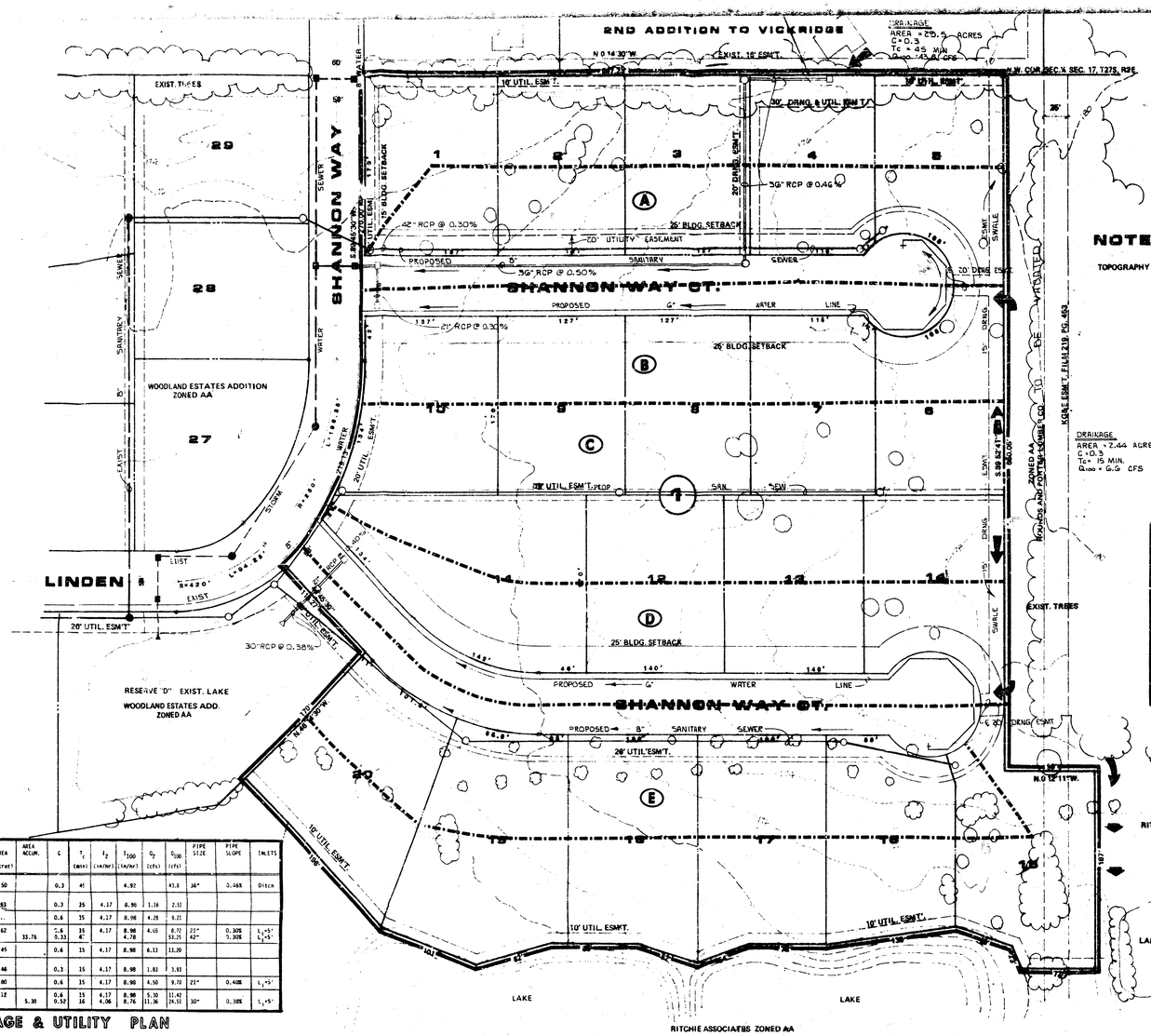


WOODLAND ESTATES II	AREA (acres)	AREA ACCUM.	C	T_1 (min)	I_2 (in/hr)	I_{100} (in/hr)	Q_2 (cfs)	Q_{100} (cfs)	PIPE SIZE	PIPE SLOPE	INLETS
Drainage Area from Wichita Country Club	29.50		0.3	45		4.92		43.8	36"	0.46%	Ditch
Drainage Area to North	0.93		0.3	35	4.17	6.96	1.16	2.51			
A	1...		0.6	15	4.17	8.98	4.28	9.21			
B	1.62	33.76	0.6 0.33	15 4	4.17	8.98 4.78	4.05	8.72 53.25	21" 42"	0.30% 1.30%	L_1=5' L_1=5'
C	2.45		0.6	15	4.17	8.98	6.13	13.20			
Drainage Area to North	1.46		0.3	15	4.17	8.98	1.83	3.93			
D	1.80		0.6	15	4.17	8.98	4.50	9.70	21"	0.40%	L_1=5'
E	2.12	5.38	0.6 0.52	15 16	4.17 4.06	8.98 8.76	5.30 11.36	11.42 24.51	30"	0.38%	L_1=5'

DRAINAGE & UTILITY PLAN

WOODLAND ESTATES 2ND

OWNER: RITCHIE ASSOCIATES 8100 E.22ND STREET NORTH BLDG.500 WICHITA KANSAS 67226

MID-KANSAS ENGINEERING CONSULTANTS PA
8500 N. ROCK ROAD
BUILDING 800
WICHITA, KANSAS 67206
682-4541

MID-KANSAS ENGINEERING CONSULTANTS, P.A.
3500 N. Rock Road, #800
Wichita, KS 67226

PROJECT: Woodland Estates Second & Third

PROJECT #: _____ DATE: 01/12/87

TO: Carl Gipson
Engineering Department
455 N. Main, 7th Floor
Wichita, KS 67202

Mr. Frank Nelson has met with you regarding our storm sewer plans for the referenced additions. We have asked for a meeting with Mr. Bill Yung to understand or obtain plans for how Mr. Coulter will convey storm run off through his "platted" lots to tie with the proposed storm water sewer.

