUNOFF)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
4.16 WATERSHED INCHES; 198 CFS-HRS; 16.4 ACRE-FEET.

OPERATION ADDHYD XSECTION 2  
INPUT HYDROGRAPHS 1,2 OUTPUT HYDROGRAPH 3

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.34 273.3 (NULL)

1  
TR20 -----  
EASTMINSTER - BEECH LAKE - EAST BRANCH GYPSUM CREEK VERSION  
09/27/\*\* BEECH2- W/O 2X12 16 AUG 2002 2,5,10,100-YR 24-HR STORM ZONE 510/01/90  
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RUNOFF ABOVE BASEFLOW OF .00 CFS  
4.04 WATERSHED INCHES; 509 CFS-HRS; 42.1 ACRE-FEET.

OPERATION RUNOFF XSECTION 5  
OUTPUT HYDROGRAPH= 5 AREA= .20 SQ MI  
INPUT RUNOFF CURVE= 89. TIME OF CONCENTRATION= 1.10 HOURS  
COMPUTED INTERNAL TIME INCREMENT = .1012 HOURS

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.43 257.3 (RUNOFF)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
4.04 WATERSHED INCHES; 509 CFS-HRS; 42.1 ACRE-FEET.

OPERATION RUNOFF XSECTION 6  
OUTPUT HYDROGRAPH= 6 AREA= .16 SQ MI  
INPUT RUNOFF CURVE= 88. TIME OF CONCENTRATION= 1.11 HOURS  
COMPUTED INTERNAL TIME INCREMENT = .1026 HOURS

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.44 199.7 (RUNOFF)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
3.94 WATERSHED INCHES; 398 CFS-HRS; 32.9 ACRE-FEET.

OPERATION ADDHYD XSECTION 7  
INPUT HYDROGRAPHS 5,6 OUTPUT HYDROGRAPH 7



RUNOFF ABOVE BASEFLOW OF .00 CFS  
4.00 WATERSHED INCHES; 1442 CFS-HRS; 119.2 ACRE-FEET.

OPERATION RESVOR STRUCTURE 14  
INPUT HYDROGRAPH 5 OUTPUT HYDROGRAPH 7  
SURFACE ELEVATION= 1369.00

1

TR20 -----  
EASTMINSTER - BEECH LAKE - EAST BRANCH GYPSUM CREEK VERSION  
09/27/\*\* BEECH2- W/O 2X12 16 AUG 2002 2,5,10,100-YR 24-HR STORM ZONE 510/01/90  
13:35:38 PASS 3 PAGE 15

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.93	518.4	1373.94

RUNOFF ABOVE BASEFLOW OF .00 CFS  
4.00 WATERSHED INCHES; 1441 CFS-HRS; 119.1 ACRE-FEET.

OPERATION RUNOFF XSECTION 16  
OUTPUT HYDROGRAPH= 6 AREA= .31 SQ MI  
INPUT RUNOFF CURVE= 86. TIME OF CONCENTRATION= 1.43 HOURS  
COMPUTED INTERNAL TIME INCREMENT = .1012 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.63	319.7	(RUNOFF)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
3.74 WATERSHED INCHES; 742 CFS-HRS; 61.3 ACRE-FEET.

OPERATION ADDHYD XSECTION 16  
INPUT HYDROGRAPHS 7,6 OUTPUT HYDROGRAPH 5

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.72	823.3	(NULL)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
3.91 WATERSHED INCHES; 2183 CFS-HRS; 180.4 ACRE-FEET.

OPERATION RUNOFF XSECTION 18  
OUTPUT HYDROGRAPH= 6 AREA= .35 SQ MI  
INPUT RUNOFF CURVE= 82. TIME OF CONCENTRATION= .87 HOURS  
COMPUTED INTERNAL TIME INCREMENT = .0945 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.30	439.0	(RUNOFF)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
3.30 WATERSHED INCHES; 741 CFS-HRS; 61.3 ACRE-FEET.

OPERATION ADDHYD XSECTION 18  
INPUT HYDROGRAPHS 5,6 OUTPUT HYDROGRAPH 7

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.44	1185.2	(NULL)

1

TR20 -----  
EASTMINSTER - BEECH LAKE - EAST BRANCH GYPSUM CREEK VERSION

09/27/\*\* BEECH2- W/O 2X12 16 AUG 2002 2,5,10,100-YR 24-HR STORM ZONE 510/01/90  
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RUNOFF ABOVE BASEFLOW OF .00 CFS  
3.73 WATERSHED INCHES; 2924 CFS-HRS; 241.7 ACRE-FEET.

OPERATION RESVOR STRUCTURE 18  
INPUT HYDROGRAPH 7 OUTPUT HYDROGRAPH 5  
SURFACE ELEVATION= 1368.70

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
13.58 606.6 1370.91

RUNOFF ABOVE BASEFLOW OF .00 CFS  
3.58 WATERSHED INCHES; 2809 CFS-HRS; 232.1 ACRE-FEET.

EXECUTIVE CONTROL ENDCMP COMPUTATIONS COMPLETED FOR PASS 3

1  
TR20 -----  
EASTMINSTER - BEECH LAKE - EAST BRANCH GYPSUM CREEK VERSION  
09/27/\*\* BEECH2- W/O 2X12 16 AUG 2002 2,5,10,100-YR 24-HR STORM ZONE 510/01/90  
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EXECUTIVE CONTROL COMPUT FROM XSECTION 1 TO STRUCTURE 18  
STARTING TIME = .00 RAIN DEPTH = 7.80 RAIN DURATION= 1.00  
ANT. MOIST. COND. = 2 MAIN TIME INCREMENT = .10 HOURS  
ALTERNATE NO.=14 STORM NO.= 4 RAIN TABLE NO.= 7

OPERATION RUNOFF XSECTION 1  
OUTPUT HYDROGRAPH= 1 AREA= .12 SQ MI  
INPUT RUNOFF CURVE= 89. TIME OF CONCENTRATION= .91 HOURS  
COMPUTED INTERNAL TIME INCREMENT = .0992 HOURS

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.32 277.3 (RUNOFF)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
6.44 WATERSHED INCHES; 505 CFS-HRS; 41.8 ACRE-FEET.

OPERATION REACH XSECTION 2  
INPUT HYDROGRAPH 1 OUTPUT HYDROGRAPH 2  
CHANNEL LENGTH 1500.00 FT  
INPUT = COEFFICIENTS RELATED TO XSECTION AREA, X= .85, M= 1.30  
MODIFIED ATT-KIN ROUTING COEFFICIENT = .67 PEAK TRAVEL TIME = .20 HOURS

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.47 270.6 (NULL)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
6.44 WATERSHED INCHES; 505 CFS-HRS; 41.7 ACRE-FEET.

OPERATION RUNOFF XSECTION 2  
OUTPUT HYDROGRAPH= 1 AREA= .07 SQ MI  
INPUT RUNOFF CURVE= 91. TIME OF CONCENTRATION= .70 HOURS  
COMPUTED INTERNAL TIME INCREMENT = .0937 HOURS



RUNOFF ABOVE BASEFLOW OF .00 CFS  
6.62 WATERSHED INCHES; 700 CFS-HRS; 57.9 ACRE-FEET.

1

TR20 -----  
EASTMINSTER - BEECH LAKE - EAST BRANCH GYPSUM CREEK VERSION  
09/27/\*\* BEECH2- W/O 2X12 16 AUG 2002 2,5,10,100-YR 24-HR STORM ZONE 510/01/90  
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OPERATION ADDHYD XSECTION 10  
INPUT HYDROGRAPHS 7,6 OUTPUT HYDROGRAPH 5

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.34 1110.6 (NULL)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
6.52 WATERSHED INCHES; 2170 CFS-HRS; 179.3 ACRE-FEET.

OPERATION RESVOR STRUCTURE 10  
INPUT HYDROGRAPH 5 OUTPUT HYDROGRAPH 7  
SURFACE ELEVATION= 1369.40

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.63 909.2 1377.30

RUNOFF ABOVE BASEFLOW OF .00 CFS  
6.52 WATERSHED INCHES; 2169 CFS-HRS; 179.3 ACRE-FEET.

OPERATION RUNOFF XSECTION 14  
OUTPUT HYDROGRAPH= 6 AREA= .04 SQ MI  
INPUT RUNOFF CURVE= 84. TIME OF CONCENTRATION= .81 HOURS  
COMPUTED INTERNAL TIME INCREMENT = .1082 HOURS

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.27 98.5 (RUNOFF)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
5.95 WATERSHED INCHES; 166 CFS-HRS; 13.7 ACRE-FEET.

OPERATION ADDHYD XSECTION 14  
INPUT HYDROGRAPHS 7,6 OUTPUT HYDROGRAPH 5

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.57 976.8 (NULL)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
6.47 WATERSHED INCHES; 2335 CFS-HRS; 193.0 ACRE-FEET.

OPERATION RESVOR STRUCTURE 14  
INPUT HYDROGRAPH 5 OUTPUT HYDROGRAPH 7  
SURFACE ELEVATION= 1369.00

1

TR20 -----  
EASTMINSTER - BEECH LAKE - EAST BRANCH GYPSUM CREEK VERSION  
09/27/\*\* BEECH2- W/O 2X12 16 AUG 2002 2,5,10,100-YR 24-HR STORM ZONE 510/01/90  
13:35:38 PASS 4 PAGE 20



RUNOFF ABOVE BASEFLOW OF .00 CFS  
 5.99 WATERSHED INCHES; 4698 CFS-HRS; 388.2 ACRE-FEET.

EXECUTIVE CONTROL ENDCMP COMPUTATIONS COMPLETED FOR PASS 4

1  
 TR20 -----  
 EASTMINSTER - BEECH LAKE - EAST BRANCH GYPSUM CREEK VERSION  
 09/27/\*\* BEECH2- W/O 2X12 16 AUG 2002 2,5,10,100-YR 24-HR STORM ZONE 510/01/90  
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SUMMARY TABLE 1

-----  
 SELECTED RESULTS OF STANDARD AND EXECUTIVE CONTROL IN ORDER PERFORMED.  
 A CHARACTER FOLLOWING THE PEAK DISCHARGE TIME AND RATE (CFS) INDICATES:  
 F-FLAT TOP HYDROGRAPH T-TRUNCATED HYDROGRAPH R-RISING TRUNCATED HYDROGRAPH

XSECTION/ STRUCTURE ID	STANDARD CONTROL OPERATION	DRAINAGE AREA (SQ MI)	RUNOFF AMOUNT (IN)	PEAK DISCHARGE			
				ELEVATION (FT)	TIME (HR)	RATE (CFS)	RATE (CSM)

RAINFALL OF 3.50 inches AND 24.00 hr DURATION, BEGINS AT .0 hrs.  
 RAINFALL NUMBER 7, AMC 2  
 MAIN TIME INCREMENT .10 HOURS

ALTERNATE 11 STORM 1

XSECTION	1	RUNOFF	.12	2.32	---	12.33	104	866.7
XSECTION	2	REACH	.12	2.32	---	12.50	100	833.3
XSECTION	2	RUNOFF	.07	2.49	---	12.20	77	1100.0
XSECTION	2	ADDHYD	.20	2.38	---	12.35	162	810.0
XSECTION	5	RUNOFF	.20	2.38	---	12.43	154	770.0
XSECTION	6	RUNOFF	.16	2.29	---	12.45	118	737.5
XSECTION	7	ADDHYD	.35	2.34	---	12.44	271	774.3
XSECTION	10	RUNOFF	.16	2.45	---	12.24	161	1006.3
XSECTION	10	ADDHYD	.52	2.38	---	12.35	419	805.8
STRUCTURE	10	RESVOR	.52	2.38	1374.66	12.53	386	742.3
XSECTION	14	RUNOFF	.04	1.96	---	12.28	33	825.0
XSECTION	14	ADDHYD	.56	2.35	---	12.50	414	739.3
STRUCTURE	14	RESVOR	.56	2.34	1372.44	12.73	376	671.4
XSECTION	16	RUNOFF	.31	2.13	---	12.64	183	590.3
XSECTION	16	ADDHYD	.87	2.27	---	12.69	558	641.4
XSECTION	18	RUNOFF	.35	1.78	---	12.31	237	677.1
XSECTION	18	ADDHYD	1.21	2.13	---	12.51	740	611.6
STRUCTURE	18	RESVOR	1.21	2.13	1370.20	13.49	294	243.0

RAINFALL OF 4.55 inches AND 24.00 hr DURATION, BEGINS AT .0 hrs.

