CITY OF
Albuquerque

Martin J. Chávez, Mayor

September 18, 1997

Fred C. Arfman, P.E.
Isaacson & Arfman, P.A.
128 Monroe St. NE
Albuquerque, New Mexico 87108

RE: Supplemental Information and Revised Arenal/Unser Drainage Management Plan (M10/D10), Engineer's Stamp Dated 6/23/97.

Dear Mr. Arfman:

Based on the information provided in the submittal of June 23, 1997, along with the additional information provided on August 25, 1997, the above referenced Drainage Management Plan is approved.

All development within this area must be in compliance with this approved Master plan.

If you should have any questions, or if I may be of further assistance to you, please call me at 924-3982.

Sincerely,

Susan Calongne

Susan M. Calongne, P.E.
City/County Floodplain Administrator

c: File

DRAINAGE INFORMATION SHEET

10

PROJECT TITLE: ARENAL/UNSER D.M.P. ZONE ATLAS/DRNG. FILE #: M10/D

DRB #: _____ EPC #: _____ WORK ORDER #: _____

LEGAL DESCRIPTION: LANDS IN VICINITY OF ZONE MAP M-10

CITY ADDRESS: _____

ENGINEERING FIRM: ISAACSON & ARFMAN, P.A CONTACT: FRED C. ARFMAN

ADDRESS: 128 MONROE ST. NE PHONE: 268-8828

OWNER: PRESLEY HOMES, LONGFORD HOMES, CURB INC, BUILDERS INVESTMENT CO. C/O ISAACSON & ARFMAN CONTACT: "

ADDRESS: 128 MONROE ST. NE PHONE: "

ARCHITECT: N/A. CONTACT: _____

ADDRESS: _____ PHONE: _____

SURVEYOR: ALDRICH LAND SURVEYING CONTACT: TIM ALDRICH

ADDRESS: _____ PHONE: 884-1990

CONTRACTOR: N/A. CONTACT: _____

ADDRESS: _____ PHONE: _____

TYPE OF SUBMITTAL:

____ DRAINAGE REPORT
____ DRAINAGE PLAN
____ CONCEPTUAL GRADING & DRAINAGE PLAN
____ GRADING PLAN
____ EROSION CONTROL PLAN
____ ENGINEER'S CERTIFICATION
X OTHER DRAINAGE MANAGEMENT PLAN (D.M.P) SUPPLEMENTAL INFO.

PRE-DESIGN MEETING:

X YES
____ NO
____ COPY PROVIDED

RECEIVED JUN 23 1997 HYDROLOGY SECTION

CHECK TYPE OF APPROVAL SOUGHT:

____ SKETCH PLAT APPROVAL
____ PRELIMINARY PLAT APPROVAL
____ S. DEV. PLAN FOR SUB'D. APPROVAL
____ S. DEV. PLAN FOR BLDG. PERMIT APPROVAL
____ SECTOR PLAN APPROVAL
____ FINAL PLAT APPROVAL
____ FOUNDATION PERMIT APPROVAL
____ BUILDING PERMIT APPROVAL
____ CERTIFICATE OF OCCUPANCY APPROVAL
____ GRADING PERMIT APPROVAL
____ PAVING PERMIT APPROVAL
____ S.A.D. DRAINAGE REPORT
____ DRAINAGE REQUIREMENTS
X OTHER D.M.P. APPROVAL

DATE SUBMITTED: ~~JUNE 23, 1997~~ AUGUST 26, 1997

BY: FRED C. ARFMAN, P.E.

FOR: ISAACSON & ARFMAN, P.A.

RECEIVED ~~JUN 23 1997~~ HYDROLOGY SECTION

ISAACSON & ARFMAN, P.A.

Consulting Engineering Associates

Thomas O. Isaacson, PE & LS • Fred C. Arfman, PE
Scott M. McGee, PE

August 21, 1997

RECEIVED
AUG 25 1997
HYDROLOGY SECTION

Ms. Susan M. Calongne, P.E.
City/County Floodplain Administrator
City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103

RE: Revised Arenal/Unser Drainage Management Plan (M10/D10)

Dear Ms. Calongne:

In response to your July 21, 1997 letter with Leedshill-Herkenhoff, Inc. (L-H, Inc.) memorandum to Kurt Browning, AMAFCA, we have made adjustments to the drainage report to address the comments. The responses to the comments are as follows:

1. Subbasins 400.2 and 504 was adjusted to 9 du/acre. The temporary detention pond at Arenal Road and Unser Blvd. was enlarged to accommodate this change.

2. The percent impervious for the existing "Westgate Heights" area used was at 29%. This lower impervious percentage accounts for the back yard ponds in this existing subdivision.

3. The 1995 drainage model has an area of 0.57580 square miles and the 1997 model 0.55146 square miles at the entrance to the detention pond. This difference in area was due to Basin 504 proposed to drain to Sage Road in the 1997 model, whereas, in the 1995 model, this basin was assumed to drain to the pond.

The adjustments made resulted in the new tables, charts, and printouts to replace those in the drainage report. Attached please find the following:

128 Monroe St. NE • Albuquerque, NM 87108 • (505) 268-8828 • FAX (505) 268-2632

–Table 2: New Hydrograph for the Amole del Norte Diversion Channel

–Hydrograph Computations for Basins Discharging to Channel at Arenal Road

–Hydrograph Computations for Basin 504

–Detention Pond Detail

–AHYMO summary and output

If there are any questions, please call me at 268-8828.

Sincerely,

ISAACSON & ARFMAN, P.A.

RECEIVED
AUG 25 1997
HYDROLOGY SECTION

Fred C. Arfman

Fred C. Arfman, P.E.

FCA/rtl

Enclosures

cc: Richard Stockton, Leedshill-Herkenhoff
Kurt Browning, AMAFCA

HYDROGRAPH FOR BASINS DISCHARGING TO CHANNEL AT ARENAL ROAD

FROM BASIN 100 TO SURGE POND

LENGTH (FT)	=	5714
DIFFERENCE IN ELEVATION ACROSS BASIN	=	102
SLOPE OF BASIN (FT/FT)	=	0.015
TIME OF CONCENTRATION (MIN)	=	23
TIME OF PEAK (MIN)	=	15

ROUTING SURGE POND AND TO AMOLE DEL NORTE CHANNEL

TIME TO PEAK (AHYMO)	=	26
AREA OF BASIN, (ACRES)	=	373.4
AREA OF BASIN, (SQ MI)	=	0.5834
100-YR, 6-HR RAINFALL, (INCHES)	=	2.20
COMPOSITE CURVE NO.	=	77
DIRECT RUNOFF (INCHES)	=	.56
TOTAL TIME TO PEAK (15+26) (MIN)	=	33
VOLUME OF RUNOFF (ACRE-FT)	=	41
PEAK RUNOFF (CFS)	=	185
AVERAGE RUNOFF PER ACRE (CFS/AC)	=	2.7

POINT	t/Tp (min/min)	t (min)	y (cfs/cfs)	Q (cfs)
1	.0	0.0	.000	0.0
2	.1	4.1	.030	5.55
3	.2	8.2	.100	18.50
4	.3	12.3	.190	35.15
5	.4	16.4	.310	57.35
6	.5	20.5	.470	86.95
7	.6	24.6	.660	122.10
8	.7	28.7	.820	151.70
9	.8	32.8	.930	172.05
10	.9	36.9	.990	183.15
11	1.0	41.0	1.000	185.00
12	1.1	45.1	.990	183.15
13	1.2	49.2	.930	172.05
14	1.3	53.3	.860	159.10
15	1.4	57.4	.780	144.30
16	1.5	61.5	.680	125.80
17	1.6	65.6	.560	103.60
18	1.7	69.7	.460	85.10
19	1.8	73.8	.390	72.15
20	1.9	77.9	.330	61.05
21	2.0	82.0	.280	51.80

POINT	t/Tp (min/min)	t (min)	y (cfs/cfs)	Q (cfs)
22	2.2	90.2	.207	38.30
23	2.4	98.4	.147	27.20
24	2.6	106.6	.107	19.80
25	2.8	114.8	.077	14.25
26	3.0	123.0	.055	10.18
27	3.2	131.2	.040	7.40
28	3.4	139.4	.029	5.37
29	3.6	147.6	.021	3.89
30	3.8	155.8	.015	2.78
31	4.0	164.0	.011	2.04
32	4.5	184.5	.005	0.93
33	5.0	205.0	.000	.00

HYDROGRAPH FOR BASIN 504
(ADDITIONAL SIDE FLOW AT SAGE ROAD)

BASIN LENGTH, (FT)	=	2897
DIFFERENCE IN ELEVATION ACROSS BASIN	=	24
SLOPE OF BASIN, (FT/FT)	=	0.0083
AREA OF BASIN, (ACRES)	=	23.75
AREA OF BASIN, (SQ MI)	=	0.0371
100-YR, 6-HR RAINFALL, (INCHES)	=	2.20
COMPOSITE CURVE NO.	=	77
DIRECT RUNOFF (INCHES)	=	.56
TIME OF CONCENTRATION (SCS UPLAND METHOD) (MIN)	=	40
TIME TO PEAK (MIN)	=	27
VOLUME OF RUNOFF (ACRE-FT) (FROM AHYMO RUN)	=	2.57
PEAK RUNOFF (CFS) (FROM AHYMO RUN)	=	92.6
RUNOFF PER ACRE (CFS/ACRE)	=	3.25

POINT	t/Tp (min/min)	t (min)	y (cfs/cfs)	Q (cfs)
1	.0	.0	.000	.00
2	.1	2.7	.030	2.78
3	.2	5.4	.100	9.26
4	.3	8.1	.190	17.59
5	.4	10.8	.310	28.71
6	.5	13.5	.470	43.52
7	.6	16.2	.660	61.12
8	.7	18.9	.820	75.93
9	.8	21.6	.930	86.12
10	.9	24.3	.990	91.67
11	1.0	27.0	1.000	92.6
12	1.1	29.7	.990	91.67
13	1.2	32.4	.930	86.12
14	1.3	35.1	.860	79.64
15	1.4	37.8	.780	72.23
16	1.5	40.5	.680	62.97
17	1.6	43.2	.560	51.86
18	1.7	45.9	.460	42.60
19	1.8	48.6	.390	36.11
20	1.9	51.3	.330	30.56
21	2.0	54.0	.280	25.93
22	2.2	59.4	.207	19.17
23	2.4	64.8	.147	13.61

POINT	t/Tp (min/min)	t (min)	y (cfs/cfs)	Q (cfs)
24	2.6	70.2	.107	9.91
25	2.8	75.6	.077	7.13
26	3.0	81.0	.055	5.09
27	3.2	86.4	.040	3.70
28	3.4	91.8	.029	2.69
29	3.6	97.2	.021	1.94
30	3.8	102.6	.015	1.39
31	4.0	108.0	.011	1.02
32	4.5	121.5	.005	0.46
33	5.0	135.0	.000	.00

TABLE 2
NEW HYDROGRAPH FOR THE AMOLE DEL NORTE DIVERSION CHANNEL

RECEIVED
AUG 25 1997
HYDROLOGY SECTION

TIME (HR)	A DISCHARGE FROM PROPOSED TIERRA BAYITA STORM SEWER	SIDE FLOW AT TOWER ROAD	SIDE FLOW AT SAGE ROAD	ADDITIONAL SIDE FLOW AT SAGE ROAD**	SIDE FLOW AT 980' S. OF SAGE ROAD**	SIDE FLOW AT 1000' N. OF ARENAL ROAD**	SIDE FLOW AT 200' N. OF ARENAL ROAD**	SIDE FLOW AT ARENAL ROAD*	B SIDE FLOW 1150' S. OF ARENAL ROAD**	SIDE FLOW 1650' S. OF ARENAL ROAD*	SIDE FLOW AT 3000' S. OF ARENAL ROAD*	SIDE FLOW 1100' N. OF BLAKE ROAD	ADDITIONAL SIDE FLOW AT 1100' N. OF BLAKE ROAD**	SIDE FLOW AT BLAKE ROAD	SIDE FLOW S. OF BLAKE ROAD	B*	A & B*	DISCHARGE FROM PROPOSED 35 AC-FT DETENTION BASIN N. OF TOWER ROAD	B & C* HYDROGRAPH PLOTTED (SEE GRAPH)
0.2	138	189	106	29	36	110	56	35	116	104	305	44	35	56	17	1238	1376	0	1238
0.4	1323	547	210	92	2	14	1	122	46	40	183	135	34	62	33	1521	2844	210	1731
0.5	1368	600	176	92	1	3		170	24	15	91	109	16	47	26	1370	2738	520	1890
0.6	1178	527	142	80		1		183	9	8	48	83	11	32	18	1142	2320	690	1832
0.8	821	335	90	36				172	2	2	13	51	3	21	11	736	1491	735	1471
1.0	614	221	64	19				125	1	1	4	37	1	15	8	496	1008	780	1276
1.2	500	158	49	10				74			1	29		12	7	340	770	720	1060
1.4	411	123	39	4				52				24		10	5	257	668	600	857
1.6	432	102	33	2				28				20		8	5	198	540	525	723
1.8	290	86	28	1				19				17		7	4	162	452	465	627
2.0	249	73	24					11				15		6	3	132	381	380	512
2.2	215	64	21					7				13		6	3	114	329	330	444
2.4	190	57	18					4				12		5	3	99	289	280	375
2.6	168	50	16					3				10		5	2	86	254	230	316
2.8	150	45	15					2				10		4	2	78	228	200	278
3.0	136	41	14					1				9		4	2	71	207	175	246
3.2	125	38	13									8		4	2	65	190	155	220
3.4	115	35	12									8		4	2	61	176	135	196
3.6	106	32	11									7		3	2	55	161	120	175
3.8	98	31	11									7		3	2	54	152	105	159
4.0	92	29	10									7		3	2	51	143	95	146
4.2	87	27	10									6		3	1	47	134	87	134
4.4	82	26	9									6		3	1	45	127	82	127
4.6	78	25	9									6		3	1	44	122	78	122
4.8	75	24	8									6		3	1	42	117	75	117
5.0	71	23	8									5		3	1	40	111	71	111
5.2	68	22	8									5		2	1	38	106	68	106
5.4	66	21	7									5		2	1	36	102	66	102
5.6	63	20	7									5		2	1	35	98	63	98
5.8	60	20	7									5		2	1	35	95	60	95
6.0																			

NOTE:

A = Runoff from the proposed Tierra Bayita storm drain.

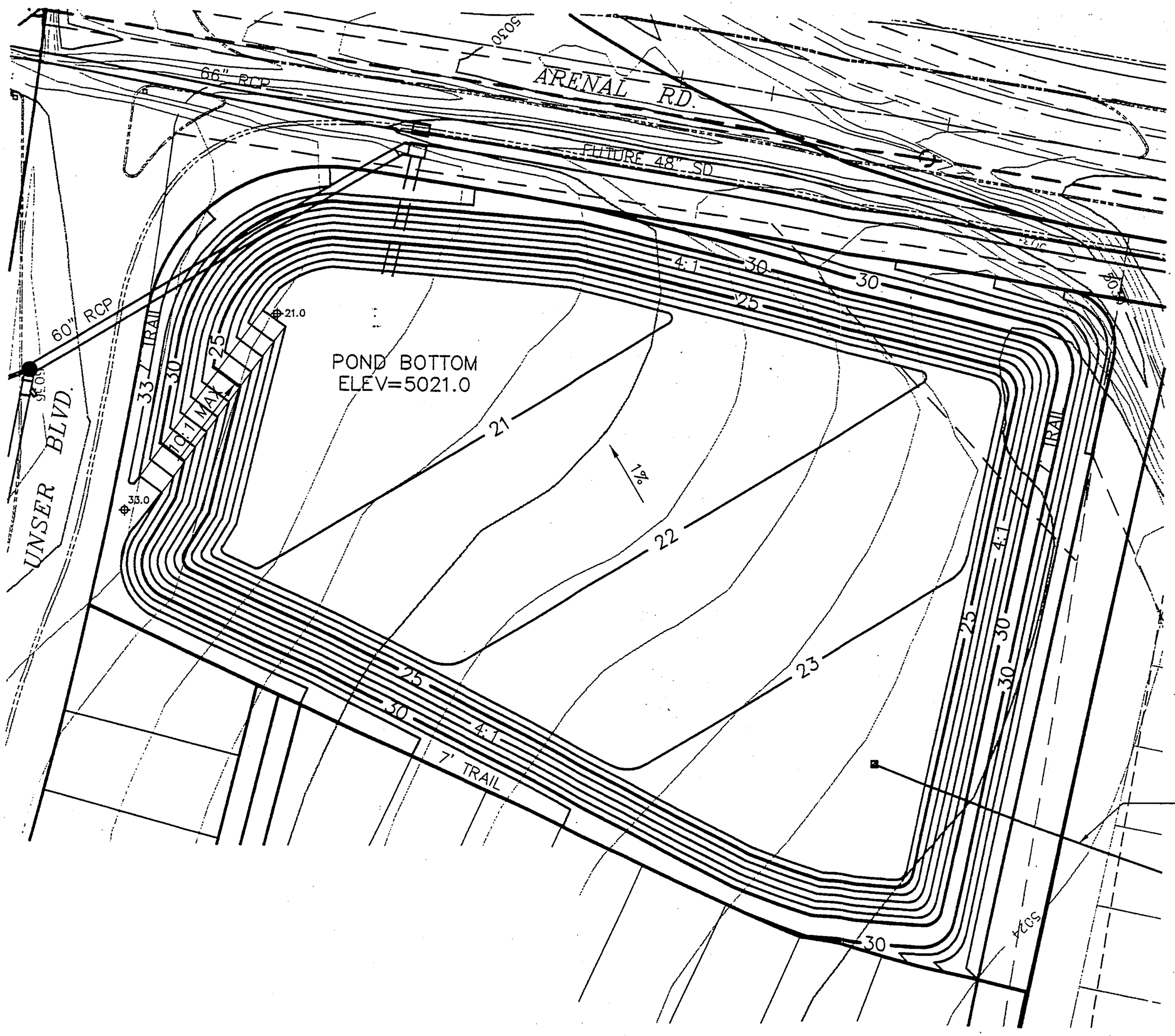
B = Sum of flows entering the Amole Channel from Tower south to the Amole Bain.

C = Discharge from a proposed 35 ac-ft detention basin at the north end of the Amole Channel (inflow = A).

*Values adjusted from Boyle Report, (see calculations section) for comparison, see table 1.

**New side flow

903TABLE.DWGems 06/17/97



SCALE: 1"=60'

TEMPORARY RETENTION POND

EL (ft)	H (ft)	AREA (Ac)	STORAGE (AF)
21	0	0.49	0
22	1	1.21	0.85
23	2	1.94	2.43
24	3	2.39	4.60
25	4	2.52	7.06
26	5	2.65	9.65
27	6	2.78	12.37
28	7	2.91	15.22
29	8	3.04	18.20
30	9	3.18	21.31

PEAK DISCHARGE TO POND= Q_{100}= 798cfs
Q_{10} = 435cfs

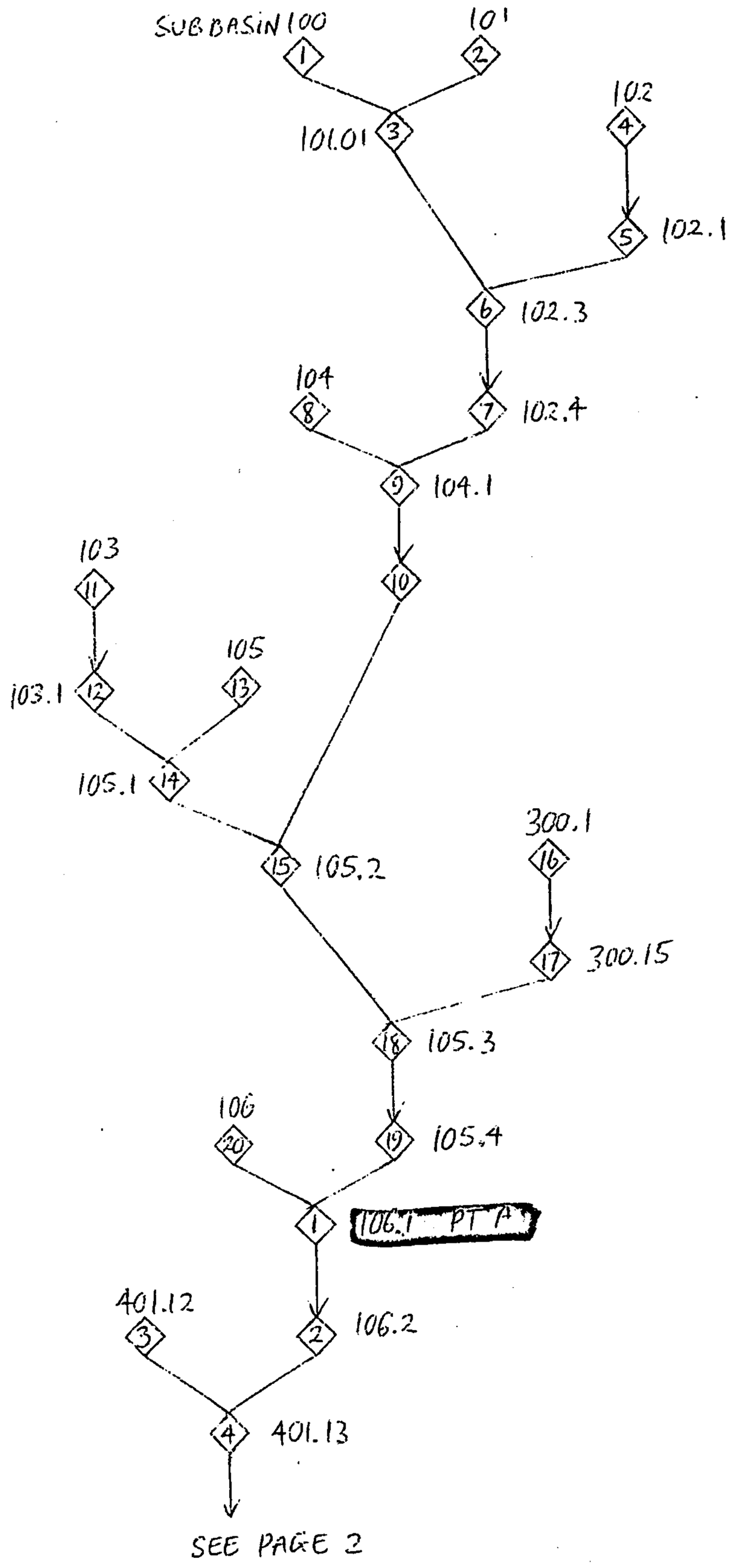
PEAK DISCHARGE= 185cfs
MAX. WATER SURFACE ELEV= 28.8'
POND STOREAGE= 17.6 Ac. ft
MAX. POND STORAGE= 21.3 Ac. ft

4" PVC DRAIN LINE. INV= 16.0,
RUN OUT @ S= 0.01 ft/ft TO DAYLIGHT

ISAACSON & ARFMAN, P.A.
Consulting Engineering Associates
128 Monroe Street N.E.
Albuquerque *New Mexico*

903EXH19.DWGdlv 8/21/97

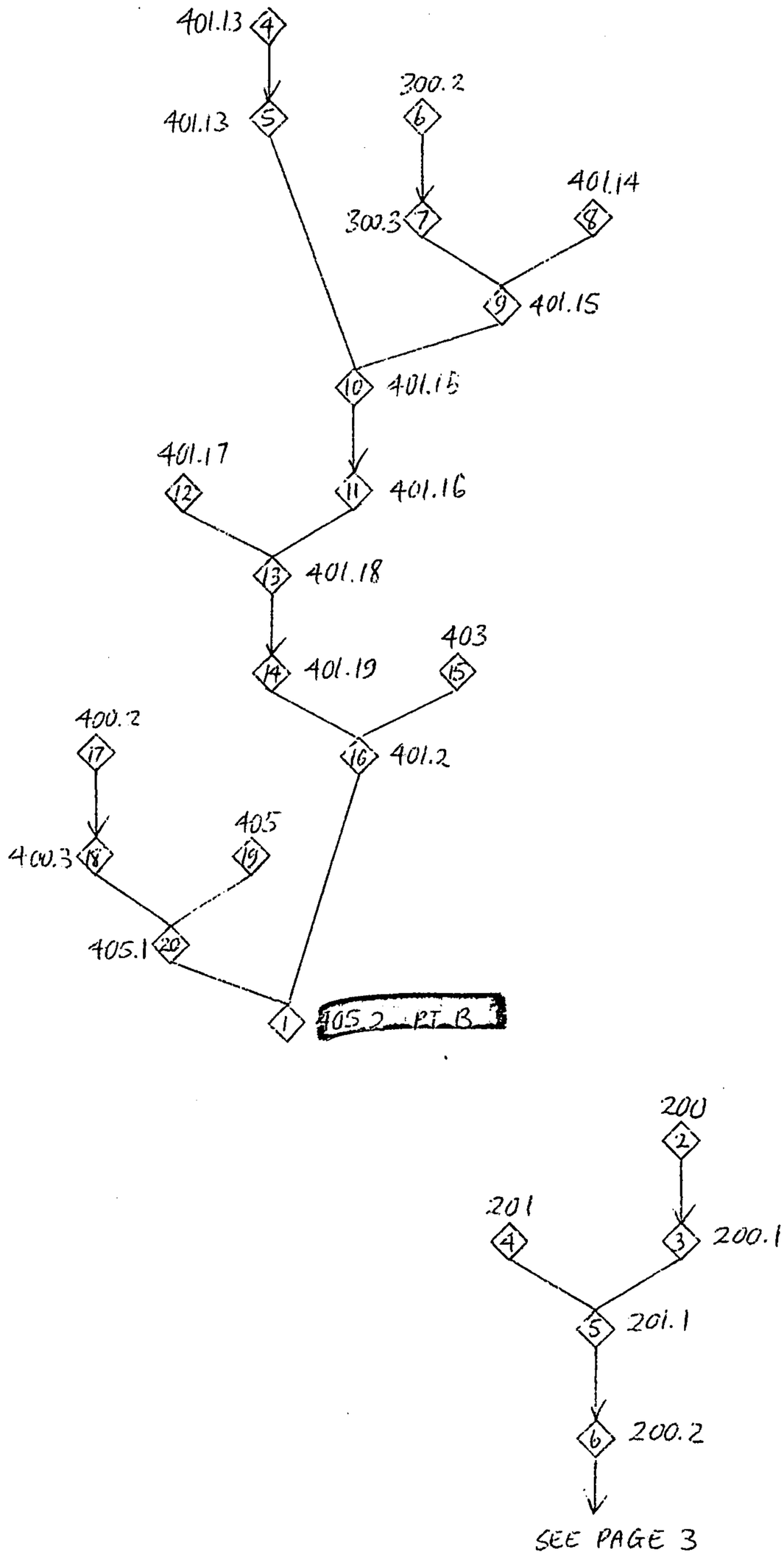
SUB-BASINS FLOWCHART



ISAACSON & ARFMAN, P.A.

SUBJECT _____ JOB NO. ____

BY _____ DATE 8/97 SHEET NO. 1 OF 3


401.13
4
401.13
5
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401.14
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401.15
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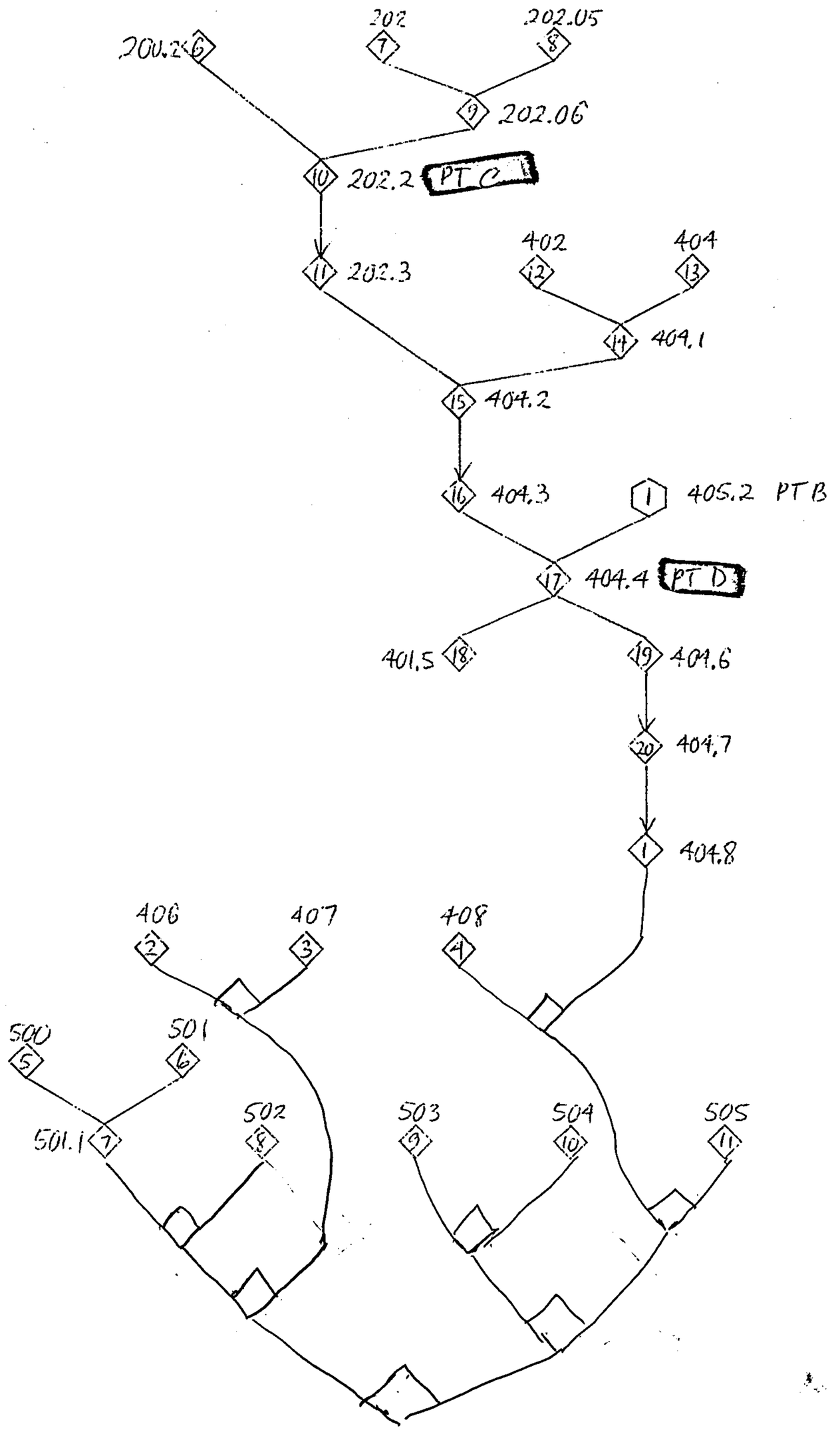

ISAACSON & ARFMAN, P.A.

SUBJECT _____ JOB NO. ____

BY _____ DATE 8/97 SHEET NO. 3 OF 3

ONSITE/OFFSITE

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994 RUN DATE (MON/DAY/YR) =08/20/1997
INPUT FILE = SUNRISE4.DAT USER NO.= ISCARFNM.I01

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION
										PAGE = 1
*S	SUNRISE4.DAT									
*S	REVISED BY: JMN 8/19/97									
START										TIME= .00
RAINFALL TYPE= 1										RAIN6= 2.200
*S BASIN 100 IS CURRENTLY UNDEVELOPED, ASSUME FUTURE DEVELOPMENT WILL										
*S BE @ A DENSITY OF 4 DU/AC										
COMPUTE NM HYD	100.00	-	1	.07150	148.70	4.952	1.29860	1.500	3.250	PER IMP= 42.00
*S BASIN 101 IS FULLY DEVELOPED WITH SINGLE FAMILY RESIDENTIAL HOMES										
*S WITH A DENSTIY OF 4 DU/AC										
COMPUTE NM HYD	101.00	-	2	.03700	60.90	1.988	1.00753	1.500	2.572	PER IMP= 29.00
ADD HYD	101.01	1& 2	3	.10850	209.60	6.940	1.19933	1.500	3.018	
*S **AREA 102 IS A MIDDLE SCHOOL (ONSITE DETENTION TO REDUCE RUNOFF)										
COMPUTE NM HYD	102.00	-	4	.04000	33.21	.937	.43925	1.533	1.297	PER IMP= .00
*S ROUTE THE SCHOOL'S RUNOFF IN A 28' F-F RESIDENTIAL STREET, S=2%										
*S ASSUME SECTION EXTENDS TO THE ROW LINE ON BOTH SIDES										
ROUTE	102.10	4	5	.04000	32.05	.937	.43927	1.567	1.252	
*S ADD THE ROUTED FLOW FROM 102 TO THE EARLIER TOTAL										
ADD HYD	102.30	3& 5	6	.14850	234.45	7.877	.99460	1.533	2.467	
*S ROUTE THE FLOW IN AN EXISTING 28' F-F RESIDENTIAL STREET										
ROUTE	102.40	6	7	.14850	227.06	7.877	.99460	1.567	2.389	
*S **BASIN 104 IS COMPLETELY DEVELOPED										
COMPUTE NM HYD	104.00	-	8	.04400	72.42	2.364	1.00753	1.500	2.572	PER IMP= 29.00
*S ADD 104 TO TOTAL										
ADD HYD	104.10	7& 8	9	.19250	291.58	10.242	.99755	1.533	2.367	
*S ROUTE THE FLOW IN AN EXISTING 28' F-F' RESIDENTIAL STREET										
ROUTE	104.20	9	10	.19250	291.69	10.242	.99756	1.567	2.368	
*S **AREA 103 IS FULLY DEVELOPED										
COMPUTE NM HYD	103.00	-	11	.04400	72.42	2.364	1.00753	1.500	2.572	PER IMP= 29.00
*S ROUTE THE FLOW IN AN EXISTING RESIDENTIAL STREET (ASSUME 28'F-F)										
ROUTE	103.10	11	12	.04400	72.84	2.364	1.00753	1.533	2.587	
*S AREA 105 IS A PARK & COA WELL SITE										
COMPUTE NM HYD	105.00	-	13	.02100	29.05	.849	.75825	1.500	2.161	PER IMP= 7.00
*S ADD BASIN 105 AND HYDROGRAPH NO. 103.1 TOGETHER										
ADD HYD	105.10	12&13	14	.06500	101.80	3.214	.92698	1.533	2.447	
*S ADD HYDROGRAPH NOs. 104.2 AND 105.1 TOGETHER										
ADD HYD	105.20	10&14	15	.25750	385.67	13.455	.97974	1.567	2.340	
*S BASIN 300.1 IS CURRENTLY UNDEVELOPED, ASSUME FUTURE DEVELOPMENT WILL BE @										
*S A DENSITY OF 4 DU/AC										
COMPUTE NM HYD	300.10	-	16	.01560	32.45	1.080	1.29860	1.500	3.250	PER IMP= 42.00
*S ROUTE THE FLOW IN AN EXISTING RESIDENTIAL STREET-86TH ST. (ASSUME 28'F-F)										
ROUTE	300.15	16	17	.01560	32.38	1.080	1.29861	1.533	3.243	
*S ADD HYDROGRAPH NOs. 105.2 AND 300.15 TOGETHER										
ADD HYD	105.30	15&17	18	.27310	416.92	14.536	.99795	1.533	2.385	
*S ROUTE THE FLOW IN AN EXISTING 28' F-F STREET-SAPPHIRE ST.										
ROUTE	105.40	18	19	.27310	401.89	14.536	.99795	1.567	2.299	
*S AREA 106 IS FULLY DEVELOPED										
COMPUTE NM HYD	106.00	-	20	.02177	35.84	1.170	1.00753	1.500	2.572	PER IMP= 29.00
*S **ADD THE FLOWS FROM BASIN 106 AND HYDROGRAPH NO 105.4 TOGETHER: ANALYSIS PT										
ADD HYD	106.10	19&20	1	.29487	433.32	15.705	.99866	1.567	2.296	
*S ROUTE THE ABOVE FLOW ON SAPPHIRE ST.										