If the plans for Mr. Coulters lots cannot be solved within the next two weeks we will call a meeting with you to discuss our proposed solution, so as to permit the construction plans for Woodland Estates II to be bid.

MID-KANSAS ENGINEERING CONSULTANTS, P.A.

Kenneth H. Bengtson

Kenneth H. Bengtson, P.E.

KHB/dm

cc: Vicki Huang
Bill Yung
Jack Ritchie

MID-KANSAS ENGINEERING CONSULTANTS P.A.
CALCULATIONS & SKETCHES

Job: Lakepoint
Reference: Lakes east of Woodland Estates 2nd

North Lake Elev	Area (acres)	Storage (acre-ft)	Elev	Storage
159	0.44			
160	0.51	0.48		
161	0.57	1.02		
162	0.62	1.62		
163	0.69	2.28	163	0
164	0.75	3.02	163.5	0.75 1.37
165	0.85	3.81	164	0.85 2.22
166	0.95	4.70	164.5	0.95 3.17
167	1.05	5.82	165	1.05 4.22
170			167.5	1.37 5.59
170			170	2.07 7.93

South Lake Elev	Area (acres)	Storage (acre-ft)	Elev	Storage
160	0.61			
161	0.70	0.66		
162	0.74	1.39		
163	0.82	2.17	163	0
164	0.89	3.05	163.5	0.77 1.37
165	1.06	4.02	164	1.37 2.21
166	1.27	5.21	164.5	1.77 1.62
167	1.50	6.66	165	2.50 2.9

Drainage Area to Lake = 62.5 + 7.6 + 2 = 72.5 acres

C = 0.76 CN = 87 L = 3300' Y = 1.33

$T_c = \frac{1000}{CN} - 10 = 1.49$ $L_t = \frac{3300^{0.8}(1.49+1)^{0.7}}{1900 \sqrt{1.33}} = 0.56$ hrs

Flume Ion $F_{Ion} = 0.85$; $I_{ion} = 55$; $T_c = 0.56(55/12) = 0.22$ hrs

16 min $Q_{100} = (.76)(7.13)(72.5) = 395.6$ cfs $Q = (13)(.76)(72.5) = 1124.33$

Try Cipoletti Weir, B = 90', H = 5', B = 60

H	Q_{90}	Q_{60}	Q_{90}	H	Q_{90}	Q_{60}
0.5	87.6	51.6	37.9	2.0	390.9	230.5
1.0	247.5	145.9	107.0	2.5	720.4	424.5
1.5	453.4	267.2	196.2	3.0	1126.8	664.1

MID-KANSAS ENGINEERING CONSULTANTS P.A.
CALCULATIONS & SKETCHES

Job: Lakepoint
Reference: Lakes east of Woodland Estates 2nd

Try 20' Cipoletti Weir

H	Q_{20}
0.5	97.7
1.0	277.9
1.5	494.6
2.0	761.9
2.5	1069.7

For South Lake assume contracted weir

Try B = 25' - .25 × .90' = 20' ; Y = 16.5 - 16.0 = .5'

$C_1 = (.6035 + .0813(\frac{H}{Y}) + \frac{.00375}{Y})(1 + \frac{.00351}{P_w + Y})^{3/2}$

$Q_2 = \frac{2}{3}(C_1)\sqrt{2g}\,(W)(H)^{3/2}$ $h_{Reference} = h_{actual} - (C_1)(W)(H)$ N=2

H	C_1	h_{act}	Q
0.5	.6183	89.9	105.1
1.0	.6232	89.8	299.6
1.5	.6304	89.7	575.4
2.0	.6375	89.6	884.7

Check: Find a Cipoletti weir with same H

For V.T. weir, use 0.90 for Cp×Cvp H = 1', B = 90'