ALTERNATE 12 STORM 2

XSECTION	1	RUNOFF	.12	3.30	---	12.32	146	1216.7
XSECTION	2	REACH	.12	3.30	---	12.49	141	1175.0
XSECTION	2	RUNOFF	.07	3.49	---	12.20	107	1528.6
XSECTION	2	ADDHYD	.20	3.37	---	12.34	229	1145.0
XSECTION	5	RUNOFF	.20	3.37	---	12.43	216	1080.0

1  
 TR20 -----  
 EASTMINSTER - BEECH LAKE - EAST BRANCH GYPSUM CREEK VERSION

SUMMARY TABLE 1

-----  
 SELECTED RESULTS OF STANDARD AND EXECUTIVE CONTROL IN ORDER PERFORMED.  
 A CHARACTER FOLLOWING THE PEAK DISCHARGE TIME AND RATE (CFS) INDICATES:  
 F-FLAT TOP HYDROGRAPH T-TRUNCATED HYDROGRAPH R-RISING TRUNCATED HYDROGRAPH

XSECTION/ STRUCTURE ID	STANDARD CONTROL OPERATION	DRAINAGE AREA (SQ MI)	RUNOFF AMOUNT (IN)	PEAK DISCHARGE			
				ELEVATION (FT)	TIME (HR)	RATE (CFS)	RATE (CSM)
ALTERNATE 12 STORM 2		-----					
XSECTION 6	RUNOFF	.16	3.27	---	12.44	167	1043.8
XSECTION 7	ADDHYD	.35	3.33	---	12.43	383	1094.3
XSECTION 10	RUNOFF	.16	3.45	---	12.24	221	1381.3
XSECTION 10	ADDHYD	.52	3.37	---	12.35	586	1126.9
STRUCTURE 10	RESVOR	.52	3.37	1375.24	12.53	540	1038.5
XSECTION 14	RUNOFF	.04	2.89	---	12.27	49	1225.0
XSECTION 14	ADDHYD	.56	3.33	---	12.51	579	1033.9
STRUCTURE 14	RESVOR	.56	3.33	1373.28	12.83	477	851.8
XSECTION 16	RUNOFF	.31	3.09	---	12.63	265	854.8
XSECTION 16	ADDHYD	.87	3.24	---	12.69	737	847.1
XSECTION 18	RUNOFF	.35	2.68	---	12.30	359	1025.7
XSECTION 18	ADDHYD	1.21	3.08	---	12.50	1030	851.2
STRUCTURE 18	RESVOR	1.21	2.94	1370.64	13.50	490	405.0

RAINFALL OF 5.25 inches AND 24.00 hr DURATION, BEGINS AT .0 hrs.

ALTERNATE 13 STORM 3		-----					
XSECTION 1	RUNOFF	.12	3.97	---	12.32	174	1450.0
XSECTION 2	REACH	.12	3.97	---	12.48	169	1408.3
XSECTION 2	RUNOFF	.07	4.16	---	12.20	126	1800.0
XSECTION 2	ADDHYD	.20	4.04	---	12.34	273	1365.0
XSECTION 5	RUNOFF	.20	4.04	---	12.43	257	1285.0
XSECTION 6	RUNOFF	.16	3.94	---	12.44	200	1250.0
XSECTION 7	ADDHYD	.35	3.99	---	12.43	457	1305.7
XSECTION 10	RUNOFF	.16	4.12	---	12.24	262	1637.5
XSECTION 10	ADDHYD	.52	4.04	---	12.35	699	1344.2
STRUCTURE 10	RESVOR	.52	4.04	1375.65	12.56	624	1200.0
XSECTION 14	RUNOFF	.04	3.54	---	12.27	59	1475.0
XSECTION 14	ADDHYD	.56	4.00	---	12.51	671	1198.2
STRUCTURE 14	RESVOR	.56	4.00	1373.94	12.93	518	925.0

SUMMARY TABLE 1

-----  
 SELECTED RESULTS OF STANDARD AND EXECUTIVE CONTROL IN ORDER PERFORMED.

A CHARACTER FOLLOWING THE PEAK DISCHARGE TIME AND RATE (CFS) INDICATES:  
 F-FLAT TOP HYDROGRAPH T-TRUNCATED HYDROGRAPH R-RISING TRUNCATED HYDROGRAPH

XSECTION/ STRUCTURE ID	STANDARD CONTROL OPERATION	DRAINAGE AREA (SQ MI)	RUNOFF AMOUNT (IN)	PEAK DISCHARGE			
				ELEVATION (FT)	TIME (HR)	RATE (CFS)	RATE (CSM)
ALTERNATE 13 STORM 3				-----			
XSECTION 16	RUNOFF	.31	3.74	---	12.63	320	1032.3
XSECTION 16	ADDHYD	.87	3.91	---	12.72	823	946.0
XSECTION 18	RUNOFF	.35	3.30	---	12.30	439	1254.3
XSECTION 18	ADDHYD	1.21	3.73	---	12.44	1185	979.3
STRUCTURE 18	RESVOR	1.21	3.58	1370.91	13.58	607	501.7

RAINFALL OF 7.80 inches AND 24.00 hr DURATION, BEGINS AT .0 hrs.

ALTERNATE 14 STORM 4				-----			
XSECTION 1	RUNOFF	.12	6.44	---	12.32	277	2308.3
XSECTION 2	REACH	.12	6.44	---	12.47	271	2258.3
XSECTION 2	RUNOFF	.07	6.66	---	12.20	197	2814.3
XSECTION 2	ADDHYD	.20	6.52	---	12.34	436	2180.0
XSECTION 5	RUNOFF	.20	6.52	---	12.42	408	2040.0
XSECTION 6	RUNOFF	.16	6.40	---	12.43	318	1987.5
XSECTION 7	ADDHYD	.35	6.47	---	12.43	726	2074.3
XSECTION 10	RUNOFF	.16	6.62	---	12.24	417	2606.3
XSECTION 10	ADDHYD	.52	6.52	---	12.34	1111	2136.5
STRUCTURE 10	RESVOR	.52	6.52	1377.30	12.63	909	1748.1
XSECTION 14	RUNOFF	.04	5.95	---	12.27	98	2450.0
XSECTION 14	ADDHYD	.56	6.47	---	12.57	977	1744.6
STRUCTURE 14	RESVOR	.56	6.47	1375.26	12.95	851	1519.6
XSECTION 16	RUNOFF	.31	6.19	---	12.62	522	1683.9
XSECTION 16	ADDHYD	.87	6.37	---	12.87	1312	1508.0
XSECTION 18	RUNOFF	.35	5.67	---	12.30	745	2128.6
XSECTION 18	ADDHYD	1.21	6.17	---	12.45	1736	1434.7
STRUCTURE 18	RESVOR	1.21	5.99	1371.62	13.36	1091	901.7

1

TR20 -----  
 EASTMINSTER - BEECH LAKE - EAST BRANCH GYPSUM CREEK VERSION  
 09/27/\*\* BEECH2 - W/O 2X12 16 AUG 2002 2,5,10,100-YR 24-HR STORM ZONE 510/01/90  
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SUMMARY TABLE 2

MODIFIED ATT-KIN REACH ROUTING IN ORDER PERFORMED.  
 QUESTION MARK (?) AFTER: OUTFLOW PEAK - MAX. NUMBER ROUTING ITERATIONS USED;  
 ATT-KIN COEFF - VALUE OUTSIDE ACCEPTABLE LIMITS.

HYDROGRAPH INFORMATION				ROUTING PARAMETERS							
XSEC ID	REACH LENGTH (FT)	FLOOD PLAIN		INFLOW		OUTFLOW		Q-A EQ.		PEAK RATIO Q/I (Q*)	ATT- KIN COEFF (C)
		LENGTH (FT)	PEAK (CFS)	TIME (HR)	PEAK (CFS)	TIME (HR)	COEFF (X)	POWER (M)	LENGTH FACTOR (K*)		

BASEFLOW IS .0 CFS

ALTERNATE	ID	STORM	NO.	DISCH.	VELOCITY	WAVE	PERCENT	PERCENT	PERCENT	PERCENT
ALTERNATE 11	11	STORM	1							
2	1500	103	12.3	100	12.5	.85	1.30	.045	.963	.57
ALTERNATE 12	12	STORM	2							
2	1500	146	12.3	141	12.5	.85	1.30	.040	.968	.61
ALTERNATE 13	13	STORM	3							
2	1500	174	12.3	169	12.5	.85	1.30	.038	.970	.62
ALTERNATE 14	14	STORM	4							
2	1500	277	12.3	270	12.5	.85	1.30	.032	.973	.67?

1  
 TR20 -----  
 EASTMINSTER - BEECH LAKE - EAST BRANCH GYPSUM CREEK VERSION  
 09/27/\*\* BEECH2- W/O 2X12 16 AUG 2002 2,5,10,100-YR 24-HR STORM ZONE 510/01/90  
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SUMMARY TABLE 3

STORM DISCHARGES (CFS) AT XSECTIONS AND STRUCTURES FOR ALL ALTERNATES

XSECTION/ STRUCTURE ID	DRAINAGE AREA (SQ MI)	STORM NUMBERS.....			
		1	2	3	4
STRUCTURE 18	1.21				
ALTERNATE 11	11	294	*****	*****	*****
ALTERNATE 12	12	*****	490	*****	*****
ALTERNATE 13	13	*****	*****	607	*****
ALTERNATE 14	14	*****	*****	*****	1091
STRUCTURE 14	.56				
ALTERNATE 11	11	376	*****	*****	*****
ALTERNATE 12	12	*****	477	*****	*****
ALTERNATE 13	13	*****	*****	518	*****
ALTERNATE 14	14	*****	*****	*****	851
STRUCTURE 10	.52				
ALTERNATE 11	11	386	*****	*****	*****
ALTERNATE 12	12	*****	540	*****	*****
ALTERNATE 13	13	*****	*****	624	*****
ALTERNATE 14	14	*****	*****	*****	909
XSECTION 1	.12				
ALTERNATE 11	11	104	*****	*****	*****
ALTERNATE 12	12	*****	146	*****	*****
ALTERNATE 13	13	*****	*****	174	*****
ALTERNATE 14	14	*****	*****	*****	277
XSECTION 2	.20				
ALTERNATE 11	11	162	*****	*****	*****



ALTERNATE 12 \*\*\*\*\* 1030 \*\*\*\*\*  
ALTERNATE 13 \*\*\*\*\* 1185 \*\*\*\*\*  
ALTERNATE 14 \*\*\*\*\* 1736

\*\*\* WARNING - UNEXPECTED RECORD(S) ENCOUNTERED WHEN LOOKING FOR "JOB" RECORD.  
IMAGES OF FIRST 10 RECORDS IGNORED FOLLOWS: \*\*\*

END OF 1 JOBS IN THIS RUN  
1

SCS TR-20, VERSION 10/01/90  
FILES

INPUT = beech2.t20  
OUTPUT = beech2.out

, DATED 09/27/\*\*,13:35:38

FILES GENERATED - DATED 09/27/\*\*,13:35:38

NONE!