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                                FROM  TO                    PEAK        RUNOFF                TIME TO   CFS
                   HYDROGRAPH    ID   ID        AREA     DISCHARGE     VOLUME      RUNOFF      PEAK    PER
COMMAND          IDENTIFICATION  NO.  NO.      (SQ MI)     (CFS)       (AC-FT)    (INCHES)   (HOURS)  ACRE     NOTATION

ROUTE                  106.20     1    2       .29487      430.80      15.705      .99866     1.600   2.283
*S  **BASIN 401.12, 401.14, 401.17, 300.2 AND 400.2 DRAINS TO SAPPHIRE ST.
*S  **BASIN 401.12 IS PART OF SUNRISE ESTATES UNIT 1
COMPUTE NM HYD         401.12     -    3       .01126       23.43        .780     1.29860     1.500   3.251 PER IMP=  42.00
*S  **ADD THE FLOWS FROM HYDROGRAPH NO 401.12 AND 106.2
ADD HYD                401.13  2& 3    4       .30613      447.77      16.485     1.00969     1.600   2.285
*S ROUTE THE ABOVE FLOW ON SAPPHIRE STREET (28' F-F)
ROUTE                  401.13     4    5       .30613      449.54      16.485     1.00969     1.600   2.294
*S  **BASIN 300.2 IS CURRENTLY UNDEVELOPED, ASSUME FUTURE DEVELOPMENT WILL BE
*S  @ A DENSITY OF 4 DU/AC
COMPUTE NM HYD         300.20     -    6       .01180       24.55        .817     1.29859     1.500   3.251 PER IMP=  42.00
*S ROUTE THE FLOW IN AN EXISTING 28' F-F STREET-82nd ST.
ROUTE                  300.30     6    7       .01180       23.60        .817     1.29861     1.533   3.125
*S ** BASIN 401.14 IS PART OF SUNRISE ESTATES UNIT 1
COMPUTE NM HYD         401.14     -    8       .01117       23.24        .774     1.29860     1.500   3.251 PER IMP=  42.00
*S  **ADD FLOWS FROM HYDROGRAPH NO 401.14 AND 300.3
ADD HYD                401.15  7& 8    9       .02297       46.09       1.591     1.29858     1.533   3.135
*S **ADD FLOWS FROM HYDROGRAPH NO 401.13 AND 401.15
ADD HYD                401.16  5& 9   10       .32910      486.63      18.076     1.02985     1.600   2.310
*S ROUTE THE ABOVE FLOW ON AN SAPPHIRE ST.
ROUTE                  401.16    10   11       .32910      486.88      18.076     1.02985     1.600   2.312
*S **BASIN 401.17 IS PART OF SUNRISE ESTATES UNIT 1
COMPUTE NM HYD         401.17     -   12       .00661       13.76        .458     1.29860     1.500   3.252 PER IMP=  42.00
*S  **ADD FLOWS FROM HYDROGRAPH NO 401.16 AND 401.17
ADD HYD                401.18 11&12   13       .33571      496.85      18.534     1.03514     1.600   2.312
*S ROUTE THE ABOVE FLOW ON AN SAPPHIRE ST. TO UNSER BLVD.
ROUTE                  401.19    13   14       .33571      488.16      18.534     1.03515     1.633   2.272
*S ** BASIN 403 DRAINS TO SAPPHIRE ST.
COMPUTE NM HYD         403.00     -   15       .01480       30.79       1.025     1.29860     1.500   3.250 PER IMP=  42.00
*S  **ADD FLOWS FROM HYDROGRAPH NO 401.19 AND 403
ADD HYD                401.20 14&15   16       .35051      507.77      19.559     1.04627     1.600   2.264
*S ** BASIN 400.2 IS CURRENTLY UNDEVELOPED, ASSUME FUTURE DEVELOPMENT WILL BE
*S @ A DENSITY OF 9 DU/AC
COMPUTE NM HYD         400.20     -   17       .03222       81.34       2.942     1.71253     1.500   3.945 PER IMP=  78.00
*S ROUTE THE ABOVE FLOW ON UNSER BLVD. TO SAPPHIRE ST. (ASSUME 24' F-F)
ROUTE                  400.30    17   18       .03222       80.15       2.942     1.71253     1.533   3.887
*S ** BASIN 405 DRAINS TO SAPPHIRE ST.
COMPUTE NM HYD         405.00     -   19       .01393       29.33        .982     1.32159     1.500   3.289 PER IMP=  44.00
*S  **ADD FLOWS FROM HYDROGRAPH NO 400.3 AND 405
ADD HYD                405.10 18&19   20       .04615      108.51       3.924     1.59448     1.533   3.674
*S  **ADD FLOWS FROM HYDROGRAPH NO 405.1 AND 401.2: ANALYSIS PT B
ADD HYD                405.20 20&16    1       .39666      592.25      23.483     1.11005     1.600   2.333
*S **BASINS 200,201, & 202 DRAIN TO KIMELA DR
COMPUTE NM HYD         200.00     -    2       .05300       87.23       2.848     1.00753     1.500   2.572 PER IMP=  29.00
*S **ROUTE FLOW ABOVE ON KIMELA DR.
ROUTE                  200.10     2    3       .05300       87.73       2.848     1.00753     1.533   2.586
*S COMPUTE DISCHARGE FOR BASIN 201
COMPUTE NM HYD         201.00     -    4       .02600       42.80       1.397     1.00753     1.500   2.572 PER IMP=  29.00
*S ADD HYDROGRAPHS NO. 201 AND 200.1 TOGETHER
ADD HYD                201.10  3& 4    5       .07900      129.70       4.245     1.00752     1.533   2.565
*S ROUTE THE ABOVE FLOW TO THE END OF KIMELA DR.
ROUTE                  200.20     5    6       .07900      129.97       4.245     1.00753     1.533   2.571
*S **BASIN 202 IS AN ELEMENTARY SCHOOL (ONSITE DETENTION TO REDUCE RUNOFF)
```

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                                FROM  TO                    PEAK        RUNOFF                TIME TO    CFS
                  HYDROGRAPH     ID   ID        AREA     DISCHARGE     VOLUME      RUNOFF      PEAK     PER
COMMAND         IDENTIFICATION   NO.  NO.      (SQ MI)     (CFS)      (AC-FT)    (INCHES)   (HOURS)   ACRE      NOTATION

COMPUTE NM HYD        202.00     -    7        .00925       7.69        .217      .43925     1.533    1.298 PER IMP=     .00
*S **BASIN 202.05 IS THE ELEMENTARY SCHOOL PARKING LOT THAT WILL DRAIN TO KIMELA
COMPUTE NM HYD        202.05     -    8        .00375      10.49        .393     1.96548     1.500    4.373 PER IMP= 100.00
*S **ADD THE BASINS OF THE ELEMENTARY SCHOOL AND PARKING LOT
ADD HYD               202.06   7& 8   9        .01300      18.01        .610      .87913     1.500    2.164
*S **ADD THE BASINS TOGETHER TO GET THE FLOW IN KIMELA DR @ ANALYSIS PT C
ADD HYD               202.20   6& 9  10        .09200     147.62       4.855      .98938     1.533    2.507
*S ROUTE THE ABOVE FLOW ON KIMELA DR. TO UNSER BLVD.
ROUTE                 202.30    10   11        .09200     143.37       4.855      .98939     1.567    2.435
*S*********************************************************************
*S*********************************************************************
*S **BASINS 402 THRU 404 ARE CURRENTLY UNDEVELOPED, FOR PURPOSES
*S OF THIS REPORT, ASSUME ALL BASINS WILL BE BUILT OUT @ THEIR CURRENT
*S ZONING
*S **BASIN 402 IS UNIT 2 OF SUNRISE ESTATES
COMPUTE NM HYD        402.00     -   12        .05200     108.14       3.601     1.29860     1.500    3.249 PER IMP=   42.00
*S **BASINS 404 IS UNIT 2 OF SUNRISE ESTATES
COMPUTE NM HYD        404.00     -   13        .01080      22.47        .748     1.29860     1.500    3.251 PER IMP=   42.00
*S **COMBINE BASINS 402 AND 404 TOGETHER
ADD HYD               404.10 12&13  14        .06280     130.61       4.349     1.29859     1.500    3.250
*S **ADD THE FLOW ABOVE TO THE FLOW ON KIMELA DR.
ADD HYD               404.20 11&14  15        .15480     268.54       9.204     1.11482     1.533    2.711
*S ROUTE THE ABOVE FLOW ON UNSER BLVD. FROM KIMELA DR. TO THE POND
ROUTE                 404.30    15   16        .15480     207.70       9.204     1.11482     1.633    2.096
*S **ADD TO FLOW IN SAPPHIRE @ ANALYSIS PT D
ADD HYD               404.40   1&16  17        .55146     798.01      32.687     1.11139     1.600    2.261
*s DIVIDE THE DISCHARGE AT ANALYSIS PT D TO ALLOW 124.0 CFS TO ENTER PIPE
*S AND FLOW TO CHANNEL BEFORE POND FILLS UP
DIVIDE HYD            404.50    17   18        .21696     124.00      12.860     1.11139     1.400     .893
                      404.60   AND   19        .33450     674.01      19.827     1.11139     1.600    3.148
*S DESIGN A RETENTION FACILITY TO REDUCE TO FLOW TO THAT WHICH WILL
*S FIT IN A 42" RCP @ S=1.8%
ROUTE RESERVOIR       405.70    19   20        .33450      66.87      15.051      .84365     2.066     .312 AC-FT=   17.617
*S ROUTE FLOW FROM THE DETENTION POND TO THE AMOLE DEL NORTE CHANNEL
ROUTE                 404.80    20    1        .33450      66.82      15.046      .84340     2.066     .312
*S*********************************************************************
*S*********************************************************************
*S **CALC BASIN 406
COMPUTE NM HYD        406.00     -    2        .05743     117.49       3.920     1.27968     1.500    3.196 PER IMP=   42.00
*S **CALC BASIN 407
COMPUTE NM HYD        407.00     -    3        .05040     104.81       3.491     1.29860     1.500    3.249 PER IMP=   42.00
*S **CALC BASIN 408
COMPUTE NM HYD        408.00     -    4        .15736     327.60      10.899     1.29860     1.500    3.253 PER IMP=   42.00
*S*********************************************************************
*S*********************************************************************
*S **BASIN 500 IS UNIT ONE OF THE PROPOSED LONGFORD SD
COMPUTE NM HYD        500.00     -    5        .02491      51.80       1.725     1.29860     1.500    3.250 PER IMP=   42.00
*S **BASIN 501 IS THE AREA PROPOSED AS FUTURE LONGFORD SD DRAINING
*S **DIRECTLY TO THE AMOLE CHANNEL
COMPUTE NM HYD        501.00     -    6        .03663      76.18       2.537     1.29860     1.500    3.249 PER IMP=   42.00
*S **COMBINE BASINS 500 AND 501 TOGETHER TO REPRESENT THE NORTHERN PART OF THE
*S **LONGFORD SD
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                                FROM  TO                    PEAK        RUNOFF                 TIME TO   CFS
                HYDROGRAPH      ID    ID        AREA     DISCHARGE     VOLUME      RUNOFF       PEAK    PER
COMMAND       IDENTIFICATION    NO.   NO.      (SQ MI)     (CFS)       (AC-FT)    (INCHES)    (HOURS)  ACRE      NOTATION

ADD HYD              501.10  5& 6   7        .06154      127.98        4.262      1.29859      1.500   3.250
*S **BASIN 502 IS THE SOUTHERN PART OF THE LONGFORD SD
COMPUTE NM HYD       502.00   -     8        .05788      121.79        4.080      1.32159      1.500   3.288 PER IMP=  44.00
*S **BASIN 503 IS CURRENTLY UNDEVELOPED, ASSUME FUTURE DEVELOPMENT WILL BE @
*S **A DENSITY OF 4 DU/AC. THE DISCHARGE FROM THIS BASIN DRAINS TO THE AMOLE
*S DEL NORTE CHANNEL AND DOES NOT AFFECT THE ARENAL/UNSER DRAINAGE MANAGEMENT
*S SITE.
COMPUTE NM HYD       503.00   -     9        .03752       78.03        2.599      1.29860      1.500   3.249 PER IMP=  42.00
*S*************************************************************************
*S **BASIN 504 IS CURRENTLY UNDEVELOPED, ASSUME FUTURE DEVELOPMENT WILL BE @
*S **A DENSITY OF 9 DU/AC. THE DISCHARGE FROM THIS BASIN TRAVEL ALONG SAGE RD.
*S AND ENTERS THE AMOLE DEL NORTE CHANNEL, DOES NOT AFFECT THE ARENAL/UNSER
*S DRAINAGE MANAGEMENT SITE.
COMPUTE NM HYD       504.00   -    10        .03667       92.58        3.349      1.71253      1.500   3.945 PER IMP=  78.00
*S **BASIN 505 IS FULLY DEVELOPED AND DRAINS SOUTH TO BLAKE RD..DISCHARGE FROM
*S THIS BASIN DOES NOT AFFECT THE ARENAL/UNSER DRAINAGE MANAGEMENT SITE.
COMPUTE NM HYD       505.00   -    11        .02618       43.10        1.407      1.00753      1.500   2.572 PER IMP=  29.00
FINISH
```

```
AHYMO PROGRAM (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
     RUN DATE (MON/DAY/YR) = 08/20/1997
     START TIME (HR:MIN:SEC) = 10:31:09     USER NO.= ISCARFNM.I01
     INPUT FILE = SUNRISE4.DAT

*S                  SUNRISE4.DAT
*S                  REVISED BY: JMN 8/19/97
START               RAINFALL BEGINS AT 0.0 HRS
RAINFALL            TYPE=1 RAIN QUARTER=0 RAIN ONE=1.87
                    RAIN SIX=2.20 RAIN DAY=2.66 DT=0.03333HR

              COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40 HR.
              DT =    .033330 HOURS       END TIME =     5.999400 HOURS
                 .0000   .0016   .0033   .0050   .0067   .0085   .0103
                 .0122   .0141   .0160   .0180   .0201   .0222   .0243
                 .0266   .0289   .0312   .0337   .0362   .0388   .0415
                 .0443   .0472   .0502   .0534   .0567   .0601   .0637
                 .0675   .0715   .0758   .0809   .0865   .0924   .1050
                 .1334   .1771   .2398   .3254   .4379   .5814   .7600
                 .9780  1.1804  1.2649  1.3363  1.3997  1.4575  1.5106
                1.5600  1.6061  1.6493  1.6900  1.7284  1.7646  1.7989
                1.8314  1.8623  1.8915  1.9193  1.9456  1.9518  1.9576
                1.9630  1.9682  1.9732  1.9780  1.9825  1.9869  1.9912
                1.9953  1.9993  2.0031  2.0068  2.0104  2.0140  2.0174
                2.0207  2.0240  2.0272  2.0303  2.0333  2.0363  2.0392
                2.0420  2.0448  2.0475  2.0502  2.0528  2.0554  2.0580
                2.0605  2.0629  2.0653  2.0677  2.0700  2.0723  2.0746
                2.0768  2.0790  2.0812  2.0833  2.0855  2.0875  2.0896
                2.0916  2.0936  2.0956  2.0976  2.0995  2.1014  2.1033
                2.1051  2.1070  2.1088  2.1106  2.1124  2.1141  2.1159
                2.1176  2.1193  2.1210  2.1227  2.1244  2.1260  2.1276
                2.1292  2.1308  2.1324  2.1340  2.1355  2.1371  2.1386
                2.1401  2.1416  2.1431  2.1446  2.1460  2.1475  2.1489
                2.1504  2.1518  2.1532  2.1546  2.1560  2.1573  2.1587
                2.1600  2.1614  2.1627  2.1640  2.1654  2.1667  2.1680
                2.1692  2.1705  2.1718  2.1731  2.1743  2.1756  2.1768
                2.1780  2.1792  2.1804  2.1817  2.1829  2.1840  2.1852
                2.1864  2.1876  2.1887  2.1899  2.1910  2.1922  2.1933
                2.1944  2.1956  2.1967  2.1978  2.1989  2.2000

*S BASIN 100 IS CURRENTLY UNDEVELOPED, ASSUME FUTURE DEVELOPMENT WILL
*S BE @ A DENSITY OF 4 DU/AC
COMPUTE NM HYD      ID=1 HYD NO=100.00 AREA=0.07150 SQ MI
                    PER A=0 PER B=29 PER C=29 PER D=42
                    TP=-0.1333 HR   MASS RAIN=-1

    K =   .072801HR    TP =   .133300HR    K/TP RATIO =   .546145     SHAPE CONSTANT, N =  7.087329
    UNIT PEAK =   118.36    CFS   UNIT VOLUME =    .9992       B =   525.38      P60 = 1.8700
    AREA =      .030030 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .118190HR    TP =   .133300HR    K/TP RATIO =   .886648     SHAPE CONSTANT, N =  4.001119
    UNIT PEAK =   110.52    CFS   UNIT VOLUME =    1.000       B =   355.24      P60 = 1.8700
    AREA =      .041470 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=1   CODE=1
```

```
                                PARTIAL HYDROGRAPH   100.00

    RUNOFF VOLUME =      1.29860 INCHES      =        4.9519 ACRE-FEET
    PEAK DISCHARGE RATE =      148.70 CFS  AT   1.500 HOURS   BASIN AREA =   .0715 SQ. MI.


*S BASIN 101 IS FULLY DEVELOPED WITH SINGLE FAMILY RESIDENTIAL HOMES
*S WITH A DENSTIY OF 4 DU/AC
COMPUTE NM HYD       ID=2 HYD NO=101.00 AREA=0.03700 SQ MI
                     PER A=33 PER B=19 PER C=19 PER D=29
                     TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   42.363    CFS   UNIT VOLUME =    .9991       B =   526.28      P60 = 1.8700
    AREA =      .010730 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .139463HR    TP =   .133300HR    K/TP RATIO =  1.046235     SHAPE CONSTANT, N =  3.374403
    UNIT PEAK =   61.299    CFS   UNIT VOLUME =    .9998       B =   311.05      P60 = 1.8700
    AREA =      .026270 SQ MI    IA =    .52958 INCHES    INF =   1.33282 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=2   CODE=1

                                PARTIAL HYDROGRAPH   101.00

    RUNOFF VOLUME =      1.00753 INCHES      =        1.9882 ACRE-FEET
    PEAK DISCHARGE RATE =       60.90 CFS  AT   1.500 HOURS   BASIN AREA =   .0370 SQ. MI.


ADD HYD              ID=3 HYD NO=101.01 ID=1 ID=2
PRINT HYD            ID=3 CODE=1

                                PARTIAL HYDROGRAPH   101.01

    RUNOFF VOLUME =      1.19933 INCHES      =        6.9401 ACRE-FEET
    PEAK DISCHARGE RATE =      209.60 CFS  AT   1.500 HOURS   BASIN AREA =   .1085 SQ. MI.


*S **AREA 102 IS A MIDDLE SCHOOL (ONSITE DETENTION TO REDUCE RUNOFF)
COMPUTE NM HYD       ID=4 HYD NO=102.00 AREA=0.04000 SQ MI
                     PER A=100 PER B=0 PER C=0 PER D=0
                     TP=-0.1333 HR   MASS RAIN=-1

    K =   .163684HR    TP =   .133300HR    K/TP RATIO =  1.227936     SHAPE CONSTANT, N =  2.899764
    UNIT PEAK =   82.084    CFS   UNIT VOLUME =    .9995       B =   273.54      P60 = 1.8700
    AREA =      .040000 SQ MI    IA =    .65000 INCHES    INF =   1.67000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=4   CODE=1
```

PARTIAL HYDROGRAPH 102.00

RUNOFF VOLUME = .43925 INCHES = .9371 ACRE-FEET
PEAK DISCHARGE RATE = 33.21 CFS AT 1.533 HOURS BASIN AREA = .0400 SQ. MI.

```
*S ROUTE THE SCHOOL'S RUNOFF IN A 28' F-F RESIDENTIAL STREET, S=2%
*S ASSUME SECTION EXTENDS TO THE ROW LINE ON BOTH SIDES
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEG=1 MIN EL=100.00 MAX EL=101.00
                     CH SLOPE=0.02 FP SLOPE=0.02 N=0.017 DIST=48.0
                     DIST  ELEV  DIST  ELEV  DIST  ELEV  DIST  ELEV
                      0   101.00 10.0 100.67 10.1 100.00 24.0 100.28
                     38.0 100.00 38.1 100.67 48.0 101.00
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
100.00	.00	.00	.00
100.05	.14	.15	5.26
100.11	.55	.95	10.52
100.16	1.25	2.80	15.78
100.21	2.22	6.03	21.04
100.26	3.46	10.94	26.30
100.32	4.92	18.84	27.99
100.37	6.39	29.08	28.01
100.42	7.87	41.00	28.03
100.47	9.34	54.46	28.04
100.53	10.82	69.37	28.06
100.58	12.30	85.66	28.07
100.63	13.78	103.24	28.09
100.68	15.26	119.89	28.96
100.74	16.87	132.52	32.13
100.79	18.64	147.34	35.31
100.84	20.59	164.39	38.48
100.89	22.69	183.72	41.66
100.95	24.97	205.41	44.83
101.00	27.41	229.56	48.00

```
COMPUTE TRAVEL TIME  ID=5 REACH NO=1 NO VS=1 L=754 FT SLP=0.02
```

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.053	.138	.15	.1937
.105	.554	.95	.1220
.158	1.246	2.80	.0931
.211	2.215	6.03	.0769
.263	3.461	10.94	.0662
.316	4.920	18.84	.0547
.368	6.394	29.08	.0461
.421	7.869	41.00	.0402
.474	9.344	54.46	.0359

.526	10.821	69.37	.0327
.579	12.298	85.66	.0301
.632	13.776	103.24	.0279
.684	15.261	119.89	.0267
.737	16.869	132.52	.0267
.790	18.644	147.34	.0265
.842	20.586	164.39	.0262
.895	22.695	183.72	.0259
.947	24.971	205.41	.0255
1.000	27.414	229.56	.0250

```
ROUTE                ID=5 HYD NO=102.1 INFLOW ID=4 DT=0.0
PRINT HYD            ID=5 CODE=1
```

PARTIAL HYDROGRAPH 102.10

RUNOFF VOLUME = .43927 INCHES = .9371 ACRE-FEET
PEAK DISCHARGE RATE = 32.05 CFS AT 1.567 HOURS BASIN AREA = .0400 SQ. MI.

```
*S ADD THE ROUTED FLOW FROM 102 TO THE EARLIER TOTAL
ADD HYD              ID=6 HYD NO=102.3 ID=3 ID=5
PRINT HYD            ID=6 CODE=1
```

PARTIAL HYDROGRAPH 102.30

RUNOFF VOLUME = .99460 INCHES = 7.8772 ACRE-FEET
PEAK DISCHARGE RATE = 234.45 CFS AT 1.533 HOURS BASIN AREA = .1485 SQ. MI.

```
*S ROUTE THE FLOW IN AN EXISTING 28' F-F RESIDENTIAL STREET
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEG=1 MIN EL=100.00 MAX EL=101.00
                     CH SLOPE=0.02 FP SLOPE=0.02 N=0.017 DIST=48.0
                     DIST  ELEV  DIST  ELEV  DIST  ELEV  DIST  ELEV
                      0   101.00 10.0 100.67 10.1 100.00 24.0 100.28
                     38.0 100.00 38.1 100.67 48.0 101.00
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
100.00	.00	.00	.00
100.05	.14	.15	5.26
100.11	.55	.95	10.52
100.16	1.25	2.80	15.78
100.21	2.22	6.03	21.04
100.26	3.46	10.94	26.30
100.32	4.92	18.84	27.99
100.37	6.39	29.08	28.01
100.42	7.87	41.00	28.03
100.47	9.34	54.46	28.04
100.53	10.82	69.37	28.06
100.58	12.30	85.66	28.07
100.63	13.78	103.24	28.09
100.68	15.26	119.89	28.96

```
                                100.74       16.87       132.52       32.13
                                100.79       18.64       147.34       35.31
                                100.84       20.59       164.39       38.48
                                100.89       22.69       183.72       41.66
                                100.95       24.97       205.41       44.83
                                101.00       27.41       229.56       48.00
COMPUTE TRAVEL TIME  ID=7 REACH NO=1 NO VS=1 L=1040 FT SLP=0.02

                        TRAVEL TIME TABLE
                                     REACH=  1.0

                        WATER       AVERAGE     FLOW        TRAVEL
                        DEPTH       AREA        RATE        TIME
                        FEET        SQ.FT.      CFS         HRS
                           .053        .138         .15       .2672
                           .105        .554         .95       .1683
                           .158       1.246        2.80       .1285
                           .211       2.215        6.03       .1060
                           .263       3.461       10.94       .0914
                           .316       4.920       18.84       .0755
                           .368       6.394       29.08       .0635
                           .421       7.869       41.00       .0554
                           .474       9.344       54.46       .0496
                           .526      10.821       69.37       .0451
                           .579      12.298       85.66       .0415
                           .632      13.776      103.24       .0385
                           .684      15.261      119.89       .0368
                           .737      16.869      132.52       .0368
                           .790      18.644      147.34       .0366
                           .842      20.586      164.39       .0362
                           .895      22.695      183.72       .0357
                           .947      24.971      205.41       .0351
                          1.000      27.414      229.56       .0345
   ROUTE                 ID=7 HYD NO=102.4 INFLOW ID=6 DT=0.0
TRAVEL TIME TABLE EXCEEDED
   PRINT HYD             ID=7 CODE=1

                                PARTIAL HYDROGRAPH   102.40


      RUNOFF VOLUME =       .99460 INCHES     =       7.8772 ACRE-FEET
      PEAK DISCHARGE RATE =     227.06 CFS  AT   1.567 HOURS   BASIN AREA =   .1485 SQ. MI.


   *S **BASIN 104 IS COMPLETELY DEVELOPED
   COMPUTE NM HYD       ID=8 HYD NO=104.00 AREA=0.04400 SQ MI
                        PER A=33 PER B=19 PER C=19 PER D=29
                        TP=-0.1333 HR   MASS RAIN=-1

      K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
      UNIT PEAK =   50.377    CFS   UNIT VOLUME =    .9992       B =   526.28      P60 = 1.8700
      AREA =      .012760 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
      RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

      K =   .139463HR    TP =   .133300HR    K/TP RATIO =  1.046235     SHAPE CONSTANT, N =  3.374403
      UNIT PEAK =   72.896    CFS   UNIT VOLUME =    .9999       B =   311.05      P60 = 1.8700
      AREA =      .031240 SQ MI    IA =    .52958 INCHES    INF =   1.33282 INCHES PER HOUR
```

```
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=8  CODE=1

                                  PARTIAL HYDROGRAPH   104.00

    RUNOFF VOLUME =      1.00753 INCHES      =       2.3643 ACRE-FEET
    PEAK DISCHARGE RATE =      72.42 CFS  AT   1.500 HOURS   BASIN AREA =   .0440 SQ. MI.


*S ADD 104 TO TOTAL
ADD HYD              ID=9 HYD NO=104.1 ID=7 ID=8
PRINT HYD            ID=9 CODE=1

                                  PARTIAL HYDROGRAPH   104.10

    RUNOFF VOLUME =       .99755 INCHES      =      10.2415 ACRE-FEET
    PEAK DISCHARGE RATE =     291.58 CFS  AT   1.533 HOURS   BASIN AREA =   .1925 SQ. MI.


*S ROUTE THE FLOW IN AN EXISTING 28' F-F' RESIDENTIAL STREET
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEG=1 MIN EL=100.00 MAX EL=101.00
                     CH SLOPE=0.02 FP SLOPE=0.02 N=0.017 DIST=48.0
                     DIST  ELEV  DIST  ELEV  DIST  ELEV  DIST  ELEV
                      0   101.00 10.0 100.67 10.1 100.00 24.0 100.28
                     38.0 100.00 38.1 100.67 48.0 101.00

                                RATING CURVE VALLEY SECTION  1.0
                                   WATER       FLOW        FLOW        TOP
                                  SURFACE      AREA        RATE       WIDTH
                                   ELEV        SQ FT       CFS        FT
                                  100.00        .00         .00        .00
                                  100.05        .14         .15       5.26
                                  100.11        .55         .95      10.52
                                  100.16       1.25        2.80      15.78
                                  100.21       2.22        6.03      21.04
                                  100.26       3.46       10.94      26.30
                                  100.32       4.92       18.84      27.99
                                  100.37       6.39       29.08      28.01
                                  100.42       7.87       41.00      28.03
                                  100.47       9.34       54.46      28.04
                                  100.53      10.82       69.37      28.06
                                  100.58      12.30       85.66      28.07
                                  100.63      13.78      103.24      28.09
                                  100.68      15.26      119.89      28.96
                                  100.74      16.87      132.52      32.13
                                  100.79      18.64      147.34      35.31
                                  100.84      20.59      164.39      38.48
                                  100.89      22.69      183.72      41.66
                                  100.95      24.97      205.41      44.83
                                  101.00      27.41      229.56      48.00
COMPUTE TRAVEL TIME  ID=10 REACH NO=1 NO VS=1 L=421 FT SLP=0.02

                                TRAVEL TIME TABLE
```

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.053	.138	.15	.1082
.105	.554	.95	.0681
.158	1.246	2.80	.0520
.211	2.215	6.03	.0429
.263	3.461	10.94	.0370
.316	4.920	18.84	.0305
.368	6.394	29.08	.0257
.421	7.869	41.00	.0224
.474	9.344	54.46	.0201
.526	10.821	69.37	.0182
.579	12.298	85.66	.0168
.632	13.776	103.24	.0156
.684	15.261	119.89	.0149
.737	16.869	132.52	.0149
.790	18.644	147.34	.0148
.842	20.586	164.39	.0146
.895	22.695	183.72	.0144
.947	24.971	205.41	.0142
1.000	27.414	229.56	.0140

```
   ROUTE                ID=10 HYD NO=104.2 INFLOW ID=9 DT=0.0
TRAVEL TIME TABLE EXCEEDED
   PRINT HYD            ID=10 CODE=1

                                PARTIAL HYDROGRAPH   104.20

   RUNOFF VOLUME =      .99756 INCHES     =      10.2415 ACRE-FEET
   PEAK DISCHARGE RATE =     291.69 CFS  AT   1.567 HOURS   BASIN AREA =   .1925 SQ. MI.


*S **AREA 103 IS FULLY DEVELOPED
COMPUTE NM HYD      ID=11 HYD NO=103.00 AREA=0.04400 SQ MI
                    PER A=33 PER B=19 PER C=19 PER D=29
                    TP=-0.1333 HR   MASS RAIN=-1

   K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
   UNIT PEAK =   50.377    CFS   UNIT VOLUME =    .9992       B =   526.28      P60 = 1.8700
   AREA =      .012760 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
   RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


   K =   .139463HR    TP =   .133300HR    K/TP RATIO =  1.046235     SHAPE CONSTANT, N =  3.374403
   UNIT PEAK =   72.896    CFS   UNIT VOLUME =    .9999       B =   311.05      P60 = 1.8700
   AREA =      .031240 SQ MI    IA =    .52958 INCHES    INF =   1.33282 INCHES PER HOUR
   RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=11   CODE=1

                                PARTIAL HYDROGRAPH   103.00


   RUNOFF VOLUME =     1.00753 INCHES     =       2.3643 ACRE-FEET
```

PEAK DISCHARGE RATE = 72.42 CFS AT 1.500 HOURS BASIN AREA = .0440 SQ. MI.

```
*S ROUTE THE FLOW IN AN EXISTING RESIDENTIAL STREET (ASSUME 28'F-F)
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEG=1 MIN EL=100.00 MAX EL=101.00
                     CH SLOPE=0.02 FP SLOPE=0.02 N=0.017 DIST=48.0
                     DIST  ELEV  DIST  ELEV  DIST  ELEV  DIST  ELEV
                      0   101.00 10.0 100.67 10.1 100.00 24.0 100.28
                     38.0 100.00 38.1 100.67 48.0 101.00
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
100.00	.00	.00	.00
100.05	.14	.15	5.26
100.11	.55	.95	10.52
100.16	1.25	2.80	15.78
100.21	2.22	6.03	21.04
100.26	3.46	10.94	26.30
100.32	4.92	18.84	27.99
100.37	6.39	29.08	28.01
100.42	7.87	41.00	28.03
100.47	9.34	54.46	28.04
100.53	10.82	69.37	28.06
100.58	12.30	85.66	28.07
100.63	13.78	103.24	28.09
100.68	15.26	119.89	28.96
100.74	16.87	132.52	32.13
100.79	18.64	147.34	35.31
100.84	20.59	164.39	38.48
100.89	22.69	183.72	41.66
100.95	24.97	205.41	44.83
101.00	27.41	229.56	48.00

```
COMPUTE TRAVEL TIME  ID=12 REACH NO=1 NO VS=1 L=556 FT SLP=0.02
```

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.053	.138	.15	.1428
.105	.554	.95	.0900
.158	1.246	2.80	.0687
.211	2.215	6.03	.0567
.263	3.461	10.94	.0489
.316	4.920	18.84	.0403
.368	6.394	29.08	.0340
.421	7.869	41.00	.0296
.474	9.344	54.46	.0265
.526	10.821	69.37	.0241
.579	12.298	85.66	.0222
.632	13.776	103.24	.0206
.684	15.261	119.89	.0197
.737	16.869	132.52	.0197
.790	18.644	147.34	.0195
.842	20.586	164.39	.0193

```
                                .895       22.695       183.72        .0191
                                .947       24.971       205.41        .0188
                               1.000       27.414       229.56        .0184
ROUTE                  ID=12 HYD NO=103.1 INFLOW ID=11 DT=0.0
PRINT HYD              ID=12 CODE=1

                                  PARTIAL HYDROGRAPH   103.10


    RUNOFF VOLUME =     1.00753 INCHES     =       2.3643 ACRE-FEET
    PEAK DISCHARGE RATE =      72.84 CFS  AT   1.533 HOURS   BASIN AREA =   .0440 SQ. MI.


*S AREA 105 IS A PARK & COA WELL SITE
COMPUTE NM HYD         ID=13 HYD NO=105.00 AREA=0.021 SQ MI
                       PER A=31 PER B=31 PER C=31 PER D=7
                       TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   5.8036    CFS   UNIT VOLUME =    .9973       B =   526.28      P60 = 1.8700
    AREA =      .001470 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .133514HR    TP =   .133300HR    K/TP RATIO =  1.001607     SHAPE CONSTANT, N =  3.524575
    UNIT PEAK =   47.194    CFS   UNIT VOLUME =    1.000       B =   322.12      P60 = 1.8700
    AREA =      .019530 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD              ID=13   CODE=1

                                  PARTIAL HYDROGRAPH   105.00


    RUNOFF VOLUME =      .75825 INCHES     =        .8492 ACRE-FEET
    PEAK DISCHARGE RATE =      29.05 CFS  AT   1.500 HOURS   BASIN AREA =   .0210 SQ. MI.


*S ADD BASIN 105 AND HYDROGRAPH NO. 103.1 TOGETHER
ADD HYD                ID=14 HYD NO=105.1 ID=12 ID=13
PRINT HYD              ID=14 CODE=1

                                  PARTIAL HYDROGRAPH   105.10


    RUNOFF VOLUME =      .92698 INCHES     =       3.2135 ACRE-FEET
    PEAK DISCHARGE RATE =     101.80 CFS  AT   1.533 HOURS   BASIN AREA =   .0650 SQ. MI.