Try 5' wide Q = 191.9 cfs H = 1.5

```
1*TRACE VERIFICATION OF LIST OF INPUT DATA PER TP-28 HYDROLOGY
1
1 JOB TP-28                                                                    10
1 TITLE HYD LAKEPOINT, N.W. LA-ESE, 100 YEAR, 24 HOUR EVENT USING SCS          20
1 TITLE TP-28, CURVE 2  SHAPPOT WEIR                                           30
1 STRUCT   01
1                                   FULLPRINT                                  40
1                                                   SUMMARY   HEADTO           50
1                                   ELEVATION   DISCHARGE   STORAGE           60
1                                   168.00        0.00       0.0               70
1                                   168.50       55.2        0.20              80
1                                   169.00       259.4       0.98              90
1                                   169.50       454.0       1.37              100
1                                   170.00       761.9       1.93              110
1 ENDTBL                                                                       120
1 STRUCT   02                                                                  130
1                                   165.00        0.00       0.0               140
1                                   165.50        35.2       0.51              150
1                                   166.00       159.40      1.07              160
1                                   166.50       454.0       1.52              170
1                                   167.00       761.90      2.27              180
1                                                                              190
1 ENDTBL                                                                       200
1 RUNOFF 1   01   5    0.113      67.0        0.26  1 1  1  1                  210
1 6 RESVOR 2   01 5   6   168.00                      1 1 1 1  1               220
1 6 RESVOR 2   02 6   5   165.00                      1 1 1 1  1               230
1       ENDATA                                                                 240
1 7 INCREN 6                0.10                                               250
1 7 COMPUT 7   01   02                7.8        1.0   2 2  01  06              260
1       ENDCOM 1                                                               270
1 HOUTB 2                                                                      280
1
1
1                                   END OF 88-00 LISTING                       290
```

```
1*TRACE VERIFICATION OF LIST OF INPUT DATA PER TP-28 HYDROLOGY
1
1 JOB TP-28                                                                    10
1 TITLE HYD LAKEPOINT, N.W. LA-ESE, 100 YEAR, 24 HOUR EVENT USING SCS          20
1 TITLE TP-28, CURVE 2  SHAPPOT WEIR                                           30
1 STRUCT   01
1                                   FULLPRINT                                  40
1                                                   SUMMARY   HEADTO           50
1                                   ELEVATION   DISCHARGE   STORAGE           60
1                                   168.00        0.00       0.0               70
1                                   168.50       55.2        0.20              80
1                                   169.00       259.4       0.98              90
1                                   169.50       454.0       1.37              100
1                                   170.00       761.9       1.93              110
1 ENDTBL                                                                       120
1 STRUCT   02                                                                  130
1                                   165.00        0.00       0.0               140
1                                   165.50        35.2       0.51              150
1                                   166.00       159.40      1.07              160
1                                   166.50       454.0       1.52              170
1                                   167.00       761.90      2.27              180
1                                                                              190
1 ENDTBL                                                                       200
1 RUNOFF 1   01   5    0.113      67.0        0.26  1 1  1  1                  210
1 6 RESVOR 2   01 5   6   168.00                      1 1 1 1  1               220
1 6 RESVOR 2   02 6   5   165.00                      1 1 1 1  1               230
1       ENDATA                                                                 240
1 7 INCREN 6                0.10                                               250
1 7 COMPUT 7   01   02                7.8        1.0   2 2  01  06              260
1       ENDCOM 1                                                               270
1 HOUTB 2                                                                      280
1
1
1                                   END OF 88-00 LISTING                       290
```

```
1*TRACE                  LAKEPOINT, N.W. LA-ESE, 100 YEAR, 24 HOUR EVENT USING SCS        20          JOB 1   PASS 1
1 REV 09/01/83           TP-28, CURVE 2  SHAPPOT WEIR                                     30                  PAGE 1

1
1
1                                   COMPUTER PROGRAM FOR PROJECT FORMULATION - HYDROLOGY   USER NOTES

1                                   THE USERS MANUAL FOR THIS PROGRAM IS THE MAY 1982 DRAFT OF TP-28.  CHANGES FROM THE 2/14/74 VERSION INCLUDE:

1                                   REACH ROUTING - THE MODIFIED ATT-MUN ROUTING PROCEDURE REPLACES THE CONVEX METHOD.  INPUT DATA PREPARED FOR
1                                   PREVIOUS PROGRAM VERSIONS USING CONVEX ROUTING COEFFICIENTS WILL NOT RUN ON THIS VERSION.