\*\*\* TR-20 RUN COMPLETED \*\*\*

**Appendix E**  
**Drainage and Utility Plan**

**Appendix F**

**Proposed TR-20 Output**

1

\*\*\*\*\*80-80 LIST OF INPUT DATA FOR TR-20 HYDROLOGY\*\*\*\*\*

JOB	TR-20	FULLPRINT	SUMMARY	NOPLOTS
TITLE	001	EASTMINSTER - BEECH LAKE - EAST BRANCH GYPSUM CREEK		
TITLE	BEECHPR2.T20	2-6'x3' 20 SEP 02	2,5,10,100-YR	24-HR STORM ZONE 5
4	DIMHYD	0.02		484
8		.000	.100	.310
8		.470	.820	.990
8		1.000	.930	.780
8		.680	.460	.330
8		.280	.207	.147
8		.126	.091	.066
8		.055	.040	.029
8		.025	.018	.013
8		.011	.008	.006
8		.005	.003	.001
8		.000	.000	.000
9	ENDTBL			
5	RAINFL 7	0.5		
8		.000	.005	.013
8		.018	.029	.042
8		.050	.068	.089
8		.101	.128	.162
8		.183	.244	.723
8		.773	.825	.861
8		.876	.903	.924
8		.934	.951	.966
8		.972	.982	.990
8		.993	.998	1.000
9	ENDTBL			
3	STRUCT	10		
8		1369.4	0.0	0.0
8		1370.4	6.0	0.279
8		1371.4	14.0	1.093
8		1372.4	30.0	2.269
8		1373.4	60.0	3.606
8		1374.4	320.0	7.212
8		1375.4	580.0	11.361
8		1376.4	760.0	16.450
8		1377.4	925.0	23.036
8		1378.4	1085.0	31.035
8		1379.4	1240.0	40.834
9	ENDTBL			
3	STRUCT	16		
8		1372.0	0.0	0.0
8		1373.0	36.5	2.98
8		1374.0	75.9	6.12
8		1375.0	158.7	9.44

1

\*\*\*\*\*80-80 LIST OF INPUT DATA (CONTINUED)\*\*\*\*\*

8		1376.0	231.5	12.94
8		1377.0	356.0	16.61
8		1378.0	380.5	20.47
9	ENDTBL			
3	STRUCT	20		
8		1368.7	0.0	0.0







2.45 WATERSHED INCHES; 260 CFS-HRS; 21.4 ACRE-FEET.

OPERATION ADDHYD XSECTION 10  
INPUT HYDROGRAPHS 7,6 OUTPUT HYDROGRAPH 5

PEAK TIME (HRS) PEAK DISCHARGE (CFS) PEAK ELEVATION (FEET)  
12.35 418.8 (NULL)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
2.38 WATERSHED INCHES; 792 CFS-HRS; 65.4 ACRE-FEET.

OPERATION RESVOR STRUCTURE 10  
INPUT HYDROGRAPH 5 OUTPUT HYDROGRAPH 7  
SURFACE ELEVATION= 1369.40

PEAK TIME (HRS) PEAK DISCHARGE (CFS) PEAK ELEVATION (FEET)  
12.53 386.3 1374.66

RUNOFF ABOVE BASEFLOW OF .00 CFS  
2.38 WATERSHED INCHES; 791 CFS-HRS; 65.4 ACRE-FEET.

OPERATION RUNOFF XSECTION 14  
OUTPUT HYDROGRAPH= 6 AREA= .04 SQ MI  
INPUT RUNOFF CURVE= 93. TIME OF CONCENTRATION= .33 HOURS  
COMPUTED INTERNAL TIME INCREMENT = .0444 HOURS

PEAK TIME (HRS) PEAK DISCHARGE (CFS) PEAK ELEVATION (FEET)  
12.01 63.4 (RUNOFF)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
2.73 WATERSHED INCHES; 76 CFS-HRS; 6.3 ACRE-FEET.

OPERATION ADDHYD XSECTION 14  
INPUT HYDROGRAPHS 7,6 OUTPUT HYDROGRAPH 5

PEAK TIME (HRS) PEAK DISCHARGE (CFS) PEAK ELEVATION (FEET)  
12.51 399.2 (NULL)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
2.40 WATERSHED INCHES; 867 CFS-HRS; 71.7 ACRE-FEET.

1

TR20 -----  
EASTMINSTER - BEECH LAKE - EAST BRANCH GYPSUM CREEK VERSION  
09/27/\*\* BEECHPR2.T20 2-6'x3'20 SEP 2002 2,5,10,100-YR 24-HR STORM ZON10/01/90  
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OPERATION RUNOFF XSECTION 15  
OUTPUT HYDROGRAPH= 4 AREA= .05 SQ MI  
INPUT RUNOFF CURVE= 78. TIME OF CONCENTRATION= .70 HOURS  
COMPUTED INTERNAL TIME INCREMENT = .0933 HOURS

PEAK TIME (HRS) PEAK DISCHARGE (CFS) PEAK ELEVATION (FEET)  
12.21 33.7 (RUNOFF)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
1.49 WATERSHED INCHES; 51 CFS-HRS; 4.2 ACRE-FEET.

OPERATION RUNOFF XSECTION 16  
OUTPUT HYDROGRAPH= 6 AREA= .08 SQ MI  
INPUT RUNOFF CURVE= 80. TIME OF CONCENTRATION= .79 HOURS  
COMPUTED INTERNAL TIME INCREMENT = .1056 HOURS

PEAK TIME (HRS)	PEAK DISCHARGE (CFS)	PEAK ELEVATION (FEET)
12.27	55.1	(RUNOFF)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
1.64 WATERSHED INCHES; 89 CFS-HRS; 7.4 ACRE-FEET.

OPERATION ADDHYD XSECTION 16  
INPUT HYDROGRAPHS 4,6 OUTPUT HYDROGRAPH 7

PEAK TIME (HRS)	PEAK DISCHARGE (CFS)	PEAK ELEVATION (FEET)
12.24	88.5	(NULL)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
1.58 WATERSHED INCHES; 140 CFS-HRS; 11.6 ACRE-FEET.

OPERATION RESVOR STRUCTURE 16  
INPUT HYDROGRAPH 7 OUTPUT HYDROGRAPH 6  
SURFACE ELEVATION= 1372.00

PEAK TIME (HRS)	PEAK DISCHARGE (CFS)	PEAK ELEVATION (FEET)
12.74	44.1	1373.19

RUNOFF ABOVE BASEFLOW OF .00 CFS  
1.58 WATERSHED INCHES; 140 CFS-HRS; 11.6 ACRE-FEET.

OPERATION RUNOFF XSECTION 17  
OUTPUT HYDROGRAPH= 4 AREA= .09 SQ MI  
INPUT RUNOFF CURVE= 96. TIME OF CONCENTRATION= .42 HOURS  
COMPUTED INTERNAL TIME INCREMENT = .0560 HOURS

1

TR20 -----  
EASTMINSTER - BEECH LAKE - EAST BRANCH GYPSUM CREEK VERSION  
09/27/\*\* BEECHPR2.T20 2-6'x3'20 SEP 2002 2,5,10,100-YR 24-HR STORM ZON10/01/90  
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PEAK TIME (HRS)	PEAK DISCHARGE (CFS)	PEAK ELEVATION (FEET)
12.05	141.8	(RUNOFF)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
3.07 WATERSHED INCHES; 188 CFS-HRS; 15.5 ACRE-FEET.

OPERATION ADDHYD XSECTION 17  
INPUT HYDROGRAPHS 4,6 OUTPUT HYDROGRAPH 7

PEAK TIME (HRS)	PEAK DISCHARGE (CFS)	PEAK ELEVATION (FEET)
12.08	160.4	(NULL)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
2.19 WATERSHED INCHES; 329 CFS-HRS; 27.1 ACRE-FEET.

OPERATION RUNOFF XSECTION 18  
OUTPUT HYDROGRAPH= 6 AREA= .07 SQ MI  
INPUT RUNOFF CURVE= 78. TIME OF CONCENTRATION= .79 HOURS

COMPUTED INTERNAL TIME INCREMENT = .1053 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.27	43.3	(RUNOFF)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
1.50 WATERSHED INCHES; 71 CFS-HRS; 5.9 ACRE-FEET.

OPERATION ADDHYD XSECTION 18  
INPUT HYDROGRAPHS 6,7 OUTPUT HYDROGRAPH 4

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.11	198.1	(NULL)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
2.02 WATERSHED INCHES; 400 CFS-HRS; 33.0 ACRE-FEET.

OPERATION ADDHYD XSECTION 19  
INPUT HYDROGRAPHS 4,5 OUTPUT HYDROGRAPH 6

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.29	532.6	(NULL)

1

TR20 -----  
EASTMINSTER - BEECH LAKE - EAST BRANCH GYPSUM CREEK VERSION  
09/27/\*\* BEECHPR2.T20 2-6'x3'20 SEP 2002 2,5,10,100-YR 24-HR STORM ZON10/01/90  
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RUNOFF ABOVE BASEFLOW OF .00 CFS  
2.27 WATERSHED INCHES; 1267 CFS-HRS; 104.7 ACRE-FEET.

OPERATION RUNOFF XSECTION 20  
OUTPUT HYDROGRAPH= 5 AREA= .35 SQ MI  
INPUT RUNOFF CURVE= 82. TIME OF CONCENTRATION= .87 HOURS  
COMPUTED INTERNAL TIME INCREMENT = .0945 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.31	236.8	(RUNOFF)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
1.78 WATERSHED INCHES; 400 CFS-HRS; 33.1 ACRE-FEET.

OPERATION ADDHYD XSECTION 20  
INPUT HYDROGRAPHS 6,5 OUTPUT HYDROGRAPH 7

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.30	769.3	(NULL)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
2.13 WATERSHED INCHES; 1667 CFS-HRS; 137.8 ACRE-FEET.

OPERATION RESVOR STRUCTURE 20  
INPUT HYDROGRAPH 7 OUTPUT HYDROGRAPH 5  
SURFACE ELEVATION= 1369.70

\*\*\* MESSAGE - STRUCTURE 20, USER ENTERED STARTING ELEVATION ( 1369.7 FEET)  
WILL DECREASE OUTFLOW HYDROGRAPH VOLUME.

\*\*\*

PEAK TIME (HRS) 13.55 PEAK DISCHARGE (CFS) 217.8 PEAK ELEVATION (FEET) 1370.02

RUNOFF ABOVE BASEFLOW OF .00 CFS  
.20 WATERSHED INCHES; 154 CFS-HRS; 12.7 ACRE-FEET.

EXECUTIVE CONTROL ENDCMP COMPUTATIONS COMPLETED FOR PASS 1

1  
TR20 -----  
EASTMINSTER - BEECH LAKE - EAST BRANCH GYPSUM CREEK VERSION  
09/27/\*\* BEECHPR2.T20 2-6'x3'20 SEP 2002 2,5,10,100-YR 24-HR STORM ZON10/01/90  
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EXECUTIVE CONTROL COMPUT FROM XSECTION 1 TO STRUCTURE 20  
STARTING TIME = .00 RAIN DEPTH = 4.55 RAIN DURATION = 1.00  
ANT. MOIST. COND. = 2 MAIN TIME INCREMENT = .10 HOURS  
ALTERNATE NO. = 12 STORM NO. = 2 RAIN TABLE NO. = 7

OPERATION RUNOFF XSECTION 1  
OUTPUT HYDROGRAPH = 1 AREA = .12 SQ MI  
INPUT RUNOFF CURVE = 89. TIME OF CONCENTRATION = .91 HOURS  
COMPUTED INTERNAL TIME INCREMENT = .0992 HOURS

PEAK TIME (HRS) 12.32 PEAK DISCHARGE (CFS) 146.0 PEAK ELEVATION (FEET) (RUNOFF)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
3.30 WATERSHED INCHES; 259 CFS-HRS; 21.4 ACRE-FEET.