*S ADD HYDROGRAPH NOs. 104.2 AND 105.1 TOGETHER
ADD HYD                ID=15 HYD NO=105.2 ID=10 ID=14
PRINT HYD              ID=15 CODE=1

                                  PARTIAL HYDROGRAPH   105.20
```

```
    RUNOFF VOLUME =       .97974 INCHES      =       13.4550 ACRE-FEET
    PEAK DISCHARGE RATE =     385.67 CFS  AT   1.567 HOURS   BASIN AREA =   .2575 SQ. MI.

*S BASIN 300.1 IS CURRENTLY UNDEVELOPED, ASSUME FUTURE DEVELOPMENT WILL BE @
*S A DENSITY OF 4 DU/AC
COMPUTE NM HYD       ID=16 HYD NO=300.1  AREA=0.0156 SQ MI
                     PER A=0  PER B=29  PER C=29  PER D=42
                     TP=-0.1333 HR  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   25.868    CFS   UNIT VOLUME =    .9989       B =   526.28      P60 = 1.8700
    AREA =      .006552 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   24.074    CFS   UNIT VOLUME =    .9999       B =   354.67      P60 = 1.8700
    AREA =      .009048 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=16  CODE=1

                                    HYDROGRAPH FROM AREA   300.10


    RUNOFF VOLUME =     1.29860 INCHES      =        1.0804 ACRE-FEET
    PEAK DISCHARGE RATE =      32.45 CFS  AT   1.500 HOURS   BASIN AREA =   .0156 SQ. MI.


*S ROUTE THE FLOW IN AN EXISTING RESIDENTIAL STREET-86TH ST. (ASSUME 28'F-F)
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEG=1 MIN EL=100.00 MAX EL=101.00
                     CH SLOPE=0.02 FP SLOPE=0.02 N=0.017 DIST=48.0
                     DIST  ELEV  DIST  ELEV  DIST  ELEV  DIST  ELEV
                      0   101.00 10.0 100.67 10.1 100.00 24.0 100.28
                     38.0 100.00 38.1 100.67 48.0 101.00
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
100.00	.00	.00	.00
100.05	.14	.15	5.26
100.11	.55	.95	10.52
100.16	1.25	2.80	15.78
100.21	2.22	6.03	21.04
100.26	3.46	10.94	26.30
100.32	4.92	18.84	27.99
100.37	6.39	29.08	28.01
100.42	7.87	41.00	28.03
100.47	9.34	54.46	28.04
100.53	10.82	69.37	28.06
100.58	12.30	85.66	28.07
100.63	13.78	103.24	28.09
100.68	15.26	119.89	28.96
100.74	16.87	132.52	32.13
100.79	18.64	147.34	35.31

```
                                    100.84       20.59       164.39       38.48
                                    100.89       22.69       183.72       41.66
                                    100.95       24.97       205.41       44.83
                                    101.00       27.41       229.56       48.00
COMPUTE TRAVEL TIME  ID=17 REACH NO=1 NO VS=1 L=357 FT SLP=0.02

                         TRAVEL TIME TABLE
                                     REACH=  1.0

                         WATER       AVERAGE     FLOW        TRAVEL
                         DEPTH       AREA        RATE        TIME
                         FEET        SQ.FT.      CFS         HRS
                            .053        .138         .15       .0917
                            .105        .554         .95       .0578
                            .158       1.246        2.80       .0441
                            .211       2.215        6.03       .0364
                            .263       3.461       10.94       .0314
                            .316       4.920       18.84       .0259
                            .368       6.394       29.08       .0218
                            .421       7.869       41.00       .0190
                            .474       9.344       54.46       .0170
                            .526      10.821       69.37       .0155
                            .579      12.298       85.66       .0142
                            .632      13.776      103.24       .0132
                            .684      15.261      119.89       .0126
                            .737      16.869      132.52       .0126
                            .790      18.644      147.34       .0125
                            .842      20.586      164.39       .0124
                            .895      22.695      183.72       .0122
                            .947      24.971      205.41       .0121
                           1.000      27.414      229.56       .0118
ROUTE                 ID=17 HYD NO=300.15 INFLOW ID=16 DT=0.0
PRINT HYD             ID=17 CODE=1

                                   HYDROGRAPH FROM AREA   300.15


    RUNOFF VOLUME =     1.29861 INCHES     =       1.0804 ACRE-FEET
    PEAK DISCHARGE RATE =      32.38 CFS  AT   1.533 HOURS   BASIN AREA =   .0156 SQ. MI.


*S ADD HYDROGRAPH NOs. 105.2 AND 300.15 TOGETHER
ADD HYD               ID=18 HYD NO=105.3 ID=15 ID=17
PRINT HYD             ID=18 CODE=1

                                PARTIAL HYDROGRAPH   105.30


    RUNOFF VOLUME =      .99795 INCHES     =      14.5354 ACRE-FEET
    PEAK DISCHARGE RATE =     416.92 CFS  AT   1.533 HOURS   BASIN AREA =   .2731 SQ. MI.


*S ROUTE THE FLOW IN AN EXISTING 28' F-F STREET-SAPPHIRE ST.
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEG=1 MIN EL=100.00 MAX EL=101.00
                     CH SLOPE=0.02 FP SLOPE=0.02 N=0.017 DIST=48.0
                     DIST  ELEV  DIST  ELEV  DIST  ELEV  DIST  ELEV
```

```
 0   101.00 10.0 100.67 10.1 100.00 24.0 100.28
38.0 100.00 38.1 100.67 48.0 101.00
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
100.00	.00	.00	.00
100.05	.14	.15	5.26
100.11	.55	.95	10.52
100.16	1.25	2.80	15.78
100.21	2.22	6.03	21.04
100.26	3.46	10.94	26.30
100.32	4.92	18.84	27.99
100.37	6.39	29.08	28.01
100.42	7.87	41.00	28.03
100.47	9.34	54.46	28.04
100.53	10.82	69.37	28.06
100.58	12.30	85.66	28.07
100.63	13.78	103.24	28.09
100.68	15.26	119.89	28.96
100.74	16.87	132.52	32.13
100.79	18.64	147.34	35.31
100.84	20.59	164.39	38.48
100.89	22.69	183.72	41.66
100.95	24.97	205.41	44.83
101.00	27.41	229.56	48.00

```
COMPUTE TRAVEL TIME  ID=19 REACH NO=1 NO VS=1 L=881 FT SLP=0.02
```

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.053	.138	.15	.2263
.105	.554	.95	.1426
.158	1.246	2.80	.1088
.211	2.215	6.03	.0898
.263	3.461	10.94	.0774
.316	4.920	18.84	.0639
.368	6.394	29.08	.0538
.421	7.869	41.00	.0470
.474	9.344	54.46	.0420
.526	10.821	69.37	.0382
.579	12.298	85.66	.0351
.632	13.776	103.24	.0327
.684	15.261	119.89	.0311
.737	16.869	132.52	.0312
.790	18.644	147.34	.0310
.842	20.586	164.39	.0306
.895	22.695	183.72	.0302
.947	24.971	205.41	.0297
1.000	27.414	229.56	.0292

```
   ROUTE                ID=19 HYD NO=105.4 INFLOW ID=18 DT=0.0
TRAVEL TIME TABLE EXCEEDED
   PRINT HYD            ID=19 CODE=1
```

```
                                PARTIAL HYDROGRAPH   105.40

    RUNOFF VOLUME =       .99795 INCHES      =       14.5355 ACRE-FEET
    PEAK DISCHARGE RATE =     401.89 CFS  AT   1.567 HOURS   BASIN AREA =   .2731 SQ. MI.


*S AREA 106 IS FULLY DEVELOPED
COMPUTE NM HYD       ID=20 HYD NO=106.00 AREA=0.02177 SQ MI
                     PER A=33 PER B=19 PER C=19 PER D=29
                     TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   24.925    CFS   UNIT VOLUME =    .9989       B =   526.28      P60 = 1.8700
    AREA =      .006313 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .139463HR    TP =   .133300HR    K/TP RATIO =  1.046235     SHAPE CONSTANT, N =  3.374403
    UNIT PEAK =   36.067    CFS   UNIT VOLUME =    .9997       B =   311.05      P60 = 1.8700
    AREA =      .015457 SQ MI    IA =    .52958 INCHES    INF =   1.33282 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=20   CODE=1

                                PARTIAL HYDROGRAPH   106.00

    RUNOFF VOLUME =     1.00753 INCHES      =        1.1698 ACRE-FEET
    PEAK DISCHARGE RATE =      35.84 CFS  AT   1.500 HOURS   BASIN AREA =   .0218 SQ. MI.


*S **ADD THE FLOWS FROM BASIN 106 AND HYDROGRAPH NO 105.4 TOGETHER: ANALYSIS PT
ADD HYD              ID=1  HYD NO=106.1  ID=19 ID=20
PRINT HYD            ID=1  CODE=1

                                PARTIAL HYDROGRAPH   106.10

    RUNOFF VOLUME =       .99866 INCHES      =       15.7052 ACRE-FEET
    PEAK DISCHARGE RATE =     433.32 CFS  AT   1.567 HOURS   BASIN AREA =   .2949 SQ. MI.


*S ROUTE THE ABOVE FLOW ON SAPPHIRE ST.
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEG=1 MIN EL=100.00 MAX EL=101.00
                     CH SLOPE=0.02 FP SLOPE=0.02 N=0.017 DIST=48.0
                     DIST  ELEV  DIST  ELEV  DIST  ELEV  DIST  ELEV
                      0   101.00 10.0 100.67 10.1 100.00 24.0 100.28
                     38.0 100.00 38.1 100.67 48.0 101.00

                                RATING CURVE VALLEY SECTION  1.0
                                   WATER       FLOW        FLOW        TOP
                                  SURFACE      AREA        RATE        WIDTH
                                   ELEV        SQ FT       CFS         FT
```

100.00	.00	.00	.00
100.05	.14	.15	5.26
100.11	.55	.95	10.52
100.16	1.25	2.80	15.78
100.21	2.22	6.03	21.04
100.26	3.46	10.94	26.30
100.32	4.92	18.84	27.99
100.37	6.39	29.08	28.01
100.42	7.87	41.00	28.03
100.47	9.34	54.46	28.04
100.53	10.82	69.37	28.06
100.58	12.30	85.66	28.07
100.63	13.78	103.24	28.09
100.68	15.26	119.89	28.96
100.74	16.87	132.52	32.13
100.79	18.64	147.34	35.31
100.84	20.59	164.39	38.48
100.89	22.69	183.72	41.66
100.95	24.97	205.41	44.83
101.00	27.41	229.56	48.00

COMPUTE TRAVEL TIME ID=2 REACH NO=1 NO VS=1 L=278 FT SLP=0.02

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.053	.138	.15	.0714
.105	.554	.95	.0450
.158	1.246	2.80	.0343
.211	2.215	6.03	.0283
.263	3.461	10.94	.0244
.316	4.920	18.84	.0202
.368	6.394	29.08	.0170
.421	7.869	41.00	.0148
.474	9.344	54.46	.0132
.526	10.821	69.37	.0120
.579	12.298	85.66	.0111
.632	13.776	103.24	.0103
.684	15.261	119.89	.0098
.737	16.869	132.52	.0098
.790	18.644	147.34	.0098
.842	20.586	164.39	.0097
.895	22.695	183.72	.0095
.947	24.971	205.41	.0094
1.000	27.414	229.56	.0092

ROUTE ID=2 HYD NO=106.2 INFLOW ID=1 DT=0.0
TRAVEL TIME TABLE EXCEEDED
PRINT HYD ID=2 CODE=1

PARTIAL HYDROGRAPH 106.20

RUNOFF VOLUME = .99866 INCHES = 15.7052 ACRE-FEET
PEAK DISCHARGE RATE = 430.80 CFS AT 1.600 HOURS BASIN AREA = .2949 SQ. MI.

```
*S  **BASIN 401.12, 401.14, 401.17, 300.2 AND 400.2 DRAINS TO SAPPHIRE ST.
*S  **BASIN 401.12 IS PART OF SUNRISE ESTATES UNIT 1
COMPUTE NM HYD       ID=3 HYD NO=401.12 AREA=0.01126 SQ MI
                     PER A=0 PER B=29 PER C=29 PER D=42
                     TP=-0.1333 HR  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   18.671    CFS   UNIT VOLUME =    .9988       B =   526.28      P60 = 1.8700
    AREA =      .004729 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   17.376    CFS   UNIT VOLUME =    .9997       B =   354.67      P60 = 1.8700
    AREA =      .006531 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=3  CODE=1

                                    HYDROGRAPH FROM AREA   401.12


    RUNOFF VOLUME =     1.29860 INCHES     =        .7798 ACRE-FEET
    PEAK DISCHARGE RATE =      23.43 CFS  AT   1.500 HOURS   BASIN AREA =   .0113 SQ. MI.


*S  **ADD THE FLOWS FROM HYDROGRAPH NO 401.12 AND 106.2
ADD HYD              ID=4 HYD NO=401.13 ID=2 ID=3
PRINT HYD            ID=4  CODE=1

                                    HYDROGRAPH FROM AREA   401.13


    RUNOFF VOLUME =     1.00969 INCHES     =      16.4851 ACRE-FEET
    PEAK DISCHARGE RATE =     447.77 CFS  AT   1.600 HOURS   BASIN AREA =   .3061 SQ. MI.


*S ROUTE THE ABOVE FLOW ON SAPPHIRE STREET (28' F-F)
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEG=1 MIN EL=100.00 MAX EL=101.00
                     CH SLOPE=0.02 FP SLOPE=0.02 N=0.017 DIST=48.0
                     DIST  ELEV  DIST  ELEV  DIST  ELEV  DIST  ELEV
                      0   101.00 10.0 100.67 10.1 100.00 24.0 100.28
                     38.0 100.00 38.1 100.67 48.0 101.00

                                RATING CURVE VALLEY SECTION  1.0
                                   WATER       FLOW        FLOW        TOP
                                  SURFACE      AREA        RATE        WIDTH
                                   ELEV        SQ FT       CFS         FT
                                  100.00         .00         .00         .00
                                  100.05         .14         .15        5.26
                                  100.11         .55         .95       10.52
                                  100.16        1.25        2.80       15.78
                                  100.21        2.22        6.03       21.04
                                  100.26        3.46       10.94       26.30
                                  100.32        4.92       18.84       27.99
```

100.37	6.39	29.08	28.01
100.42	7.87	41.00	28.03
100.47	9.34	54.46	28.04
100.53	10.82	69.37	28.06
100.58	12.30	85.66	28.07
100.63	13.78	103.24	28.09
100.68	15.26	119.89	28.96
100.74	16.87	132.52	32.13
100.79	18.64	147.34	35.31
100.84	20.59	164.39	38.48
100.89	22.69	183.72	41.66
100.95	24.97	205.41	44.83
101.00	27.41	229.56	48.00

```
COMPUTE TRAVEL TIME  ID=5 REACH NO=1 NO VS=1 L=278 FT SLP=0.02
```

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.053	.138	.15	.0714
.105	.554	.95	.0450
.158	1.246	2.80	.0343
.211	2.215	6.03	.0283
.263	3.461	10.94	.0244
.316	4.920	18.84	.0202
.368	6.394	29.08	.0170
.421	7.869	41.00	.0148
.474	9.344	54.46	.0132
.526	10.821	69.37	.0120
.579	12.298	85.66	.0111
.632	13.776	103.24	.0103
.684	15.261	119.89	.0098
.737	16.869	132.52	.0098
.790	18.644	147.34	.0098
.842	20.586	164.39	.0097
.895	22.695	183.72	.0095
.947	24.971	205.41	.0094
1.000	27.414	229.56	.0092

```
   ROUTE                ID=5 HYD NO=401.13 INFLOW ID=4 DT=0.0
TRAVEL TIME TABLE EXCEEDED
   PRINT HYD            ID=5 CODE=1
```

HYDROGRAPH FROM AREA 401.13

```
    RUNOFF VOLUME =     1.00969 INCHES     =     16.4851 ACRE-FEET
    PEAK DISCHARGE RATE =     449.54 CFS  AT   1.600 HOURS   BASIN AREA =   .3061 SQ. MI.


   *S  **BASIN 300.2 IS CURRENTLY UNDEVELOPED, ASSUME FUTURE DEVELOPMENT WILL BE
   *S  @ A DENSITY OF 4 DU/AC
   COMPUTE NM HYD       ID=6 HYD NO=300.2 AREA=0.0118 SQ MI
                        PER A=0  PER B=29  PER C=29  PER D=42
                        TP=-0.1333 HR MASS RAIN=-1
```

```
K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
UNIT PEAK =    19.567    CFS    UNIT VOLUME =    .9988        B =    526.28      P60 = 1.8700
AREA =       .004956 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330

K =    .118429HR    TP =    .133300HR    K/TP RATIO =    .888442     SHAPE CONSTANT, N =  3.992480
UNIT PEAK =    18.210    CFS    UNIT VOLUME =    .9997        B =    354.67      P60 = 1.8700
AREA =       .006844 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330

PRINT HYD            ID=6  CODE=1

                                    HYDROGRAPH FROM AREA   300.20


RUNOFF VOLUME =      1.29859 INCHES      =         .8172 ACRE-FEET
PEAK DISCHARGE RATE =       24.55 CFS  AT   1.500 HOURS   BASIN AREA =    .0118 SQ. MI.


*S ROUTE THE FLOW IN AN EXISTING 28' F-F STREET-82nd ST.
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEG=1 MIN EL=100.00 MAX EL=101.00
                     CH SLOPE=0.02 FP SLOPE=0.02 N=0.017 DIST=48.0
                     DIST  ELEV  DIST  ELEV  DIST  ELEV  DIST  ELEV
                      0   101.00 10.0 100.67 10.1 100.00 24.0 100.28
                     38.0 100.00 38.1 100.67 48.0 101.00

                                RATING CURVE VALLEY SECTION  1.0
                                    WATER       FLOW        FLOW        TOP
                                   SURFACE      AREA        RATE       WIDTH
                                    ELEV        SQ FT       CFS        FT
                                   100.00        .00         .00        .00
                                   100.05        .14         .15       5.26
                                   100.11        .55         .95      10.52
                                   100.16       1.25        2.80      15.78
                                   100.21       2.22        6.03      21.04
                                   100.26       3.46       10.94      26.30
                                   100.32       4.92       18.84      27.99
                                   100.37       6.39       29.08      28.01
                                   100.42       7.87       41.00      28.03
                                   100.47       9.34       54.46      28.04
                                   100.53      10.82       69.37      28.06
                                   100.58      12.30       85.66      28.07
                                   100.63      13.78      103.24      28.09
                                   100.68      15.26      119.89      28.96
                                   100.74      16.87      132.52      32.13
                                   100.79      18.64      147.34      35.31
                                   100.84      20.59      164.39      38.48
                                   100.89      22.69      183.72      41.66
                                   100.95      24.97      205.41      44.83
                                   101.00      27.41      229.56      48.00
COMPUTE TRAVEL TIME  ID=7 REACH NO=1 NO VS=1 L=635 FT SLP=0.02

                         TRAVEL TIME TABLE
                                      REACH=  1.0

                         WATER       AVERAGE     FLOW        TRAVEL
                         DEPTH       AREA        RATE        TIME
```

FEET	SQ.FT.	CFS	HRS
.053	.138	.15	.1631
.105	.554	.95	.1028
.158	1.246	2.80	.0784
.211	2.215	6.03	.0647
.263	3.461	10.94	.0558
.316	4.920	18.84	.0461
.368	6.394	29.08	.0388
.421	7.869	41.00	.0339
.474	9.344	54.46	.0303
.526	10.821	69.37	.0275
.579	12.298	85.66	.0253
.632	13.776	103.24	.0235
.684	15.261	119.89	.0225
.737	16.869	132.52	.0225
.790	18.644	147.34	.0223
.842	20.586	164.39	.0221
.895	22.695	183.72	.0218
.947	24.971	205.41	.0214
1.000	27.414	229.56	.0211

```
ROUTE                ID=7 HYD NO=300.3 INFLOW ID=6 DT=0.0
PRINT HYD            ID=7 CODE=1

                                HYDROGRAPH FROM AREA   300.30

    RUNOFF VOLUME =     1.29861 INCHES     =        .8173 ACRE-FEET
    PEAK DISCHARGE RATE =      23.60 CFS  AT   1.533 HOURS   BASIN AREA =   .0118 SQ. MI.

*S ** BASIN 401.14 IS PART OF SUNRISE ESTATES UNIT 1
COMPUTE NM HYD       ID=8 HYD NO=401.14 AREA=0.01117 SQ MI
                     PER A=0 PER B=29 PER C=29 PER D=42
                     TP=-0.1333 HR MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   18.522    CFS   UNIT VOLUME =    .9988       B =   526.28      P60 = 1.8700
    AREA =      .004691 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   17.237    CFS   UNIT VOLUME =    .9997       B =   354.67      P60 = 1.8700
    AREA =      .006479 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=8 CODE=1

                                HYDROGRAPH FROM AREA   401.14

    RUNOFF VOLUME =     1.29860 INCHES     =        .7736 ACRE-FEET
    PEAK DISCHARGE RATE =      23.24 CFS  AT   1.500 HOURS   BASIN AREA =   .0112 SQ. MI.


*S  **ADD FLOWS FROM HYDROGRAPH NO 401.14 AND 300.3
```

```
ADD HYD              ID=9 HYD NO=401.15 ID=7 ID=8
PRINT HYD            ID=9 CODE=1

                                        HYDROGRAPH FROM AREA   401.15

    RUNOFF VOLUME =     1.29858 INCHES     =       1.5908 ACRE-FEET
    PEAK DISCHARGE RATE =      46.09 CFS  AT   1.533 HOURS   BASIN AREA =   .0230 SQ. MI.


*S **ADD FLOWS FROM HYDROGRAPH NO 401.13 AND 401.15
ADD HYD              ID=10 HYD NO=401.16 ID=5 ID=9
PRINT HYD            ID=10 CODE=1

                                        HYDROGRAPH FROM AREA   401.16

    RUNOFF VOLUME =     1.02985 INCHES     =      18.0759 ACRE-FEET
    PEAK DISCHARGE RATE =     486.63 CFS  AT   1.600 HOURS   BASIN AREA =   .3291 SQ. MI.


*S ROUTE THE ABOVE FLOW ON AN SAPPHIRE ST.
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEG=1 MIN EL=100.00 MAX EL=101.00
                     CH SLOPE=0.02 FP SLOPE=0.02 N=0.017 DIST=48.0
                     DIST  ELEV  DIST  ELEV  DIST  ELEV  DIST  ELEV
                      0   101.00 10.0 100.67 10.1 100.00 24.0 100.28
                     38.0 100.00 38.1 100.67 48.0 101.00

                                RATING CURVE VALLEY SECTION  1.0
                                   WATER       FLOW        FLOW        TOP
                                  SURFACE      AREA        RATE        WIDTH
                                   ELEV        SQ FT       CFS         FT
                                  100.00         .00         .00         .00
                                  100.05         .14         .15        5.26
                                  100.11         .55         .95       10.52
                                  100.16        1.25        2.80       15.78
                                  100.21        2.22        6.03       21.04
                                  100.26        3.46       10.94       26.30
                                  100.32        4.92       18.84       27.99
                                  100.37        6.39       29.08       28.01
                                  100.42        7.87       41.00       28.03
                                  100.47        9.34       54.46       28.04
                                  100.53       10.82       69.37       28.06
                                  100.58       12.30       85.66       28.07
                                  100.63       13.78      103.24       28.09
                                  100.68       15.26      119.89       28.96
                                  100.74       16.87      132.52       32.13
                                  100.79       18.64      147.34       35.31
                                  100.84       20.59      164.39       38.48
                                  100.89       22.69      183.72       41.66
                                  100.95       24.97      205.41       44.83
                                  101.00       27.41      229.56       48.00
COMPUTE TRAVEL TIME  ID=11 REACH NO=1 NO VS=1 L=278 FT SLP=0.02

                         TRAVEL TIME TABLE
                                     REACH=  1.0
```

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.053	.138	.15	.0714
.105	.554	.95	.0450
.158	1.246	2.80	.0343
.211	2.215	6.03	.0283
.263	3.461	10.94	.0244
.316	4.920	18.84	.0202
.368	6.394	29.08	.0170
.421	7.869	41.00	.0148
.474	9.344	54.46	.0132
.526	10.821	69.37	.0120
.579	12.298	85.66	.0111
.632	13.776	103.24	.0103
.684	15.261	119.89	.0098
.737	16.869	132.52	.0098
.790	18.644	147.34	.0098
.842	20.586	164.39	.0097
.895	22.695	183.72	.0095
.947	24.971	205.41	.0094
1.000	27.414	229.56	.0092

```
   ROUTE                ID=11 HYD NO=401.16 INFLOW ID=10 DT=0.0
TRAVEL TIME TABLE EXCEEDED
   PRINT HYD            ID=11 CODE=1

                                   HYDROGRAPH FROM AREA   401.16

   RUNOFF VOLUME =     1.02985 INCHES     =      18.0759 ACRE-FEET
   PEAK DISCHARGE RATE =     486.88 CFS  AT   1.600 HOURS   BASIN AREA =   .3291 SQ. MI.


*S **BASIN 401.17 IS PART OF SUNRISE ESTATES UNIT 1
COMPUTE NM HYD      ID=12 HYD NO=401.17 AREA=0.00661 SQ MI
                    PER A=0 PER B=29 PER C=29 PER D=42
                    TP=-0.1333 HR MASS RAIN=-1

   K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
   UNIT PEAK =   10.961    CFS   UNIT VOLUME =    .9984       B =   526.28      P60 = 1.8700
   AREA =      .002776 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
   RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


   K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
   UNIT PEAK =   10.201    CFS   UNIT VOLUME =    .9992       B =   354.67      P60 = 1.8700
   AREA =      .003834 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
   RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=12 CODE=1

                                   HYDROGRAPH FROM AREA   401.17


   RUNOFF VOLUME =     1.29860 INCHES     =        .4578 ACRE-FEET
   PEAK DISCHARGE RATE =      13.76 CFS  AT   1.500 HOURS   BASIN AREA =   .0066 SQ. MI.
```

```
*S  **ADD FLOWS FROM HYDROGRAPH NO 401.16 AND 401.17
ADD HYD              ID=13 HYD NO=401.18 ID=11 ID=12
PRINT HYD            ID=13 CODE=1
```

HYDROGRAPH FROM AREA 401.18

RUNOFF VOLUME = 1.03514 INCHES = 18.5337 ACRE-FEET
PEAK DISCHARGE RATE = 496.85 CFS AT 1.600 HOURS BASIN AREA = .3357 SQ. MI.

```
*S ROUTE THE ABOVE FLOW ON AN SAPPHIRE ST. TO UNSER BLVD.
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEG=1 MIN EL=100.00 MAX EL=101.00
                     CH SLOPE=0.02 FP SLOPE=0.02 N=0.017 DIST=48.0
                     DIST  ELEV  DIST  ELEV  DIST  ELEV  DIST  ELEV
                      0   101.00 10.0 100.67 10.1 100.00 24.0 100.28
                     38.0 100.00 38.1 100.67 48.0 101.00
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
100.00	.00	.00	.00
100.05	.14	.15	5.26
100.11	.55	.95	10.52
100.16	1.25	2.80	15.78
100.21	2.22	6.03	21.04
100.26	3.46	10.94	26.30
100.32	4.92	18.84	27.99
100.37	6.39	29.08	28.01
100.42	7.87	41.00	28.03
100.47	9.34	54.46	28.04
100.53	10.82	69.37	28.06
100.58	12.30	85.66	28.07
100.63	13.78	103.24	28.09
100.68	15.26	119.89	28.96
100.74	16.87	132.52	32.13
100.79	18.64	147.34	35.31
100.84	20.59	164.39	38.48
100.89	22.69	183.72	41.66
100.95	24.97	205.41	44.83
101.00	27.41	229.56	48.00

```
COMPUTE TRAVEL TIME  ID=14 REACH NO=1 NO VS=1 L=500 FT SLP=0.02
```

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.053	.138	.15	.1285
.105	.554	.95	.0809
.158	1.246	2.80	.0618
.211	2.215	6.03	.0510
.263	3.461	10.94	.0439
.316	4.920	18.84	.0363

```
                                .368       6.394       29.08       .0305
                                .421       7.869       41.00       .0267
                                .474       9.344       54.46       .0238
                                .526      10.821       69.37       .0217
                                .579      12.298       85.66       .0199
                                .632      13.776      103.24       .0185
                                .684      15.261      119.89       .0177
                                .737      16.869      132.52       .0177
                                .790      18.644      147.34       .0176
                                .842      20.586      164.39       .0174
                                .895      22.695      183.72       .0172
                                .947      24.971      205.41       .0169
                               1.000      27.414      229.56       .0166
    ROUTE                 ID=14 HYD NO=401.19 INFLOW ID=13 DT=0.0
TRAVEL TIME TABLE EXCEEDED
    PRINT HYD             ID=14 CODE=1

                                        HYDROGRAPH FROM AREA   401.19


        RUNOFF VOLUME =     1.03515 INCHES     =      18.5337 ACRE-FEET
        PEAK DISCHARGE RATE =     488.16 CFS  AT   1.633 HOURS   BASIN AREA =   .3357 SQ. MI.


    *S ** BASIN 403 DRAINS TO SAPPHIRE ST.
    COMPUTE NM HYD       ID=15  HYD NO=403.0  AREA=0.0148 SQ MI
                         PER A=0 PER B=29 PER C=29 PER D=42
                         TP=-0.1333 HR MASS RAIN=-1

        K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
        UNIT PEAK =   24.541    CFS   UNIT VOLUME =    .9989       B =   526.28      P60 = 1.8700
        AREA =      .006216 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


        K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
        UNIT PEAK =   22.839    CFS   UNIT VOLUME =    .9999       B =   354.67      P60 = 1.8700
        AREA =      .008584 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
        RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

    PRINT HYD            ID=15  CODE=1

                                        HYDROGRAPH FROM AREA   403.00


        RUNOFF VOLUME =     1.29860 INCHES     =       1.0250 ACRE-FEET
        PEAK DISCHARGE RATE =      30.79 CFS  AT   1.500 HOURS   BASIN AREA =   .0148 SQ. MI.


    *S  **ADD FLOWS FROM HYDROGRAPH NO 401.19 AND 403
    ADD HYD              ID=16 HYD NO=401.2  ID=14 ID=15
    PRINT HYD            ID=16 CODE=1

                                        HYDROGRAPH FROM AREA   401.20
```

```
    RUNOFF VOLUME =      1.04627 INCHES      =       19.5587 ACRE-FEET
    PEAK DISCHARGE RATE =      507.77 CFS  AT   1.600 HOURS   BASIN AREA =   .3505 SQ. MI.


*S ** BASIN 400.2 IS CURRENTLY UNDEVELOPED, ASSUME FUTURE DEVELOPMENT WILL BE
*S @ A DENSITY OF 9 DU/AC
COMPUTE NM HYD       ID=17  HYD NO=400.2  AREA=0.032215 SQ MI
                     PER A=0 PER B=11 PER C=11 PER D=78
                     TP=-0.1333 HR MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   99.205    CFS   UNIT VOLUME =    .9993       B =   526.28      P60 = 1.8700
    AREA =       .025128 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   18.857    CFS   UNIT VOLUME =    .9997       B =   354.67      P60 = 1.8700
    AREA =       .007087 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=17  CODE=1

                                    HYDROGRAPH FROM AREA   400.20


    RUNOFF VOLUME =      1.71253 INCHES      =        2.9423 ACRE-FEET
    PEAK DISCHARGE RATE =       81.34 CFS  AT   1.500 HOURS   BASIN AREA =   .0322 SQ. MI.


*S ROUTE THE ABOVE FLOW ON UNSER BLVD. TO SAPPHIRE ST. (ASSUME 24' F-F)
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEG=1 MIN EL=100.00 MAX EL=101.00
                     CH SLOPE=0.02 FP SLOPE=0.02 N=0.017 DIST=48.0
                     DIST  ELEV  DIST  ELEV  DIST  ELEV  DIST  ELEV
                      0   101.00 10.0 100.67 10.1 100.00 24.0 100.28
                     38.0 100.00 38.1 100.67 48.0 101.00
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
100.00	.00	.00	.00
100.05	.14	.15	5.26
100.11	.55	.95	10.52
100.16	1.25	2.80	15.78
100.21	2.22	6.03	21.04
100.26	3.46	10.94	26.30
100.32	4.92	18.84	27.99
100.37	6.39	29.08	28.01
100.42	7.87	41.00	28.03
100.47	9.34	54.46	28.04
100.53	10.82	69.37	28.06
100.58	12.30	85.66	28.07
100.63	13.78	103.24	28.09
100.68	15.26	119.89	28.96

100.74	16.87	132.52	32.13
100.79	18.64	147.34	35.31
100.84	20.59	164.39	38.48
100.89	22.69	183.72	41.66
100.95	24.97	205.41	44.83
101.00	27.41	229.56	48.00

```
COMPUTE TRAVEL TIME  ID=18 REACH NO=1 NO VS=1 L=738 FT SLP=0.02
```

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.053	.138	.15	.1896
.105	.554	.95	.1194
.158	1.246	2.80	.0912
.211	2.215	6.03	.0752
.263	3.461	10.94	.0648
.316	4.920	18.84	.0535
.368	6.394	29.08	.0451
.421	7.869	41.00	.0393
.474	9.344	54.46	.0352
.526	10.821	69.37	.0320
.579	12.298	85.66	.0294
.632	13.776	103.24	.0274
.684	15.261	119.89	.0261
.737	16.869	132.52	.0261
.790	18.644	147.34	.0259
.842	20.586	164.39	.0257
.895	22.695	183.72	.0253
.947	24.971	205.41	.0249
1.000	27.414	229.56	.0245

```
ROUTE                ID=18 HYD NO=400.3 INFLOW ID=17 DT=0.0
PRINT HYD            ID=18 CODE=1
```

HYDROGRAPH FROM AREA 400.30

```
RUNOFF VOLUME =     1.71253 INCHES     =       2.9423 ACRE-FEET
PEAK DISCHARGE RATE =      80.15 CFS  AT   1.533 HOURS   BASIN AREA =   .0322 SQ. MI.


*S ** BASIN 405 DRAINS TO SAPPHIRE ST.
COMPUTE NM HYD       ID=19  HYD NO=405.0  AREA=0.013934 SQ MI
                     PER A=0 PER B=28 PER C=28 PER D=44
                     TP=-0.1333 HR MASS RAIN=-1

K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
UNIT PEAK =   24.205    CFS   UNIT VOLUME =    .9989       B =   526.28      P60 = 1.8700
AREA =      .006131 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
UNIT PEAK =   20.761    CFS   UNIT VOLUME =    .9998       B =   354.67      P60 = 1.8700
AREA =      .007803 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
```

```
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330

PRINT HYD           ID=19  CODE=1

                                        HYDROGRAPH FROM AREA   405.00

    RUNOFF VOLUME =     1.32159 INCHES     =        .9821 ACRE-FEET
    PEAK DISCHARGE RATE =      29.33 CFS  AT   1.500 HOURS   BASIN AREA =   .0139 SQ. MI.


*S  **ADD FLOWS FROM HYDROGRAPH NO 400.3 AND 405
ADD HYD             ID=20 HYD NO=405.1  ID=18 ID=19
PRINT HYD           ID=20 CODE=1

                                        HYDROGRAPH FROM AREA   405.10

    RUNOFF VOLUME =     1.59448 INCHES     =       3.9244 ACRE-FEET
    PEAK DISCHARGE RATE =     108.51 CFS  AT   1.533 HOURS   BASIN AREA =   .0461 SQ. MI.