1                                   THE PREFERRED TYPE OF DATA ENTRY IS CROSS SECTION DATA REPRESENTATIVE OF A REACH.  IT IS RECOMMENDED THAT
1                                   THE OPTIONAL CROSS SECTION DISCHARGE-AREA PLOTS BE OBTAINED WHENEVER NEW CROSS SECTION DATA IS ENTERED.
1                                   THE PLOTS SHOULD BE CHECKED FOR REASONABLENESS AND ACCURACY OF INPUT DATA FOR THE COMPUTATION OF "AM"
1                                   VALUES USED IN THE ROUTING PROCEDURE.

1                                   GUIDELINES FOR DETERMINING OR ANALYZING REACH LENGTHS AND COEFFICIENTS (X,M) ARE AVAILABLE IN THE USERS
1                                   MANUAL.  SUMMARY TABLE 2 DISPLAYS REACH ROUTING RESULTS AND ROUTING PARAMETERS FOR COMPARISON AND CHECKING.

1                                   HYDROGRAPH GENERATION - THE PROCEDURE TO CALCULATE THE INTERNAL TIME INCREMENT AND PEAK TIME OF THE UNIT
1                                   HYDROGRAPH HAVE BEEN IMPROVED.  PEAK DISCHARGES AND TIMES MAY DIFFER FROM THE PREVIOUS VERSION.  OUTPUT
1                                   HYDROGRAPHS ARE STILL INTERPOLATED, PRINTED, AND ROUTED AT THE USER SELECTED MAIN TIME INCREMENT.

1                                   INTERMEDIATE PEAKS - METHOD ADDED TO PROVIDE DISCHARGES AT INTERMEDIATE POINTS WITHIN REACHES WITHOUT ROUTING.

1                                   OTHER - THIS VERSION CONTAINS SOME ADDITIONS TO THE INPUT AND NUMEROUS MODIFICATIONS TO THE OUTPUT.  USER
1                                   OPTIONS HAVE BEEN MODIFIED AND AUGMENTED ON THE JOB RECORD, PRINTABLES ADDED, ERROR AND WARNING MESSAGES
1                                   EXPANDED, AND THE SUMMARY TABLES COMPLETELY REVISED.  THE HOLDOUT OPTION IS NOT OPERATIONAL AT THIS TIME.

1                                   PROGRAM QUESTIONS OR PROBLEMS SHOULD BE DIRECTED TO HYDRAULIC ENGINEERS AT THE NWS NATIONAL TECHNICAL CENTERS:

1                                   (CHESTER, PA (NORTHEAST)  — 215-499-2953.      FORT WORTH, TX (SOUTH) — 334-5242 (FTS)
1                                   (LINCOLN, NE (LIDNEST)    — 541-5318 (FTS),    PORTLAND, OR (WEST)    — 423-4899 (FTS)
1                                   OR HYDROLOGY UNIT, ENGINEERING DIVISION, LANHAM, MD  — 436-7385 (FTS).

1
1
1                                   PROGRAM CHANGES SINCE MAY 1982:

1                                   12/17/82 - CORRECT PEAK RATE FACTOR FOR USER ENTERED DQ/DVD
1                                              CORRECT REACH ROUTING PEAK TRAVEL TIME PRINTED WITH FULLPRINT OPTION
1                                   5/02/83 - CORRECT COMPUTATIONS FOR —
1                                              1. DQ/DSTM OF BASEFLOW IN DIVERT OPERATION
1                                              2. HYDROGRAPH VOLUME SPLIT BETWEEN BASEFLOW AND ABOVE BASEFLOW
1                                              3. CROSS SECTION DATA PLOTTING POSITION
1                                              4. INTERMEDIATE PEAK WHEN "FROM" AREA IS LARGER THAN "THRU" AREA
1                                              5. STORAGE ROUTED REACH TRAVEL TIME FOR MULTIPEAK HYDROGRAPH
1                                              6. ORDERING "FLOW-FREQ" FILE FROM SUMMARY TABLE #3 DATA
1                                              7. BASEFLOW ENTERED WITH READHD
```

```
1*TRACE                  LAKEPOINT, N.W. LA-ESE, 100 YEAR, 24 HOUR EVENT USING SCS        20          JOB 1   PASS 1
1 REV 09/01/83           TP-28, CURVE 2  SHAPPOT WEIR                                     30                  PAGE 2

1
1
1
1
1                                   STRUCTURE DATA,  STRUCTURE NO  1
1                                                    ELEVATION   DISCHARGE   STORAGE
1 8                                                  160.00        00          00
1 8                                                  160.50        55.20       .49
1 8                                                  159.00       259.40      .90
1 8                                                  169.50       454.00      1.37
1 8                                                  170.00       761.90      1.93
1
1 9 ENDTBL
1
1                                   STRUCTURE DATA,  STRUCTURE NO  2
1                                                    ELEVATION   DISCHARGE   STORAGE
1 8                                                  165.00        00          00
1 8                                                  165.50        35.20       51
1 8                                                  166.00       159.40      1.07
1 8                                                  166.50       454.00      1.52
1 8                                                  167.00       761.90      2.27
1
1 9 ENDTBL
1
1 STANDARD CONTROL OPERATION RUNOFF   STRUCTURE 1                                                  RECORD ID   100
1                                     OUTPUT HYDROGRAPH = 5                    DATA FIELD VALUES =   .1130   87 0000   2500
1                                     OUTPUT OPTIONS IN EFFECT  PEAK  HYD  VOL  SUM
1
1 STANDARD CONTROL OPERATION RESVOR   STRUCTURE 1                                                  RECORD ID   100
1                                     INPUT HYDROGRAPH = 5     OUTPUT HYDROGRAPH = 6   DATA FIELD VALUES =  169.9000   0000   6000
1                                     OUTPUT OPTIONS IN EFFECT  PEAK  HYD  ELEV  VOL  SUM
1
1 STANDARD CONTROL OPERATION RESVOR   STRUCTURE 2                                                  RECORD ID   200
1                                     INPUT HYDROGRAPH = 6     OUTPUT HYDROGRAPH = 6   DATA FIELD VALUES =  165.0000   0000   8000
1                                     OUTPUT OPTIONS IN EFFECT  PEAK  HYD  ELEV  VOL  SUM
```