OPERATION REACH XSECTION 2  
INPUT HYDROGRAPH 1 OUTPUT HYDROGRAPH 2  
CHANNEL LENGTH 1500.00 FT  
INPUT = COEFFICIENTS RELATED TO XSECTION AREA, X = .85, M = 1.30  
MODIFIED ATT-KIN ROUTING COEFFICIENT = .61 PEAK TRAVEL TIME = .20 HOURS

PEAK TIME (HRS) 12.49 PEAK DISCHARGE (CFS) 141.1 PEAK ELEVATION (FEET) (NULL)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
3.30 WATERSHED INCHES; 259 CFS-HRS; 21.4 ACRE-FEET.

OPERATION RUNOFF XSECTION 2  
OUTPUT HYDROGRAPH = 1 AREA = .07 SQ MI  
INPUT RUNOFF CURVE = 91. TIME OF CONCENTRATION = .70 HOURS  
COMPUTED INTERNAL TIME INCREMENT = .0937 HOURS

PEAK TIME (HRS) 12.20 PEAK DISCHARGE (CFS) 107.0 PEAK ELEVATION (FEET) (RUNOFF)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
3.49 WATERSHED INCHES; 166 CFS-HRS; 13.7 ACRE-FEET.

OPERATION ADDHYD XSECTION 2  
INPUT HYDROGRAPHS 1,2 OUTPUT HYDROGRAPH 3

PEAK TIME (HRS) 12.34 PEAK DISCHARGE (CFS) 229.1 PEAK ELEVATION (FEET) (NULL)

1

TR20 -----  
 EASTMINSTER - BEECH LAKE - EAST BRANCH GYPSUM CREEK                      VERSION  
 09/27/\*\* BEECHPR2.T20 2-6'x3'20 SEP 2002 2,5,10,100-YR 24-HR STORM ZON10/01/90  
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RUNOFF ABOVE BASEFLOW OF     .00 CFS  
                           3.37 WATERSHED INCHES;           425 CFS-HRS;           35.1 ACRE-FEET.

OPERATION RUNOFF   XSECTION   5  
 OUTPUT HYDROGRAPH= 5           AREA=     .20 SQ MI  
 INPUT RUNOFF CURVE= 89.        TIME OF CONCENTRATION= 1.10 HOURS  
 COMPUTED INTERNAL TIME INCREMENT = .1012 HOURS

PEAK TIME(HRS)                      PEAK DISCHARGE(CFS)                      PEAK ELEVATION(FEET)  
 12.43                                      215.6                                      (RUNOFF)

RUNOFF ABOVE BASEFLOW OF     .00 CFS  
                           3.37 WATERSHED INCHES;           425 CFS-HRS;           35.1 ACRE-FEET.

OPERATION RUNOFF   XSECTION   6  
 OUTPUT HYDROGRAPH= 6           AREA=     .16 SQ MI  
 INPUT RUNOFF CURVE= 88.        TIME OF CONCENTRATION= 1.11 HOURS  
 COMPUTED INTERNAL TIME INCREMENT = .1026 HOURS

PEAK TIME(HRS)                      PEAK DISCHARGE(CFS)                      PEAK ELEVATION(FEET)  
 12.44                                      167.0                                      (RUNOFF)

RUNOFF ABOVE BASEFLOW OF     .00 CFS  
                           3.27 WATERSHED INCHES;           331 CFS-HRS;           27.3 ACRE-FEET.

OPERATION ADDHYD   XSECTION   7  
 INPUT HYDROGRAPHS 5,6           OUTPUT HYDROGRAPH 7

PEAK TIME(HRS)                      PEAK DISCHARGE(CFS)                      PEAK ELEVATION(FEET)  
 12.43                                      382.6                                      (NULL)

RUNOFF ABOVE BASEFLOW OF     .00 CFS  
                           3.33 WATERSHED INCHES;           756 CFS-HRS;           62.4 ACRE-FEET.

OPERATION RUNOFF   XSECTION   10  
 OUTPUT HYDROGRAPH= 6           AREA=     .16 SQ MI  
 INPUT RUNOFF CURVE= 90.        TIME OF CONCENTRATION= .77 HOURS  
 COMPUTED INTERNAL TIME INCREMENT = .1033 HOURS

PEAK TIME(HRS)                      PEAK DISCHARGE(CFS)                      PEAK ELEVATION(FEET)  
 12.24                                      220.9                                      (RUNOFF)

RUNOFF ABOVE BASEFLOW OF     .00 CFS  
                           3.45 WATERSHED INCHES;           365 CFS-HRS;           30.1 ACRE-FEET.

1

TR20 -----  
 EASTMINSTER - BEECH LAKE - EAST BRANCH GYPSUM CREEK                      VERSION  
 09/27/\*\* BEECHPR2.T20 2-6'x3'20 SEP 2002 2,5,10,100-YR 24-HR STORM ZON10/01/90  
 13:36:02    PASS     2    PAGE  10

OPERATION ADDHYD   XSECTION   10

INPUT HYDROGRAPHS 7,6      OUTPUT HYDROGRAPH 5

PEAK TIME(HRS)                      PEAK DISCHARGE(CFS)                      PEAK ELEVATION(FEET)  
12.35                                      586.5                                      (NULL)

RUNOFF ABOVE BASEFLOW OF      .00 CFS  
3.37 WATERSHED INCHES;              1120 CFS-HRS;              92.6 ACRE-FEET.

OPERATION RESVOR      STRUCTURE 10  
INPUT HYDROGRAPH 5              OUTPUT HYDROGRAPH 7  
SURFACE ELEVATION= 1369.40

PEAK TIME(HRS)                      PEAK DISCHARGE(CFS)                      PEAK ELEVATION(FEET)  
12.53                                      539.6                                      1375.24

RUNOFF ABOVE BASEFLOW OF      .00 CFS  
3.37 WATERSHED INCHES;              1120 CFS-HRS;              92.6 ACRE-FEET.

OPERATION RUNOFF      XSECTION 14  
OUTPUT HYDROGRAPH= 6              AREA= .04 SQ MI  
INPUT RUNOFF CURVE= 93.              TIME OF CONCENTRATION= .33 HOURS  
COMPUTED INTERNAL TIME INCREMENT = .0444 HOURS

PEAK TIME(HRS)                      PEAK DISCHARGE(CFS)                      PEAK ELEVATION(FEET)  
12.01                                      85.3                                      (RUNOFF)

RUNOFF ABOVE BASEFLOW OF      .00 CFS  
3.75 WATERSHED INCHES;              105 CFS-HRS;              8.6 ACRE-FEET.

OPERATION ADDHYD      XSECTION 14  
INPUT HYDROGRAPHS 7,6              OUTPUT HYDROGRAPH 5

PEAK TIME(HRS)                      PEAK DISCHARGE(CFS)                      PEAK ELEVATION(FEET)  
12.51                                      556.6                                      (NULL)

RUNOFF ABOVE BASEFLOW OF      .00 CFS  
3.40 WATERSHED INCHES;              1225 CFS-HRS;              101.2 ACRE-FEET.

OPERATION RUNOFF      XSECTION 15  
OUTPUT HYDROGRAPH= 4              AREA= .05 SQ MI  
INPUT RUNOFF CURVE= 78.              TIME OF CONCENTRATION= .70 HOURS  
COMPUTED INTERNAL TIME INCREMENT = .0933 HOURS

1

TR20 -----  
EASTMINSTER - BEECH LAKE - EAST BRANCH GYPSUM CREEK              VERSION  
09/27/\*\* BEECHPR2.T20 2-6'x3'20 SEP 2002 2,5,10,100-YR 24-HR STORM ZON10/01/90  
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PEAK TIME(HRS)                      PEAK DISCHARGE(CFS)                      PEAK ELEVATION(FEET)  
12.21                                      53.5                                      (RUNOFF)

RUNOFF ABOVE BASEFLOW OF      .00 CFS  
2.34 WATERSHED INCHES;              80 CFS-HRS;              6.6 ACRE-FEET.

OPERATION RUNOFF      XSECTION 16  
OUTPUT HYDROGRAPH= 6              AREA= .08 SQ MI  
INPUT RUNOFF CURVE= 80.              TIME OF CONCENTRATION= .79 HOURS  
COMPUTED INTERNAL TIME INCREMENT = .1056 HOURS

PEAK TIME(HRS)                      PEAK DISCHARGE(CFS)                      PEAK ELEVATION(FEET)  
12.27                                      83.8                                      (RUNOFF)

RUNOFF ABOVE BASEFLOW OF    .00 CFS  
   2.50 WATERSHED INCHES;                      136 CFS-HRS;                      11.3 ACRE-FEET.

OPERATION ADDHYD    XSECTION 16  
   INPUT HYDROGRAPHS 4,6                      OUTPUT HYDROGRAPH 7

PEAK TIME(HRS)                      PEAK DISCHARGE(CFS)                      PEAK ELEVATION(FEET)  
12.24                                      136.8                                      (NULL)

RUNOFF ABOVE BASEFLOW OF    .00 CFS  
   2.44 WATERSHED INCHES;                      216 CFS-HRS;                      17.9 ACRE-FEET.

OPERATION RESVOR    STRUCTURE 16  
   INPUT HYDROGRAPH 7                      OUTPUT HYDROGRAPH 6  
   SURFACE ELEVATION= 1372.00

PEAK TIME(HRS)                      PEAK DISCHARGE(CFS)                      PEAK ELEVATION(FEET)  
12.72                                      69.6                                      1373.84

RUNOFF ABOVE BASEFLOW OF    .00 CFS  
   2.44 WATERSHED INCHES;                      216 CFS-HRS;                      17.9 ACRE-FEET.

OPERATION RUNOFF    XSECTION 17  
   OUTPUT HYDROGRAPH= 4                      AREA= .09 SQ MI  
   INPUT RUNOFF CURVE= 96.                      TIME OF CONCENTRATION= .42 HOURS  
   COMPUTED INTERNAL TIME INCREMENT = .0560 HOURS

PEAK TIME(HRS)                      PEAK DISCHARGE(CFS)                      PEAK ELEVATION(FEET)  
12.05                                      186.8                                      (RUNOFF)

1

TR20 -----  
   EASTMINSTER - BEECH LAKE - EAST BRANCH GYPSUM CREEK                      VERSION  
09/27/\*\* BEECHPR2.T20 2-6'x3'20 SEP 2002 2,5,10,100-YR 24-HR STORM ZON10/01/90  
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RUNOFF ABOVE BASEFLOW OF    .00 CFS  
   4.12 WATERSHED INCHES;                      252 CFS-HRS;                      20.8 ACRE-FEET.

OPERATION ADDHYD    XSECTION 17  
   INPUT HYDROGRAPHS 4,6                      OUTPUT HYDROGRAPH 7

PEAK TIME(HRS)                      PEAK DISCHARGE(CFS)                      PEAK ELEVATION(FEET)  
12.09                                      218.1                                      (NULL)

RUNOFF ABOVE BASEFLOW OF    .00 CFS  
   3.12 WATERSHED INCHES;                      468 CFS-HRS;                      38.7 ACRE-FEET.