*S  **ADD FLOWS FROM HYDROGRAPH NO 405.1 AND 401.2: ANALYSIS PT B
ADD HYD             ID=1 HYD NO=405.2  ID=20 ID=16
PRINT HYD           ID=1 CODE=1

                                        HYDROGRAPH FROM AREA   405.20

    RUNOFF VOLUME =     1.11005 INCHES     =      23.4831 ACRE-FEET
    PEAK DISCHARGE RATE =     592.25 CFS  AT   1.600 HOURS   BASIN AREA =   .3967 SQ. MI.


*************************************************************************
*************************************************************************
*S **BASINS 200,201, & 202 DRAIN TO KIMELA DR
COMPUTE NM HYD      ID=2 HYD NO=200.00 AREA=0.053 SQ MI
                    PER A=33 PER B=19 PER C=19 PER D=29
                    TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   60.682    CFS   UNIT VOLUME =    .9992       B =   526.28      P60 = 1.8700
    AREA =      .015370 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330


    K =   .139463HR    TP =   .133300HR    K/TP RATIO =  1.046235     SHAPE CONSTANT, N =  3.374403
    UNIT PEAK =   87.807    CFS   UNIT VOLUME =    .9999       B =   311.05      P60 = 1.8700
    AREA =      .037630 SQ MI    IA =    .52958 INCHES    INF =   1.33282 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330

PRINT HYD           ID=2   CODE=1

                                    PARTIAL HYDROGRAPH   200.00
```

RUNOFF VOLUME = 1.00753 INCHES = 2.8479 ACRE-FEET
PEAK DISCHARGE RATE = 87.23 CFS AT 1.500 HOURS BASIN AREA = .0530 SQ. MI.

*S **ROUTE FLOW ABOVE ON KIMELA DR.
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEG=1 MIN EL=100.00 MAX EL=101.00
CH SLOPE=0.02 FP SLOPE=0.02 N=0.017 DIST=48.0

DIST	ELEV	DIST	ELEV	DIST	ELEV	DIST	ELEV
0	101.00	10.0	100.67	10.1	100.00	24.0	100.28
38.0	100.00	38.1	100.67	48.0	101.00		

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
100.00	.00	.00	.00
100.05	.14	.15	5.26
100.11	.55	.95	10.52
100.16	1.25	2.80	15.78
100.21	2.22	6.03	21.04
100.26	3.46	10.94	26.30
100.32	4.92	18.84	27.99
100.37	6.39	29.08	28.01
100.42	7.87	41.00	28.03
100.47	9.34	54.46	28.04
100.53	10.82	69.37	28.06
100.58	12.30	85.66	28.07
100.63	13.78	103.24	28.09
100.68	15.26	119.89	28.96
100.74	16.87	132.52	32.13
100.79	18.64	147.34	35.31
100.84	20.59	164.39	38.48
100.89	22.69	183.72	41.66
100.95	24.97	205.41	44.83
101.00	27.41	229.56	48.00

COMPUTE TRAVEL TIME ID=3 REACH NO=1 NO VS=1 L=595 FT SLP=0.02

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.053	.138	.15	.1529
.105	.554	.95	.0963
.158	1.246	2.80	.0735
.211	2.215	6.03	.0607
.263	3.461	10.94	.0523
.316	4.920	18.84	.0432
.368	6.394	29.08	.0363
.421	7.869	41.00	.0317
.474	9.344	54.46	.0284
.526	10.821	69.37	.0258
.579	12.298	85.66	.0237
.632	13.776	103.24	.0221

```
                                .684      15.261      119.89       .0210
                                .737      16.869      132.52       .0210
                                .790      18.644      147.34       .0209
                                .842      20.586      164.39       .0207
                                .895      22.695      183.72       .0204
                                .947      24.971      205.41       .0201
                               1.000      27.414      229.56       .0197
ROUTE                  ID=3 HYD NO=200.1 INFLOW ID=2 DT=0.0
PRINT HYD              ID=3 CODE=1

                                PARTIAL HYDROGRAPH   200.10

    RUNOFF VOLUME =     1.00753 INCHES     =       2.8479 ACRE-FEET
    PEAK DISCHARGE RATE =      87.73 CFS  AT   1.533 HOURS   BASIN AREA =   .0530 SQ. MI.


*S COMPUTE DISCHARGE FOR BASIN 201
COMPUTE NM HYD       ID=4 HYD NO=201.00 AREA=0.026 SQ MI
                     PER A=33 PER B=19 PER C=19 PER D=29
                     TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   29.768    CFS   UNIT VOLUME =    .9990       B =   526.28      P60 = 1.8700
    AREA =      .007540 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

    K =   .139463HR    TP =   .133300HR    K/TP RATIO =  1.046235     SHAPE CONSTANT, N =  3.374403
    UNIT PEAK =   43.075    CFS   UNIT VOLUME =    .9997       B =   311.05      P60 = 1.8700
    AREA =      .018460 SQ MI    IA =    .52958 INCHES    INF =   1.33282 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=4  CODE=1

                                PARTIAL HYDROGRAPH   201.00

    RUNOFF VOLUME =     1.00753 INCHES     =       1.3971 ACRE-FEET
    PEAK DISCHARGE RATE =      42.80 CFS  AT   1.500 HOURS   BASIN AREA =   .0260 SQ. MI.


*S ADD HYDROGRAPHS NO. 201 AND 200.1 TOGETHER
ADD HYD              ID=5 HYD NO=201.1 ID=3 ID=4
PRINT HYD            ID=5 CODE=1

                                PARTIAL HYDROGRAPH   201.10

    RUNOFF VOLUME =     1.00752 INCHES     =       4.2450 ACRE-FEET
    PEAK DISCHARGE RATE =     129.70 CFS  AT   1.533 HOURS   BASIN AREA =   .0790 SQ. MI.


*S ROUTE THE ABOVE FLOW TO THE END OF KIMELA DR.
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEG=1 MIN EL=100.00 MAX EL=101.00
```

```
                                PARTIAL HYDROGRAPH   200.20

    RUNOFF VOLUME =     1.00753 INCHES     =       4.2450 ACRE-FEET
    PEAK DISCHARGE RATE =     129.97 CFS  AT   1.533 HOURS   BASIN AREA =   .0790 SQ. MI.


*S **BASIN 202 IS AN ELEMENTARY SCHOOL (ONSITE DETENTION TO REDUCE RUNOFF)
COMPUTE NM HYD      ID=7 HYD NO=202.00 AREA=0.009253 SQ MI
                    PER A=100 PER B=0 PER C=0 PER D=0
                    TP=-0.1333 HR   MASS RAIN=-1

    K =   .163684HR    TP =   .133300HR    K/TP RATIO =  1.227936     SHAPE CONSTANT, N =  2.899764
    UNIT PEAK =   18.988    CFS   UNIT VOLUME =    .9989       B =   273.54      P60 = 1.8700
    AREA =      .009253 SQ MI    IA =    .65000 INCHES    INF =   1.67000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=7   CODE=1

                                PARTIAL HYDROGRAPH   202.00

    RUNOFF VOLUME =      .43925 INCHES     =        .2168 ACRE-FEET
    PEAK DISCHARGE RATE =       7.69 CFS  AT   1.533 HOURS   BASIN AREA =   .0093 SQ. MI.


*S **BASIN 202.05 IS THE ELEMENTARY SCHOOL PARKING LOT THAT WILL DRAIN TO KIMELA
COMPUTE NM HYD      ID=8  HYD NO=202.05 AREA=0.003747 SQ MI
                    PER A=0  PER B=0  PER C=0  PER D=100
                    TP=-0.1333 HR  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   14.793    CFS   UNIT VOLUME =    .9987       B =   526.28      P60 = 1.8700
    AREA =      .003747 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=8  CODE=1

                                PARTIAL HYDROGRAPH   202.05

    RUNOFF VOLUME =     1.96548 INCHES     =        .3928 ACRE-FEET
    PEAK DISCHARGE RATE =      10.49 CFS  AT   1.500 HOURS   BASIN AREA =   .0037 SQ. MI.


*S **ADD THE BASINS OF THE ELEMENTARY SCHOOL AND PARKING LOT
ADD HYD             ID=9  HYD NO=202.06 ID I=7  ID II=8
PRINT HYD           ID=9  CODE=1

                                PARTIAL HYDROGRAPH   202.06

    RUNOFF VOLUME =      .87913 INCHES     =        .6095 ACRE-FEET
    PEAK DISCHARGE RATE =      18.01 CFS  AT   1.500 HOURS   BASIN AREA =   .0130 SQ. MI.
```

```
*S **ADD THE BASINS TOGETHER TO GET THE FLOW IN KIMELA DR @ ANALYSIS PT C
ADD HYD              ID=10 HYD NO=202.2 ID=6 ID=9
PRINT HYD            ID=10 CODE=1
```

PARTIAL HYDROGRAPH 202.20

RUNOFF VOLUME = .98938 INCHES = 4.8545 ACRE-FEET
PEAK DISCHARGE RATE = 147.62 CFS AT 1.533 HOURS BASIN AREA = .0920 SQ. MI.

```
*S ROUTE THE ABOVE FLOW ON KIMELA DR. TO UNSER BLVD.
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEG=1 MIN EL=100.00 MAX EL=101.00
                     CH SLOPE=0.0193 FP SLOPE=0.0193 N=0.017 DIST=48.0
                     DIST  ELEV  DIST  ELEV  DIST  ELEV  DIST  ELEV
                      0   101.00 10.0 100.67 10.1 100.00 24.0 100.28
                     38.0 100.00 38.1 100.67 48.0 101.00
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
100.00	.00	.00	.00
100.05	.14	.15	5.26
100.11	.55	.93	10.52
100.16	1.25	2.75	15.78
100.21	2.22	5.93	21.04
100.26	3.46	10.75	26.30
100.32	4.92	18.50	27.99
100.37	6.39	28.57	28.01
100.42	7.87	40.27	28.03
100.47	9.34	53.50	28.04
100.53	10.82	68.15	28.06
100.58	12.30	84.15	28.07
100.63	13.78	101.42	28.09
100.68	15.26	117.78	28.96
100.74	16.87	130.18	32.13
100.79	18.64	144.74	35.31
100.84	20.59	161.49	38.48
100.89	22.69	180.48	41.66
100.95	24.97	201.79	44.83
101.00	27.41	225.50	48.00

```
COMPUTE TRAVEL TIME  ID=11 REACH NO=1 NO VS=1 L=738 FT SLP=0.0193
```

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.053	.138	.15	.1930
.105	.554	.93	.1216
.158	1.246	2.75	.0928
.211	2.215	5.93	.0766
.263	3.461	10.75	.0660
.316	4.920	18.50	.0545
.368	6.394	28.57	.0459

```
                                .421        7.869       40.27       .0401
                                .474        9.344       53.50       .0358
                                .526       10.821       68.15       .0325
                                .579       12.298       84.15       .0300
                                .632       13.776      101.42       .0278
                                .684       15.261      117.78       .0266
                                .737       16.869      130.18       .0266
                                .790       18.644      144.74       .0264
                                .842       20.586      161.49       .0261
                                .895       22.695      180.48       .0258
                                .947       24.971      201.79       .0254
                               1.000       27.414      225.50       .0249
ROUTE                 ID=11 HYD NO=202.3 INFLOW ID=10 DT=0.0
PRINT HYD             ID=11 CODE=1

                                PARTIAL HYDROGRAPH   202.30

    RUNOFF VOLUME =       .98939 INCHES     =       4.8546 ACRE-FEET
    PEAK DISCHARGE RATE =     143.37 CFS  AT   1.567 HOURS   BASIN AREA =   .0920 SQ. MI.


*S*************************************************************************
*S*************************************************************************
*S **BASINS 402 THRU 404 ARE CURRENTLY UNDEVELOPED, FOR PURPOSES
*S OF THIS REPORT, ASSUME ALL BASINS WILL BE BUILT OUT @ THEIR CURRENT
*S ZONING
*S **BASIN 402 IS UNIT 2 OF SUNRISE ESTATES
COMPUTE NM HYD        ID=12 HYD NO=402.00 AREA=0.052 SQ MI
                      PER A=0 PER B=29 PER C=29 PER D=42
                      TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   86.225    CFS   UNIT VOLUME =    .9992       B =   526.28      P60 = 1.8700
    AREA =      .021840 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   80.246    CFS   UNIT VOLUME =   1.000       B =   354.67      P60 = 1.8700
    AREA =      .030160 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD             ID=12   CODE=1

                                HYDROGRAPH FROM AREA   402.00

    RUNOFF VOLUME =     1.29860 INCHES     =       3.6014 ACRE-FEET
    PEAK DISCHARGE RATE =     108.14 CFS  AT   1.500 HOURS   BASIN AREA =   .0520 SQ. MI.


*S **BASINS 404 IS UNIT 2 OF SUNRISE ESTATES
COMPUTE NM HYD        ID=13 HYD NO=404.00 AREA=0.0108 SQ MI
                      PER A=0 PER B=29 PER C=29 PER D=42
                      TP=-0.1333 HR   MASS RAIN=-1
```

```
    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   17.908    CFS   UNIT VOLUME =    .9988       B =   526.28      P60 = 1.8700
    AREA =      .004536 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   16.666    CFS   UNIT VOLUME =    .9997       B =   354.67      P60 = 1.8700
    AREA =      .006264 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=13   CODE=1

                                    HYDROGRAPH FROM AREA   404.00

    RUNOFF VOLUME =     1.29860 INCHES     =        .7480 ACRE-FEET
    PEAK DISCHARGE RATE =      22.47 CFS  AT   1.500 HOURS   BASIN AREA =   .0108 SQ. MI.


*S **COMBINE BASINS 402 AND 404 TOGETHER
ADD HYD             ID=14 HYD NO=404.1 ID=12 ID=13
PRINT HYD           ID=14 CODE=1

                                    HYDROGRAPH FROM AREA   404.10

    RUNOFF VOLUME =     1.29859 INCHES     =       4.3494 ACRE-FEET
    PEAK DISCHARGE RATE =     130.61 CFS  AT   1.500 HOURS   BASIN AREA =   .0628 SQ. MI.


*S **ADD THE FLOW ABOVE TO THE FLOW ON KIMELA DR.
ADD HYD             ID=15 HYD NO=404.2 ID=11 ID=14
PRINT HYD           ID=15 CODE=1

                                    HYDROGRAPH FROM AREA   404.20

    RUNOFF VOLUME =     1.11482 INCHES     =       9.2039 ACRE-FEET
    PEAK DISCHARGE RATE =     268.54 CFS  AT   1.533 HOURS   BASIN AREA =   .1548 SQ. MI.


*S ROUTE THE ABOVE FLOW ON UNSER BLVD. FROM KIMELA DR. TO THE POND
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEG=1 MIN EL=100.00 MAX EL=101.00
                     CH SLOPE=0.005 FP SLOPE=0.005 N=0.017 DIST=48.0
                     DIST  ELEV  DIST  ELEV  DIST  ELEV  DIST  ELEV
                      0   101.00 10.0 100.67 10.1 100.00 24.0 100.28
                     38.0 100.00 38.1 100.67 48.0 101.00

                                RATING CURVE VALLEY SECTION  1.0
                                   WATER       FLOW        FLOW        TOP
                                  SURFACE      AREA        RATE        WIDTH
                                   ELEV        SQ FT       CFS         FT
                                  100.00        .00         .00         .00
                                  100.05        .14         .07        5.26
```

100.11	.55	.48	10.52
100.16	1.25	1.40	15.78
100.21	2.22	3.02	21.04
100.26	3.46	5.47	26.30
100.32	4.92	9.42	27.99
100.37	6.39	14.54	28.01
100.42	7.87	20.50	28.03
100.47	9.34	27.23	28.04
100.53	10.82	34.69	28.06
100.58	12.30	42.83	28.07
100.63	13.78	51.62	28.09
100.68	15.26	59.95	28.96
100.74	16.87	66.26	32.13
100.79	18.64	73.67	35.31
100.84	20.59	82.19	38.48
100.89	22.69	91.86	41.66
100.95	24.97	102.71	44.83
101.00	27.41	114.78	48.00

COMPUTE TRAVEL TIME ID=16 REACH NO=1 NO VS=1 L=1230 FT SLP=0.005

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.053	.138	.07	.6320
.105	.554	.48	.3981
.158	1.246	1.40	.3038
.211	2.215	3.02	.2508
.263	3.461	5.47	.2161
.316	4.920	9.42	.1785
.368	6.394	14.54	.1502
.421	7.869	20.50	.1312
.474	9.344	27.23	.1172
.526	10.821	34.69	.1066
.579	12.298	42.83	.0981
.632	13.776	51.62	.0912
.684	15.261	59.95	.0870
.737	16.869	66.26	.0870
.790	18.644	73.67	.0865
.842	20.586	82.19	.0856
.895	22.695	91.86	.0844
.947	24.971	102.71	.0831
1.000	27.414	114.78	.0816

ROUTE ID=16 HYD NO=404.3 INFLOW ID=15 DT=0.0
TRAVEL TIME TABLE EXCEEDED
PRINT HYD ID=16 CODE=1

HYDROGRAPH FROM AREA 404.30

RUNOFF VOLUME = 1.11482 INCHES = 9.2039 ACRE-FEET
PEAK DISCHARGE RATE = 207.70 CFS AT 1.633 HOURS BASIN AREA = .1548 SQ. MI.

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*S **ADD TO FLOW IN SAPPHIRE @ ANALYSIS PT D
ADD HYD              ID=17 HYD NO=404.4 ID=1 ID=16
PRINT HYD            ID=17 CODE=1

                                    HYDROGRAPH FROM AREA   404.40

    RUNOFF VOLUME =     1.11139 INCHES     =      32.6870 ACRE-FEET
    PEAK DISCHARGE RATE =     798.01 CFS  AT   1.600 HOURS   BASIN AREA =   .5515 SQ. MI.


*s DIVIDE THE DISCHARGE AT ANALYSIS PT D TO ALLOW 124.0 CFS TO ENTER PIPE
*S AND FLOW TO CHANNEL BEFORE POND FILLS UP
DIVIDE HYD           ID=17  Q=124   ID=18 HYD=404.5
                                     ID=19 HYD=404.6
PRINT HYD            ID=18  CODE=1

                                    HYDROGRAPH FROM AREA   404.50

    RUNOFF VOLUME =     1.11139 INCHES     =      12.8598 ACRE-FEET
    PEAK DISCHARGE RATE =     124.00 CFS  AT   1.400 HOURS   BASIN AREA =   .2170 SQ. MI.

PRINT HYD            ID=19  CODE=1

                                    HYDROGRAPH FROM AREA   404.60

    RUNOFF VOLUME =     1.11139 INCHES     =      19.8272 ACRE-FEET
    PEAK DISCHARGE RATE =     674.01 CFS  AT   1.600 HOURS   BASIN AREA =   .3345 SQ. MI.


*S DESIGN A RETENTION FACILITY TO REDUCE TO FLOW TO THAT WHICH WILL
*S FIT IN A 42" RCP @ S=1.8%
ROUTE RESERVOIR      ID=20 HYD NO=405.7 INFLOW ID=19  CODE=1
                     OUTFLOW(CFS)  STORAGE(AF)  ELEV(FT)
                         0              0          0
                         0.01          0.43        0.5
                         0.01          0.85        1
                         0.02          2.43        2
                         0.02          4.60        3
                         6             7.06        4
                         22            9.65        5
                         36           12.37        6
                         54           15.22        7
                         70           18.20        8
                         84           21.31        9

  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *
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TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
.00	.00	.00	.000	.00
.03	.00	.00	.000	.00
.07	.00	.00	.000	.00
.10	.00	.00	.000	.00
.13	.00	.00	.000	.00
.17	.00	.00	.000	.00
.20	.00	.00	.000	.00
.23	.00	.00	.000	.00
.27	.00	.00	.000	.00
.30	.00	.00	.000	.00
.33	.00	.00	.000	.00
.37	.00	.00	.000	.00
.40	.00	.00	.000	.00
.43	.00	.00	.000	.00
.47	.00	.00	.000	.00
.50	.00	.00	.000	.00
.53	.00	.00	.000	.00
.57	.00	.00	.000	.00
.60	.00	.00	.000	.00
.63	.00	.00	.000	.00
.67	.00	.00	.000	.00
.70	.00	.00	.000	.00
.73	.00	.00	.000	.00
.77	.00	.00	.000	.00
.80	.00	.00	.000	.00
.83	.00	.00	.000	.00
.87	.00	.00	.000	.00
.90	.00	.00	.000	.00
.93	.00	.00	.000	.00
.97	.00	.00	.000	.00
1.00	.00	.00	.000	.00
1.03	.00	.00	.000	.00
1.07	.00	.00	.000	.00
1.10	.00	.00	.000	.00
1.13	.00	.00	.000	.00
1.17	.00	.00	.000	.00
1.20	.00	.00	.000	.00
1.23	.00	.00	.000	.00
1.27	.00	.00	.000	.00
1.30	.00	.00	.000	.00
1.33	.00	.00	.000	.00
1.37	.00	.00	.000	.00
1.40	28.40	.05	.039	.00
1.43	156.19	.34	.293	.01
1.47	289.34	1.04	.907	.01
1.50	431.68	1.66	1.900	.02
1.53	557.01	3.00	4.600	.02
1.57	640.78	3.13	4.910	.77
1.60	674.01	3.86	6.713	5.16
1.63	662.11	4.57	8.525	15.05
1.67	616.18	5.21	10.231	24.99
1.70	549.30	5.77	11.756	32.84
1.73	475.98	6.24	13.067	40.40
1.77	433.16	6.64	14.198	47.55
1.80	370.86	6.98	15.166	53.66

1.83	320.99	7.25	15.965	58.00

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
1.87	233.31	7.45	16.565	61.22
1.90	181.80	7.59	16.965	63.37
1.93	150.51	7.68	17.246	64.88
1.97	121.83	7.75	17.441	65.92
2.00	97.40	7.79	17.560	66.56
2.03	76.14	7.80	17.615	66.86
2.07	58.52	7.80	17.617	66.87
2.10	41.89	7.79	17.571	66.62
2.13	24.29	7.76	17.480	66.13
2.17	6.34	7.71	17.341	65.39
2.20	.00	7.65	17.170	64.47
2.23	.00	7.60	16.994	63.53
2.27	.00	7.54	16.820	62.59
2.30	.00	7.48	16.649	61.67
2.33	.00	7.42	16.481	60.77
2.37	.00	7.37	16.315	59.88
2.40	.00	7.31	16.151	59.00
2.43	.00	7.26	15.989	58.13
2.47	.00	7.20	15.831	57.28
2.50	.00	7.15	15.674	56.44
2.53	.00	7.10	15.520	55.61
2.57	.00	7.05	15.368	54.79
2.60	.00	7.00	15.218	53.99
2.63	.00	6.95	15.070	53.05
2.67	.00	6.90	14.925	52.14
2.70	.00	6.85	14.783	51.24
2.73	.00	6.80	14.643	50.36
2.77	.00	6.75	14.506	49.49
2.80	.00	6.70	14.370	48.63
2.83	.00	6.66	14.238	47.80
2.87	.00	6.61	14.107	46.97
2.90	.00	6.56	13.979	46.16
2.93	.00	6.52	13.853	45.37
2.97	.00	6.48	13.729	44.58
3.00	.00	6.43	13.607	43.81
3.03	.00	6.39	13.488	43.06
3.07	.00	6.35	13.370	42.32
3.10	.00	6.31	13.254	41.59
3.13	.00	6.27	13.141	40.87
3.17	.00	6.23	13.029	40.16
3.20	.00	6.19	12.920	39.47
3.23	.00	6.16	12.812	38.79
3.27	.00	6.12	12.706	38.12
3.30	.00	6.08	12.602	37.46
3.33	.00	6.05	12.499	36.82
3.37	.00	6.01	12.399	36.18
3.40	.00	5.97	12.300	35.64
3.43	.00	5.94	12.202	35.14
3.47	.00	5.90	12.106	34.64
3.50	.00	5.87	12.012	34.16
3.53	.00	5.83	11.918	33.67

3.57	.00	5.80	11.826	33.20
3.60	.00	5.77	11.735	32.73
3.63	.00	5.73	11.646	32.27
3.67	.00	5.70	11.557	31.82
3.70	.00	5.67	11.470	31.37

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
3.73	.00	5.64	11.385	30.93
3.77	.00	5.61	11.300	30.49
3.80	.00	5.58	11.217	30.06
3.83	.00	5.55	11.134	29.64
3.87	.00	5.52	11.053	29.22
3.90	.00	5.49	10.973	28.81
3.93	.00	5.46	10.895	28.41
3.97	.00	5.43	10.817	28.01
4.00	.00	5.40	10.740	27.61
4.03	.00	5.37	10.665	27.22
4.07	.00	5.35	10.590	26.84
4.10	.00	5.32	10.517	26.46
4.13	.00	5.29	10.445	26.09
4.17	.00	5.27	10.373	25.72
4.20	.00	5.24	10.303	25.36
4.23	.00	5.21	10.233	25.00
4.27	.00	5.19	10.165	24.65
4.30	.00	5.16	10.098	24.30
4.33	.00	5.14	10.031	23.96
4.37	.00	5.12	9.966	23.62
4.40	.00	5.09	9.901	23.29
4.43	.00	5.07	9.837	22.96
4.47	.00	5.05	9.775	22.64
4.50	.00	5.02	9.713	22.32
4.53	.00	5.00	9.652	22.01
4.57	.00	4.98	9.591	21.64
4.60	.00	4.95	9.532	21.27
4.63	.00	4.93	9.474	20.91
4.67	.00	4.91	9.417	20.56
4.70	.00	4.89	9.361	20.21
4.73	.00	4.87	9.306	19.87
4.77	.00	4.85	9.251	19.54
4.80	.00	4.83	9.198	19.21
4.83	.00	4.81	9.146	18.88
4.87	.00	4.79	9.094	18.57
4.90	.00	4.77	9.043	18.25
4.93	.00	4.75	8.993	17.94
4.97	.00	4.73	8.944	17.64
5.00	.00	4.71	8.896	17.34
5.03	.00	4.69	8.849	17.05
5.07	.00	4.67	8.802	16.76
5.10	.00	4.66	8.757	16.48
5.13	.00	4.64	8.712	16.20
5.17	.00	4.62	8.667	15.93
5.20	.00	4.60	8.624	15.66
5.23	.00	4.59	8.581	15.40
5.27	.00	4.57	8.539	15.14
5.30	.00	4.56	8.498	14.88
5.33	.00	4.54	8.457	14.63

5.37	.00	4.52	8.417	14.38
5.40	.00	4.51	8.378	14.14
5.43	.00	4.49	8.339	13.90
5.47	.00	4.48	8.301	13.67
5.50	.00	4.46	8.264	13.44
5.53	.00	4.45	8.227	13.21
5.57	.00	4.44	8.191	12.99

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
5.60	.00	4.42	8.156	12.77
5.63	.00	4.41	8.121	12.55
5.67	.00	4.40	8.086	12.34
5.70	.00	4.38	8.053	12.13
5.73	.00	4.37	8.020	11.93
5.77	.00	4.36	7.987	11.73
5.80	.00	4.35	7.955	11.53
5.83	.00	4.33	7.923	11.33
5.87	.00	4.32	7.892	11.14
5.90	.00	4.31	7.862	10.95
5.93	.00	4.30	7.832	10.77
5.97	.00	4.29	7.803	10.59
6.00	.00	4.28	7.774	10.41
6.03	.00	4.26	7.745	10.23
6.07	.00	4.25	7.717	10.06
6.10	.00	4.24	7.690	9.89
6.13	.00	4.23	7.663	9.72
6.17	.00	4.22	7.636	9.56
6.20	.00	4.21	7.610	9.40
6.23	.00	4.20	7.585	9.24
6.27	.00	4.19	7.559	9.08
6.30	.00	4.18	7.535	8.93
6.33	.00	4.17	7.510	8.78
6.37	.00	4.16	7.486	8.63
6.40	.00	4.16	7.463	8.49
6.43	.00	4.15	7.439	8.34
6.47	.00	4.14	7.417	8.20
6.50	.00	4.13	7.394	8.06
6.53	.00	4.12	7.372	7.93
6.57	.00	4.11	7.351	7.79
6.60	.00	4.10	7.329	7.66
6.63	.00	4.10	7.308	7.53
6.67	.00	4.09	7.288	7.41
6.70	.00	4.08	7.267	7.28
6.73	.00	4.07	7.248	7.16
6.77	.00	4.06	7.228	7.04
6.80	.00	4.06	7.209	6.92
6.83	.00	4.05	7.190	6.80
6.87	.00	4.04	7.171	6.69
6.90	.00	4.04	7.153	6.57
6.93	.00	4.03	7.135	6.46
6.97	.00	4.02	7.117	6.35
7.00	.00	4.02	7.100	6.25
7.03	.00	4.01	7.083	6.14
7.07	.00	4.00	7.066	6.04
7.10	.00	4.00	7.050	5.98
7.13	.00	3.99	7.033	5.94

7.17	.00	3.98	7.017	5.90
7.20	.00	3.98	7.001	5.86
7.23	.00	3.97	6.985	5.82
7.27	.00	3.96	6.969	5.78
7.30	.00	3.96	6.953	5.74
7.33	.00	3.95	6.937	5.70
7.37	.00	3.94	6.922	5.66
7.40	.00	3.94	6.906	5.63
7.43	.00	3.93	6.891	5.59

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
7.47	.00	3.92	6.875	5.55
7.50	.00	3.92	6.860	5.51
7.53	.00	3.91	6.845	5.48
7.57	.00	3.91	6.830	5.44
7.60	.00	3.90	6.815	5.40
7.63	.00	3.89	6.800	5.37
7.67	.00	3.89	6.785	5.33
7.70	.00	3.88	6.771	5.30
7.73	.00	3.88	6.756	5.26
7.77	.00	3.87	6.742	5.23
7.80	.00	3.86	6.727	5.19
7.83	.00	3.86	6.713	5.16
7.87	.00	3.85	6.699	5.12
7.90	.00	3.85	6.685	5.09
7.93	.00	3.84	6.671	5.05
7.97	.00	3.84	6.657	5.02
8.00	.00	3.83	6.643	4.99
8.03	.00	3.83	6.630	4.95
8.07	.00	3.82	6.616	4.92
8.10	.00	3.81	6.602	4.89
8.13	.00	3.81	6.589	4.85
8.17	.00	3.80	6.576	4.82
8.20	.00	3.80	6.562	4.79
8.23	.00	3.79	6.549	4.76
8.27	.00	3.79	6.536	4.73
8.30	.00	3.78	6.523	4.70
8.33	.00	3.78	6.510	4.66
8.37	.00	3.77	6.498	4.63
8.40	.00	3.77	6.485	4.60
8.43	.00	3.76	6.472	4.57
8.47	.00	3.76	6.460	4.54
8.50	.00	3.75	6.447	4.51
8.53	.00	3.75	6.435	4.48
8.57	.00	3.74	6.422	4.45
8.60	.00	3.74	6.410	4.42
8.63	.00	3.73	6.398	4.39
8.67	.00	3.73	6.386	4.36
8.70	.00	3.72	6.374	4.33
8.73	.00	3.72	6.362	4.30
8.77	.00	3.71	6.350	4.27
8.80	.00	3.71	6.339	4.25
8.83	.00	3.70	6.327	4.22
8.87	.00	3.70	6.315	4.19
8.90	.00	3.69	6.304	4.16
8.93	.00	3.69	6.292	4.13

8.97	.00	3.68	6.281	4.11
9.00	.00	3.68	6.270	4.08
9.03	.00	3.67	6.259	4.05
9.07	.00	3.67	6.248	4.02
9.10	.00	3.67	6.236	4.00
9.13	.00	3.66	6.226	3.97
9.17	.00	3.66	6.215	3.94
9.20	.00	3.65	6.204	3.92
9.23	.00	3.65	6.193	3.89
9.27	.00	3.64	6.182	3.87
9.30	.00	3.64	6.172	3.84

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
9.33	.00	3.63	6.161	3.82
9.37	.00	3.63	6.151	3.79
9.40	.00	3.63	6.140	3.76
9.43	.00	3.62	6.130	3.74
9.47	.00	3.62	6.120	3.71
9.50	.00	3.61	6.109	3.69
9.53	.00	3.61	6.099	3.66
9.57	.00	3.61	6.089	3.64
9.60	.00	3.60	6.079	3.62
9.63	.00	3.60	6.069	3.59
9.67	.00	3.59	6.060	3.57
9.70	.00	3.59	6.050	3.54
9.73	.00	3.59	6.040	3.52
9.77	.00	3.58	6.030	3.50
9.80	.00	3.58	6.021	3.47
9.83	.00	3.57	6.011	3.45
9.87	.00	3.57	6.002	3.43
9.90	.00	3.57	5.992	3.40
9.93	.00	3.56	5.983	3.38
9.97	.00	3.56	5.974	3.36
10.00	.00	3.55	5.964	3.34
10.03	.00	3.55	5.955	3.31
10.07	.00	3.55	5.946	3.29
10.10	.00	3.54	5.937	3.27
10.13	.00	3.54	5.928	3.25
10.17	.00	3.54	5.919	3.23
10.20	.00	3.53	5.910	3.21
10.23	.00	3.53	5.902	3.18
10.27	.00	3.53	5.893	3.16
10.30	.00	3.52	5.884	3.14
10.33	.00	3.52	5.876	3.12
10.37	.00	3.52	5.867	3.10
10.40	.00	3.51	5.858	3.08
10.43	.00	3.51	5.850	3.06
10.47	.00	3.50	5.842	3.04
10.50	.00	3.50	5.833	3.02
10.53	.00	3.50	5.825	3.00
10.57	.00	3.49	5.817	2.98
10.60	.00	3.49	5.809	2.96
10.63	.00	3.49	5.800	2.94
10.67	.00	3.48	5.792	2.92
10.70	.00	3.48	5.784	2.90
10.73	.00	3.48	5.776	2.88

10.77	.00	3.48	5.769	2.86
10.80	.00	3.47	5.761	2.84
10.83	.00	3.47	5.753	2.82
10.87	.00	3.47	5.745	2.80
10.90	.00	3.46	5.737	2.78
10.93	.00	3.46	5.730	2.77
10.97	.00	3.46	5.722	2.75
11.00	.00	3.45	5.715	2.73
11.03	.00	3.45	5.707	2.71
11.07	.00	3.45	5.700	2.69
11.10	.00	3.44	5.692	2.68
11.13	.00	3.44	5.685	2.66
11.17	.00	3.44	5.678	2.64

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
11.20	.00	3.44	5.670	2.62
11.23	.00	3.43	5.663	2.60
11.27	.00	3.43	5.656	2.59
11.30	.00	3.43	5.649	2.57
11.33	.00	3.42	5.642	2.55
11.37	.00	3.42	5.635	2.54
11.40	.00	3.42	5.628	2.52
11.43	.00	3.42	5.621	2.50
11.47	.00	3.41	5.614	2.49
11.50	.00	3.41	5.607	2.47
11.53	.00	3.41	5.601	2.45
11.57	.00	3.40	5.594	2.44
11.60	.00	3.40	5.587	2.42
11.63	.00	3.40	5.581	2.40
11.67	.00	3.40	5.574	2.39
11.70	.00	3.39	5.567	2.37
11.73	.00	3.39	5.561	2.36
11.77	.00	3.39	5.554	2.34
11.80	.00	3.39	5.548	2.32
11.83	.00	3.38	5.542	2.31
11.87	.00	3.38	5.535	2.29
11.90	.00	3.38	5.529	2.28
11.93	.00	3.38	5.523	2.26
11.97	.00	3.37	5.516	2.25
12.00	.00	3.37	5.510	2.23
12.03	.00	3.37	5.504	2.22
12.07	.00	3.37	5.498	2.20
12.10	.00	3.36	5.492	2.19
12.13	.00	3.36	5.486	2.17
12.17	.00	3.36	5.480	2.16
12.20	.00	3.36	5.474	2.14
12.23	.00	3.35	5.468	2.13
12.27	.00	3.35	5.462	2.12
12.30	.00	3.35	5.457	2.10
12.33	.00	3.35	5.451	2.09
12.37	.00	3.34	5.445	2.07
12.40	.00	3.34	5.439	2.06
12.43	.00	3.34	5.434	2.05
12.47	.00	3.34	5.428	2.03
12.50	.00	3.33	5.423	2.02
12.53	.00	3.33	5.417	2.01