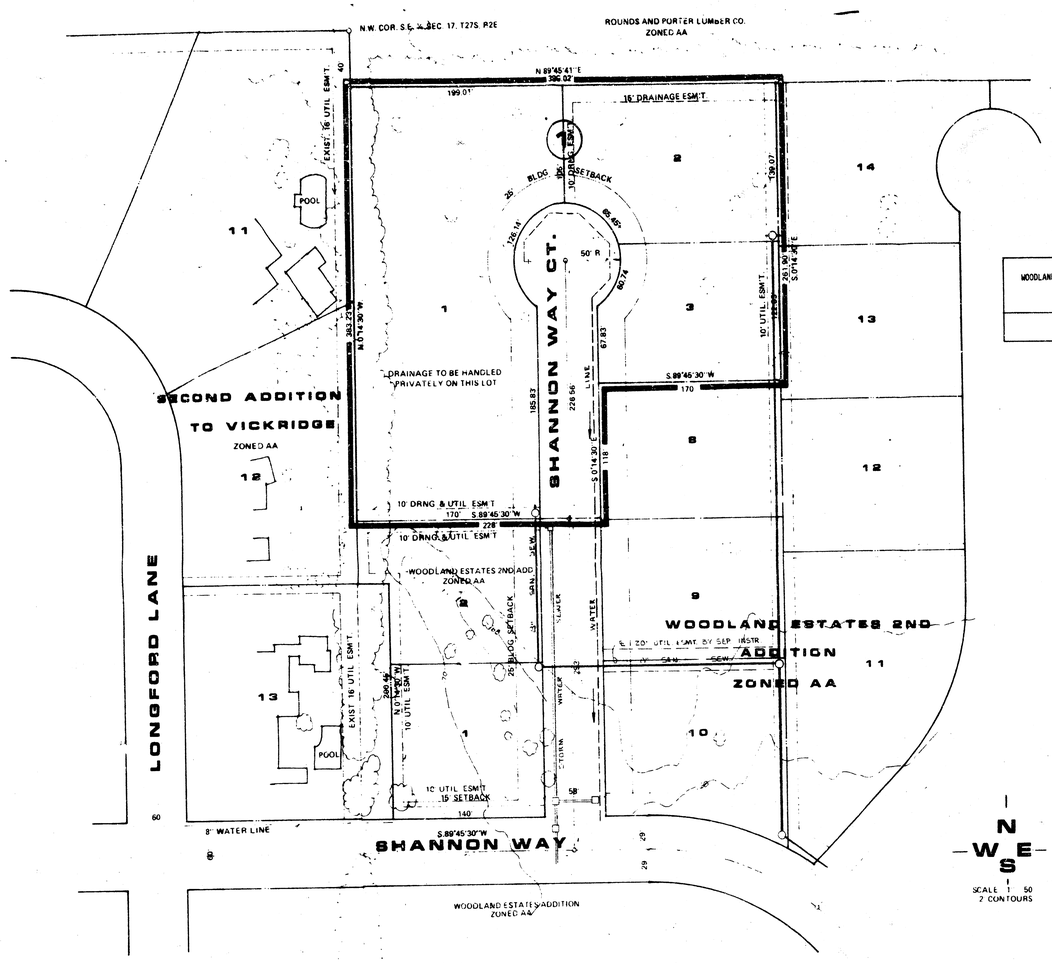
```
1*TRACE                  LAKEPOINT, N.W. LA-ESE, 100 YEAR, 24 HOUR EVENT USING SCS        20          JOB 1   PASS 1
1 REV 09/01/83           TP-28, CURVE 2  SHAPPOT WEIR                                     30                  PAGE 1

1
1
1                                   EXECUTIVE CONTROL OPERATION COMPUT    MAIN TIME INCREMENT =  10 HOURS                                  FEET/ID   10   100

1                                   EXECUTIVE CONTROL OPERATION COMPUT    FROM STRUCTURE  1  TO STRUCTURE  3                                FEET/ID   10   100
1                                                 STARTING TIME =   00   MAIN STOP =  168   MAIN DURATION  168   MAIN TABLE NO = 2   WAT *100* DIGIT 1
1                                   ALTERNATE NO = 1                    OUTPUT NO = 6   MAIN TIME INCREMENT =  10 HOURS

1
1
1                                   OPERATION RUNOFF   STRUCTURE  1
1                                                      OUTPUT HYDROGRAPH = 5
1                                                      AREA=   10.50 MI   INPUT RUNOFF CURVE 87.    TIME OF CONCENTRATION    36 HOURS
1                                                      INTERNAL HYDROGRAPH TIME INCREMENT   0.047 YEARS

1                                                      PEAK TIME(HRS)          PEAK DISCHARGE(CFS)          PEAK ELEVATION(FEET)
1                                                                12.85                   486.71                        (RUNOFF)
1                                                                16.45                    13.22                        (ROUT)
1                                                                17.55                    11.91                        (ROUT)
1                                                                19.65                     8.83                        (RUNOFF)
1                                                                29.55                     6.64                        (RUNOFF)
1
1
1                                   (HRS)   FIRST HYDROGRAPH POINT =   00 HOURS     TIME INCREMENT =  10 HOURS     DRAINAGE AREA =   10.50 MI.
1                                   2.00    DISCHG    00     00     00     00     00     00     00     00     00     00     00     00
1                                   4.00    DISCHG    00     00     00     00     00     00     00     00     00     00     00     00
1                                   5.00    DISCHG    .56    .90    1.11   1.19   1.22   1.23   1.23   1.22   1.21   1.20   1.19   1.18
1                                   6.00    DISCHG    1.90   1.91   2.61   2.12   2.22   2.32   2.41   2.51   2.60   2.69   2.78   2.87
1                                   7.00    DISCHG    2.78   2.98   3.38   3.70   3.90   4.00   4.13   4.21   4.28   4.35   4.42   4.52
1                                   8.00    DISCHG    4.64   4.75   4.85   4.95   5.05   5.15   5.25   5.34   5.43   5.52   5.61   5.70
1                                   9.00    DISCHG    5.61   5.87   6.43   6.95   7.44   7.91   8.14   8.36   8.72   8.93   9.14   9.34
1                                   10.00   DISCHG    9.18   9.52   10.13  10.70  10.99  11.15  11.57  11.87  12.15  12.42  12.68  12.93
1                                   11.00   DISCHG    13.38  13.81  14.52  15.29  15.34  16.64  15.55  15.38  15.20  15.02  14.85  14.68
1                                   12.00   DISCHG    20.79  30.02  35.68  39.55  44.93  49.73  175.44 44.93  49.73  39.55  35.68  30.02
1                                   13.00   DISCHG    454.56 455.14 454.39 177.88 112.46 55.95  44.93  39.55  35.68  30.02  20.79  13.38
1                                   14.00   DISCHG    42.23  39.44  36.81  35.75  35.25  34.75  34.25  33.75  33.25  32.75  32.25  31.75
1                                   15.00   DISCHG    22.57  20.79  20.79  20.79  20.79  20.79  20.79  20.79  20.79  20.79  20.79  20.79
1                                   16.00   DISCHG    15.79  15.35  15.35  15.35  15.35  15.35  15.35  15.35  15.35  15.35  15.35  15.35
1                                   17.00   DISCHG    15.17  13.17  13.17  13.17  13.17  13.17  13.17  13.17  13.17  13.17  13.17  13.17
1                                   18.00   DISCHG    11.25  11.41  11.00  10.59  10.18  9.77   9.36   8.95   8.54   8.13   7.72   7.31
1                                   19.00   DISCHG    9.41   9.68   9.93   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   20.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   21.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   22.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   23.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   24.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   25.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   26.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   27.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   28.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   29.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   30.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   31.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   32.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   33.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   34.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   35.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   36.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   37.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   38.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   39.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   40.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   41.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   42.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   43.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   44.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   45.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   46.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   47.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   48.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   49.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   50.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   51.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   52.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   53.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   54.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   55.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   56.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   57.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   58.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   59.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   60.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   61.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   62.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   63.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   64.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   65.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   66.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   67.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   68.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   69.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   70.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   71.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   72.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   73.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   74.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   75.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   76.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   77.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   78.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   79.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   80.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   81.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   82.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   83.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   84.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   85.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   86.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   87.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   88.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   89.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   90.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   91.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   92.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   93.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   94.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   95.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   96.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   97.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   98.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   99.00   DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   100.00  DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   101.00  DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   102.00  DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   103.00  DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   104.00  DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   105.00  DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   106.00  DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   107.00  DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   108.00  DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   109.00  DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   110.00  DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   111.00  DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   112.00  DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   113.00  DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   114.00  DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   115.00  DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   116.00  DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   117.00  DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   118.00  DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   119.00  DISCHG    9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94   9.94
1                                   120.00  DISCHG    9.94   9.94   9.94   9.94   9
```