OPERATION RUNOFF    XSECTION 18  
   OUTPUT HYDROGRAPH= 6                      AREA= .07 SQ MI  
   INPUT RUNOFF CURVE= 78.                      TIME OF CONCENTRATION= .79 HOURS  
   COMPUTED INTERNAL TIME INCREMENT = .1053 HOURS

PEAK TIME(HRS)                      PEAK DISCHARGE(CFS)                      PEAK ELEVATION(FEET)  
12.26                                      69.1                                      (RUNOFF)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
2.33 WATERSHED INCHES; 111 CFS-HRS; 9.2 ACRE-FEET.

OPERATION ADDHYD XSECTION 18  
INPUT HYDROGRAPHS 6,7 OUTPUT HYDROGRAPH 4

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.12 279.6 (NULL)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
2.93 WATERSHED INCHES; 579 CFS-HRS; 47.9 ACRE-FEET.

OPERATION ADDHYD XSECTION 19  
INPUT HYDROGRAPHS 4,5 OUTPUT HYDROGRAPH 6

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.31 747.6 (NULL)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
3.23 WATERSHED INCHES; 1804 CFS-HRS; 149.1 ACRE-FEET.

1

TR20 -----  
EASTMINSTER - BEECH LAKE - EAST BRANCH GYPSUM CREEK VERSION  
09/27/\*\* BEECHPR2.T20 2-6'x3'20 SEP 2002 2,5,10,100-YR 24-HR STORM ZON10/01/90  
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OPERATION RUNOFF XSECTION 20  
OUTPUT HYDROGRAPH= 5 AREA= .35 SQ MI  
INPUT RUNOFF CURVE= 82. TIME OF CONCENTRATION= .87 HOURS  
COMPUTED INTERNAL TIME INCREMENT = .0945 HOURS

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.30 359.1 (RUNOFF)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
2.68 WATERSHED INCHES; 602 CFS-HRS; 49.8 ACRE-FEET.

OPERATION ADDHYD XSECTION 20  
INPUT HYDROGRAPHS 6,5 OUTPUT HYDROGRAPH 7

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.31 1106.7 (NULL)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
3.07 WATERSHED INCHES; 2406 CFS-HRS; 198.9 ACRE-FEET.

OPERATION RESVOR STRUCTURE 20  
INPUT HYDROGRAPH 7 OUTPUT HYDROGRAPH 5  
SURFACE ELEVATION= 1369.70

\*\*\* MESSAGE - STRUCTURE 20, USER ENTERED STARTING ELEVATION ( 1369.7 FEET).  
WILL DECREASE OUTFLOW HYDROGRAPH VOLUME. \*\*\*

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
13.32 405.0 1370.45

RUNOFF ABOVE BASEFLOW OF .00 CFS

1.12 WATERSHED INCHES; 880 CFS-HRS; 72.7 ACRE-FEET.

EXECUTIVE CONTROL ENDCMP COMPUTATIONS COMPLETED FOR PASS 2

1

TR20 -----

EASTMINSTER - BEECH LAKE - EAST BRANCH GYPSUM CREEK VERSION  
09/27/\*\* BEECHPR2.T20 2-6'x3'20 SEP 2002 2,5,10,100-YR 24-HR STORM ZON10/01/90  
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EXECUTIVE CONTROL COMPUT FROM XSECTION 1 TO STRUCTURE 20  
STARTING TIME = .00 RAIN DEPTH = 5.25 RAIN DURATION= 1.00  
ANT. MOIST. COND. = 2 MAIN TIME INCREMENT = .10 HOURS  
ALTERNATE NO.=13 STORM NO.= 3 RAIN TABLE NO.= 7

OPERATION RUNOFF XSECTION 1  
OUTPUT HYDROGRAPH= 1 AREA= .12 SQ MI  
INPUT RUNOFF CURVE= 89. TIME OF CONCENTRATION= .91 HOURS  
COMPUTED INTERNAL TIME INCREMENT = .0992 HOURS

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.32 174.3 (RUNOFF)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
3.97 WATERSHED INCHES; 311 CFS-HRS; 25.7 ACRE-FEET.

OPERATION REACH XSECTION 2  
INPUT HYDROGRAPH 1 OUTPUT HYDROGRAPH 2  
CHANNEL LENGTH 1500.00 FT  
INPUT = COEFFICIENTS RELATED TO XSECTION AREA, X= .85, M= 1.30  
MODIFIED ATT-KIN ROUTING COEFFICIENT = .62 PEAK TRAVEL TIME = .20 HOURS

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.48 169.0 (NULL)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
3.97 WATERSHED INCHES; 311 CFS-HRS; 25.7 ACRE-FEET.

OPERATION RUNOFF XSECTION 2  
OUTPUT HYDROGRAPH= 1 AREA= .07 SQ MI  
INPUT RUNOFF CURVE= 91. TIME OF CONCENTRATION= .70 HOURS  
COMPUTED INTERNAL TIME INCREMENT = .0937 HOURS

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.20 125.6 (RUNOFF)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
4.16 WATERSHED INCHES; 198 CFS-HRS; 16.4 ACRE-FEET.

OPERATION ADDHYD XSECTION 2  
INPUT HYDROGRAPHS 1,2 OUTPUT HYDROGRAPH 3

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.34 273.3 (NULL)

1

TR20 -----

EASTMINSTER - BEECH LAKE - EAST BRANCH GYPSUM CREEK VERSION  
09/27/\*\* BEECHPR2.T20 2-6'x3'20 SEP 2002 2,5,10,100-YR 24-HR STORM ZON10/01/90

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RUNOFF ABOVE BASEFLOW OF .00 CFS  
 4.04 WATERSHED INCHES; 509 CFS-HRS; 42.1 ACRE-FEET.

OPERATION RUNOFF XSECTION 5  
 OUTPUT HYDROGRAPH= 5 AREA= .20 SQ MI  
 INPUT RUNOFF CURVE= 89. TIME OF CONCENTRATION= 1.10 HOURS  
 COMPUTED INTERNAL TIME INCREMENT = .1012 HOURS

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
 12.43 257.3 (RUNOFF)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
 4.04 WATERSHED INCHES; 509 CFS-HRS; 42.1 ACRE-FEET.

OPERATION RUNOFF XSECTION 6  
 OUTPUT HYDROGRAPH= 6 AREA= .16 SQ MI  
 INPUT RUNOFF CURVE= 88. TIME OF CONCENTRATION= 1.11 HOURS  
 COMPUTED INTERNAL TIME INCREMENT = .1026 HOURS

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
 12.44 199.7 (RUNOFF)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
 3.94 WATERSHED INCHES; 398 CFS-HRS; 32.9 ACRE-FEET.

OPERATION ADDHYD XSECTION 7  
 INPUT HYDROGRAPHS 5,6 OUTPUT HYDROGRAPH 7

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
 12.43 456.9 (NULL)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
 3.99 WATERSHED INCHES; 907 CFS-HRS; 75.0 ACRE-FEET.

OPERATION RUNOFF XSECTION 10  
 OUTPUT HYDROGRAPH= 6 AREA= .16 SQ MI  
 INPUT RUNOFF CURVE= 90. TIME OF CONCENTRATION= .77 HOURS  
 COMPUTED INTERNAL TIME INCREMENT = .1033 HOURS

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
 12.24 261.9 (RUNOFF)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
 4.12 WATERSHED INCHES; 436 CFS-HRS; 36.0 ACRE-FEET.

1

TR20

-----  
 EASTMINSTER - BEECH LAKE - EAST BRANCH GYPSUM CREEK VERSION  
 09/27/\*\* BEECHPR2.T20 2-6'x3'20 SEP 2002 2,5,10,100-YR 24-HR STORM ZON10/01/90  
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OPERATION ADDHYD XSECTION 10  
 INPUT HYDROGRAPHS 7,6 OUTPUT HYDROGRAPH 5

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
 12.35 699.0 (NULL)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
4.04 WATERSHED INCHES; 1343 CFS-HRS; 111.0 ACRE-FEET.

OPERATION RESVOR STRUCTURE 10  
INPUT HYDROGRAPH 5 OUTPUT HYDROGRAPH 7  
SURFACE ELEVATION= 1369.40

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.56 624.5 1375.65

RUNOFF ABOVE BASEFLOW OF .00 CFS  
4.04 WATERSHED INCHES; 1343 CFS-HRS; 111.0 ACRE-FEET.

OPERATION RUNOFF XSECTION 14  
OUTPUT HYDROGRAPH= 6 AREA= .04 SQ MI  
INPUT RUNOFF CURVE= 93. TIME OF CONCENTRATION= .33 HOURS  
COMPUTED INTERNAL TIME INCREMENT = .0444 HOURS

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.01 99.9 (RUNOFF)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
4.44 WATERSHED INCHES; 124 CFS-HRS; 10.2 ACRE-FEET.

OPERATION ADDHYD XSECTION 14  
INPUT HYDROGRAPHS 7,6 OUTPUT HYDROGRAPH 5

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.53 643.2 (NULL)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
4.07 WATERSHED INCHES; 1467 CFS-HRS; 121.2 ACRE-FEET.

OPERATION RUNOFF XSECTION 15  
OUTPUT HYDROGRAPH= 4 AREA= .05 SQ MI  
INPUT RUNOFF CURVE= 78. TIME OF CONCENTRATION= .70 HOURS  
COMPUTED INTERNAL TIME INCREMENT = .0933 HOURS

1

TR20 -----  
EASTMINSTER - BEECH LAKE - EAST BRANCH GYPSUM CREEK VERSION  
09/27/\*\* BEECHPR2.T20 2-6'x3'20 SEP 2002 2,5,10,100-YR 24-HR STORM ZON10/01/90  
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PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.21 66.4 (RUNOFF)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
2.92 WATERSHED INCHES; 100 CFS-HRS; 8.3 ACRE-FEET.

OPERATION RUNOFF XSECTION 16  
OUTPUT HYDROGRAPH= 6 AREA= .08 SQ MI  
INPUT RUNOFF CURVE= 80. TIME OF CONCENTRATION= .79 HOURS  
COMPUTED INTERNAL TIME INCREMENT = .1056 HOURS

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.26 104.3 (RUNOFF)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
3.11 WATERSHED INCHES; 169 CFS-HRS; 14.0 ACRE-FEET.

OPERATION ADDHYD XSECTION 16  
INPUT HYDROGRAPHS 4,6 OUTPUT HYDROGRAPH 7

PEAK TIME (HRS) PEAK DISCHARGE (CFS) PEAK ELEVATION (FEET)  
12.24 170.1 (NULL)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
3.04 WATERSHED INCHES; 269 CFS-HRS; 22.3 ACRE-FEET.

OPERATION RESVOR STRUCTURE 16  
INPUT HYDROGRAPH 7 OUTPUT HYDROGRAPH 6  
SURFACE ELEVATION= 1372.00

PEAK TIME (HRS) PEAK DISCHARGE (CFS) PEAK ELEVATION (FEET)  
12.68 95.1 1374.23

RUNOFF ABOVE BASEFLOW OF .00 CFS  
3.04 WATERSHED INCHES; 269 CFS-HRS; 22.3 ACRE-FEET.

OPERATION RUNOFF XSECTION 17  
OUTPUT HYDROGRAPH= 4 AREA= .09 SQ MI  
INPUT RUNOFF CURVE= 96. TIME OF CONCENTRATION= .42 HOURS  
COMPUTED INTERNAL TIME INCREMENT = .0560 HOURS

PEAK TIME (HRS) PEAK DISCHARGE (CFS) PEAK ELEVATION (FEET)  
12.05 216.7 (RUNOFF)

1

TR20 -----  
EASTMINSTER - BEECH LAKE - EAST BRANCH GYPSUM CREEK VERSION  
09/27/\*\* BEECHPR2.T20 2-6'x3'20 SEP 2002 2,5,10,100-YR 24-HR STORM ZON10/01/90  
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RUNOFF ABOVE BASEFLOW OF .00 CFS  
4.81 WATERSHED INCHES; 294 CFS-HRS; 24.3 ACRE-FEET.