12.57	.00	3.33	5.411	1.99
12.60	.00	3.33	5.406	1.98
12.63	.00	3.33	5.401	1.97
12.67	.00	3.32	5.395	1.95
12.70	.00	3.32	5.390	1.94
12.73	.00	3.32	5.384	1.93
12.77	.00	3.32	5.379	1.91
12.80	.00	3.31	5.374	1.90
12.83	.00	3.31	5.369	1.89
12.87	.00	3.31	5.364	1.88
12.90	.00	3.31	5.358	1.86
12.93	.00	3.31	5.353	1.85
12.97	.00	3.30	5.348	1.84
13.00	.00	3.30	5.343	1.83
13.03	.00	3.30	5.338	1.81

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
13.07	.00	3.30	5.333	1.80
13.10	.00	3.30	5.328	1.79
13.13	.00	3.29	5.323	1.78
13.17	.00	3.29	5.318	1.77
13.20	.00	3.29	5.314	1.75
13.23	.00	3.29	5.309	1.74
13.27	.00	3.29	5.304	1.73
13.30	.00	3.28	5.299	1.72
13.33	.00	3.28	5.294	1.71
13.37	.00	3.28	5.290	1.70
13.40	.00	3.28	5.285	1.69
13.43	.00	3.28	5.280	1.67
13.47	.00	3.27	5.276	1.66
13.50	.00	3.27	5.271	1.65
13.53	.00	3.27	5.267	1.64
13.57	.00	3.27	5.262	1.63
13.60	.00	3.27	5.258	1.62
13.63	.00	3.27	5.253	1.61
13.67	.00	3.26	5.249	1.60
13.70	.00	3.26	5.245	1.59
13.73	.00	3.26	5.240	1.58
13.77	.00	3.26	5.236	1.57
13.80	.00	3.26	5.232	1.56
13.83	.00	3.26	5.227	1.54
13.87	.00	3.25	5.223	1.53
13.90	.00	3.25	5.219	1.52
13.93	.00	3.25	5.215	1.51
13.97	.00	3.25	5.211	1.50
14.00	.00	3.25	5.206	1.49
14.03	.00	3.24	5.202	1.48
14.07	.00	3.24	5.198	1.47
14.10	.00	3.24	5.194	1.46
14.13	.00	3.24	5.190	1.45
14.17	.00	3.24	5.186	1.44
14.20	.00	3.24	5.182	1.44
14.23	.00	3.24	5.178	1.43
14.27	.00	3.23	5.174	1.42
14.30	.00	3.23	5.170	1.41
14.33	.00	3.23	5.167	1.40

14.37	.00	3.23	5.163	1.39
14.40	.00	3.23	5.159	1.38
14.43	.00	3.23	5.155	1.37
14.47	.00	3.22	5.151	1.36
14.50	.00	3.22	5.148	1.35
14.53	.00	3.22	5.144	1.34
14.57	.00	3.22	5.140	1.33
14.60	.00	3.22	5.137	1.32
14.63	.00	3.22	5.133	1.32
14.67	.00	3.22	5.129	1.31
14.70	.00	3.21	5.126	1.30
14.73	.00	3.21	5.122	1.29
14.77	.00	3.21	5.119	1.28
14.80	.00	3.21	5.115	1.27
14.83	.00	3.21	5.112	1.26
14.87	.00	3.21	5.108	1.26
14.90	.00	3.21	5.105	1.25

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
14.93	.00	3.20	5.101	1.24
14.97	.00	3.20	5.098	1.23
15.00	.00	3.20	5.095	1.22
15.03	.00	3.20	5.091	1.21
15.07	.00	3.20	5.088	1.21
15.10	.00	3.20	5.085	1.20
15.13	.00	3.20	5.081	1.19
15.17	.00	3.19	5.078	1.18
15.20	.00	3.19	5.075	1.17
15.23	.00	3.19	5.072	1.17
15.27	.00	3.19	5.068	1.16
15.30	.00	3.19	5.065	1.15
15.33	.00	3.19	5.062	1.14
15.37	.00	3.19	5.059	1.14
15.40	.00	3.19	5.056	1.13
15.43	.00	3.18	5.053	1.12
15.47	.00	3.18	5.050	1.11
15.50	.00	3.18	5.046	1.11
15.53	.00	3.18	5.043	1.10
15.57	.00	3.18	5.040	1.09
15.60	.00	3.18	5.037	1.08
15.63	.00	3.18	5.034	1.08
15.67	.00	3.18	5.032	1.07
15.70	.00	3.17	5.029	1.06
15.73	.00	3.17	5.026	1.05
15.77	.00	3.17	5.023	1.05
15.80	.00	3.17	5.020	1.04
15.83	.00	3.17	5.017	1.03
15.87	.00	3.17	5.014	1.03
15.90	.00	3.17	5.011	1.02
15.93	.00	3.17	5.009	1.01
15.97	.00	3.16	5.006	1.01
16.00	.00	3.16	5.003	1.00
16.03	.00	3.16	5.000	.99
16.07	.00	3.16	4.998	.99
16.10	.00	3.16	4.995	.98
16.13	.00	3.16	4.992	.97

16.17	.00	3.16	4.989	.97
16.20	.00	3.16	4.987	.96
16.23	.00	3.16	4.984	.95
16.27	.00	3.16	4.982	.95
16.30	.00	3.15	4.979	.94
16.33	.00	3.15	4.976	.93
16.37	.00	3.15	4.974	.93
16.40	.00	3.15	4.971	.92
16.43	.00	3.15	4.969	.92
16.47	.00	3.15	4.966	.91
16.50	.00	3.15	4.964	.90
16.53	.00	3.15	4.961	.90
16.57	.00	3.15	4.959	.89
16.60	.00	3.14	4.956	.89
16.63	.00	3.14	4.954	.88
16.67	.00	3.14	4.951	.87
16.70	.00	3.14	4.949	.87
16.73	.00	3.14	4.947	.86
16.76	.00	3.14	4.944	.86

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
16.80	.00	3.14	4.942	.85
16.83	.00	3.14	4.940	.85
16.86	.00	3.14	4.937	.84
16.90	.00	3.14	4.935	.83
16.93	.00	3.14	4.933	.83
16.96	.00	3.13	4.930	.82
17.00	.00	3.13	4.928	.82
17.03	.00	3.13	4.926	.81
17.06	.00	3.13	4.924	.81
17.10	.00	3.13	4.922	.80
17.13	.00	3.13	4.919	.80
17.16	.00	3.13	4.917	.79
17.20	.00	3.13	4.915	.79
17.23	.00	3.13	4.913	.78
17.26	.00	3.13	4.911	.78
17.30	.00	3.13	4.909	.77
17.33	.00	3.12	4.906	.76
17.36	.00	3.12	4.904	.76
17.40	.00	3.12	4.902	.75
17.43	.00	3.12	4.900	.75
17.46	.00	3.12	4.898	.74
17.50	.00	3.12	4.896	.74
17.53	.00	3.12	4.894	.73
17.56	.00	3.12	4.892	.73
17.60	.00	3.12	4.890	.72
17.63	.00	3.12	4.888	.72
17.66	.00	3.12	4.886	.72
17.70	.00	3.12	4.884	.71
17.73	.00	3.11	4.882	.71
17.76	.00	3.11	4.880	.70
17.80	.00	3.11	4.878	.70
17.83	.00	3.11	4.876	.69
17.86	.00	3.11	4.874	.69
17.90	.00	3.11	4.873	.68
17.93	.00	3.11	4.871	.68

17.96	.00	3.11	4.869	.67
18.00	.00	3.11	4.867	.67
18.03	.00	3.11	4.865	.66
18.06	.00	3.11	4.863	.66
18.10	.00	3.11	4.861	.66
18.13	.00	3.11	4.860	.65
18.16	.00	3.10	4.858	.65
18.20	.00	3.10	4.856	.64
18.23	.00	3.10	4.854	.64
18.26	.00	3.10	4.853	.63
18.30	.00	3.10	4.851	.63
18.33	.00	3.10	4.849	.63
18.36	.00	3.10	4.847	.62
18.40	.00	3.10	4.846	.62
18.43	.00	3.10	4.844	.61
18.46	.00	3.10	4.842	.61
18.50	.00	3.10	4.841	.61
18.53	.00	3.10	4.839	.60
18.56	.00	3.10	4.837	.60
18.60	.00	3.10	4.836	.59
18.63	.00	3.10	4.834	.59

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
18.66	.00	3.09	4.832	.59
18.70	.00	3.09	4.831	.58
18.73	.00	3.09	4.829	.58
18.76	.00	3.09	4.828	.57
18.80	.00	3.09	4.826	.57
18.83	.00	3.09	4.825	.57
18.86	.00	3.09	4.823	.56
18.90	.00	3.09	4.821	.56
18.93	.00	3.09	4.820	.55
18.96	.00	3.09	4.818	.55
19.00	.00	3.09	4.817	.55
19.03	.00	3.09	4.815	.54
19.06	.00	3.09	4.814	.54
19.10	.00	3.09	4.812	.54
19.13	.00	3.09	4.811	.53
19.16	.00	3.09	4.809	.53
19.20	.00	3.08	4.808	.53
19.23	.00	3.08	4.807	.52
19.26	.00	3.08	4.805	.52
19.30	.00	3.08	4.804	.52
19.33	.00	3.08	4.802	.51
19.36	.00	3.08	4.801	.51
19.40	.00	3.08	4.800	.50
19.43	.00	3.08	4.798	.50
19.46	.00	3.08	4.797	.50
19.50	.00	3.08	4.795	.49
19.53	.00	3.08	4.794	.49
19.56	.00	3.08	4.793	.49
19.60	.00	3.08	4.791	.49
19.63	.00	3.08	4.790	.48
19.66	.00	3.08	4.789	.48
19.70	.00	3.08	4.787	.48
19.73	.00	3.08	4.786	.47

19.76	.00	3.08	4.785	.47
19.80	.00	3.07	4.783	.47
19.83	.00	3.07	4.782	.46
19.86	.00	3.07	4.781	.46
19.90	.00	3.07	4.780	.46
19.93	.00	3.07	4.778	.45
19.96	.00	3.07	4.777	.45

PEAK DISCHARGE = 66.868 CFS - PEAK OCCURS AT HOUR 2.07
MAXIMUM WATER SURFACE ELEVATION = 7.804
MAXIMUM STORAGE = 17.6168 AC-FT INCREMENTAL TIME= .033330HRS

PRINT HYD ID=20 CODE=1

HYDROGRAPH FROM AREA 405.70

RUNOFF VOLUME = .84365 INCHES = 15.0507 ACRE-FEET
PEAK DISCHARGE RATE = 66.87 CFS AT 2.066 HOURS BASIN AREA = .3345 SQ. MI.

*S ROUTE FLOW FROM THE DETENTION POND TO THE AMOLE DEL NORTE CHANNEL
COMPUTE RATING CURVE CID=1 VS NO=1 CODE=-1 SLOPE=0.010
DIA=4.0 FT N=0.013

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.21	.25	.75	1.78
.42	.69	3.27	2.44
.63	1.25	7.60	2.91
.83	1.90	13.68	3.25
1.04	2.60	21.35	3.51
1.25	3.36	30.47	3.71
1.46	4.15	40.82	3.85
1.67	4.96	52.19	3.94
1.88	5.79	64.33	3.99
2.08	6.62	77.00	4.00
2.29	7.45	89.89	4.00
2.50	8.27	102.71	4.00
2.71	9.06	115.11	4.00
2.92	9.82	126.73	4.00
3.13	10.54	137.13	4.00
3.34	11.20	145.78	4.00
3.54	11.77	151.97	4.00
3.75	12.24	154.52	4.00
4.00	12.57	154.52	4.00

COMPUTE TRAVEL TIME ID=1 REACH NO=1 NO VS=1 L=1240 FT SLP=0.010

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.208	.250	.75	.1142

.417	.695	3.27	.0732
.625	1.255	7.60	.0568
.834	1.898	13.68	.0478
1.042	2.604	21.35	.0420
1.251	3.358	30.47	.0380
1.459	4.146	40.82	.0350
1.668	4.960	52.19	.0327
1.876	5.788	64.33	.0310
2.084	6.621	77.00	.0296
2.293	7.451	89.89	.0285
2.501	8.267	102.71	.0277
2.710	9.062	115.11	.0271
2.918	9.823	126.73	.0267
3.127	10.539	137.13	.0265
3.335	11.195	145.78	.0265
3.544	11.773	151.97	.0267
3.752	12.243	154.52	.0273
4.000	12.566	154.52	.0280

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ROUTE                ID=1 HYD NO=404.8 INFLOW ID=20 DT=0.0
PRINT HYD            ID=1 CODE=1

                                HYDROGRAPH FROM AREA   404.80

   RUNOFF VOLUME =      .84340 INCHES     =      15.0463 ACRE-FEET
   PEAK DISCHARGE RATE =      66.82 CFS  AT   2.066 HOURS   BASIN AREA =   .3345 SQ. MI.


*S*********************************************************************
*S*********************************************************************
*S **CALC BASIN 406
COMPUTE NM HYD       ID=2 HYD NO=406.00 AREA=0.057434 SQ MI
                     PER A=4 PER B=27 PER C=27 PER D=42
                     TP=-0.1333 HR   MASS RAIN=-1
                        0,22
   K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
   UNIT PEAK =   95.236    CFS   UNIT VOLUME =    .9993       B =   526.28      P60 = 1.8700
   AREA =      .024122 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
   RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


   K =   .121550HR    TP =   .133300HR    K/TP RATIO =   .911856     SHAPE CONSTANT, N =  3.883611
   UNIT PEAK =   86.799    CFS   UNIT VOLUME =    1.000       B =   347.33      P60 = 1.8700
   AREA =      .033312 SQ MI    IA =    .44052 INCHES    INF =   1.08345 INCHES PER HOUR
   RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=2   CODE=1

                                HYDROGRAPH FROM AREA   406.00

   RUNOFF VOLUME =     1.27968 INCHES     =       3.9198 ACRE-FEET
   PEAK DISCHARGE RATE =     117.49 CFS  AT   1.500 HOURS   BASIN AREA =   .0574 SQ. MI.


*S **CALC BASIN 407
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COMPUTE NM HYD       ID=3 HYD NO=407.00 AREA=0.0504 SQ MI
                     PER A=0 PER B=29 PER C=29 PER D=42
                     TP=-0.1333 HR   MASS RAIN=-1
                        0.21
    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   83.572    CFS   UNIT VOLUME =    .9992       B =   526.28      P60 = 1.8700
    AREA =      .021168 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   77.777    CFS   UNIT VOLUME =    1.000       B =   354.67      P60 = 1.8700
    AREA =      .029232 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=3   CODE=1

                                    HYDROGRAPH FROM AREA   407.00

    RUNOFF VOLUME =     1.29860 INCHES     =       3.4906 ACRE-FEET
    PEAK DISCHARGE RATE =     104.81 CFS  AT   1.500 HOURS   BASIN AREA =   .0504 SQ. MI.


*S **CALC BASIN 408
COMPUTE NM HYD       ID=4  HYD NO=408.00  AREA=0.15736 SQ MI
                     PER A=0  PER B=29  PER C=29  PER D=42
                     TP=-0.1333 HR  MASS RAIN=-1
                        0.25
    K =   .074258HR    TP =   .133300HR    K/TP RATIO =   .557073     SHAPE CONSTANT, N =  6.910316
    UNIT PEAK =   256.33    CFS   UNIT VOLUME =    .9995       B =   516.99      P60 = 1.8700
    AREA =      .066091 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

    K =   .115909HR    TP =   .133300HR    K/TP RATIO =   .869534     SHAPE CONSTANT, N =  4.085829
    UNIT PEAK =   247.07    CFS   UNIT VOLUME =    1.000       B =   360.85      P60 = 1.8700
    AREA =      .091269 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=4  CODE=1

                                    HYDROGRAPH FROM AREA   408.00

    RUNOFF VOLUME =     1.29860 INCHES     =      10.8984 ACRE-FEET
    PEAK DISCHARGE RATE =     327.60 CFS  AT   1.500 HOURS   BASIN AREA =   .1574 SQ. MI.


*S*************************************************************************
*S*************************************************************************
*S **BASIN 500 IS UNIT ONE OF THE PROPOSED LONGFORD SD
COMPUTE NM HYD       ID=5 HYD NO=500.00 AREA=0.024905 SQ MI
                     PER A=0 PER B=29 PER C=29 PER D=42
                     TP=-0.1333 HR   MASS RAIN=-1
```

```
    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   41.297    CFS   UNIT VOLUME =    .9991       B =   526.28      P60 = 1.8700
    AREA =      .010460 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   38.433    CFS   UNIT VOLUME =   1.000       B =   354.67      P60 = 1.8700
    AREA =      .014445 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=5   CODE=1

                                OUTFLOW HYDROGRAPH RESERVOIR   500.00


    RUNOFF VOLUME =     1.29860 INCHES     =       1.7249 ACRE-FEET
    PEAK DISCHARGE RATE =      51.80 CFS  AT   1.500 HOURS   BASIN AREA =   .0249 SQ. MI.


*S **BASIN 501 IS THE AREA PROPOSED AS FUTURE LONGFORD SD DRAINING
*S **DIRECTLY TO THE AMOLE CHANNEL
COMPUTE NM HYD      ID=6 HYD NO=501.00 AREA=0.03663 SQ MI
                    PER A=0 PER B=29 PER C=29 PER D=42
                    TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   60.739    CFS   UNIT VOLUME =    .9992       B =   526.28      P60 = 1.8700
    AREA =      .015385 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   56.527    CFS   UNIT VOLUME =   1.000       B =   354.67      P60 = 1.8700
    AREA =      .021245 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=6   CODE=1

                                OUTFLOW HYDROGRAPH RESERVOIR   501.00


    RUNOFF VOLUME =     1.29860 INCHES     =       2.5369 ACRE-FEET
    PEAK DISCHARGE RATE =      76.18 CFS  AT   1.500 HOURS   BASIN AREA =   .0366 SQ. MI.


*S **COMBINE BASINS 500 AND 501 TOGETHER TO REPRESENT THE NORTHERN PART OF THE
*S **LONGFORD SD
ADD HYD             ID=7  HYD NO=501.1  ID I=5  ID II=6
PRINT HYD           ID=7  CODE=1

                                OUTFLOW HYDROGRAPH RESERVOIR   501.10


    RUNOFF VOLUME =     1.29859 INCHES     =       4.2618 ACRE-FEET
    PEAK DISCHARGE RATE =     127.98 CFS  AT   1.500 HOURS   BASIN AREA =   .0615 SQ. MI.
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```
*S **BASIN 502 IS THE SOUTHERN PART OF THE LONGFORD SD
COMPUTE NM HYD       ID=8 HYD NO=502.00 AREA=0.05788 SQ MI
                     PER A=0 PER B=28 PER C=28 PER D=44
                     TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   100.55    CFS   UNIT VOLUME =    .9993       B =   526.28      P60 = 1.8700
    AREA =      .025467 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   86.240    CFS   UNIT VOLUME =    1.000       B =   354.67      P60 = 1.8700
    AREA =      .032413 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=8  CODE=1

                                 OUTFLOW HYDROGRAPH RESERVOIR   502.00


    RUNOFF VOLUME =     1.32159 INCHES     =       4.0796 ACRE-FEET
    PEAK DISCHARGE RATE =     121.79 CFS  AT   1.500 HOURS   BASIN AREA =   .0579 SQ. MI.


*S **BASIN 503 IS CURRENTLY UNDEVELOPED, ASSUME FUTURE DEVELOPMENT WILL BE @
*S **A DENSITY OF 4 DU/AC. THE DISCHARGE FROM THIS BASIN DRAINS TO THE AMOLE
*S DEL NORTE CHANNEL AND DOES NOT AFFECT THE ARENAL/UNSER DRAINAGE MANAGEMENT
*S SITE.
COMPUTE NM HYD       ID=9 HYD NO=503.00 AREA=0.03752 SQ MI
                     PER A=0 PER B=29 PER C=29 PER D=42
                     TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   62.215    CFS   UNIT VOLUME =    .9992       B =   526.28      P60 = 1.8700
    AREA =      .015758 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   57.901    CFS   UNIT VOLUME =    1.000       B =   354.67      P60 = 1.8700
    AREA =      .021762 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=9  CODE=1

                                 OUTFLOW HYDROGRAPH RESERVOIR   503.00


    RUNOFF VOLUME =     1.29860 INCHES     =       2.5986 ACRE-FEET
    PEAK DISCHARGE RATE =      78.03 CFS  AT   1.500 HOURS   BASIN AREA =   .0375 SQ. MI.


*S*************************************************************************
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*S **BASIN 504 IS CURRENTLY UNDEVELOPED, ASSUME FUTURE DEVELOPMENT WILL BE @
*S **A DENSITY OF 9 DU/AC. THE DISCHARGE FROM THIS BASIN TRAVEL ALONG SAGE RD.
*S AND ENTERS THE AMOLE DEL NORTE CHANNEL, DOES NOT AFFECT THE ARENAL/UNSER
*S DRAINAGE MANAGEMENT SITE.
COMPUTE NM HYD       ID=10 HYD NO=504.00 AREA=0.036668 MI
                     PER A=0 PER B=11 PER C=11 PER D=78
                     TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   112.92    CFS   UNIT VOLUME =    .9993       B =   526.28      P60 = 1.8700
    AREA =      .028601 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   21.464    CFS   UNIT VOLUME =    .9998       B =   354.67      P60 = 1.8700
    AREA =      .008067 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=10  CODE=1

                                OUTFLOW HYDROGRAPH RESERVOIR   504.00


    RUNOFF VOLUME =     1.71253 INCHES     =       3.3490 ACRE-FEET
    PEAK DISCHARGE RATE =      92.58 CFS  AT   1.500 HOURS   BASIN AREA =   .0367 SQ. MI.


*S **BASIN 505 IS FULLY DEVELOPED AND DRAINS SOUTH TO BLAKE RD..DISCHARGE FROM
*S THIS BASIN DOES NOT AFFECT THE ARENAL/UNSER DRAINAGE MANAGEMENT SITE.
COMPUTE NM HYD       ID=11 HYD NO=505.00 AREA=0.02618 SQ MI
                     PER A=33 PER B=19 PER C=19 PER D=29
                     TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   29.974    CFS   UNIT VOLUME =    .9990       B =   526.28      P60 = 1.8700
    AREA =      .007592 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .139463HR    TP =   .133300HR    K/TP RATIO =  1.046235     SHAPE CONSTANT, N =  3.374403
    UNIT PEAK =   43.373    CFS   UNIT VOLUME =    .9997       B =   311.05      P60 = 1.8700
    AREA =      .018588 SQ MI    IA =    .52958 INCHES    INF =   1.33282 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=11   CODE=1

                                OUTFLOW HYDROGRAPH RESERVOIR   505.00


    RUNOFF VOLUME =     1.00753 INCHES     =       1.4068 ACRE-FEET
    PEAK DISCHARGE RATE =      43.10 CFS  AT   1.500 HOURS   BASIN AREA =   .0262 SQ. MI.