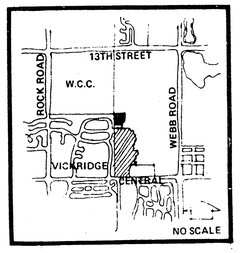
WOODLAND ESTATES 3RD	AREA (acres)	AREA ACCUM.	C_2	C_{100}	T_c (min)	I_2 (in/hr)	I_{100} (in/hr)	Q_2 (cfs)	Q_{100} (cfs)	PIPE SIZE	PIPE SLOPE	INLETS
	3.0	3.0	0.50	0.76	15	3.63	7.37	5.7	16.8			

NOTES:

TOPOGRAPHY IS FROM AERIAL TAKEN JUNE 1985

A DRAINAGE CONCEPT PLAN WILL BE PREPARED BY M.K.E.C. AND SUBMITTED TO CITY ENGINEER

BENCH MARK SPIKE STEP IN CORNER FENCE POST 90' S OF N.W. CORNER LOT 15 BLOCK 1 WOODLAND ESTATES 2ND ADDITION ELEV 178.09



LOCATION MAP

N
W E
S

SCALE 1" = 50'
2' CONTOURS

How to handle
Drainage from West?

DRAINAGE & UTILITY PLAN (REPLAT OF A PORTION OF WOODLANDS ESTATES 2ND ADDITION)

WOODLAND ESTATES 3RD

OWNER: RITCHIE ASSOCIATES, 8100 E. 22ND NORTH, BLDG. 500, WICHITA, KS 67226

MID-KANSAS ENGINEERING CONSULTANTS PA
3600 NORTH ROCK ROAD
BUILDING 9400
WICHITA, KANSAS 67226
682-4561

INPUT HYDROGRAPH 6 OUTPUT HYDROGRAPH 6
SURFACE ELEVATION 165.00

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.00	438.55	166.47
16.45	13.34	165.97
17.55	11.09	165.86
19.65	8.02	165.65
22.65	6.03	165.43