OPERATION ADDHYD XSECTION 17  
INPUT HYDROGRAPHS 4,6 OUTPUT HYDROGRAPH 7

PEAK TIME (HRS) PEAK DISCHARGE (CFS) PEAK ELEVATION (FEET)  
12.09 257.4 (NULL)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
3.76 WATERSHED INCHES; 564 CFS-HRS; 46.6 ACRE-FEET.

OPERATION RUNOFF XSECTION 18  
OUTPUT HYDROGRAPH= 6 AREA= .07 SQ MI  
INPUT RUNOFF CURVE= 78. TIME OF CONCENTRATION= .79 HOURS  
COMPUTED INTERNAL TIME INCREMENT = .1053 HOURS

PEAK TIME (HRS) PEAK DISCHARGE (CFS) PEAK ELEVATION (FEET)  
12.26 86.1 (RUNOFF)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
2.92 WATERSHED INCHES; 139 CFS-HRS; 11.5 ACRE-FEET.

OPERATION ADDHYD XSECTION 18  
INPUT HYDROGRAPHS 6,7 OUTPUT HYDROGRAPH 4

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.12 334.5 (NULL)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
3.56 WATERSHED INCHES; 703 CFS-HRS; 58.1 ACRE-FEET.

OPERATION ADDHYD XSECTION 19  
INPUT HYDROGRAPHS 4,5 OUTPUT HYDROGRAPH 6

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.29 894.0 (NULL)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
3.89 WATERSHED INCHES; 2170 CFS-HRS; 179.3 ACRE-FEET.

1

TR20 -----  
EASTMINSTER - BEECH LAKE - EAST BRANCH GYPSUM CREEK VERSION  
09/27/\*\* BEECHPR2.T20 2-6'x3'20 SEP 2002 2,5,10,100-YR 24-HR STORM ZON10/01/90  
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OPERATION RUNOFF XSECTION 20  
OUTPUT HYDROGRAPH= 5 AREA= .35 SQ MI  
INPUT RUNOFF CURVE= 82. TIME OF CONCENTRATION= .87 HOURS  
COMPUTED INTERNAL TIME INCREMENT = .0945 HOURS

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.30 438.9 (RUNOFF)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
3.30 WATERSHED INCHES; 741 CFS-HRS; 61.3 ACRE-FEET.

OPERATION ADDHYD XSECTION 20  
INPUT HYDROGRAPHS 6,5 OUTPUT HYDROGRAPH 7

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.30 1332.7 (NULL)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
3.72 WATERSHED INCHES; 2911 CFS-HRS; 240.6 ACRE-FEET.

OPERATION RESVOR STRUCTURE 20  
INPUT HYDROGRAPH 7 OUTPUT HYDROGRAPH 5  
SURFACE ELEVATION= 1369.70

\*\*\* MESSAGE - STRUCTURE 20, USER ENTERED STARTING ELEVATION ( 1369.7 FEET)  
WILL DECREASE OUTFLOW HYDROGRAPH VOLUME. \*\*\*

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
13.25 532.3 1370.74

RUNOFF ABOVE BASEFLOW OF .00 CFS  
1.76 WATERSHED INCHES; 1378 CFS-HRS; 113.9 ACRE-FEET.

EXECUTIVE CONTROL ENDCMP COMPUTATIONS COMPLETED FOR PASS 3



6.52 WATERSHED INCHES; 822 CFS-HRS; 67.9 ACRE-FEET.

OPERATION RUNOFF XSECTION 5  
OUTPUT HYDROGRAPH= 5 AREA= .20 SQ MI  
INPUT RUNOFF CURVE= 89. TIME OF CONCENTRATION= 1.10 HOURS  
COMPUTED INTERNAL TIME INCREMENT = .1012 HOURS

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.42 408.2 (RUNOFF)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
6.52 WATERSHED INCHES; 822 CFS-HRS; 68.0 ACRE-FEET.

OPERATION RUNOFF XSECTION 6  
OUTPUT HYDROGRAPH= 6 AREA= .16 SQ MI  
INPUT RUNOFF CURVE= 88. TIME OF CONCENTRATION= 1.11 HOURS  
COMPUTED INTERNAL TIME INCREMENT = .1026 HOURS

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.43 318.1 (RUNOFF)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
6.40 WATERSHED INCHES; 647 CFS-HRS; 53.5 ACRE-FEET.

OPERATION ADDHYD XSECTION 7  
INPUT HYDROGRAPHS 5,6 OUTPUT HYDROGRAPH 7

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.43 726.2 (NULL)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
6.47 WATERSHED INCHES; 1469 CFS-HRS; 121.4 ACRE-FEET.

OPERATION RUNOFF XSECTION 10  
OUTPUT HYDROGRAPH= 6 AREA= .16 SQ MI  
INPUT RUNOFF CURVE= 90. TIME OF CONCENTRATION= .77 HOURS  
COMPUTED INTERNAL TIME INCREMENT = .1033 HOURS

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.24 416.9 (RUNOFF)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
6.62 WATERSHED INCHES; 700 CFS-HRS; 57.9 ACRE-FEET.

1

TR20 -----  
EASTMINSTER - BEECH LAKE - EAST BRANCH GYPSUM CREEK VERSION  
09/27/\*\* BEECHPR2.T20 2-6'x3'20 SEP 2002 2,5,10,100-YR 24-HR STORM ZON10/01/90  
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OPERATION ADDHYD XSECTION 10  
INPUT HYDROGRAPHS 7,6 OUTPUT HYDROGRAPH 5

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.34 1110.6 (NULL)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
6.52 WATERSHED INCHES; 2170 CFS-HRS; 179.3 ACRE-FEET.

OPERATION RESVOR STRUCTURE 10  
INPUT HYDROGRAPH 5 OUTPUT HYDROGRAPH 7  
SURFACE ELEVATION= 1369.40

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.63 909.2 1377.30

RUNOFF ABOVE BASEFLOW OF .00 CFS  
6.52 WATERSHED INCHES; 2169 CFS-HRS; 179.3 ACRE-FEET.

OPERATION RUNOFF XSECTION 14  
OUTPUT HYDROGRAPH= 6 AREA= .04 SQ MI  
INPUT RUNOFF CURVE= 93. TIME OF CONCENTRATION= .33 HOURS  
COMPUTED INTERNAL TIME INCREMENT = .0444 HOURS

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.01 153.2 (RUNOFF)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
6.95 WATERSHED INCHES; 194 CFS-HRS; 16.0 ACRE-FEET.

OPERATION ADDHYD XSECTION 14  
INPUT HYDROGRAPHS 7,6 OUTPUT HYDROGRAPH 5

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.60 933.7 (NULL)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
6.55 WATERSHED INCHES; 2363 CFS-HRS; 195.3 ACRE-FEET.

OPERATION RUNOFF XSECTION 15  
OUTPUT HYDROGRAPH= 4 AREA= .05 SQ MI  
INPUT RUNOFF CURVE= 78. TIME OF CONCENTRATION= .70 HOURS  
COMPUTED INTERNAL TIME INCREMENT = .0933 HOURS

1

TR20 -----  
EASTMINSTER - BEECH LAKE - EAST BRANCH GYPSUM CREEK VERSION  
09/27/\*\* BEECHPR2.T20 2-6'x3'20 SEP 2002 2,5,10,100-YR 24-HR STORM ZON10/01/90  
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PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.20 116.9 (RUNOFF)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
5.19 WATERSHED INCHES; 178 CFS-HRS; 14.7 ACRE-FEET.

OPERATION RUNOFF XSECTION 16  
OUTPUT HYDROGRAPH= 6 AREA= .08 SQ MI  
INPUT RUNOFF CURVE= 80. TIME OF CONCENTRATION= .79 HOURS  
COMPUTED INTERNAL TIME INCREMENT = .1056 HOURS

PEAK TIME(HRS) PEAK DISCHARGE(CFS) PEAK ELEVATION(FEET)  
12.26 179.5 (RUNOFF)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
5.43 WATERSHED INCHES; 296 CFS-HRS; 24.4 ACRE-FEET.

OPERATION ADDHYD XSECTION 16  
INPUT HYDROGRAPHS 4,6 OUTPUT HYDROGRAPH 7

PEAK TIME (HRS) PEAK DISCHARGE (CFS) PEAK ELEVATION (FEET)  
12.23 295.6 (NULL)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
5.34 WATERSHED INCHES; 474 CFS-HRS; 39.1 ACRE-FEET.

OPERATION RESVOR STRUCTURE 16  
INPUT HYDROGRAPH 7 OUTPUT HYDROGRAPH 6  
SURFACE ELEVATION= 1372.00

PEAK TIME (HRS) PEAK DISCHARGE (CFS) PEAK ELEVATION (FEET)  
12.60 189.6 1375.42

RUNOFF ABOVE BASEFLOW OF .00 CFS  
5.34 WATERSHED INCHES; 474 CFS-HRS; 39.2 ACRE-FEET.

OPERATION RUNOFF XSECTION 17  
OUTPUT HYDROGRAPH= 4 AREA= .09 SQ MI  
INPUT RUNOFF CURVE= 96. TIME OF CONCENTRATION= .42 HOURS  
COMPUTED INTERNAL TIME INCREMENT = .0560 HOURS

PEAK TIME (HRS) PEAK DISCHARGE (CFS) PEAK ELEVATION (FEET)  
12.05 325.0 (RUNOFF)

1

TR20 -----  
EASTMINSTER - BEECH LAKE - EAST BRANCH GYPSUM CREEK VERSION  
09/27/\*\* BEECHPR2.T20 2-6'x3'20 SEP 2002 2,5,10,100-YR 24-HR STORM ZON10/01/90  
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RUNOFF ABOVE BASEFLOW OF .00 CFS  
7.35 WATERSHED INCHES; 450 CFS-HRS; 37.2 ACRE-FEET.

OPERATION ADDHYD XSECTION 17  
INPUT HYDROGRAPHS 4,6 OUTPUT HYDROGRAPH 7

PEAK TIME (HRS) PEAK DISCHARGE (CFS) PEAK ELEVATION (FEET)  
12.12 408.8 (NULL)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
6.16 WATERSHED INCHES; 924 CFS-HRS; 76.3 ACRE-FEET.

OPERATION RUNOFF XSECTION 18  
OUTPUT HYDROGRAPH= 6 AREA= .07 SQ MI  
INPUT RUNOFF CURVE= 78. TIME OF CONCENTRATION= .79 HOURS  
COMPUTED INTERNAL TIME INCREMENT = .1053 HOURS

PEAK TIME (HRS) PEAK DISCHARGE (CFS) PEAK ELEVATION (FEET)  
12.25 153.1 (RUNOFF)

RUNOFF ABOVE BASEFLOW OF .00 CFS  
5.20 WATERSHED INCHES; 248 CFS-HRS; 20.5 ACRE-FEET.

OPERATION ADDHYD XSECTION 18  
INPUT HYDROGRAPHS 6,7 OUTPUT HYDROGRAPH 4

PEAK TIME(HRS) 12.16 PEAK DISCHARGE(CFS) 553.8 PEAK ELEVATION(FEET) (NULL)

RUNOFF ABOVE BASEFLOW OF .00 CFS 5.93 WATERSHED INCHES; 1172 CFS-HRS; 96.8 ACRE-FEET.