FINISH
```

CITY OF
Albuquerque

July 21, 1997

Martin J. Chávez, Mayor

Fred C. Arfman, P.E.
Isaacson & Arfman
128 Monroe St. NE
Albuquerque, New Mexico

RE: Revised Arenal/Unser Drainage Management Plan (M10/D10), Engineer's Stamp Dated 6/23/97.

Dear Mr. Arfman:

The technical analysis in the above referenced report was reviewed by Richard Stockton of Leedshill-Herkenhoff. Prior to approval of this plan, please address his comments provided in the attached Memo dated July 16, 1997. The issue of land treatments is most critical.

In addition to his comments, it has been brought to my attention that Drainage Basins 400.2, 504 and perhaps 300.2 are to be developed at 9 du/acre. Your analysis accounted for 4 du/acre for these areas. What impact would this more dense development have on the storm drain system?

Although my previous comments were addressed, these issues must be resolved prior to Master Plan approval. If you should have any questions regarding these comments, please call me at 924-3982.

Sincerely,

Susan Calongne

Susan M. Calongne, P.E.
City/County Floodplain Administrator

c: File

LEEDSHILL-HERKENHOFF, INC.
an ASCG Company
500 Copper Avenue NW, Suite 500
P.O. Box 1217
Albuquerque, New Mexico 87103
(505) 247-0294 Fax (505) 242-4845

748-95043/0500-97

MEMORANDUM

VIA FAX 884-0214 & U.S. MAIL

ATTN: SUSAN CALONGNE

TO: KURT BROWNING

FROM: RICHARD STOCKTON

DATE: JULY 16, 1997

RE: AMOLE DRAINAGE MANAGEMENT PLAN REVIEW OF REVISED SUNRISE ESTATES AHYMO MODEL SUBMITTED BY ISAACSON AND ARFMAN

The revised AHYMO model for the Arenal\Unser Drainage Management Plan, dated June 1997, by Isaacson and Arfman, P.A., was reviewed for the possible impact on the Amole Del Norte Channel. The following procedures were performed and conclusions reached comparing the December 19, 1995 Sunrise Estates (1995 model) and the June 4, 1997 Sunrise Estates (1997 model) AHYMO models and the effects on the Amole Del Norte Channel.

1. The 1997 model submitted was for the 100 year, 6 hour developed conditions. We changed the rainfall to a type 2, to model the 100 year 24 hour event to be consistent with the Amole DMP analysis for comparison purposes. Although the volume is significantly larger, the peak flow rate at the entrance to the Amole del Norte Channel is approximately the same.

2. The 1995 model submitted to LH for use in the Developed Condition Amole DMP AHYMO model, DID NOT include a detention pond. However, the 1997 model does include a detention pond. There is a common point between the two models HYD NO. 404.20, the flow at the entrance into the detention pond.

3. The 1995 model had a percent imperviousness of 42 for the existing "Westgate Heights" area. That was changed to 29% in the 1997 model. Based on the 4 du/ac land use, the 29% impervious appears to be low. The result is a reduction from 2.663 cfs/ac (1995) to 2.370 cfs\ac (1997). After review of the basin maps, it has been determined that the 1997 model has revised areas as well. The 1995 model has an area of 0.57580 sq. mi. and the 1997 model 0.55146 sq. mi at the entrance to the detention basin. Therefore, the flow rates into the detention pond are 981 cfs (1995 model) and 836 cfs (1997 model), respectively.

LEEDSHILL-HERKENHOFF, INC.
an ASCG Company

4. The net result with the inclusion of the 1997 model with detention is that the peak flow into Amole del Norte is reduced from 981 cfs to 190 cfs and at AP 38, the Arenal crossing, the flow in the Amole Del Norte Channel is reduced from 2,148 cfs (1995) to 1,938 cfs (1997).

   It should be noted that the 500 series basins in the 1997 model uses a percent impervious of 42 and the LH developed conditions model uses 56. LH's values are based on the runoff categories and zoning analysis performed in Appendix V-II of the DRAFT Developed Conditions Report. However, since this area has a preliminary subdivision plat at 4 du/ac, LH should incorporate this change.

If you have any questions or wish to discuss the impact of these results, please give me or Clint a call.

Isaacson & Arfman, P.A.

Consulting Engineering Associates

Letter of Transmittal

To HYDROLOGY DIV.
P.W.D.
C.O.A.

Date 06-30-97

Job No.

Attn: SUSAN C.

Reference ARENAL / UNSER D.M.P.

Gentlemen:

We transmit to you 1 copy(ies) of the following

- [ ] Plats
- [ ] Plans
- [ ] Specifications
- [ ] Report
- [x] BASIN I.D. MAP.
- [ ]
- [ ] Shop Drawings
- [ ] Submittals
- [ ] Material Specifications
- [ ] Copy of Letter

This information is transmitted:

- [x] As per your request
- [ ] For your review & approval
- [ ] For your information
- [ ] For your attention
- [ ] For your signature
- [ ]
- [ ] For your files
- [x] For your use
- [ ] Please review & return
- [ ] For return to your files
- [ ] Please advise
- [x] FOR INSERTION INTO DRNG. RPT (REPLACEMENT)

Remarks:

By: FRED C. ARFMAN

Copies To

128 Monroe, NE • Albuquerque, NM 87108 • (505) 268-8828

DRAINAGE INFORMATION SHEET

PROJECT TITLE: ARENAL/UNSER D.M.P. ZONE ATLAS/DRNG. FILE #: M10/D10

DRB #: _____ EPC #: _____ WORK ORDER #: _____

LEGAL DESCRIPTION: LANDS IN VICINITY OF ZONE MAP M-10

CITY ADDRESS: _____

ENGINEERING FIRM: ISAACSON & ARFMAN, P.A CONTACT: FRED C. ARFMAN

ADDRESS: 128 MONROE ST. NE PHONE: 268-8828

OWNER: PRESLEY HOMES, LONGFORD HOMES, CURB INC, BUILDERS INVESTMENT CO. C/O ISAACSON & ARFMAN CONTACT: "

ADDRESS: 128 MONROE ST. NE PHONE: "

ARCHITECT: N/A. CONTACT: _____

ADDRESS: _____ PHONE: _____

SURVEYOR: ALDRICH LAND SURVEYING CONTACT: TIM ALDRICH

ADDRESS: _____ PHONE: 884-1990

CONTRACTOR: N/A. CONTACT: _____

ADDRESS: _____ PHONE: _____

TYPE OF SUBMITTAL:

____ DRAINAGE REPORT

____ DRAINAGE PLAN

____ CONCEPTUAL GRADING & DRAINAGE PLAN

____ GRADING PLAN

____ EROSION CONTROL PLAN

____ ENGINEER'S CERTIFICATION

X OTHER DRAINAGE MANAGEMENT PLAN (D.M.P.)

PRE-DESIGN MEETING:

X YES

____ NO

____ COPY PROVIDED

RECEIVED JUN 23 1997 HYDROLOGY SECTION

CHECK TYPE OF APPROVAL SOUGHT:

____ SKETCH PLAT APPROVAL

____ PRELIMINARY PLAT APPROVAL

____ S. DEV. PLAN FOR SUB'D. APPROVAL

____ S. DEV. PLAN FOR BLDG. PERMIT APPROVAL

____ SECTOR PLAN APPROVAL

____ FINAL PLAT APPROVAL

____ FOUNDATION PERMIT APPROVAL

____ BUILDING PERMIT APPROVAL

____ CERTIFICATE OF OCCUPANCY APPROVAL

____ GRADING PERMIT APPROVAL

____ PAVING PERMIT APPROVAL

____ S.A.D. DRAINAGE REPORT

____ DRAINAGE REQUIREMENTS

X OTHER D.M.P. (SPECIFY)

Leadhill Richard Stockton 247.0294

no report as of 7-11-97

RECEIVED ~~JUN 2 8 1997~~ HYDROLOGY SECTION

DATE SUBMITTED: JUNE 23, 1997

BY: FRED C. ARFMAN, PE

FOR: ISAACSON & ARFMAN, P.A.

ISAACSON & ARFMAN, P.A.
Consulting Engineering Associates
Thomas O. Isaacson, PE & LS • Fred C. Arfman, PE
Scott M. McGee, PE

June 20, 1997

Ms. Susan Calongne, P.E.
City/County Floodplain Administrator
Hydrology Division/PWD
City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103

RE: Arenal/Unser Drainage Management Plan (M10/D8)

Dear Ms. Calongne:

We offer the following response to your twelve (12) comments found in your June 17, 1997 review letter. Please note that this plan has gone through a major overhaul and should be less difficult to follow. Accordingly, we offer the following responses to your questions:

1. *The report states that a portion of the site is within an existing FEMA floodplain. Please provide a copy of the flood map, identifying the subdivisions within the floodplain. Also identify the FIRM panel(s) and the flood zone designation.*

   Maps have been added, see pocket section.

2. *Section II of the report describes the sponsors and participants who are located within the study area. Please provide a map or exhibit showing the location of each area associated with each different participant. The exhibit should also clearly identify the streets mentioned in the report.*

   Maps have been added, see Section II, Plan Sponsors and Participants.

3. *Section II describes existing or proposed storm drain systems, however, these systems are not shown anywhere in the report. Please provide schematics of the storm drain systems or show them on the basin maps to clarify them. I assume that these have been designed, so also indicate the sizes and capacities.*

   The existing and proposed systems are shown on half-sized reduced drawings in the pockets at the end of the document.

128 Monroe St. NE • Albuquerque, NM 87108 • (505) 268-8828 • FAX (505) 268-2632

4. *If the development by Curb, Inc. is part of this master plan, then why does the report state that the developer must produce another master plan? This is unclear.*

   Correction has been made.

5. *This report is unclear on how the proposed release rates into the Amole del Norte compare with those determined in the BEC report. Please summarize the comparison. On the Amole basin map, please indicate the existing release rates at the points identified and indicate the proposed rates. Free discharge from Basins 406-408 has not been justified in this report.*

   See Tables 1 and 2 and the graph, new values and adjusted values have been highlighted for comparison between the two tables.

6. *Where are sub-basins 32-36 and 38 located?*

   The original BEC basin map has been incorporated into the report.

7. *What is the status of the Arenal Road and Unser storm drain systems? It appears that the developments east of Unser depend on having both of these storm drain systems in place. What is the schedule for development?*

   The Unser Blvd. storm drain (60" diameter) is under construction and is expected to be completed 08/01/97.

8. *The Basin Summary tables do not match the AHYMO runs with respect to land treatments and Q's. The AHYMO for the south basins is hard to follow. Please provide flow arrows to indicate the direction of flow for each basin.*

   Flow arrows have been added as well as a flow chart.

9. *The proposed regional detention pond is nearly 12 acre feet in size. This will require approval by the State Engineer's Office.*

   We understand that the Sate Engineer's Office must approve the detention facility. They will be contacted when approval is obtained from the city.

10. *It appears that the basin directly west of Basin 402 was left out.*

    Basin 502 has a historical drainage outfall to the south. Storm waters are accepted by a 48" RCP storm drain through the Vista del Sol Mobile Home Park.

11. *There seems to be an error in the routing of the hydrographs from areas 406.1 and 408.1. Why are you losing more than 100 cfs?*

    Corrected.

12. *Where is the Temporary Surge Pond location in relation to the basins? How does it affect the overall drainage systems?*

    See flood hazard maps and other exhibits.

Please advise our office if any additional information or clarification is needed in your review of this report.

Very truly yours,

ISAACSON & ARFMAN, P.A.

Fred C. Arfman

Fred C. Arfman, P.E.

FCA/rtl

ISAACSON & ARFMAN, P.A.

Consulting Engineering Associates

Albuquerque, NM

[redacted]

M-10 | D01 0

ARENAL/UNSER
DRAINAGE MANAGEMENT PLAN

ALBUQUERQUE NEW MEXICO
JUNE 1997

Prepared by:
ISAACSON & ARFMAN, P.A.

FRED C. ARFMAN
STATE OF NEW MEXICO
7322
REGISTERED PROFESSIONAL ENGINEER

06-23-97

RECEIVED
JUN 23 1997
HYDROLOGY SECTION

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IV. The Plan

Appendices

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Table 2: Revised Hydrograph Datas of the Amole del Norte Channel
Hydrograph of the Amole del Norte Channel

Appendix B: Hydrograph Computational Datas

Appendix C: Time to Peak Calculations

Appendix D: Previous Hydrograph Computational Datas by BEC

Appendix E: Design of the Temporary Detention Pond

Appendix F: AHYMO Summary and Output

Pockets

Subbasin Drainage Map
FEMA Flood Map

I. INTRODUCTION

The Arenal/Unser Drainage Management Plan has evolved from the original master drainage study of the area, prepared in July 1994 and updated in July 1996. That plan defined and analyzed the storm water runoff situation for a large portion of land south of Sage Road SW between the Snow Vista Diversion Channel at the westerly boundary unit and the Amole del Norte Diversion Channel defining the easterly boundary of the study.

The previous study defined the existing drainage basins and quantified the storm water runoff characteristics for the 100-year frequency/6-hour duration storm. The storm water rates and volumes calculated in the 1996 study are used as the basis of developing the Drainage Management Plan presented in this report. The AHYMO models have been revised and expanded to reflect the proposed developable areas. The summary files and output files from these models are found in Appendix C of this report.

It is the intent of this plan to present a viable solution to the basin storm water runoff problem currently inhibiting the development potential of the area. Currently, those storm waters generated by the older Westgate Heights residential neighborhood are identified as a floodway by the latest edition of the F.E.M.A. floodway maps. The ultimate solution of providing those storm drainage facilities and eliminating the floodplain is contingent upon the joint efforts of both the public and private sectors. Their role shall be clearly delineated by the following plan.

II. PLAN SPONSORS AND PARTICIPANTS

The following passive land owner and active developers along with the City of Albuquerque are responsible for the funding and construction of the public infrastructure required for the completion of the plan.

A. **Albuquerque South:** A passive land holding general partnership owning most of the undeveloped land in the contributing drainage basins.

B. **Presley Homes, Inc.:** Developers of the Summerfield Subdivision (Sunrise Estates, Units One, Two, and Three). The initial development of Unit One (93 R-1 lots) required the construction of a 60-66" diameter storm drain to convey those storm waters generated for the Westgate Heights development immediately to the west and discharging its storm water via Sapphire Street.

The second unit of Presley's development will construct the Kimela Road and Unser Blvd. storm drains and will be 100% funded by the developer.

C. **Longford Homes of New Mexico:** The Rolling Hills Subdivision will ultimately consist of approximately 336 single family residential lots divided into five phases with the Unit Two project currently under

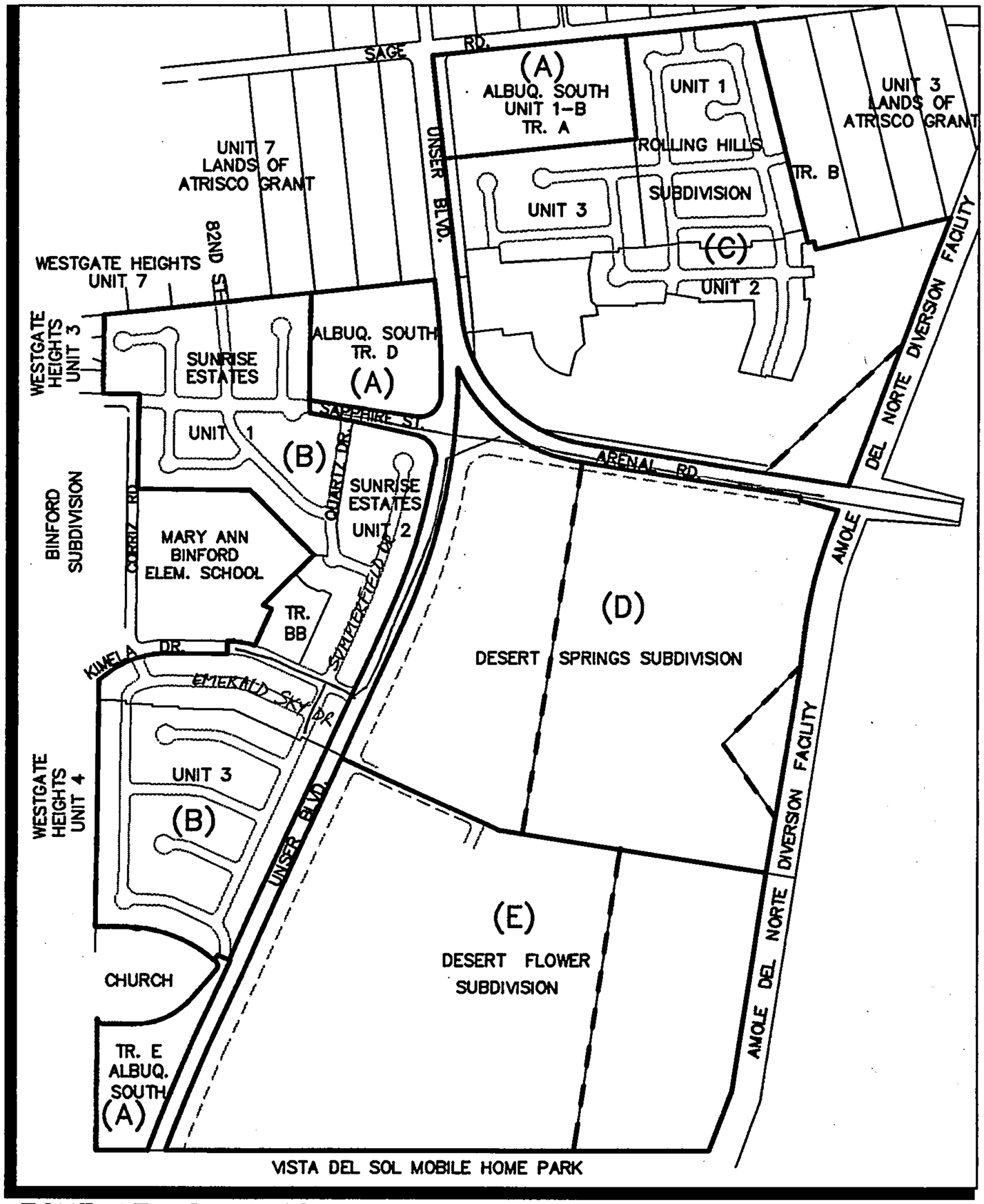
construction. The development is situated between Sage Road and Arenal Road just east of Unser Blvd. SW. Units Three and Four are at various stages in the platting process and are scheduled for construction in early 1997.

The overall development is covered by the Rolling Hills Drainage Management Plan on file at City of Albuquerque Hydrology Division. This plan proposes to discharge the developed storm waters directly to the Amole del Norte Channel at two locations. The project will construct two storm drain lines in the east-west streets and construction of all phases shall be independent of the City funded storm drain situated in Arenal Road.

D. **Builders Investment Co. of NM, Ltd.:** This developer is under contract to purchase 77 acres along the south right-of-way of Arenal Road between Unser Blvd. and the Amole del Norte Diversion Channel. The single family subdivisions (RLT zoning) is projected to be developed in four units with the first phase being a 102 lot subdivision east of Unser Blvd.

The approval and development of Unit One will require the dedication of approximately 3.8 acres at the southeast corner of Unser Blvd. and Arenal Road SW. This area will be utilized as a detention facility for the Unser/Sapphire storm drain system. The phased development

PLAN SPONSORS OWNERSHP MAP



ZONE ATLAS: M-10

SCALE: 1"=750'±

(A) ALBUQUERQUE SOUTH GENERAL PARTNERSHIP
(B) PRESLEY HOMES
(C) LONGFORD HOMES OF NEW MEXICO
(D) BUILDERS INVESTMENT COMPANY OF NEW MEXICO, LTD.
(E) CURB, INC.

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of this first, temporary/ultimately, permanent detention pond shall be discussed further in the body of this report.

E. **Curb, Inc.:** Curb, Inc. has purchased a portion of Tract F, Albuquerque South, Unit One, consisting of 60.2 acres. A majority of Tract F is protected from upstream drainage by the proposed improvements to Unser Blvd. bordering on the west. The single family subdivision (proposed R-LT zoning) is projected to be developed in four units. The first phase will have an 84 lot subdivision and lies east of Unser Blvd.

III. PROPOSED DRAINAGE MANAGEMENT PLAN SOLUTION

The plan participants identified above have all purchased their parcels from the Albuquerque South General Partnership. The storm water runoff from each development will ultimately be accepted by the Amole del Norte Diversion Channel. The channel was designed using the older hydrology methods and is now under study by Leedshill-Herkenhoff Engineers under contract to AMAFCA to determine if and how much the channel is undersized with respect to handling the fully developed storm water runoff under current hydrology criteria.

It is the intent of this plan to demonstrate that a single regional detention facility at the southeast quadrant of Unser Blvd. and Arenal Road will provide the necessary detention of storm waters and a reduction in the storm water rate of flow into the Amole del Norte Diversion Channel to the same discharge rate the channel was originally designed by Boyle Engineering Corp (BEC) in 1985. The reduced rate shall apply to the parcels identified as the plan participants and will encompass eight to nine connection points to the channel.

The BEC report titled "Investigation Phase Report for the Re-Evaluation Study of the Amole del Norte Storm Diversion Facility" dated June 1984 was the design basis for the construction of the Amole del Norte Channel. The report was a hydrological analysis for the Amole del Norte Drainage basin using the SCS curve number method which was the accepted rationale at the time. The subbasin boundaries determined in the BEC report correspond with the boundaries used in our analysis. BEC's subbasins 32-36 and 38 were replaced with subbasins 100-505 in this report. It was determined that the best way to derive a discharge rate to the Amole del Norte Channel was to reduce the flow rate/unit area (cfs/ac) from the current analysis to that of the BEC study. The detention pond will then be designed such that it will be sufficiently large enough to detain the discharge from the upstream areas to the cfs/ac that the channel was originally designed for in 1984. The AHYMO model in Appendix C includes a reservoir route to preliminarily design the detention pond. A more complete design of the pond will be performed when construction of the pond becomes necessary for further development to proceed.

Analysis of the side discharges to the channel were needed to determine how much runoff could discharge into the channel. BEC report shows that subbasins 32-35 make a side discharge to the channel at Arenal Road, subbasin 36 makes a side discharge 1700' south of Arenal Road, and subbasin 38 makes a side discharge 3000' south of Arenal Road. Hydrographs for these side discharges into the channel are shown in Table 1 (see Appendix), taken from BEC report. New hydrographs of the subbasins above were needed to represent current developed discharges into the side of the channel. Our study derived nine new hydrographs to replace the hydrographs above. Four new side flows, side flow 980' south of Sage Road, side flow 1000' north of Arenal Road, side flow 200' north of Arenal Road, and side flow 1150' south of Arenal Road were added and are shown in Table 2 (see Appendix). The hydrographs of the side flows in Table 2 were obtained from computations with peak runoffs and times of concentration. Peak runoffs were based from AHYMO runs, combined with times of concentration using SCS Upland Method, to obtain a list of hydrograph data points. The hydrograph results are shown in Table 2. Comparison between the new and the previous hydrographs of the Amole del Norte Channel can be made by referring to Tables 1 and 2 or to the graph. Table 2 shows that the new channel hydrograph peak discharge is slightly lower than that of the previous hydrograph, roughly 1891 cfs vs. 1902 cfs. This is achieved by several factors. First, the temporary surge pond at Arenal Road and Unser Blvd. was enlarged to detain enough runoff so that discharge to the channel via Arenal Road would not exceed previous discharge calculated by BEC report. Second, storm drain pipes from the pond to the channel were sized and placed at certain elevation in the pond to

control the flow to the channel. Third, side discharges north and south of Arenal Road were computed using adjusted areas giving lower times of concentration. The times to peak averaged at 14 minutes vs. 21 minutes computed from BEC report. As a result, the factors pointed out above derive a hydrograph shown on Table 2 with a peak discharge slightly lower than the one from BEC report.

The Appendix contains tables, graph, and computational datas regarding the analysis of the discharges to the Amole del Norte Channel. Basin ID map from Boyle Engineering Corporation report is attached, followed by tables and graph of the hydrograph for the channel. Hydrograph calculations and referencing datas gathered from BEC report make up the last part of the appendix in this section.

IV. THE PLAN

A four acre regional storm water detention facility shall be the backbone of the plan solution. The interim storage of storm water volumes in excess of the downstream storm drain carrying capacity for both the proposed Arenal Road storm drain and the Amole del Norte Diversion Channel shall be analyzed to achieve a balance runoff credit for the combined developing area of the participant's developments.

A. **Existing Conditions:** Presently, 100% of the offsite storm waters being accepted by the Amole del Norte Diversion Channel is from overland flows generated from the Westgate Heights Subdivision, Presley Homes Summerfield Subdivision, Unit One, and the undeveloped property west of the Amole del Norte Channel.

The existing storm drain in Sapphire Street releases its flows to the historical overland drainage route where they are eventually accepted by the channel via a side inlet approximately 800 feet south of Arenal Road.

B. **Proposed Improvements:** The required improvements are proposed for construction in three distinct and coordinated phases as follows:

1. Presley Homes: Sunrise Estates, Unit Two has the Sapphire Street storm drain extension to Unser Blvd.; the Kimela Road storm drain from the east end of the APS property to Unser Blvd.; the Unser Blvd. storm drain from Kimela to Arenal Road; and the temporary storm water detention and surge pond at Unser Blvd. and Arenal Road as found on the Required Infrastructure Listing of the subdivision and will be financially guaranteed and constructed.

2. Longford Homes of New Mexico: The Rolling Hills Subdivision Units Two through Five are allowed to develop independently of the Arenal Road storm drain. This is due to the fact that the Rolling Hills development has two interior backbone storm drains and separate connections to the Amole del Norte Diversion Channel approved per the Rolling Hills D.M.P.

3. Builders Investment Co. of NM, Ltd.: Development of the multi-phase Desert Springs Subdivisions is dependent upon the construction of the Unser Blvd. storm drain and the interim detention pond. These improvements will allow for the development of Unit One along Unser Blvd. The subsequent Units will require the construction of the Arenal Road storm drain and modifying the temporary detention/surge pond into the permanent regional storm water detention facility.

4. City of Albuquerque: The City has designated the Arenal Road storm drain as a masterplan facility and is currently on the City's 1997 C.I.P. funding of storm drainage projects. This improvement is required for the development of those subdivisions east of Desert Springs, Unit One.

5. Curb, Inc.: The development of this 60.2 acre parcel is dependent upon the Kimela Road and Unser Blvd. storm drainage improvements. The individual subdivisions shall be covered by a master drainage plan and will be required to have internal storm drain systems to supplement the street carrying capability to convey 100% of the offsite and onsite storm waters to the Amole del Norte Diversion Channel.

APPENDIX A

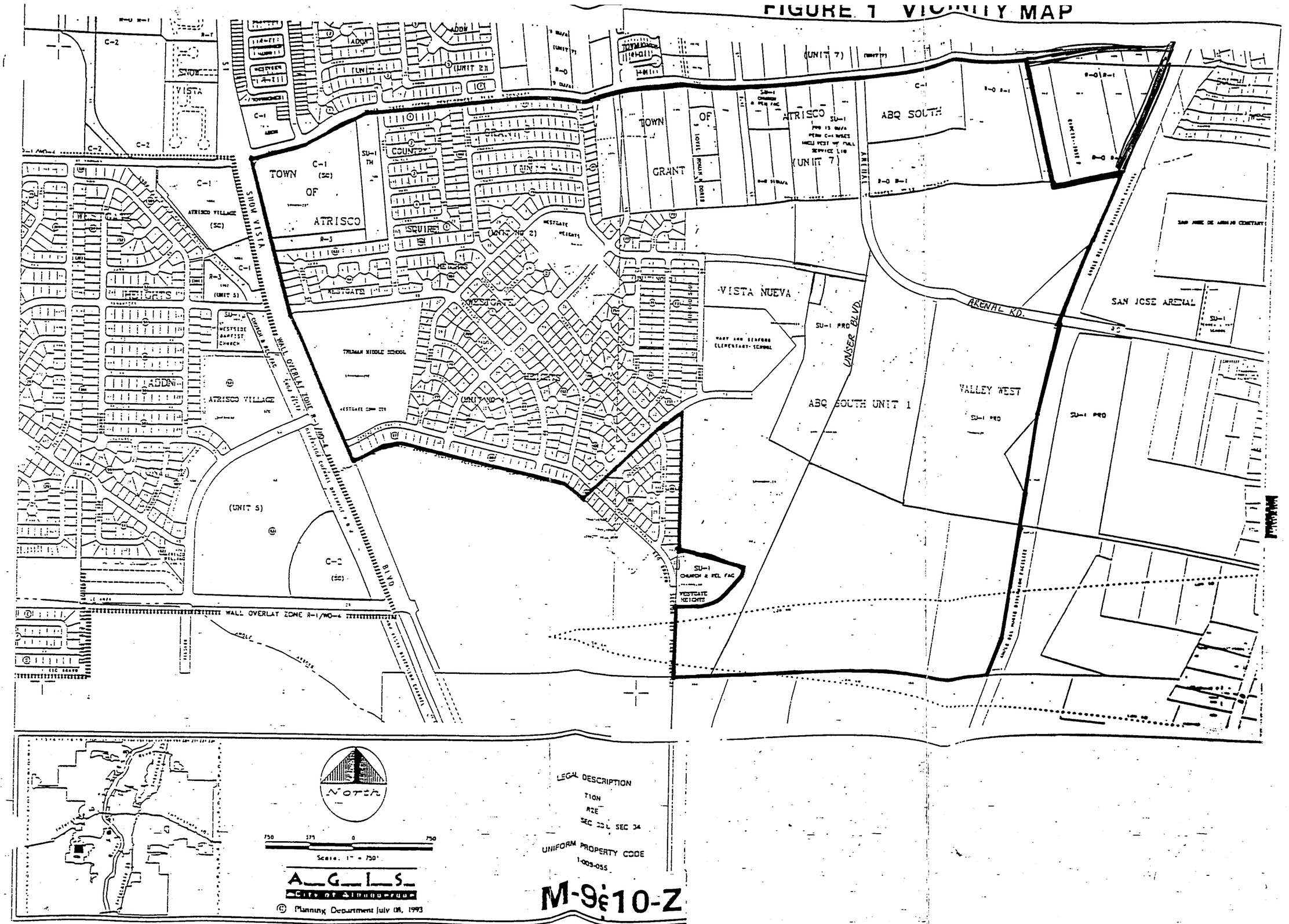
BEC Subbasin Maps

Table 1: Previous Hydrograph Datas of the Amole del Norte Channel

Table 2: Revised Hydrograph Datas of the Amole del Norte Channel

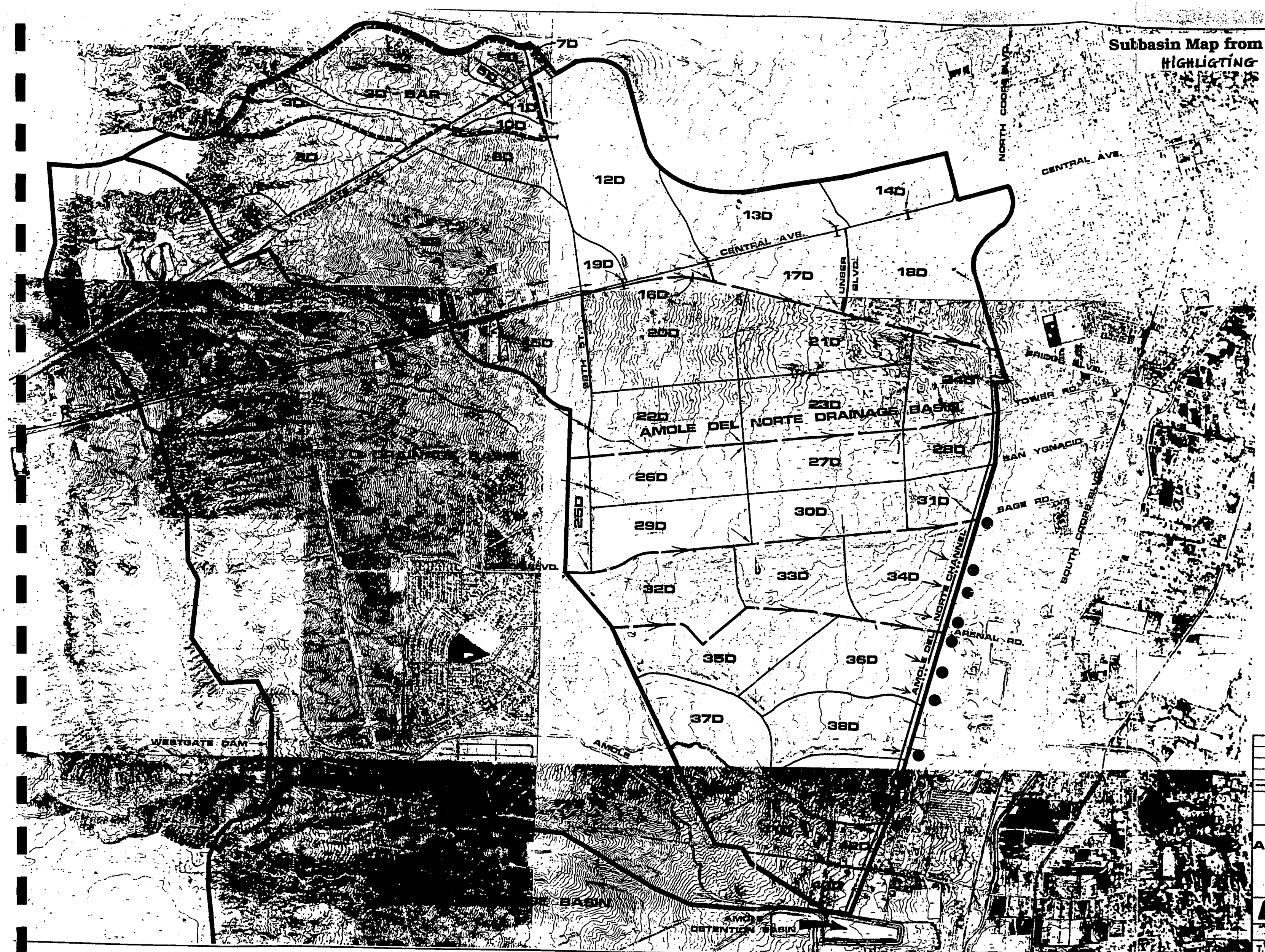
Hydrograph of the Amole del Norte Channel

FIGURE 1 VICINITY MAP



M-9 & 10-Z

Subbasin Map from Boyle Engineering Report HIGHLIGTING areas of study



N

SCALE: 1" = 1000'

1000 0 1000 2000 FEET

☐ Drainage subbasins to be adjusted

● locations of side discharges for adjusted drainage basins

LEGEND

- DRAINAGE BOUNDARY
- SUBBASIN BOUNDARY
- 24D SUBBASIN NUMBER
- EXIST. CULVERTS
- FUTURE STORM SEWER
- OUTFLOW LOCATIONS
- COMBINED SUBBASIN BOUNDARY

SYMBOL	DATE	DESCRIPTION	APPROVED

PLATE 1

AMOLE DETENTION BASIN UPLAND DRAINAGE AREAS

Boyle Engineering Corporation
consulting engineers

DESIGNED	DRAWN	CHECKED	DATE	DRAWING NO.
T.W.P.	J.D.M.	T.D.S.	FEB. 85	

SHEET NO.

TABLE 1

For Reference
From the Amole del Norte Storm Diversion Facility Report February 1995, Boyle Engineering

NOTE:

A = Runoff from the proposed Tierra Bayita storm drain.

B = Sum of flows entering the Amole Channel from Tower so. to the Amole Basin.

C = Discharge from a proposed 35 ac-ft detention basin at the north end of the Amole Channel (inflow = A)

TIME (HR)	A: DISCHARGE FROM PROPOSED TIERRA BAYITA STORM SEWER	B: SIDE FLOW AT TOWER ROAD	B: SIDE FLOW AT SAGE ROAD	B: SIDE FLOW AT ARENAL ROAD	B: SIDE FLOW 1700' SO. OF ARENAL	B: SIDE FLOW 3000' SO. OF ARENAL	B: SIDE FLOW 1100' NO. OF BLAKE	B: SIDE FLOW AT BLAKE ROAD	B: SIDE FLOW SOUTH OF BLAKE	B	A & B	C: DISCHARGE FROM PROPOSED 35 AC-FT DETENTION BASIN NO. OF TOWER ROAD	B & C	HYDROGRAPH PLOTTED (SEE GRAPH)
0.2	138	189	106	117	14	42	44	56	17	585	723	0	585	173
0.4	1323	547	210	317	75	84	135	62	33	1463	2786	210	1673	476
0.5	1368	600	176	280	79	65	109	47	26	1382	2750	520	1902	424
0.6	1178	527	142	242	63	45	83	32	18	1152	2330	690	1842	350
0.8	821	335	90	151	38	27	51	21	11	724	1545	735	1459	216
1.0	614	221	64	103	26	21	37	15	8	495	1109	780	1275	150
1.2	500	158	49	79	20	17	29	12	7	371	871	720	1091	
1.4	411	123	39	64	17	14	24	10	5	296	707	600	896	
1.6	342	102	33	53	14	11	20	8	5	246	588	525	771	
1.8	290	86	28	46	12	10	17	7	4	219	500	465	675	
2.0	249	73	24	40	11	9	15	6	3	181	430	380	561	
2.2	215	64	21	35	9	8	13	6	3	159	374	330	489	
2.4	190	57	18	31	8	7	12	5	3	141	331	280	421	
2.6	168	50	16	28	8	6	10	5	2	125	293	230	355	
2.8	150	45	15	25	7	6	10	4	2	114	264	200	314	
3.0	136	41	14	23	6	5	9	4	2	104	240	175	279	
3.2	125	38	13	21	6	5	8	4	2	97	222	155	252	
3.4	115	35	12	20	5	5	8	4	2	91	206	135	226	
3.6	106	32	11	19	5	4	7	3	2	83	189	120	203	
3.8	98	31	11	18	5	4	7	3	2	81	179	105	186	
4.0	92	29	10	17	4	4	7	3	2	76	168	95	171	
4.2	87	27	10	16	4	4	6	3	1	71	158	87	158	
4.4	82	26	9	15	4	4	6	3	1	68	150	82	150	
4.6	78	25	9	15	4	3	6	3	1	66	144	78	144	
4.8	75	24	8	14	4	3	6	3	1	63	138	75	138	
5.0	71	23	8	13	4	3	5	3	1	60	131	71	131	
5.2	68	22	8	13	3	3	5	2	1	57	125	68	125	
5.4	66	21	7	12	3	3	5	2	1	54	120	66	120	
5.6	63	20	7	12	3	3	5	2	1	53	116	63	116	
5.8	60	20	7	12	3	3	5	2	1	53	113	60	113	
6.0														

Side Flow 1600' N of Arenal

TABLE 2.
NEW HYDROGRAPH FOR THE AMOLE DEL NORTE DIVERSION CHANNEL

TIME (HR)	DISCHARGE FROM PROPOSED TIERRA BAYITA STORM SEWER A	SIDE FLOW AT TOWER ROAD	SIDE FLOW AT SAGE ROAD	ADDITIONAL SIDE FLOW AT SAGE ROAD** 504	SIDE FLOW AT 980' S. OF SAGE ROAD** 503	SIDE FLOW AT 1000' N. OF ARENAL ROAD** 501	SIDE FLOW AT 200' N. OF ARENAL ROAD** 502	SIDE FLOW AT ARENAL ROAD*	SIDE FLOW 1150' S. OF ARENAL ROAD** B 406	SIDE FLOW 1650' S. OF ARENAL ROAD* 407	SIDE FLOW AT 3000' S. OF ARENAL ROAD* 408	SIDE FLOW 1100' N. OF BLAKE ROAD	ADDITIONAL SIDE FLOW AT 1100' N. OF BLAKE ROAD** 505	SIDE FLOW AT BLAKE ROAD	SIDE FLOW S. OF BLAKE ROAD	B*	A & B*	DISCHARGE FROM PROPOSED 35 AC-FT DETENTION BASIN N. OF TOWER ROAD C	B & C* HYDROGRAPH PLOTTED (SEE GRAPH)	
0.2	138	189	106	29	36	170	56	45	116	104	305	44	35	56	17	1248	1386	0	1248	836
0.4	1323	547	210	76	2	14	1	156	46	40	183	135	34	62	33	1539	2862	210	1749	552
0.5	1368	600	176	76	1	3		188	24	15	91	109	16	47	26	1372	2740	520	1891	417
0.6	1178	527	142	66		1		188	9	8	48	83	11	32	18	1133	2311	690	1823	331
0.8	821	335	90	30				139	2	2	13	51	3	21	11	697	1518	735	1432	189
1.0	614	221	64	16				74	1	1	4	37	1	15	8	442	1056	780	1222	97
1.2	500	158	49	7				39			1	29		12	7	302	802	720	1022	
1.4	411	123	39	3				22				24		10	5	226	637	600	826	
1.6	432	102	33	2				12				20		8	5	182	524	525	707	
1.8	290	86	28	1				7				17		7	4	150	440	465	615	
2.0	249	73	24					3				15		6	3	124	373	380	504	
2.2	215	64	21					2				13		6	3	109	324	330	439	
2.4	190	57	18					1				12		5	3	96	286	280	376	
2.6	168	50	16									10		5	2	83	251	230	313	
2.8	150	45	15									10		4	2	76	226	200	276	
3.0	136	41	14									9		4	2	70	206	175	245	
3.2	125	38	13									8		4	2	65	190	155	220	
3.4	115	35	12									8		4	2	61	176	135	196	
3.6	106	32	11									7		3	2	55	161	120	175	
3.8	98	31	11									7		3	2	54	152	105	159	
4.0	92	29	10									7		3	2	51	143	95	146	
4.2	87	27	10									6		3	1	47	134	87	134	
4.4	82	26	9									6		3	1	45	127	82	127	
4.6	78	25	9									6		3	1	44	122	78	122	
4.8	75	24	8									6		3	1	42	117	75	117	
5.0	71	23	8									5		3	1	40	111	71	111	
5.2	68	22	8									5		2	1	38	106	68	106	
5.4	66	21	7									5		2	1	36	102	66	102	
5.6	63	20	7									5		2	1	35	98	63	98	
5.8	60	20	7									5		2	1	35	95	60	95	
6.0																				

NOTE:

A = Runoff from the proposed Tierra Bayita storm drain.

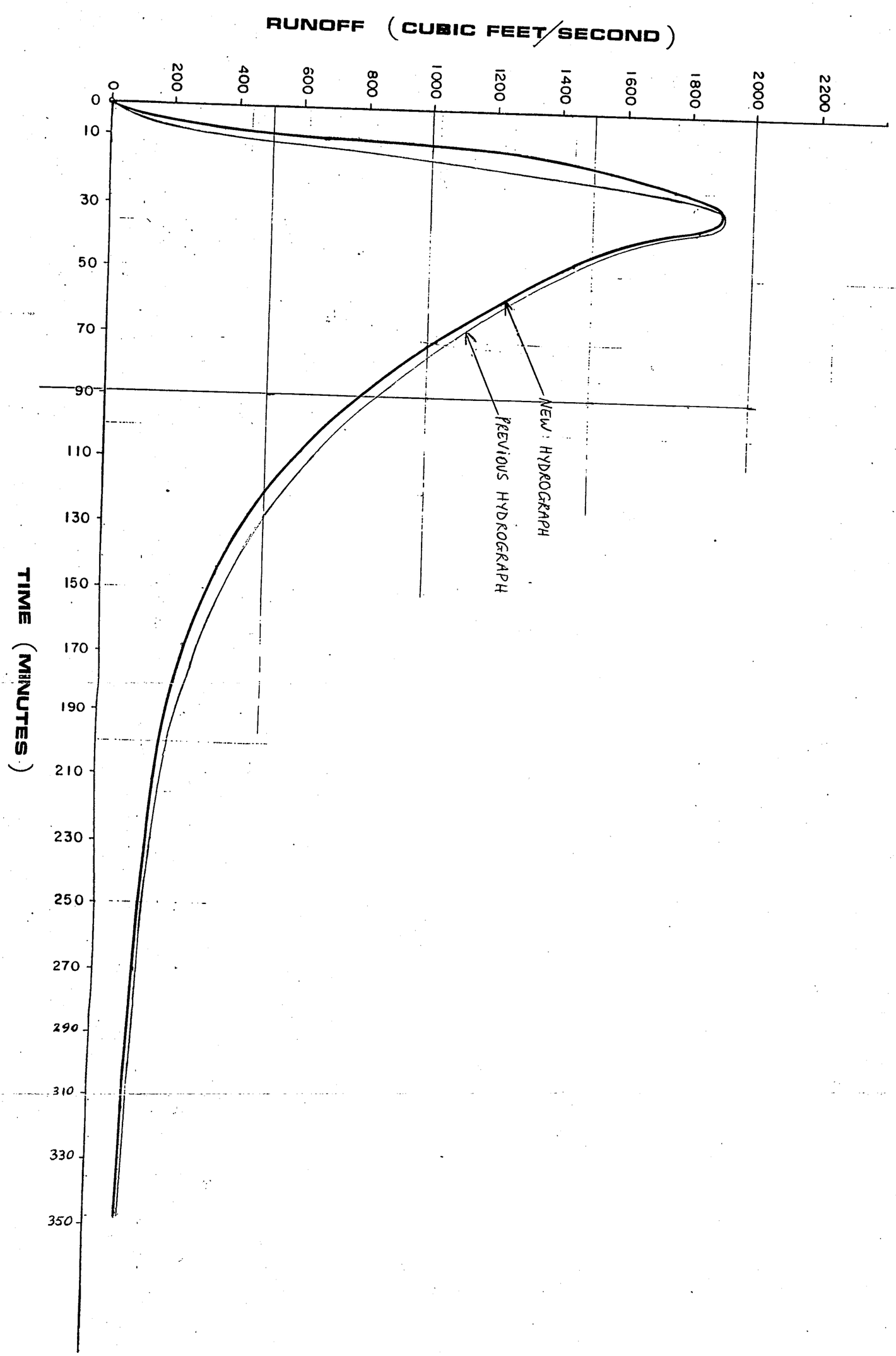
B = Sum of flows entering the Amole Channel from Tower south to the Amole Bain.

C = Discharge from a proposed 35 ac-ft detention basin at the north end of the Amole Channel (inflow = A).