TIME(HRS)	FIRST HYDROGRAPH POINT = .00 HOURS				TIME INCREMENT = .10 HOURS				DRAINAGE AREA = .11 SQ.MI.			
3.00	DISCHG	.00	.00	.00	.00	.00	.01	.05	.10	.10	.27	
3.50	ELEV	165.00	165.00	165.00	165.00	165.00	165.00	165.00	165.00	165.00	165.00	
4.00	DISCHG	.09	.53	.58	.52	.35	1.48	1.38	1.22	1.44	1.56	
4.00	ELEV	165.00	165.00	165.00	165.00	165.00	165.01	165.01	165.01	165.01	165.01	
5.00	DISCHG	1.77	1.78	1.29	2.00	2.16	2.29	2.38	2.48	2.62	2.75	
5.00	ELEV	165.01	165.01	165.01	165.01	165.01	165.01	165.01	165.01	165.01	165.01	
6.00	DISCHG	2.68	2.79	2.84	3.31	3.62	3.85	4.02	4.16	4.28	4.39	
6.00	ELEV	165.01	165.01	165.02	165.02	165.02	165.02	165.02	165.02	165.02	165.02	
7.00	DISCHG	4.52	4.63	4.73	4.54	4.54	4.64	4.14	3.53	3.65	3.63	
7.00	ELEV	165.02	165.02	165.02	165.02	165.02	165.02	165.02	165.02	165.02	165.02	
8.00	DISCHG	5.51	5.63	5.69	6.24	6.65	7.42	7.28	6.68	6.57	6.46	
8.00	ELEV	165.03	165.03	165.03	165.03	165.04	165.04	165.04	165.04	165.05	165.05	
9.00	DISCHG	6.01	5.28	5.55	10.07	14.56	18.01	13.19	11.69	11.17	10.72	
9.00	ELEV	165.05	165.05	165.05	165.06	165.06	165.06	165.06	165.06	165.06	165.07	
10.00	DISCHG	10.09	11.48	11.83	14.47	15.31	15.46	17.54	19.21	21.60	23.56	
10.00	ELEV	165.07	165.07	165.07	165.08	165.08	165.09	165.09	165.10	165.11	165.12	
11.00	DISCHG	25.53	25.28	30.55	33.15	35.94	39.45	47.38	74.86	130.02	227.16	
11.00	ELEV	165.14	165.15	165.16	165.17	165.19	165.21	165.25	165.32	165.45	165.65	
12.00	DISCHG	395.42	575.33	688.14	757.47	793.15	805.21	805.25	799.71	787.14	773.13	
12.00	ELEV	166.15	166.45	166.71	166.92	167.08	167.22	167.32	167.39	167.44	167.48	
13.00	DISCHG	47.97	43.53	79.38	54.22	32.44	38.13	36.55	36.09	36.95	35.85	
13.00	ELEV	165.25	166.22	165.21	165.19	165.18	165.17	165.16	165.15	165.14	165.13	
14.00	DISCHG	23.01	21.79	21.87	20.57	19.16	19.12	19.34	17.85	17.52	17.12	
14.00	ELEV	165.12	165.12	165.11	165.11	165.11	165.10	165.10	165.10	165.10	165.10	
15.00	DISCHG	16.88	16.42	15.97	15.80	15.16	14.85	13.88	13.53	13.71	13.52	
15.00	ELEV	165.08	165.08	165.08	165.08	165.08	165.07	165.07	165.07	165.07	165.07	
16.00	DISCHG	12.19	11.72	11.53	11.43	11.35	11.26	11.17	11.09	11.01	10.93	
16.00	ELEV	165.07	165.07	165.07	165.07	165.06	165.06	165.06	165.06	165.06	165.06	
17.00	DISCHG	11.24	11.16	11.13	11.06	11.00	10.97	10.91	10.85	10.79	10.73	

OPERATION RESERVOIR STRUCTURE 2
INPUT HYDROGRAPH 6 OUTPUT HYDROGRAPH 5
SURFACE ELEVATION 165.00

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.16	470.26	166.45
16.45	13.16	165.97
17.55	11.00	165.86
19.65	8.02	165.65
22.65	6.03	165.43