OPERATION ADDHYD XSECTION 19 INPUT HYDROGRAPHS 4,5 OUTPUT HYDROGRAPH 6

PEAK TIME(HRS) 12.24 PEAK DISCHARGE(CFS) 1373.3 PEAK ELEVATION(FEET) (NULL)

RUNOFF ABOVE BASEFLOW OF .00 CFS 6.33 WATERSHED INCHES; 3535 CFS-HRS; 292.1 ACRE-FEET.

1

TR20 ----- EASTMINSTER - BEECH LAKE - EAST BRANCH GYPSUM CREEK VERSION 09/27/\*\* BEECHPR2.T20 2-6'x3'20 SEP 2002 2,5,10,100-YR 24-HR STORM ZON10/01/90 13:36:02 PASS 4 PAGE 25

OPERATION RUNOFF XSECTION 20 OUTPUT HYDROGRAPH= 5 AREA= .35 SQ MI INPUT RUNOFF CURVE= 82. TIME OF CONCENTRATION= .87 HOURS COMPUTED INTERNAL TIME INCREMENT = .0945 HOURS

PEAK TIME(HRS) 12.30 PEAK DISCHARGE(CFS) 744.1 PEAK ELEVATION(FEET) (RUNOFF)

RUNOFF ABOVE BASEFLOW OF .00 CFS 5.66 WATERSHED INCHES; 1273 CFS-HRS; 105.2 ACRE-FEET.

OPERATION ADDHYD XSECTION 20 INPUT HYDROGRAPHS 6,5 OUTPUT HYDROGRAPH 7

PEAK TIME(HRS) 12.28 PEAK DISCHARGE(CFS) 2108.7 PEAK ELEVATION(FEET) (NULL)

RUNOFF ABOVE BASEFLOW OF .00 CFS 6.14 WATERSHED INCHES; 4808 CFS-HRS; 397.3 ACRE-FEET.

OPERATION RESVOR STRUCTURE 20 INPUT HYDROGRAPH 7 OUTPUT HYDROGRAPH 5 SURFACE ELEVATION= 1369.70

\*\*\* MESSAGE - STRUCTURE 20, USER ENTERED STARTING ELEVATION ( 1369.7 FEET) WILL DECREASE OUTFLOW HYDROGRAPH VOLUME. \*\*\*

PEAK TIME(HRS) 13.15 PEAK DISCHARGE(CFS) 1098.3 PEAK ELEVATION(FEET) 1371.63

RUNOFF ABOVE BASEFLOW OF .00 CFS 4.16 WATERSHED INCHES; 3257 CFS-HRS; 269.2 ACRE-FEET.

EXECUTIVE CONTROL ENDCMP COMPUTATIONS COMPLETED FOR PASS 4

1

TR20 ----- EASTMINSTER - BEECH LAKE - EAST BRANCH GYPSUM CREEK VERSION 09/27/\*\* BEECHPR2.T20 2-6'x3'20 SEP 2002 2,5,10,100-YR 24-HR STORM ZON10/01/90

SUMMARY TABLE 1

-----  
 SELECTED RESULTS OF STANDARD AND EXECUTIVE CONTROL IN ORDER PERFORMED.  
 A CHARACTER FOLLOWING THE PEAK DISCHARGE TIME AND RATE (CFS) INDICATES:  
 F-FLAT TOP HYDROGRAPH T-TRUNCATED HYDROGRAPH R-RISING TRUNCATED HYDROGRAPH

XSECTION/ STRUCTURE ID	STANDARD CONTROL OPERATION	DRAINAGE AREA (SQ MI)	RUNOFF AMOUNT (IN)	PEAK DISCHARGE				
				ELEVATION (FT)	TIME (HR)	RATE (CFS)	RATE (CSM)	
RAINFALL OF 3.50 inches AND 24.00 hr DURATION, BEGINS AT .0 hrs.								
RAINTABLE NUMBER 7, AMC 2								
MAIN TIME INCREMENT .10 HOURS								
ALTERNATE 11 STORM 1								
XSECTION	1	RUNOFF	.12	2.32	---	12.33	104	866.7
XSECTION	2	REACH	.12	2.32	---	12.50	100	833.3
XSECTION	2	RUNOFF	.07	2.49	---	12.20	77	1100.0
XSECTION	2	ADDHYD	.20	2.38	---	12.35	162	810.0
XSECTION	5	RUNOFF	.20	2.38	---	12.43	154	770.0
XSECTION	6	RUNOFF	.16	2.29	---	12.45	118	737.5
XSECTION	7	ADDHYD	.35	2.34	---	12.44	271	774.3
XSECTION	10	RUNOFF	.16	2.45	---	12.24	161	1006.3
XSECTION	10	ADDHYD	.52	2.38	---	12.35	419	805.8
STRUCTURE	10	RESVOR	.52	2.38	1374.66	12.53	386	742.3
XSECTION	14	RUNOFF	.04	2.73	---	12.01	63	1575.0
XSECTION	14	ADDHYD	.56	2.40	---	12.51	399	712.5
XSECTION	15	RUNOFF	.05	1.49	---	12.21	34	680.0
XSECTION	16	RUNOFF	.08	1.64	---	12.27	55	687.5
XSECTION	16	ADDHYD	.14	1.58	---	12.24	89	635.7
STRUCTURE	16	RESVOR	.14	1.58	1373.19	12.74	44	314.3
XSECTION	17	RUNOFF	.09	3.07	---	12.05	142	1577.8
XSECTION	17	ADDHYD	.23	2.19	---	12.08	160	695.7
XSECTION	18	RUNOFF	.07	1.50	---	12.27	43	614.3
XSECTION	18	ADDHYD	.31	2.02	---	12.11	198	638.7
XSECTION	19	ADDHYD	.87	2.27	---	12.29	533	612.6
XSECTION	20	RUNOFF	.35	1.78	---	12.31	237	677.1
XSECTION	20	ADDHYD	1.21	2.13	---	12.30	769	635.5
STRUCTURE	20	RESVOR	1.21	.20	1370.02	13.55	218	180.2

1

TR20

-----  
 EASTMINSTER - BEECH LAKE - EAST BRANCH GYPSUM CREEK VERSION  
 09/27/\*\* BEECHPR2.T20 2-6'x3'20 SEP 2002 2,5,10,100-YR 24-HR STORM ZON10/01/90  
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SUMMARY TABLE 1

-----  
 SELECTED RESULTS OF STANDARD AND EXECUTIVE CONTROL IN ORDER PERFORMED.  
 A CHARACTER FOLLOWING THE PEAK DISCHARGE TIME AND RATE (CFS) INDICATES:  
 F-FLAT TOP HYDROGRAPH T-TRUNCATED HYDROGRAPH R-RISING TRUNCATED HYDROGRAPH

XSECTION/ STRUCTURE ID	STANDARD CONTROL OPERATION	DRAINAGE AREA	RUNOFF AMOUNT	PEAK DISCHARGE			
				ELEVATION	TIME	RATE	RATE

(SQ MI)      (IN)      (FT)      (HR)      (CFS)      (CSM)

RAINFALL OF 4.55 inches AND 24.00 hr DURATION, BEGINS AT .0 hrs.

ALTERNATE		12	STORM		2			
XSECTION	1	RUNOFF	.12	3.30	---	12.32	146	1216.7
XSECTION	2	REACH	.12	3.30	---	12.49	141	1175.0
XSECTION	2	RUNOFF	.07	3.49	---	12.20	107	1528.6
XSECTION	2	ADDHYD	.20	3.37	---	12.34	229	1145.0
XSECTION	5	RUNOFF	.20	3.37	---	12.43	216	1080.0
XSECTION	6	RUNOFF	.16	3.27	---	12.44	167	1043.8
XSECTION	7	ADDHYD	.35	3.33	---	12.43	383	1094.3
XSECTION	10	RUNOFF	.16	3.45	---	12.24	221	1381.3
XSECTION	10	ADDHYD	.52	3.37	---	12.35	586	1126.9
STRUCTURE	10	RESVOR	.52	3.37	1375.24	12.53	540	1038.5
XSECTION	14	RUNOFF	.04	3.75	---	12.01	85	2125.0
XSECTION	14	ADDHYD	.56	3.40	---	12.51	557	994.6
XSECTION	15	RUNOFF	.05	2.34	---	12.21	53	1060.0
XSECTION	16	RUNOFF	.08	2.50	---	12.27	84	1050.0
XSECTION	16	ADDHYD	.14	2.44	---	12.24	137	978.6
STRUCTURE	16	RESVOR	.14	2.44	1373.84	12.72	70	500.0
XSECTION	17	RUNOFF	.09	4.12	---	12.05	187	2077.8
XSECTION	17	ADDHYD	.23	3.12	---	12.09	218	947.8
XSECTION	18	RUNOFF	.07	2.33	---	12.26	69	985.7
XSECTION	18	ADDHYD	.31	2.93	---	12.12	280	903.2
XSECTION	19	ADDHYD	.87	3.23	---	12.31	748	859.8
XSECTION	20	RUNOFF	.35	2.68	---	12.30	359	1025.7
XSECTION	20	ADDHYD	1.21	3.07	---	12.31	1107	914.9
STRUCTURE	20	RESVOR	1.21	1.12	1370.45	13.32	405	334.7

1  
TR20 -----  
EASTMINSTER - BEECH LAKE - EAST BRANCH GYPSUM CREEK      VERSION  
09/27/\*\* BEECHPR2.T20 2-6'x3'20 SEP 2002 2,5,10,100-YR 24-HR STORM ZON10/01/90  
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SUMMARY TABLE 1

-----  
SELECTED RESULTS OF STANDARD AND EXECUTIVE CONTROL IN ORDER PERFORMED.  
A CHARACTER FOLLOWING THE PEAK DISCHARGE TIME AND RATE (CFS) INDICATES:  
F-FLAT TOP HYDROGRAPH      T-TRUNCATED HYDROGRAPH      R-RISING TRUNCATED HYDROGRAPH

XSECTION/ STRUCTURE ID	STANDARD CONTROL OPERATION	DRAINAGE AREA (SQ MI)	RUNOFF AMOUNT (IN)	PEAK DISCHARGE			
				ELEVATION (FT)	TIME (HR)	RATE (CFS)	RATE (CSM)

RAINFALL OF 5.25 inches AND 24.00 hr DURATION, BEGINS AT .0 hrs.