*Values adjusted from Boyle Report, (see calculations section). FOR COMPARISON, SEE TABLE 1

**New side flow

903TABLE,DWGems 06/17/97



Runoff Hydrograph for the Amole del Norte Channel

APPENDIX B

Hydrograph Computational Datas

HYDROGRAPH FOR BASINS DISCHARGING TO CHANNEL AT ARENAL ROAD

FROM BASIN 100 TO SURGE POND

LENGTH (FT)	=	5714
DIFFERENCE IN ELEVATION ACROSS BASIN	=	102
SLOPE OF BASIN (FT/FT)	=	0.015
TIME OF CONCENTRATION (MIN)	=	23
TIME OF PEAK (MIN)	=	15

ROUTING SURGE POND AND TO AMOLE DEL NORTE CHANNEL

TIME TO PEAK (AHYMO)	=	18	
AREA OF BASIN, (ACRES)	=	373.4	352.9
AREA OF BASIN, (SQ MI)	=	0.5834	0.55146
100-YR, 6-HR RAINFALL, (INCHES)	=	2.20	
COMPOSITE CURVE NO.	=	77	
DIRECT RUNOFF (INCHES)	=	.56	
TOTAL TIME TO PEAK (15+18) (MIN)	=	33	
VOLUME OF RUNOFF (ACRE-FT)	=	32.0	
PEAK RUNOFF (CFS)	=	190	
AVERAGE RUNOFF PER ACRE (CFS/AC)	=	2.7	

POINT	t/Tp (min/min)	t (min)	y (cfs/cfs)	Q (cfs)
1	.0	0.0	.000	0.0
2	.1	3.3	.030	5.7
3	.2	6.6	.100	19.0
4	.3	9.9	.190	36.1
5	.4	13.2	.310	58.9
6	.5	16.5	.470	89.3
7	.6	19.8	.660	125.4
8	.7	23.1 ,4	.820	155.8
9	.8	26.4	.930	176.7
10	.9	29.7 ,5	.990	188.1
11	1.0	33.0	1.000	190.0
12	1.1	36.3 ,6	.990	188.1
13	1.2	39.6	.930	176.7
14	1.3	42.9	.860	163.4
15	1.4	46.2 ,8	.780	148.2
16	1.5	49.5	.680	129.2
17	1.6	52.8	.560	106.4
18	1.7	56.1	.460	87.4
19	1.8	59.4	.390	74.1
20	1.9	62.7	.330	62.7
21	2.0	66.0	.280	53.2

POINT	t/Tp (min/min)	t (min)	y (cfs/cfs)	Q (cfs)
22	2.2	72.6	.207	39.3
23	2.4	79.2	.147	27.9
24	2.6	85.8	.107	20.3
25	2.8	92.4	.077	14.6
26	3.0	99.0	.055	10.5
27	3.2	105.6	.040	7.6
28	3.4	112.2	.029	5.5
29	3.6	118.8	.021	4.0
30	3.8	125.4	.015	2.9
31	4.0	132.0	.011	2.1
32	4.5	148.5	.005	1.0
33	5.0	165.0	.000	.00

HYDROGRAPH FOR BASIN 406
(SIDE FLOW 1150′ S. OF ARENAL ROAD)

BASIN LENGTH, (FT)	=	2063
DIFFERENCE IN ELEVATION ACROSS BASIN	=	28
SLOPE OF BASIN, (FT/FT)	=	0.0136
AREA OF BASIN, (ACRES)	=	36.2 36.8
AREA OF BASIN, (SQ MI)	=	0.05750
100-YR, 6-HR RAINFALL, (INCHES)	=	2.20
COMPOSITE CURVE NO.	=	77
DIRECT RUNOFF (INCHES)	=	.56
TIME OF CONCENTRATION (SCS UPLAND METHOD) (MIN)	=	20
TIME TO PEAK (MIN)	=	13
VOLUME OF RUNOFF (ACRE-FT) (from AHYMO run)	=	3.9
PEAK RUNOFF (CFS) (from AHYMO run)	=	117.49
RUNOFF PER ACRE (CFS/ACRE)	=	3.25

POINT	t/Tp (min/min)	t (min)	y (cfs/cfs)	Q (cfs)
1	.0	.0	.000	.00
2	.1	1.3	.030	3.52
3	.2	2.3	.100	11.75
4	.3	3.9	.190	22.33
5	.4	5.2	.310	36.43
6	.5	6.5	.470	55.23
7	.6	7.8	.660	77.55
8	.7	9.1	.820	96.35
9	.8	10.4	.930	109.28
10	.9	11.7 .2	.990	116.33
11	1.0	13.0	1.000	117.49
12	1.1	14.3	.990	116.33
13	1.2	15.6	.930	109.28
14	1.3	16.9	.860	101.05
15	1.4	18.2	.780	91.65
16	1.5	19.5	.680	79.90
17	1.6	20.8	.560	65.8
18	1.7	22.1	.460	54.05
19	1.8	23.4 .4	.390	45.83
20	1.9	24.7	.330	38.78
21	2.0	26.0	.280	32.90
22	2.2	28.6	.207	24.32
23	2.4	31.2	.147	17.27

POINT	t/Tp (min/min)	t (min)	y (cfs/cfs)	Q (cfs)
24	2.6	33.8	.107	12.57
25	2.8	36.4	.077	9.05
26	3.0	39.0	.055	6.46
27	3.2	41.6	.040	4.7
28	3.4	44.2	.029	3.41
29	3.6	46.8	.021	2.47
30	3.8	49.4	.015	1.76
31	4.0	52.0	.011	1.29
32	4.5	58.5	.005	0.59
33	5.0	65.0	.000	.00

HYDROGRAPH FOR BASIN 407
(SIDE FLOW 1650′ S. OF ARENAL ROAD)

BASIN LENGTH, (FT)	=	2103
DIFFERENCE IN ELEVATION ACROSS BASIN	=	32
SLOPE OF BASIN, (FT/FT)	=	0.0152
AREA OF BASIN, (ACRES)	=	32.26
AREA OF BASIN, (SQ MI)	=	0.05040
100-YR, 6-HR RAINFALL, (INCHES)	=	2.20
COMPOSITE CURVE NO.	=	77
DIRECT RUNOFF (INCHES)	=	.56
TIME OF CONCENTRATION (SCS UPLAND METHOD) (MIN)	=	19.2
TIME TO PEAK (MIN)	=	13
VOLUME OF RUNOFF (ACRE-FT) (from AHYMO run)	=	3.5
PEAK RUNOFF (CFS) (from AHYMO run)	=	104.81
RUNOFF PER ACRE (CFS/ACRE)	=	3.25

POINT	t/Tp (min/min)	t (min)	y (cfs/cfs)	Q (cfs)
1	.0	.0	.000	.00
2	.1	1.3	.030	3.14
3	.2	2.3	.100	10.48
4	.3	3.9	.190	19.91
5	.4	5.2	.310	32.49
6	.5	6.5	.470	49.26
7	.6	7.8	.660	69.17
8	.7	9.1	.820	85.94
9	.8	10.4	.930	97.46
10	.9	11.7	.990	103.75
11	1.0	13.0	1.000	104.81
12	1.1	14.3	.990	103.75
13	1.2	15.6	.930	97.46
14	1.3	16.9	.860	90.13
15	1.4	18.2	.780	81.74
16	1.5	19.5	.680	71.26
17	1.6	20.8	.560	58.69
18	1.7	22.1	.460	48.21
19	1.8	23.4	.390	40.87
20	1.9	24.7	.330	34.58
21	2.0	26.0	.280	29.34
22	2.2	28.6	.207	21.69
23	2.4	31.2	.147	15.41

POINT	t/Tp (min/min)	t (min)	y (cfs/cfs)	Q (cfs)
24	2.6	33.8	.107	11.21
25	2.8	36.4	.077	8.07
26	3.0	39.0	.055	5.76
27	3.2	41.6	.040	4.19
28	3.4	44.2	.029	3.04
29	3.6	46.8	.021	2.20
30	3.8	49.4	.015	1.57
31	4.0	52.0	.011	1.15
32	4.5	58.5	.005	0.52
33	5.0	65.0	.000	.00

HYDROGRAPH FOR BASIN 408
(SIDE FLOW 3000′ S. OF ARENAL ROAD)

BASIN LENGTH, (FT)	=	2974
DIFFERENCE IN ELEVATION ACROSS BASIN	=	56
SLOPE OF BASIN, (FT/FT)	=	.0188
AREA OF BASIN, (ACRES)	=	100.7
AREA OF BASIN, (SQ MI)	=	.15736
100-YR, 6-HR RAINFALL, (INCHES)	=	2.20
COMPOSITE CURVE NO.	=	77
DIRECT RUNOFF (INCHES)	=	.56
TIME OF CONCENTRATION (SCS UPLAND METHOD) (MIN)	=	23
TIME TO PEAK (MIN)	=	15
VOLUME OF RUNOFF (ACRE-FT) (from AHYMO run)	=	10.9
PEAK RUNOFF (CFS) (from AHYMO run)	=	327.60
RUNOFF PER ACRE (CFS/ACRE)	=	3.25

POINT	t/Tp (min/min)	t (min)	y (cfs/cfs)	Q (cfs)
1	.0	.0	.000	.00
2	.1	1.5	.030	9.83
3	.2	3.0	.100	32.76
4	.3	4.5	.190	62.24
5	.4	6.0	.310	101.56
6	.5	7.5	.470	153.97
7	.6	9.0	.660	216.22
8	.7	10.5	.820	268.63
9	.8	12.0 ,2	.930	304.67
10	.9	13.5	.990	324.32
11	1.0	15.0	1.000	327.60
12	1.1	16.5	.990	324.32
13	1.2	18.0	.930	304.67
14	1.3	19.5	.860	281.74
15	1.4	21.0	.780	255.53
16	1.5	22.5	.680	222.77
17	1.6	24.0 ,4	.560	183.46
18	1.7	25.5	.460	150.70
19	1.8	27.0	.390	127.76
20	1.9	28.5	.330	108.11
21	2.0	30.0	.280	91.73
22	2.2	33.0	.207	67.81
23	2.4	36.0	.147	48.16

POINT	t/Tp (min/min)	t (min)	y (cfs/cfs)	Q (cfs)
24	2.6	39.0	.107	35.05
25	2.8	42.0	.077	25.23
26	3.0	45.0	.055	18.02
27	3.2	48.0	.040	13.10
28	3.4	51.0	.029	9.50
29	3.6	54.0	.021	6.88
30	3.8	57.0	.015	4.91
31	4.0	60.0	.011	3.60
32	4.5	67.5	.005	1.64
33	5.0	75.0	.000	.00

HYDROGRAPH FOR BASINS 500 & 501 OF LONGFORD SUBDIVISION
(SIDE FLOW 1000' N. OF ARENAL ROAD)

BASIN LENGTH, (FT)	=	2325
DIFFERENCE IN ELEVATION ACROSS BASIN	=	57
SLOPE OF BASIN, (FT/FT)	=	0.0245
AREA OF BASIN, (ACRES)	=	32.7
AREA OF BASIN, (SQ MI)	=	0.0511
100-YR, 6-HR RAINFALL, (INCHES)	=	2.20
COMPOSITE CURVE NO.	=	77
DIRECT RUNOFF (SCS UPLAND METHOD) (INCHES)	=	.56
TIME OF CONCENTRATION (MIN)	=	14
TIME TO PEAK (MIN)	=	9
VOLUME OF RUNOFF (ACRE-FT) (from AHYMO run)	=	4.4
PEAK RUNOFF (CFS) (from AHYMO run)	=	128
RUNOFF PER ACRE (CFS/ACRE)	=	3.4

POINT	t/Tp (min/min)	t (min)	y (cfs/cfs)	Q (cfs)
1	.0	.0	.000	.0
2	.1	0.9	.030	3.84
3	.2	1.8	.100	12.80
4	.3	2.7	.190	24.32
5	.4	3.6	.310	39.68
6	.5	4.5	.470	60.16
7	.6	5.4	.660	84.48
8	.7	6.3	.820	104.96
9	.8	7.2	.930	119.04
10	.9	8.1	.990	126.72
11	1.0	9.0	1.000	128.00
12	1.1	9.9	.990	126.72
13	1.2	10.8	.930	119.04
14	1.3	11.7	.860	110.08
15	1.4	12.6 .2	.780	99.84
16	1.5	13.5	.680	87.04
17	1.6	14.4	.560	71.68
18	1.7	15.3	.460	58.88
19	1.8	16.2	.390	49.92
20	1.9	17.1	.330	42.24
21	2.0	18.0	.280	35.84
22	2.2	19.8	.207	26.50
23	2.4	21.6	.147	18.82

POINT	t/Tp (min/min)	t (min)	y (cfs/cfs)	Q (cfs)
24	2.6	23.4	.107	13.70
25	2.8	25.2	.077	9.86
26	3.0	27.0	.055	7.04
27	3.2	28.8	.040	5.12
28	3.4	30.6	.029	3.71
29	3.6	32.4	.021	2.69
30	3.8	34.2	.015	1.92
31	4.0	36.0	.011	1.41
32	4.5	40.5	.005	0.64
33	5.0	45.0	.000	0.00

HYDROGRAPH FOR BASIN 502 OF LONGFORD SUBDIVISION
(SIDE FLOW 200' N. OF ARENAL ROAD)

BASIN LENGTH, (FT)	=	2714
DIFFERENCE IN ELEVATION ACROSS BASIN	=	72
SLOPE OF BASIN, (FT/FT)	=	0.0265
AREA OF BASIN, (ACRES)	=	36.9
AREA OF BASIN, (SQ MI)	=	0.05788
100-YR, 6-HR RAINFALL, (INCHES)	=	2.20
COMPOSITE CURVE NO.	=	77
DIRECT RUNOFF (INCHES)	=	.56
TIME OF CONCENTRATION (SCS UPLAND METHOD) (MIN)	=	10
TIME TO PEAK (MIN)	=	7
VOLUME OF RUNOFF (ACRE-FT) (from AHYMO run)	=	4.16
PEAK RUNOFF (CFS) (from AHYMO run)	=	121.8
RUNOFF PER ACRE (CFS/ACRE)	=	3.3

POINT	t/Tp (min/min)	t (min)	y (cfs/cfs)	Q (cfs)
1	.0	.0	.000	.00
2	.1	0.7	.030	3.65
3	.2	1.4	.100	12.18
4	.3	2.1	.190	23.14
5	.4	2.8	.310	37.76
6	.5	3.5	.470	57.25
7	.6	4.2	.660	80.39
8	.7	4.9	.820	99.88
9	.8	5.6	.930	113.27
10	.9	6.3	.990	120.58
11	1.0	7.0	1.000	121.8
12	1.1	7.7	.990	120.58
13	1.2	8.4	.930	113.27
14	1.3	9.1	.860	104.75
15	1.4	9.8	.780	95.00
16	1.5	10.5	.680	82.82
17	1.6	11.2	.560	68.21
18	1.7	11.9 ,2	.460	56.03
19	1.8	12.6	.390	47.50
20	1.9	13.3	.330	40.19
21	2.0	14.0	.280	34.10
22	2.2	15.4	.207	25.21
23	2.4	16.8	.147	17.90

POINT	t/Tp (min/min)	t (min)	y (cfs/cfs)	Q (cfs)
24	2.6	18.2	.107	13.03
25	2.8	19.6	.077	9.38
26	3.0	21.0	.055	6.70
27	3.2	22.4	.040	4.87
28	3.4	23.8	.029	3.53
29	3.6	25.2	.021	2.56
30	3.8	26.6	.015	1.83
31	4.0	28.0	.011	1.34
32	4.5	31.5	.005	0.61
33	5.0	35.0	.000	0.00

HYDROGRAPH FOR BASIN 503
(SIDE FLOW 980' S. OF SAGE ROAD)

BASIN LENGTH, (FT)	=	1190
DIFFERENCE IN ELEVATION ACROSS BASIN	=	44
SLOPE OF BASIN, (FT/FT)	=	0.037
AREA OF BASIN, (ACRES)	=	24.0
AREA OF BASIN, (SQ MI)	=	0.03752
100-YR, 6-HR RAINFALL, (INCHES)	=	2.20
COMPOSITE CURVE NO.	=	77
DIRECT RUNOFF (INCHES)	=	.56
TIME OF CONCENTRATION (SCS UPLAND METHOD) (MIN)	=	8
TIME TO PEAK (MIN)	=	7
VOLUME OF RUNOFF (ACRE-FT) (from AHYMO run)	=	2.60
PEAK RUNOFF (CFS) (from AHYMO run)	=	78.03
RUNOFF PER ACRE (CFS/ACRE)	=	3.25

POINT	t/Tp (min/min)	t (min)	y (cfs/cfs)	Q (cfs)
1	.0	.0	.000	.00
2	.1	0.7	.030	2.34
3	.2	1.4	.100	7.80
4	.3	2.1	.190	14.82
5	.4	2.8	.310	24.18
6	.5	3.5	.470	36.66
7	.6	4.2	.660	51.48
8	.7	4.9	.820	63.96
9	.8	5.6	.930	72.54
10	.9	6.3	.990	77.22
11	1.0	7.0	1.000	78.03
12	1.1	7.7	.990	77.22
13	1.2	8.4	.930	72.54
14	1.3	9.1	.860	67.08
15	1.4	9.8	.780	60.84
16	1.5	10.5	.680	53.04
17	1.6	11.2	.560	43.68
18	1.7	11.9	.460	35.88
19	1.8	12.6	.390	30.42
20	1.9	13.3	.330	25.74
21	2.0	14.0	.280	21.84
22	2.2	15.4	.207	16.15
23	2.4	16.8	.147	11.47

POINT	t/Tp (min/min)	t (min)	y (cfs/cfs)	Q (cfs)
24	2.6	18.2	.107	8.35
25	2.8	19.6	.077	6.01
26	3.0	21.0	.055	4.29
27	3.2	22.4	.040	3.12
28	3.4	23.8	.029	2.26
29	3.6	25.2	.021	1.64
30	3.8	26.6	.015	1.17
31	4.0	28.0	.011	0.86
32	4.5	31.5	.005	0.39
33	5.0	35.0	.000	.00

HYDROGRAPH FOR BASIN 504
(ADDITIONAL SIDE FLOW AT SAGE ROAD)

BASIN LENGTH, (FT)	=	2897
DIFFERENCE IN ELEVATION ACROSS BASIN	=	24
SLOPE OF BASIN, (FT/FT)	=	0.0083
AREA OF BASIN, (ACRES)	=	23.75
AREA OF BASIN, (SQ MI)	=	0.0366
100-YR, 6-HR RAINFALL, (INCHES)	=	2.20
COMPOSITE CURVE NO.	=	77
DIRECT RUNOFF (INCHES)	=	.56
TIME OF CONCENTRATION (SCS UPLAND METHOD) (MIN)	=	40
TIME TO PEAK (MIN)	=	27
VOLUME OF RUNOFF (ACRE-FT) (from AHYMO run)	=	2.57
PEAK RUNOFF (CFS) (from AHYMO run)	=	77.16
RUNOFF PER ACRE (CFS/ACRE)	=	3.25

POINT	t/Tp (min/min)	t (min)	y (cfs/cfs)	Q (cfs)
1	.0	.0	.000	.00
2	.1	2.7	.030	2.31
3	.2	5.4	.100	7.72
4	.3	8.1	.190	14.66
5	.4	10.8	.310	23.92
6	.5	13.5	.470	36.27
7	.6	16.2	.660	50.93
8	.7	18.9	.820	63.27
9	.8	21.6	.930	71.76
10	.9	24.3	.990	76.39
11	1.0	27.0	1.000	77.16
12	1.1	29.7	.990	76.39
13	1.2	32.4	.930	71.76
14	1.3	35.1	.860	66.36
15	1.4	37.8	.780	60.18
16	1.5	40.5	.680	52.47
17	1.6	43.2	.560	43.21
18	1.7	45.9	.460	35.49
19	1.8	48.6	.390	30.09
20	1.9	51.3	.330	25.47
21	2.0	54.0	.280	21.60
22	2.2	59.4	.207	15.97
23	2.4	64.8	.147	11.34

POINT	t/Tp (min/min)	t (min)	y (cfs/cfs)	Q (cfs)
24	2.6	70.2	.107	8.26
25	2.8	75.6	.077	5.94
26	3.0	81.0	.055	4.29
27	3.2	86.4	.040	3.09
28	3.4	91.8	.029	2.24
29	3.6	97.2	.021	1.62
30	3.8	102.6	.015	1.16
31	4.0	108.0	.011	0.85
32	4.5	121.5	.005	0.39
33	5.0	135.0	.000	.00

HYDROGRAPH FOR BASIN 505
(ADDITIONAL SIDE FLOW 1100′ N. OF BLAKE ROAD)

BASIN LENGTH, (FT)	=	1468
DIFFERENCE IN ELEVATION ACROSS BASIN	=	8
SLOPE OF BASIN, (FT/FT)	=	0.00545
AREA OF BASIN, (ACRES)	=	16.8
AREA OF BASIN, (SQ MI)	=	0.02618
100-YR, 6-HR RAINFALL, (INCHES)	=	2.20
COMPOSITE CURVE NO.	=	77
DIRECT RUNOFF (INCHES)	=	.56
TIME OF CONCENTRATION (SCS UPLAND MEDHOD) (MIN)	=	26
TIME TO PEAK (MIN)	=	17
VOLUME OF RUNOFF (ACRE-FT) (from AHYMO run)	=	1.41
PEAK RUNOFF (CFS) (from AHYMO run)	=	43.10
RUNOFF PER ACRE (CFS/ACRE)	=	2.57

POINT	t/Tp (min/min)	t (min)	y (cfs/cfs)	Q (cfs)
1	.0	.0	.000	.00
2	.1	1.7	.030	1.29
3	.2	3.4	.100	4.31
4	.3	5.1	.190	8.19
5	.4	6.8	.310	13.36
6	.5	8.5	.470	20.26
7	.6	10.2	.660	28.45
8	.7	11.9	.820	35.34
9	.8	13.6	.930	40.08
10	.9	15.3	.990	42.67
11	1.0	17.0	1.000	43.10
12	1.1	18.7	.990	42.67
13	1.2	20.4	.930	40.08
14	1.3	22.1	.860	37.07
15	1.4	23.8	.780	33.62
16	1.5	25.5	.680	29.31
17	1.6	27.2	.560	24.14
18	1.7	28.9	.460	19.83
19	1.8	30.6	.390	16.81
20	1.9	32.3	.330	14.22
21	2.0	34.0	.280	12.07
22	2.2	37.4	.207	8.92
23	2.4	40.8	.147	6.34

POINT	t/Tp (min/min)	t (min)	y (cfs/cfs)	Q (cfs)
24	2.6	44.2	.107	4.61
25	2.8	47.6	.077	3.32
26	3.0	51.0	.055	2.37
27	3.2	54.4	.040	1.72
28	3.4	57.8	.029	1.25
29	3.6	61.2	.021	0.91
30	3.8	64.6	.015	0.65
31	4.0	68.0	.011	0.47
32	4.5	76.5	.005	0.22
33	5.0	85.0	.000	.00

APPENDIX C

Time to Peak Calculations

TIME TO PEAK CALCULATIONS

BASINS 100-405 : SIDE FLOW AT ARENAL RD.

$$T_c = \left[(12000-L)/(120 * K * S^{0.5})\right] + \left[(L-4000) * K_n * \frac{(L_{ca}/L)^{0.33}}{4.305 * S^{0.165}}\right]$$

$L = 5714$

Based on engineering judgement,
let $K_n = 0.023$, $K = 2.3$

$$T_c = \frac{12000-5714}{120 * 2.3 * \sqrt{1.5}} + \frac{(5714-4000) * 0.023\left(\frac{714}{5714}\right)^{0.33}}{4.305 * (1.5)^{0.165}}$$

$= 22.91$ MIN.

$t_p = 2/3(22.91) = 15.3$ MIN $\quad$ 0.255 Hr

BASIN 406: SIDE FLOW 1150' S. OF ARENAL RD.

$L_1 = 400'$, $K_1 = 0.7$, $S = 0.0136$
$V_1 = 0.7\sqrt{1.36} = 0.82$ fps

$L_2 = 1663'$, $K_2 = 2.0$
$V_2 = 2.0\sqrt{1.36} = 2.33$ fps

$$T_c = \frac{(400/0.82) + (1663/2.33)}{3600} = 0.33\,h$$

$T_p = 2/3(0.33\,h) = 0.22\,h = 13.2$ min

BASIN 407: SIDE FLOW 1650' S. OF ARENAL RD.

$L_1 = 400'$, $K_1 = 0.7$, $S = 0.0152$

$V_1 = 0.7\sqrt{1.52} = 0.86$

$L_2 = 1703$, $K_2 = 2.0$

$V_2 = 2.0\sqrt{1.52} = 2.47$

$$T_c = \frac{(400/0.86) + (1703/2.47)}{3600} = 0.32h$$

$$T_p = \tfrac{2}{3}(0.32) = 0.21h = 13 \text{ min.}$$

BASIN 408: SIDE FLOW 3000' S. OF ARENAL RD.

$L_1 = 400'$, $K_1 = 0.7$, $S = 0.0188$

$V_1 = 0.7\sqrt{1.88} = 0.96$ fps

$L_2 = 2574'$, $K_2 = 2.0$

$V_2 = 2.0\sqrt{1.88} = 2.74$ fps

$$T_c = \frac{(400/0.96) + (2574/2.74)}{3600} = 0.38h$$

$$T_p = \tfrac{2}{3}(0.38h) = 0.25h = 15 \text{ MIN.}$$

BASINS 500 + 501: SIDE FLOW 1000' N. OF ARENAL RD.

$L_1 = 400'$, $K_1 = 0.7$, $S = 2.45\%$

$V_1 = 0.7\sqrt{2.45} = 1.10$

$L_2 = 400'$, $K_2 = 2.0$

$V_2 = 2.0\sqrt{2.45} = 3.13$

$L_3 = 1525$, $K_3 = 3.0$

$V_3 = 3.0\sqrt{2.45} = 4.70$

$$T_c = \frac{(400/1.10) + (400/3.13) + (1525/4.70)}{3600} = 0.23\,h$$

$t_p = 2/3\,(0.23h) = 0.15h = 9$ MIN.

BASIN 502: SIDE FLOW 200' N. OF ARENAL RD.

$L_1 = 400'$, $K_1 = 2.0$

$V_1 = 2.0\sqrt{2.65} = 3.26$

$L_2 = 2314'$, $K_2 = 3.0$

$V_2 = 3.0\sqrt{2.65} = 4.88$

$$T_c = \frac{(400/3.26) + (2314/4.88)}{3600} = 0.17\,h$$

$T_p = 2/3\,(0.17h) = 0.11h = 7$ MIN.

BASIN 503: SIDE FLOW 980' S. OF SAGE RD.

$L_1 = 400'$, $K_1 = 0.7$, $S = 3.70\%$

$V_1 = 0.7\sqrt{3.70} = 1.35$

$L_2 = 790'$, $K_2 = 2.0$

$V_2 = 2.0\sqrt{3.70} = 3.85$

$$T_c = \frac{(400/1.35) + (790/3.85)}{3600} = 0.14h = 8.4 \text{ MIN.}$$

$T_p = 2/3\,(8.4 \text{ min}) = 6.6$ MIN.

BASIN 504: : ADDITIONAL SIDE FLOW AT SAGE RD.

$L_1 = 400'$, $K_1 = 0.7'$, $S_1 = 0.83\%$

$V_1 = 0.7\sqrt{0.83} = 0.64$

$L_2 = 2497'$, $K_2 = 2.0$, $S_2 = 0.83\%$

$V_2 = 2.0\sqrt{0.83} = 1.82$

$L_3 = 1984'$, $K_3 = 3.0$, $S_3 = 2.92\%$

$V_3 = 3.0\sqrt{2.92} = 5.13$

$$T_c = \frac{(400/0.64) + (2497/1.82) + (1984/5.13)}{3600} = 0.66\,h = 40\text{ MIN.}$$

$$T_p = 2/3\,(40\text{ min}) = 27\text{ min}.$$

BASIN 505: ADDITIONAL SIDE FLOW 1100' N. OF BLAKE RD.

$L_1 = 400'$, $K_1 = 2.0'$, $S_1 = 0.545\%$

$V_1 = 2.0\sqrt{0.545} = 1.48$

$L_2 = 1068'$, $K_2 = 3.0$, $S_2 = 0.545\%$

$V_2 = 3.0\sqrt{0.545} = 2.21$

$L_3 = 3200'$, $K_3 = 3.0$, $S_3 = 1.88\%$

$V_3 = 3.0\sqrt{1.88} = 4.11$

$$T_c = \frac{(400/1.48) + (1068/2.21) + (3200/4.11)}{3600} = 0.43\,h$$

$$t_p = 2/3\,(0.43h) = 0.29\,h = 17\text{ MIN.}$$

APPENDIX D

Previous Hydrograph Computational Datas by BEC

TABLE 4

DATA SUMMARY

100-YEAR STORM DEVELOPED CONDITIONS

Area No.	Basin Length (Feet)	Elev. Drop (Feet)	Slope	Area (Acres)	CN	T_p (Min.)	Direct Runoff (Inches)	Runoff Volume (Acre-ft.)	Peak Flow (cfs)
21D	4015	52	0.0130	128.8	82	24	0.78	8.33	191
22D	3550	82	0.0231	119.6	83	18	0.84	8.25	252
23D	3910	36	0.0092	137.0	83	28	0.84	9.45	186
24D	2010	57	0.0284	89.0	77	10	0.56	4.11	226
25D	2600	40	0.0154	36.0	77	16	0.56	1.66	57
26D	3450	72	0.0209	90.5	80	18	0.69	5.14	157
27D	3840	23	0.0060	99.2	85	32	0.94	7.74	133
28D	2030	57	0.0281	57.0	79	10	0.64	3.03	166
29D	3630	68	0.0187	98.1	79	20	0.64	5.21	143
30D	2430	26	0.0107	97.1	85	18	0.94	7.58	231
31D	1900	62	0.0326	52.0	77	10	0.56	2.40	132
32D	4140	83	0.0200	126.9	79	22	0.64	6.74	168
33D	3650	74	0.0203	93.9	79	20	0.64	4.99	137
34D	3180	76	0.0239	137.5	82	16	0.78	8.90	306 317
35D	5200	100	0.0192	127.3	77	26	0.56	5.88	124
36D	4300	70	0.0163	140.8	77	24	0.56	6.50	149 79
37D	3850	86	0.0223	102.5	77	20	0.56	4.74	130
38D	3100	58	0.0187	131.5	77	18	0.56	6.07	186 84
39D	2670	50	0.0187	52.2	77	16	0.56	2.41	83
40D	2750	50	0.0182	64.5	77	16	0.56	2.98	102

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AMOLE DEL NORTE STORM DIVERSION FACILITY

HYDROGRAPH FOR AREA 32D

BASIN LENGTH, (FT)	=	4140.
DIFFERENCE IN ELEVATION ACROSS BASIN	=	83.
SLOPE OF BASIN, (FT/FT)	=	.0200
AREA OF BASIN, (ACRES)	=	126.9
AREA OF BASIN, (SQ MI)	=	.1982
100-YR, 6-HR RAINFALL, (INCHES)	=	2.20
COMPOSITE CURVE NO.	=	79.00
DIRECT RUNOFF (INCHES)	=	.64
TIME OF CONCENTRATION (KIRPICH EQN.)	=	21.42
TIME TO PEAK (NEAREST EVEN MINUTE)	=	22
VOLUME OF RUNOFF (ACRE-FT)	=	6.739
PEAK RUNOFF (CFS)	=	168.43
PEAK RUNOFF PER ACRE (CFS/ACRE)	=	1.33

POINT	t/Tp (min/min)	t (min)	y (cfs/cfs)	Q (cfs)
1	.0	.0	.000	.00
2	.1	2.2	.030	5.05
3	.2	4.4	.100	16.84
4	.3	6.6	.190	32.00
5	.4	8.8	.310	52.21
6	.5	11.0	.470	79.16
7	.6	13.2	.660	111.16
8	.7	15.4	.820	138.11
9	.8	17.6	.930	156.64
10	.9	19.8	.990	166.75
11	1.0	22.0	1.000	168.43
12	1.1	24.2	.990	166.75
13	1.2	26.4	.930	156.64
14	1.3	28.6	.860	144.85
15	1.4	30.8	.780	131.38
16	1.5	33.0	.680	114.53
17	1.6	35.2	.560	94.32
18	1.7	37.4	.460	77.48
19	1.8	39.6	.390	65.69
20	1.9	41.8	.330	55.58
21	2.0	44.0	.280	47.16
22	2.2	48.4	.207	34.87
23	2.4	52.8	.147	24.76
24	2.6	57.2	.107	18.02
25	2.8	61.6	.077	12.97
26	3.0	66.0	.055	9.26
27	3.2	70.4	.040	6.74
28	3.4	74.8	.029	4.88
29	3.6	79.2	.021	3.54
30	3.8	83.6	.015	2.53
31	4.0	88.0	.011	1.85
32	4.5	99.0	.005	.84
33	5.0	110.0	.000	.00

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AMOLE DEL NORTE STORM DIVERSION FACILITY

HYDROGRAPH FOR AREA 33D

BASIN LENGTH, (FT)	=	3650.
DIFFERENCE IN ELEVATION ACROSS BASIN	=	74.
SLOPE OF BASIN, (FT/FT)	=	.0203
AREA OF BASIN, (ACRES)	=	93.9
AREA OF BASIN, (SQ MI)	=	.1467
100-YR, 6-HR RAINFALL, (INCHES)	=	2.20
COMPOSITE CURVE NO.	=	79.00
DIRECT RUNOFF (INCHES)	=	.64
TIME OF CONCENTRATION (KIRPICH EQN.)	=	19.36
TIME TO PEAK (NEAREST EVEN MINUTE)	=	20
VOLUME OF RUNOFF (ACRE-FT)	=	4.987
PEAK RUNOFF (CFS)	=	137.11
PEAK RUNOFF PER ACRE (CFS/ACRE)	=	1.46

POINT	t/Tp (min/min)	t (min)	Y (cfs/cfs)	Q (cfs)
1	.0	.0	.000	.00
2	.1	2.0	.030	4.11
3	.2	4.0	.100	13.71
4	.3	6.0	.190	26.05
5	.4	8.0	.310	42.50
6	.5	10.0	.470	64.44
7	.6	12.0	.660	90.49
8	.7	14.0	.820	112.43
9	.8	16.0	.930	127.51
10	.9	18.0	.990	135.74
11	1.0	20.0	1.000	137.11
12	1.1	22.0	.990	135.74
13	1.2	24.0	.930	127.51
14	1.3	26.0	.860	117.92
15	1.4	28.0	.780	106.95
16	1.5	30.0	.680	93.24
17	1.6	32.0	.560	76.78
18	1.7	34.0	.460	63.07
19	1.8	36.0	.390	53.47
20	1.9	38.0	.330	45.25
21	2.0	40.0	.280	38.39
22	2.2	44.0	.207	28.38
23	2.4	48.0	.147	20.16
24	2.6	52.0	.107	14.67
25	2.8	56.0	.077	10.56
26	3.0	60.0	.055	7.54
27	3.2	64.0	.040	5.48
28	3.4	68.0	.029	3.98
29	3.6	72.0	.021	2.88
30	3.8	76.0	.015	2.06
31	4.0	80.0	.011	1.51
32	4.5	90.0	.005	.69
33	5.0	100.0	.000	.00

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AMOLE DEL NORTE STORM DIVERSION FACILITY

HYDROGRAPH FOR AREA 34D

BASIN LENGTH, (FT)	=	3180.
DIFFERENCE IN ELEVATION ACROSS BASIN	=	76.
SLOPE OF BASIN, (FT/FT)	=	.0239
AREA OF BASIN, (ACRES)	=	137.5
AREA OF BASIN, (SQ MI)	=	.2149
100-YR, 6-HR RAINFALL, (INCHES)	=	2.20
COMPOSITE CURVE NO.	=	82.00
DIRECT RUNOFF (INCHES)	=	.78
TIME OF CONCENTRATION (KIRPICH EQN.)	=	16.34
TIME TO PEAK (NEAREST EVEN MINUTE)	=	16
VOLUME OF RUNOFF (ACRE-FT)	=	8.900
PEAK RUNOFF (CFS)	=	305.85
PEAK RUNOFF PER ACRE (CFS/ACRE)	=	2.22

POINT	t/Tp (min/min)	t (min)	y (cfs/cfs)	Q (cfs)
1	.0	.0	.000	.00
2	.1	1.6	.030	9.18
3	.2	3.2	.100	30.59
4	.3	4.8	.190	58.11
5	.4	6.4	.310	94.81
6	.5	8.0	.470	143.75
7	.6	9.6	.660	201.86
8	.7	11.2	.820	250.80
9	.8	12.8	.930	284.44
10	.9	14.4	.990	302.79
11	1.0	16.0	1.000	305.85
12	1.1	17.6	.990	302.79
13	1.2	19.2	.930	284.44
14	1.3	20.8	.860	263.03
15	1.4	22.4	.780	238.56
16	1.5	24.0	.680	207.98
17	1.6	25.6	.560	171.28
18	1.7	27.2	.460	140.69
19	1.8	28.8	.390	119.28
20	1.9	30.4	.330	100.93
21	2.0	32.0	.280	85.64
22	2.2	35.2	.207	63.31
23	2.4	38.4	.147	44.96
24	2.6	41.6	.107	32.73
25	2.8	44.8	.077	23.55
26	3.0	48.0	.055	16.82
27	3.2	51.2	.040	12.23
28	3.4	54.4	.029	8.87
29	3.6	57.6	.021	6.42
30	3.8	60.8	.015	4.59
31	4.0	64.0	.011	3.36
32	4.5	72.0	.005	1.53
33	5.0	80.0	.000	.00

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AMOLE DEL NORTE STORM DIVERSION FACILITY

HYDROGRAPH FOR AREA 35D

BASIN LENGTH, (FT)	=	5200.
DIFFERENCE IN ELEVATION ACROSS BASIN	=	100.
SLOPE OF BASIN, (FT/FT)	=	.0192
AREA OF BASIN, (ACRES)	=	127.3
AREA OF BASIN, (SQ MI)	=	.1990
100-YR, 6-HR RAINFALL, (INCHES)	=	2.20
COMPOSITE CURVE NO.	=	77.00
DIRECT RUNOFF (INCHES)	=	.56
TIME OF CONCENTRATION (KIRPICH EQN.)	=	25.95
TIME TO PEAK (NEAREST EVEN MINUTE)	=	26
VOLUME OF RUNOFF (ACRE-FT)	=	5.883
PEAK RUNOFF (CFS)	=	124.43
PEAK RUNOFF PER ACRE (CFS/ACRE)	=	.98

POINT	t/Tp (min/min)	t (min)	y (cfs/cfs)	Q (cfs)
1	.0	.0	.000	.00
2	.1	2.6	.030	3.73
3	.2	5.2	.100	12.44
4	.3	7.8	.190	23.64
5	.4	10.4	.310	38.57
6	.5	13.0	.470	58.48
7	.6	15.6	.660	82.12
8	.7	18.2	.820	102.03
9	.8	20.8	.930	115.72
10	.9	23.4	.990	123.18
11	1.0	26.0	1.000	124.43
12	1.1	28.6	.990	123.18
13	1.2	31.2	.930	115.72
14	1.3	33.8	.860	107.01
15	1.4	36.4	.780	97.05
16	1.5	39.0	.680	84.61
17	1.6	41.6	.560	69.68
18	1.7	44.2	.460	57.24
19	1.8	46.8	.390	48.53
20	1.9	49.4	.330	41.06
21	2.0	52.0	.280	34.84
22	2.2	57.2	.207	25.76
23	2.4	62.4	.147	18.29
24	2.6	67.6	.107	13.31
25	2.8	72.8	.077	9.58
26	3.0	78.0	.055	6.84
27	3.2	83.2	.040	4.98
28	3.4	88.4	.029	3.61
29	3.6	93.6	.021	2.61
30	3.8	98.8	.015	1.87
31	4.0	104.0	.011	1.37
32	4.5	117.0	.005	.62
33	5.0	130.0	.000	.00

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AMOLE DEL NORTE STORM DIVERSION FACILITY

HYDROGRAPH FOR AREA 36D

BASIN LENGTH, (FT)	=	4300.
DIFFERENCE IN ELEVATION ACROSS BASIN	=	70.
SLOPE OF BASIN, (FT/FT)	=	.0163
AREA OF BASIN, (ACRES)	=	140.8
AREA OF BASIN, (SQ MI)	=	.2200
100-YR, 6-HR RAINFALL, (INCHES)	=	2.20
COMPOSITE CURVE NO.	=	77.00
DIRECT RUNOFF (INCHES)	=	.56
TIME OF CONCENTRATION (KIRPICH EQN.)	=	23.90
TIME TO PEAK (NEAREST EVEN MINUTE)	=	24
VOLUME OF RUNOFF (ACRE-FT)	=	6.504
PEAK RUNOFF (CFS)	=	149.01
PEAK RUNOFF PER ACRE (CFS/ACRE)	=	1.06

POINT	t/Tp (min/min)	t (min)	y (cfs/cfs)	Q (cfs)
1	.0	.0	.000	.00
2	.1	2.4	.030	4.47
3	.2	4.8	.100	14.90
4	.3	7.2	.190	28.31
5	.4	9.6	.310	46.19
6	.5	12.0	.470	70.04
7	.6	14.4	.660	98.35
8	.7	16.8	.820	122.19
9	.8	19.2	.930	138.58
10	.9	21.6	.990	147.52
11	1.0	24.0	1.000	149.01
12	1.1	26.4	.990	147.52
13	1.2	28.8	.930	138.58
14	1.3	31.2	.860	128.15
15	1.4	33.6	.780	116.23
16	1.5	36.0	.680	101.33
17	1.6	38.4	.560	83.45
18	1.7	40.8	.460	68.55
19	1.8	43.2	.390	58.12
20	1.9	45.6	.330	49.17
21	2.0	48.0	.280	41.72
22	2.2	52.8	.207	30.85
23	2.4	57.6	.147	21.91
24	2.6	62.4	.107	15.94
25	2.8	67.2	.077	11.47
26	3.0	72.0	.055	8.20
27	3.2	76.8	.040	5.96
28	3.4	81.6	.029	4.32
29	3.6	86.4	.021	3.13
30	3.8	91.2	.015	2.24
31	4.0	96.0	.011	1.64
32	4.5	108.0	.005	.75
33	5.0	120.0	.000	.00

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AMOLE DEL NORTE STORM DIVERSION FACILITY

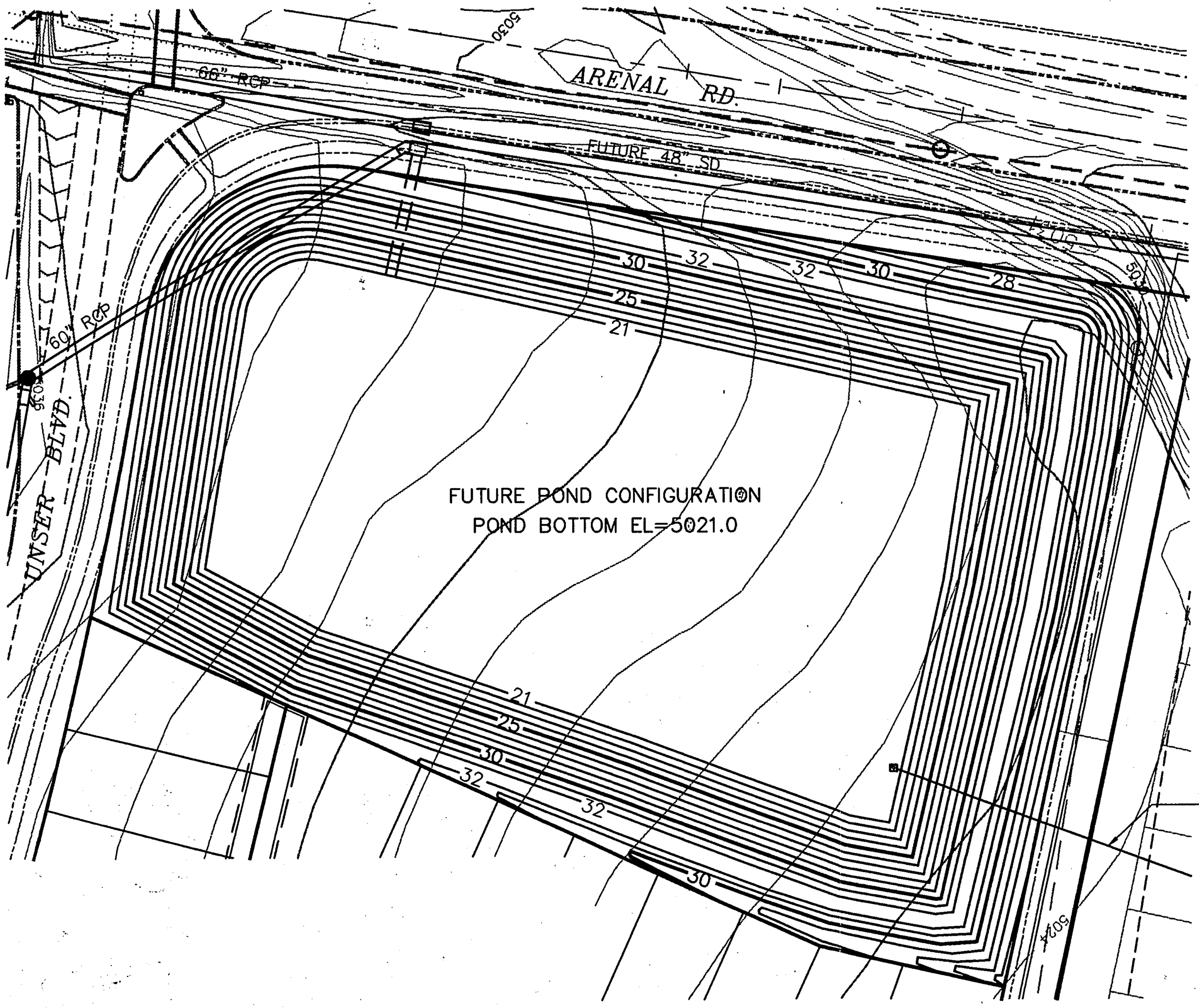
HYDROGRAPH FOR AREA 38D

BASIN LENGTH, (FT)	=	3100.
DIFFERENCE IN ELEVATION ACROSS BASIN	=	58.
SLOPE OF BASIN, (FT/FT)	=	.0187
AREA OF BASIN, (ACRES)	=	131.5
AREA OF BASIN, (SQ MI)	=	.2054
100-YR, 6-HR RAINFALL, (INCHES)	=	2.20
COMPOSITE CURVE NO.	=	77.00
DIRECT RUNOFF (INCHES)	=	.56
TIME OF CONCENTRATION (KIRPICH EQN.)	=	17.61
TIME TO PEAK (NEAREST EVEN MINUTE)	=	18
VOLUME OF RUNOFF (ACRE-FT)	=	6.074
PEAK RUNOFF (CFS)	=	185.56
PEAK RUNOFF PER ACRE (CFS/ACRE)	=	1.41

POINT	t/Tp (min/min)	t (min)	y (cfs/cfs)	Q (cfs)
1	.0	.0	.000	.00
2	.1	1.8	.030	5.57
3	.2	3.6	.100	18.56
4	.3	5.4	.190	35.26
5	.4	7.2	.310	57.52
6	.5	9.0	.470	87.21
7	.6	10.8	.660	122.47
8	.7	12.6	.820	152.16
9	.8	14.4	.930	172.57
10	.9	16.2	.990	183.70
11	1.0	18.0	1.000	185.56
12	1.1	19.8	.990	183.70
13	1.2	21.6	.930	172.57
14	1.3	23.4	.860	159.58
15	1.4	25.2	.780	144.74
16	1.5	27.0	.680	126.18
17	1.6	28.8	.560	103.91
18	1.7	30.6	.460	85.36
19	1.8	32.4	.390	72.37
20	1.9	34.2	.330	61.23
21	2.0	36.0	.280	51.96
22	2.2	39.6	.207	38.41
23	2.4	43.2	.147	27.28
24	2.6	46.8	.107	19.85
25	2.8	50.4	.077	14.29
26	3.0	54.0	.055	10.21
27	3.2	57.6	.040	7.42
28	3.4	61.2	.029	5.38
29	3.6	64.8	.021	3.90
30	3.8	68.4	.015	2.78
31	4.0	72.0	.011	2.04
32	4.5	81.0	.005	.93
33	5.0	90.0	.000	.00

APPENDIX E

Design of the Temporary Detention Pond



SCALE: 1"=60'

TEMPORARY RETENTION POND

EL (ft)	H (ft)	AREA (Ac)	STORAGE (AF)
21	0	1.85	0
22	1	1.96	1.91
23	2	2.07	3.93
24	3	2.18	6.06
25	4	2.30	8.30
26	5	2.42	10.66
27	6	2.54	13.14
28	7	2.66	15.74
29	8	2.79	18.47
30	9	2.92	21.33
31	10	3.05	24.32
32	11	3.18	27.44

PEAK DISCHARGE TO POND: Q_{100}= 880cfs
Q_{10} = 475cfs

PEAK DISCHARGE= 190cfs
MAX. WATER SURFACE ELEV= 26.79'

4" PVC DRAIN LINE. INV= 16.0,
RUN OUT @ S= 0.01 ft/ft TO DAYLIGHT

ISAACSON & ARFMAN, P.A.
Consulting Engineering Associates
128 Monroe Street N.E.
Albuquerque *New Mexico*

903EXH16.DWGdlv 6/12/97

APPENDIX F

AHYMO Summary & Output

ONSITE/OFFSITE

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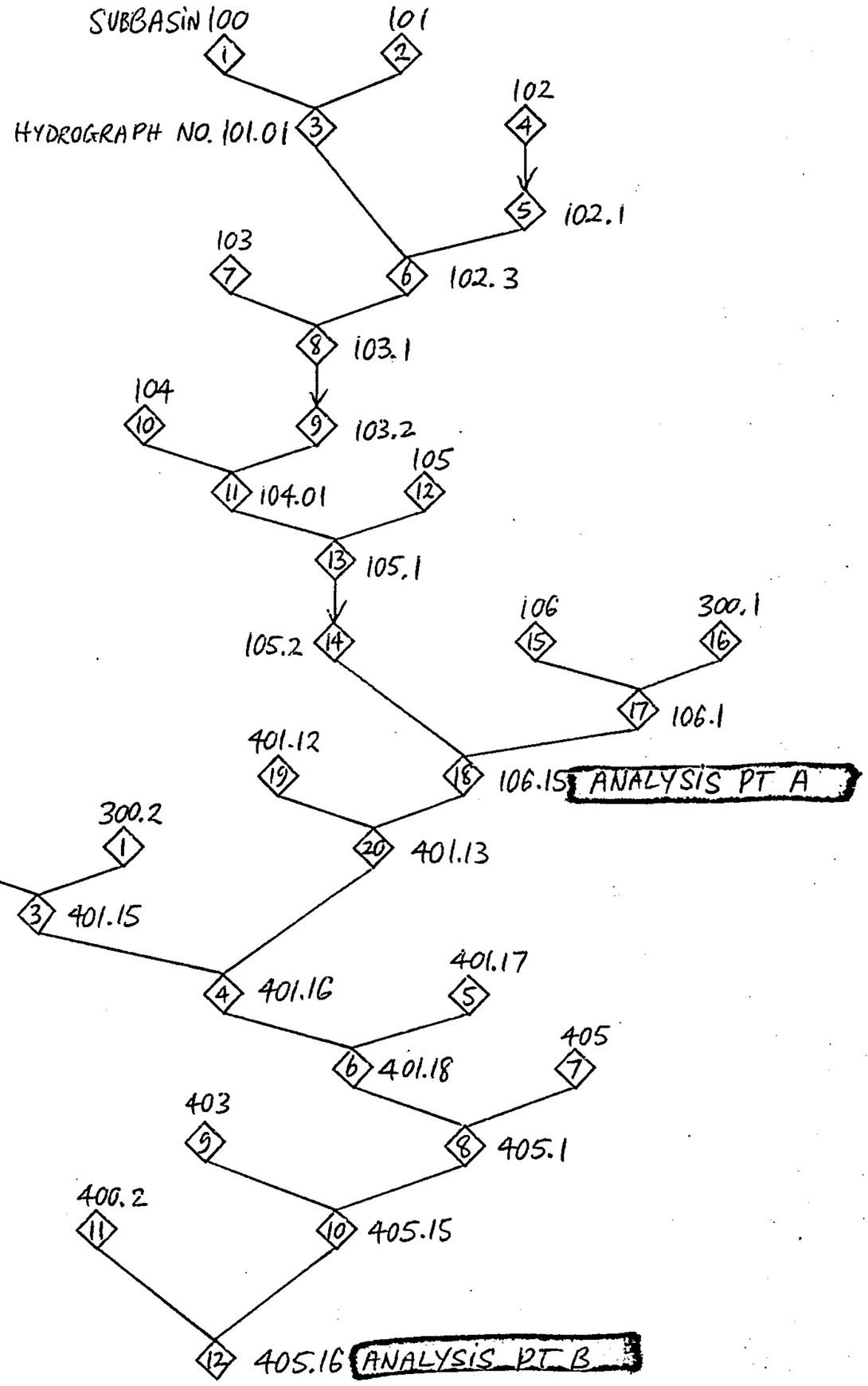
AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994          RUN DATE (MON/DAY/YR) =06/16/1997
INPUT FILE = sunrise.dat                                                                  USER NO.= ISCARFNM.I01

                                FROM  TO                    PEAK        RUNOFF                TIME TO   CFS      PAGE =   1
                   HYDROGRAPH    ID   ID        AREA     DISCHARGE     VOLUME      RUNOFF      PEAK    PER
COMMAND          IDENTIFICATION  NO.  NO.      (SQ MI)     (CFS)       (AC-FT)    (INCHES)   (HOURS)  ACRE      NOTATION

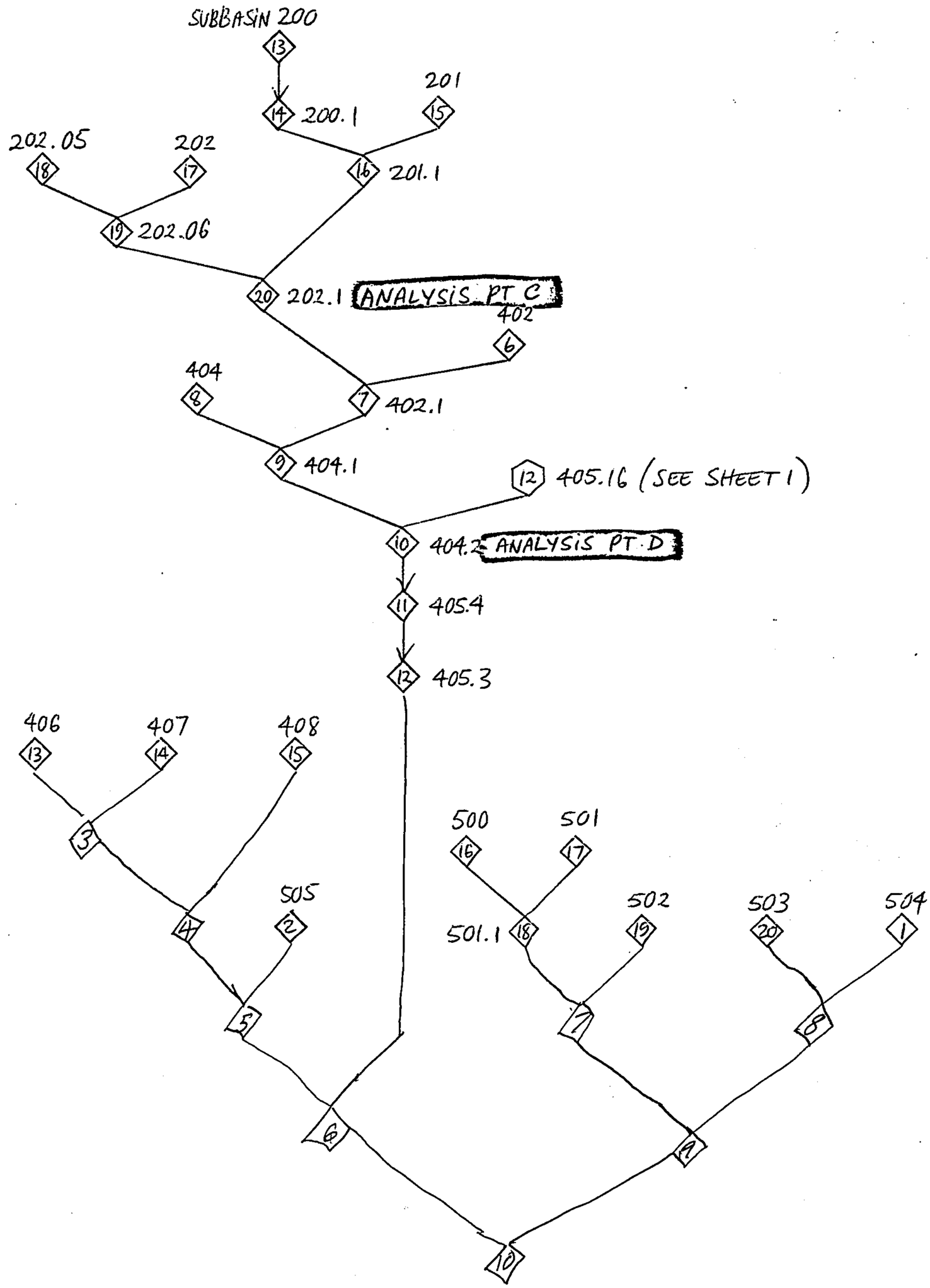
*S                   SUNRISE.DAT
*S                   REVISED BY: JMN 6/04/97
START                                                                                                   TIME=       .00
RAINFALL  TYPE= 1                                                                                       RAIN6=     2.200
*S BASIN 100 IS CURRENTLY UNDEVELOPED, ASSUME FUTURE DEVELOPMENT WILL
*S BE @ A DENSITY OF 4 DU/AC
COMPUTE NM HYD         100.00   -     1        .07150       148.70       4.952      1.29860    1.500    3.250 PER IMP=  42.00
*S BASIN 101 IS FULLY DEVELOPED WITH SINGLE FAMILY RESIDENTIAL HOMES
*S WITH A DENSTIY OF 4 DU/AC
COMPUTE NM HYD         101.00   -     2        .03700        60.90       1.988      1.00753    1.500    2.572 PER IMP=  29.00
ADD HYD                101.01  1& 2   3        .10850       209.60       6.940      1.19933    1.500    3.018
*S **AREA 102 IS A MIDDLE SCHOOL (ONSITE DETENTION TO REDUCE RUNOFF)
COMPUTE NM HYD         102.00   -     4        .04000        33.21        .937       .43925    1.533    1.297 PER IMP=    .00
*S ROUTE THE SCHOOL'S RUNOFF IN A 28' F-F RESIDENTIAL STREET, S=2%
*S ASSUME SECTION EXTENDS TO THE ROW LINE ON BOTH SIDES
ROUTE                  102.10    4    5        .04000        32.41        .937       .43927    1.567    1.266
*S ADD THE ROUTED FLOW FROM 102 TO THE EARLIER TOTAL
ADD HYD                102.30  3& 5   6        .14850       236.14       7.877       .99460    1.500    2.485
*S **BASIN 103 IS COMPLETELY DEVELOPED
COMPUTE NM HYD         103.00   -     7        .04400        72.42       2.364      1.00753    1.500    2.572 PER IMP=  29.00
*S ADD 103 TO TOTAL
ADD HYD                103.10  6& 7   8        .19250       308.56      10.242       .99755    1.500    2.505
*S **ASSUME FLOW IS ROUTED IN 28' STREET AS EARLIER
ROUTE                  103.20    8    9        .19250       293.93      10.242       .99756    1.533    2.386
*S **AREA 104 IS FULLY DEVELOPED
COMPUTE NM HYD         104.00   -    10        .04400        72.42       2.364      1.00753    1.500    2.572 PER IMP=  29.00
*S ADD THE FLOW TO THE TOTAL
ADD HYD                104.01  9&10  11        .23650       364.94      12.606       .99941    1.533    2.411
*S AREA 105 IS A PARK & COA WELL SITE
COMPUTE NM HYD         105.00   -    12        .02100        29.05        .849       .75825    1.500    2.161 PER IMP=   7.00
ADD HYD                105.10 11&12  13        .25750       393.90      13.455       .97974    1.533    2.390
*S ROUTE THE FLOW TO THE EXISTING END OF SAPPHIRE ST.
ROUTE                  105.20   13   14        .25750       364.47      13.455       .97974    1.567    2.212
*S AREA 106 IS FULLY DEVELOPED
COMPUTE NM HYD         106.00   -    15        .02177        35.84       1.170      1.00753    1.500    2.572 PER IMP=  29.00
*S BASIN 300.1 IS CURRENTLY UNDEVELOPED, ASSUME FUTURE DEVELOPMENT WILL BE @
*S A DENSITY OF 4 DU/AC
COMPUTE NM HYD         300.10   -    16        .01560        32.45       1.080      1.29860    1.500    3.250 PER IMP=  42.00
*S **ADD THE FLOWS FROM BASINS 106 AND 300.1
ADD HYD                106.10 15&16  17        .03737        68.29       2.250      1.12902    1.500    2.855
*S **TOTAL FLOW IN SAPHIRE ST AT ANALYSIS POINT A
ADD HYD                106.15 14&17  18        .29487       423.63      15.705       .99866    1.567    2.245
*S  **BASIN 401.12, 401.14, 401.17, 300.2 AND 400.2 DRAINS TO SAPPHIRE ST.
*S  **BASIN 401.12 IS PART OF SUNRISE ESTATES UNIT 1
COMPUTE NM HYD         401.12   -    19        .01126        23.43        .780      1.29860    1.500    3.251 PER IMP=  42.00
*S  **ADD THE FLOWS FROM HYDROGRAPH NO 401.12 AND 106.15
ADD HYD                401.13 19&18  20        .30613       443.65      16.485      1.00969    1.567    2.264
*S  **BASIN 300.2 IS CURRENTLY UNDEVELOPED, ASSUME FUTURE DEVELOPMENT WILL BE
*S  @ A DENSITY OF 4 DU/AC
```