TIME(HRS)	FIRST HYDROGRAPH POINT = .00 HOURS				TIME INCREMENT = .10 HOURS				DRAINAGE AREA = .11 SQ.MI.			
3.00	DISCHG	.00	.00	.00	.00	.00	.01	.05	.10	.10	.27	
3.00	ELEV	165.00	165.00	165.00	165.00	165.00	165.00	165.00	165.00	165.00	165.00	
4.00	DISCHG	.09	.53	.58	.52	.35	1.48	1.38	1.22	1.44	1.56	
4.00	ELEV	165.00	165.00	165.00	165.00	165.00	165.01	165.01	165.01	165.01	165.01	
5.00	DISCHG	1.77	1.78	1.29	2.00	2.16	2.29	2.38	2.48	2.62	2.75	
5.00	ELEV	165.01	165.01	165.01	165.01	165.01	165.01	165.01	165.01	165.01	165.01	
6.00	DISCHG	2.68	2.79	2.84	3.31	3.62	3.85	4.02	4.16	4.28	4.39	
6.00	ELEV	165.01	165.01	165.02	165.02	165.02	165.02	165.02	165.02	165.02	165.02	
7.00	DISCHG	4.52	4.63	4.73	4.54	4.54	4.64	4.14	3.53	3.65	3.63	
7.00	ELEV	165.02	165.02	165.02	165.02	165.02	165.02	165.02	165.02	165.02	165.02	
8.00	DISCHG	5.51	5.63	5.69	6.24	6.65	7.42	7.28	6.68	6.57	6.46	
8.00	ELEV	165.03	165.03	165.03	165.03	165.04	165.04	165.04	165.04	165.05	165.05	
9.00	DISCHG	6.01	5.28	5.55	10.07	14.56	18.01	13.19	11.69	11.17	10.72	
9.00	ELEV	165.05	165.05	165.05	165.06	165.06	165.06	165.06	165.06	165.06	165.07	
10.00	DISCHG	10.09	11.48	11.83	14.47	15.31	15.46	17.54	19.21	21.60	23.56	
10.00	ELEV	165.07	165.07	165.07	165.08	165.08	165.09	165.09	165.10	165.11	165.12	
11.00	DISCHG	25.53	25.28	30.55	33.15	35.94	39.45	47.38	74.86	130.02	227.16	
11.00	ELEV	165.14	165.15	165.16	165.17	165.19	165.21	165.25	165.32	165.45	165.65	
12.00	DISCHG	395.42	575.33	688.14	757.47	793.15	805.21	805.25	799.71	787.14	773.13	
12.00	ELEV	166.15	166.45	166.71	166.92	167.08	167.22	167.32	167.39	167.44	167.48	
13.00	DISCHG	47.97	43.53	79.38	54.22	32.44	38.13	36.55	36.09	36.95	35.85	
13.00	ELEV	165.25	166.22	165.21	165.19	165.18	165.17	165.16	165.15	165.14	165.13	
14.00	DISCHG	23.01	21.79	21.87	20.57	19.16	19.12	19.34	17.85	17.52	17.12	
14.00	ELEV	165.12	165.12	165.11	165.11	165.11	165.10	165.10	165.10	165.10	165.10	
15.00	DISCHG	16.88	16.42	15.97	15.80	15.16	14.85	13.88	13.53	13.71	13.52	
15.00	ELEV	165.08	165.08	165.08	165.08	165.08	165.07	165.07	165.07	165.07	165.07	
16.00	DISCHG	12.19	11.72	11.53	11.43	11.35	11.26	11.17	11.09	11.01	10.93	
16.00	ELEV	165.07	165.07	165.07	165.07	165.06	165.06	165.06	165.06	165.06	165.06	
17.00	DISCHG	11.24	11.16	11.13	11.06	11.00	10.97	10.91	10.85	10.79	10.73	

RUNOFF VOLUME ABOVE BASEFLOW = 6.25 WATERSHED INCHES, 456.70 CFS-HRS, 37.66 ACRE-FEET; BASEFLOW = .00 CFS

RECORD ID 240

EXECUTIVE CONTROL OPERATION ENDCMP COMPUTATIONS COMPLETED FOR PASS 1

RECORD ID 250

EXECUTIVE CONTROL OPERATION ENDJOB

TITLE KEO LAWRENCE, N.W. LARSEN, 1980 SERIES, 24 HOUR EVENT USING SCS TYPE-II, CURVE 2 SEMI-ARID AREA — JOB 1 SUMMARY PAGE 7

SUMMARY TABLE 1 - SELECTED RESULTS OF STANDARD AND EXECUTIVE CONTROL INSTRUCTIONS IN THE ORDER PERFORMED
(A STORM IS AFTER THE PEAK DISCHARGE TIME HAS PASSED. VALUES INDICATED A PLOT TOP HYDROGRAPH.
A QUESTION MARK(?) INDICATES A HYDROGRAPH WITH PEAK AS LAST POINT.)

SECTION/ STRUCTURE ID	STANDARD CONTROL OPERATION	DRAINAGE AREA (SQ MI)	RAIN GAGE #	WATER TABLE	MAIN PLOT CNC	TIME INDEX (HR)	PRECIPITATION DEPTH (IN)	PRECIPITATION AMOUNT (IN)	PRECIPITATION DURATION (HR)	RUNOFF AMOUNT (IN)	PEAK DISCHARGE ELEVATION (FT)	PEAK DISCHARGE TIME (HR)	PEAK DISCHARGE RATE (CFS)	PEAK DISCHARGE RATE (CSM)
ALTERNATE 1: STORM 6														
STRUCTURE 1	RUNOFF	.11	2	2	.10	.0	7.50	24.00	6.25	—	12.95	486.21	4260.8	
STRUCTURE 1	RESVOR	.11	2	2	.10	.0	7.50	24.00	6.25	169.47	12.95	480.88	4255.6	
STRUCTURE 2	RESVOR	.11	2	2	.10	.0	7.50	24.00	6.25	166.46	12.19	470.26	4252.4	

Lowest Lake

TITLE KEO LAWRENCE, N.W. LARSEN, 1980 SERIES, 24 HOUR EVENT USING SCS TYPE-II, CURVE 2 SEMI-ARID AREA — JOB 1 SUMMARY PAGE 2

SUMMARY TABLE 3 - DISCHARGE (CFS) AT VARIOUS AND STRUCTURES FOR ALL STORMS AND ALTERNATES

SECTION/ STRUCTURE ID	DRAINAGE AREA (SQ MI)	STORM NUMBERS 6
STRUCTURE 2 11		
ALTERNATE 1		470.26
STRUCTURE 1 11		—
ALTERNATE 1		480.88