ALTERNATE		13	STORM		3			
XSECTION	1	RUNOFF	.12	3.97	---	12.32	174	1450.0
XSECTION	2	REACH	.12	3.97	---	12.48	169	1408.3
XSECTION	2	RUNOFF	.07	4.16	---	12.20	126	1800.0
XSECTION	2	ADDHYD	.20	4.04	---	12.34	273	1365.0
XSECTION	5	RUNOFF	.20	4.04	---	12.43	257	1285.0

XSECTION	6	RUNOFF	.16	3.94	---	12.44	200	1250.0
XSECTION	7	ADDHYD	.35	3.99	---	12.43	457	1305.7
XSECTION	10	RUNOFF	.16	4.12	---	12.24	262	1637.5
XSECTION	10	ADDHYD	.52	4.04	---	12.35	699	1344.2
STRUCTURE	10	RESVOR	.52	4.04	1375.65	12.56	624	1200.0
XSECTION	14	RUNOFF	.04	4.44	---	12.01	100	2500.0
XSECTION	14	ADDHYD	.56	4.07	---	12.53	643	1148.2
XSECTION	15	RUNOFF	.05	2.92	---	12.21	66	1320.0
XSECTION	16	RUNOFF	.08	3.11	---	12.26	104	1300.0
XSECTION	16	ADDHYD	.14	3.04	---	12.24	170	1214.3
STRUCTURE	16	RESVOR	.14	3.04	1374.23	12.68	95	678.6
XSECTION	17	RUNOFF	.09	4.81	---	12.05	217	2411.1
XSECTION	17	ADDHYD	.23	3.76	---	12.09	257	1117.4
XSECTION	18	RUNOFF	.07	2.92	---	12.26	86	1228.6
XSECTION	18	ADDHYD	.31	3.56	---	12.12	335	1080.6
XSECTION	19	ADDHYD	.87	3.89	---	12.29	894	1027.6
XSECTION	20	RUNOFF	.35	3.30	---	12.30	439	1254.3
XSECTION	20	ADDHYD	1.21	3.72	---	12.30	1333	1101.7
STRUCTURE	20	RESVOR	1.21	1.76	1370.74	13.25	532	439.7

1  
 TR20 -----  
 EASTMINSTER - BEECH LAKE - EAST BRANCH GYPSUM CREEK      VERSION  
 09/27/\*\* BEECHPR2.T20 2-6'x3'20 SEP 2002 2,5,10,100-YR 24-HR STORM ZON10/01/90  
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SUMMARY TABLE 1  
 -----

SELECTED RESULTS OF STANDARD AND EXECUTIVE CONTROL IN ORDER PERFORMED.  
 A CHARACTER FOLLOWING THE PEAK DISCHARGE TIME AND RATE (CFS) INDICATES:  
 F-FLAT TOP HYDROGRAPH    T-TRUNCATED HYDROGRAPH    R-RISING TRUNCATED HYDROGRAPH

XSECTION/ STRUCTURE ID	STANDARD CONTROL OPERATION	DRAINAGE AREA (SQ MI)	RUNOFF AMOUNT (IN)	PEAK DISCHARGE				
				ELEVATION (FT)	TIME (HR)	RATE (CFS)	RATE (CSM)	
RAINFALL OF 7.80 inches AND 24.00 hr DURATION, BEGINS AT .0 hrs.								
ALTERNATE	14	STORM	4					
XSECTION	1	RUNOFF	.12	6.44	---	12.32	277	2308.3
XSECTION	2	REACH	.12	6.44	---	12.47	271	2258.3
XSECTION	2	RUNOFF	.07	6.66	---	12.20	197	2814.3
XSECTION	2	ADDHYD	.20	6.52	---	12.34	436	2180.0
XSECTION	5	RUNOFF	.20	6.52	---	12.42	408	2040.0
XSECTION	6	RUNOFF	.16	6.40	---	12.43	318	1987.5
XSECTION	7	ADDHYD	.35	6.47	---	12.43	726	2074.3
XSECTION	10	RUNOFF	.16	6.62	---	12.24	417	2606.3
XSECTION	10	ADDHYD	.52	6.52	---	12.34	1111	2136.5
STRUCTURE	10	RESVOR	.52	6.52	1377.30	12.63	909	1748.1
XSECTION	14	RUNOFF	.04	6.95	---	12.01	153	3825.0
XSECTION	14	ADDHYD	.56	6.55	---	12.60	934	1667.9
XSECTION	15	RUNOFF	.05	5.19	---	12.20	117	2340.0
XSECTION	16	RUNOFF	.08	5.43	---	12.26	180	2250.0
XSECTION	16	ADDHYD	.14	5.34	---	12.23	296	2114.3
STRUCTURE	16	RESVOR	.14	5.34	1375.42	12.60	190	1357.1

XSECTION	17	RUNOFF	.09	7.35	---	12.05	325	3611.1
XSECTION	17	ADDHYD	.23	6.16	---	12.12	409	1778.3
XSECTION	18	RUNOFF	.07	5.20	---	12.25	153	2185.7
XSECTION	18	ADDHYD	.31	5.93	---	12.16	554	1787.1
XSECTION	19	ADDHYD	.87	6.33	---	12.24	1373	1578.2
XSECTION	20	RUNOFF	.35	5.66	---	12.30	744	2125.7
XSECTION	20	ADDHYD	1.21	6.14	---	12.28	2109	1743.0
STRUCTURE	20	RESVOR	1.21	4.16	1371.63	13.15	1098	907.4

1

TR20 -----  
 EASTMINSTER - BEECH LAKE - EAST BRANCH GYPSUM CREEK VERSION  
 09/27/\*\* BEECHPR2.T20 2-6'x3'20 SEP 2002 2,5,10,100-YR 24-HR STORM ZON10/01/90  
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SUMMARY TABLE 2

MODIFIED ATT-KIN REACH ROUTING IN ORDER PERFORMED.  
 QUESTION MARK (?) AFTER: OUTFLOW PEAK - MAX. NUMBER ROUTING ITERATIONS USED;  
 ATT-KIN COEFF - VALUE OUTSIDE ACCEPTABLE LIMITS.

XSEC ID	REACH LENGTH (FT)	FLOOD PLAIN LENGTH (FT)	INFLOW		OUTFLOW		ROUTING PARAMETERS			ATT-KIN COEFF (C)	
			PEAK (CFS)	TIME (HR)	PEAK (CFS)	TIME (HR)	Q-A COEFF (X)	EQ. POWER (M)	LENGTH FACTOR (K*)		PEAK RATIO Q/I (Q*)
BASEFLOW IS			.0 CFS								
ALTERNATE 11			STORM 1								
2	1500		103	12.3	100	12.5	.85	1.30	.045	.963	.57
ALTERNATE 12			STORM 2								
2	1500		146	12.3	141	12.5	.85	1.30	.040	.968	.61
ALTERNATE 13			STORM 3								
2	1500		174	12.3	169	12.5	.85	1.30	.038	.970	.62
ALTERNATE 14			STORM 4								
2	1500		277	12.3	270	12.5	.85	1.30	.032	.973	.67?

1

TR20 -----  
 EASTMINSTER - BEECH LAKE - EAST BRANCH GYPSUM CREEK VERSION  
 09/27/\*\* BEECHPR2.T20 2-6'x3'20 SEP 2002 2,5,10,100-YR 24-HR STORM ZON10/01/90  
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SUMMARY TABLE 3

STORM DISCHARGES (CFS) AT XSECTIONS AND STRUCTURES FOR ALL ALTERNATES

XSECTION/ STRUCTURE ID	DRAINAGE AREA (SQ MI)	STORM NUMBERS.....			
		1	2	3	4
STRUCTURE 20	1.21				

-----					
ALTERNATE	11		218	*****	*****
ALTERNATE	12		*****	405	*****
ALTERNATE	13		*****	*****	532
ALTERNATE	14		*****	*****	*****
					1098
STRUCTURE	16	.14			
-----					
ALTERNATE	11		44	*****	*****
ALTERNATE	12		*****	70	*****
ALTERNATE	13		*****	*****	95
ALTERNATE	14		*****	*****	*****
					190
STRUCTURE	10	.52			
-----					
ALTERNATE	11		386	*****	*****
ALTERNATE	12		*****	540	*****
ALTERNATE	13		*****	*****	624
ALTERNATE	14		*****	*****	*****
					909
XSECTION	1	.12			
-----					
ALTERNATE	11		104	*****	*****
ALTERNATE	12		*****	146	*****
ALTERNATE	13		*****	*****	174
ALTERNATE	14		*****	*****	*****
					277
XSECTION	2	.20			
-----					
ALTERNATE	11		162	*****	*****
ALTERNATE	12		*****	229	*****
ALTERNATE	13		*****	*****	273
ALTERNATE	14		*****	*****	*****
					436
XSECTION	5	.20			
-----					
ALTERNATE	11		154	*****	*****
ALTERNATE	12		*****	216	*****
ALTERNATE	13		*****	*****	257
ALTERNATE	14		*****	*****	*****
					408
XSECTION	6	.16			
-----					
ALTERNATE	11		118	*****	*****
ALTERNATE	12		*****	167	*****
ALTERNATE	13		*****	*****	200
ALTERNATE	14		*****	*****	*****
					318

1

TR20 -----  
 EASTMINSTER - BEECH LAKE - EAST BRANCH GYPSUM CREEK      VERSION  
 09/27/\*\* BEECHPR2.T20 2-6'x3'20 SEP 2002 2,5,10,100-YR 24-HR STORM ZON10/01/90  
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SUMMARY TABLE 3

STORM DISCHARGES (CFS) AT XSECTIONS AND STRUCTURES FOR ALL ALTERNATES

XSECTION/ STRUCTURE ID	DRAINAGE AREA (SQ MI)	STORM NUMBERS.....			
		1	2	3	4
XSECTION	7	.35			

-----				
ALTERNATE	11	271	*****	*****
ALTERNATE	12	*****	383	*****
ALTERNATE	13	*****	*****	457
ALTERNATE	14	*****	*****	*****
-----				
XSECTION	10	.52		
-----				
ALTERNATE	11	419	*****	*****
ALTERNATE	12	*****	586	*****
ALTERNATE	13	*****	*****	699
ALTERNATE	14	*****	*****	*****
-----				
XSECTION	14	.56		
-----				
ALTERNATE	11	399	*****	*****
ALTERNATE	12	*****	557	*****
ALTERNATE	13	*****	*****	643
ALTERNATE	14	*****	*****	*****
-----				
XSECTION	15	.05		
-----				
ALTERNATE	11	34	*****	*****
ALTERNATE	12	*****	53	*****
ALTERNATE	13	*****	*****	66
ALTERNATE	14	*****	*****	*****
-----				
XSECTION	16	.14		
-----				
ALTERNATE	11	89	*****	*****
ALTERNATE	12	*****	137	*****
ALTERNATE	13	*****	*****	170
ALTERNATE	14	*****	*****	*****
-----				
XSECTION	17	.23		
-----				
ALTERNATE	11	160	*****	*****
ALTERNATE	12	*****	218	*****
ALTERNATE	13	*****	*****	257
ALTERNATE	14	*****	*****	*****
-----				
XSECTION	18	.31		
-----				
ALTERNATE	11	198	*****	*****
ALTERNATE	12	*****	280	*****
ALTERNATE	13	*****	*****	335

1  
 TR20 -----  
 EASTMINSTER - BEECH LAKE - EAST BRANCH GYPSUM CREEK      VERSION  
 09/27/\*\* BEECHPR2.T20 2-6'x3'20 SEP 2002 2,5,10,100-YR 24-HR STORM ZON10/01/90  
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SUMMARY TABLE 3

STORM DISCHARGES (CFS) AT XSECTIONS AND STRUCTURES FOR ALL ALTERNATES

XSECTION/ STRUCTURE ID	DRAINAGE AREA (SQ MI)	STORM NUMBERS.....			
		1	2	3	4
XSECTION	18	.31			

```

ALTERNATE 14 ***** 554
XSECTION 19 .87
-----
ALTERNATE 11 533 *****
ALTERNATE 12 ***** 748 *****
ALTERNATE 13 ***** 894 *****
ALTERNATE 14 ***** 1373
XSECTION 20 1.21
-----
ALTERNATE 11 769 *****
ALTERNATE 12 ***** 1107 *****
ALTERNATE 13 ***** 1333 *****
ALTERNATE 14 ***** 2109

```

\*\*\* WARNING - UNEXPECTED RECORD(S) ENCOUNTERED WHEN LOOKING FOR "JOB" RECORD.  
 IMAGES OF FIRST 10 RECORDS IGNORED FOLLOWS: \*\*\*

END OF 1 JOBS IN THIS RUN  
 1

SCS TR-20, VERSION 10/01/90  
 FILES

INPUT = beechpr2.t20  
 OUTPUT = beechpr2.out , DATED 09/27/\*\*,13:36:02

FILES GENERATED - DATED 09/27/\*\*,13:36:02

NONE!

\*\*\* TR-20 RUN COMPLETED \*\*\*