SUBBASINS FLOWCHART



ISAACSON & ARFMAN, P.A.

SUBJECT SUNRISE ESTATES UNIT 2 JOB NO. ___
BY JMN DATE 6/97 SHEET NO. 1 OF 2



ISAACSON & ARFMAN, P.A.

SUBJECT _____ JOB NO. ____

BY _____ DATE _____ SHEET NO. 2 OF 2

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                                FROM  TO                    PEAK        RUNOFF                TIME TO   CFS
                HYDROGRAPH      ID    ID        AREA     DISCHARGE     VOLUME      RUNOFF      PEAK    PER
COMMAND       IDENTIFICATION    NO.   NO.      (SQ MI)     (CFS)       (AC-FT)    (INCHES)   (HOURS)  ACRE      NOTATION

COMPUTE NM HYD        300.20    -     1        .01180       24.55        .817      1.29859    1.500   3.251 PER IMP=  42.00
*S ** BASIN 401.14 IS PART OF SUNRISE ESTATES UNIT 1
COMPUTE NM HYD        401.14    -     2        .01117       23.24        .774      1.29860    1.500   3.251 PER IMP=  42.00
*S  **ADD FLOWS FROM HYDROGRAPH NO 401.14 AND 300.2
ADD HYD               401.15  1& 2    3        .02297       47.79       1.591      1.29857    1.500   3.251
*S **ADD FLOWS FROM HYDROGRAPH NO 401.15 AND 401.13
ADD HYD               401.16  3&20    4        .32910      484.48      18.076      1.02985    1.567   2.300
*S **BASIN 401.17 IS PART OF SUNRISE ESTATES UNIT 1
COMPUTE NM HYD        401.17    -     5        .00661       13.76        .458      1.29860    1.500   3.252 PER IMP=  42.00
*S  **ADD FLOWS FROM HYDROGRAPH NO 401.16 AND 401.17
ADD HYD               401.18  4& 5    6        .33571      496.23      18.534      1.03514    1.567   2.310
*S ** BASIN 405 DRAINS TO SAPPHIRE ST.
COMPUTE NM HYD        405.00    -     7        .01393       29.33        .982      1.32159    1.500   3.289 PER IMP=  44.00
*S  **ADD FLOWS FROM HYDROGRAPH NO 401.18 AND 405
ADD HYD               405.10  6& 7    8        .34964      521.25      19.516      1.04656    1.567   2.329
*S ** BASIN 403 DRAINS TO SAPPHIRE ST.
COMPUTE NM HYD        403.00    -     9        .01480       30.79       1.025      1.29860    1.500   3.250 PER IMP=  42.00
*S  **ADD FLOWS FROM HYDROGRAPH NO 405.1 AND 403
ADD HYD               405.15  8& 9   10        .36444      547.55      20.541      1.05679    1.567   2.348
*S ** BASIN 400.2 IS CURRENTLY UNDEVELOPED, ASSUME FUTURE DEVELOPMENT WILL BE
*S @ A DENSITY OF 4 DU/AC
COMPUTE NM HYD        400.20    -    11        .03222       67.80       2.271      1.32159    1.500   3.288 PER IMP=  44.00
*S  **ADD FLOWS FROM HYDROGRAPH NO 405.15 AND 400.2 TOGETHER TO GET THE FLOW
*S IN SAPPHIRE ST. @ ANALYSIS PT B
ADD HYD               405.16 10&11   12        .39666      607.35      22.812      1.07830    1.533   2.392
*S*************************************************************************
*S*************************************************************************
*S **BASINS 200,201, & 202 DRAIN TO KIMELA DR
COMPUTE NM HYD        200.00    -    13        .05300       87.23       2.848      1.00753    1.500   2.572 PER IMP=  29.00
*S **ROUTE FLOW TO THE END OF KIMELA DR.
ROUTE                 200.10   13    14        .05300       86.94       2.848      1.00753    1.533   2.563
COMPUTE NM HYD        201.00    -    15        .02600       42.80       1.397      1.00753    1.500   2.572 PER IMP=  29.00
ADD HYD               201.10 15&14   16        .07900      128.91       4.245      1.00752    1.533   2.550
*S **BASIN 202 IS AN ELEMENTARY SCHOOL (ONSITE DETENTION TO REDUCE RUNOFF)
COMPUTE NM HYD        202.00    -    17        .00925        7.69        .217       .43925    1.533   1.298 PER IMP=   .00
*S **BASIN 202.05 IS THE ELEMENTARY SCHOOL PARKING LOT THAT WILL DRAIN TO KIMELA
COMPUTE NM HYD        202.05    -    18        .00375       10.49        .393      1.96548    1.500   4.373 PER IMP= 100.00
*S **ADD THE BASINS OF THE ELEMENTARY SCHOOL AND PARKING LOT
ADD HYD               202.06 17&18   19        .01300       18.01        .610       .87913    1.500   2.164
*S **ADD THE BASINS TOGETHER TO GET THE FLOW IN KIMELA DR @ ANALYSIS PT C
ADD HYD               202.10 16&19   20        .09200      146.56       4.855       .98938    1.533   2.489
*S*************************************************************************
*S*************************************************************************
*S **BASINS 402 THRU 404 ARE CURRENTLY UNDEVELOPED, FOR PURPOSES
*S OF THIS REPORT, ASSUME ALL BASINS WILL BE BUILT OUT @ THEIR CURRENT
*S ZONING
*S **BASIN 402 IS UNIT 2 OF SUNRISE ESTATES
COMPUTE NM HYD        402.00    -     6        .05200      108.14       3.601      1.29860    1.500   3.249 PER IMP=  42.00
*S **ADD BASIN 402 TO THE TOTAL FLOW @ THE END OF EXTENDED KIMELA
ADD HYD               402.10 20& 6    7        .14400      251.21       8.456      1.10104    1.533   2.726
COMPUTE NM HYD        404.00    -     8        .01080       22.47        .748      1.29860    1.500   3.251 PER IMP=  42.00
*S **ADD FLOW TO THAT IN KIMELA DR
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                          FROM   TO                    PEAK        RUNOFF                    TIME TO   CFS
              HYDROGRAPH  ID     ID        AREA     DISCHARGE     VOLUME      RUNOFF        PEAK     PER
COMMAND     IDENTIFICATION NO.   NO.      (SQ MI)     (CFS)      (AC-FT)     (INCHES)      (HOURS)   ACRE      NOTATION

ADD HYD          404.10  7& 8   9         .15480      272.95       9.204      1.11482      1.533    2.755
*S **ADD TO FLOW IN SAPPHIRE @ ANALYSIS PT D
ADD HYD          404.20  9&12  10 352.9   .55146      880.30      32.016      1.08855      1.533    2.494
*S DESIGN A RETENTION FACILITY TO REDUCE TO FLOW TO THAT WHICH WILL
*S FIT IN A 48" RCP @ S=1.8%
ROUTE RESERVOIR  405.40  10    11        .55146      190.04      32.016      1.08855      1.966     .538 AC-FT=   18.136
*S ROUTE FLOW FROM THE DETENTION POND TO THE AMOLE DEL NORTE CHANNEL
ROUTE            405.30  11    12        .55146      190.02      32.016      1.08855      2.000     .538
*S*************************************************************************************
*S*************************************************************************************
*S **CALC BASIN 406
COMPUTE NM HYD   406.00  -     13  36.8  .05743      117.49       3.920      1.27968      1.500    3.196 PER IMP=   42.00
*S **CALC BASIN 407
COMPUTE NM HYD   407.00  -     14  32.3  .05040      104.81       3.491      1.29860      1.500    3.249 PER IMP=   42.00
*S **CALC BASIN 408
COMPUTE NM HYD   408.00  -     15 100.7  .15736      327.60      10.899      1.29860      1.500    3.253 PER IMP=   42.00
*S*************************************************************************************
*S*************************************************************************************
*S **BASIN 500 IS UNIT ONE OF THE PROPOSED LONGFORD SD
COMPUTE NM HYD   500.00  -     16        .02491       51.80       1.725      1.29860      1.500    3.250 PER IMP=   42.00
*S **BASIN 501 IS THE AREA PROPOSED AS FUTURE LONGFORD SD DRAINING
*S **DIRECTLY TO THE AMOLE CHANNEL
COMPUTE NM HYD   501.00  -     17        .03663       76.18       2.537      1.29860      1.500    3.249 PER IMP=   42.00
*S **COMBINE BASINS 500 AND 501 TOGETHER TO REPRESENT THE NORTHERN PART OF THE
*S **LONGFORD SD
ADD HYD          501.10 16&17  18        .06154      127.98       4.262      1.29859      1.500    3.250
*S **BASIN 502 IS THE SOUTHERN PART OF THE LONGFORD SD
COMPUTE NM HYD   502.00  -     19        .05788      121.79       4.080      1.32159      1.500    3.288 PER IMP=   44.00
*S **BASIN 503 IS CURRENTLY UNDEVELOPED, ASSUME FUTURE DEVELOPMENT WILL BE @ A DENSITY OF 4 DU/AC THE DISCHARGE FROM THIS BASIN
*S **DRAINS TO THE AMOLE DEL NORTE CHANNEL AND DOES NOT AFFECT THE ARENAL/UNSER DRAINAGE MANAGEMENT SITE.
COMPUTE NM HYD   503.00  -     20        .03752       78.03       2.599      1.29860      1.500    3.249 PER IMP=   42.00
*S*************************************************************************************
*S **BASIN 504 IS CURRENTLY UNDEVELOPED, ASSUME FUTURE DEVELOPMENT WILL BE @
*S **A DENSITY OF 4 DU/AC
COMPUTE NM HYD   504.00  -     1         .03667       77.16       2.585      1.32159      1.500    3.288 PER IMP=   44.00
*S **BASIN 505 IS FULLY DEVELOPED AND DRAINS SOUTH TO BLAKE RD.
COMPUTE NM HYD   505.00  -     2         .02618       43.10       1.407      1.00753      1.500    2.572 PER IMP=   29.00
FINISH
```

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AHYMO PROGRAM (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
     RUN DATE (MON/DAY/YR) = 06/16/1997
     START TIME (HR:MIN:SEC) = 11:10:21     USER NO.= ISCARFNM.I01
     INPUT FILE = sunrise.dat

*S                  SUNRISE.DAT
*S                  REVISED BY: JMN 6/04/97
*
START               RAINFALL BEGINS AT 0.0 HRS
RAINFALL            TYPE=1 RAIN QUARTER=0 RAIN ONE=1.87
                    RAIN SIX=2.20 RAIN DAY=2.66 DT=0.03333HR

                 COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40 HR.
                 DT =     .033330 HOURS       END TIME =     5.999400 HOURS
                    .0000   .0016   .0033   .0050   .0067   .0085   .0103
                    .0122   .0141   .0160   .0180   .0201   .0222   .0243
                    .0266   .0289   .0312   .0337   .0362   .0388   .0415
                    .0443   .0472   .0502   .0534   .0567   .0601   .0637
                    .0675   .0715   .0758   .0809   .0865   .0924   .1050
                    .1334   .1771   .2398   .3254   .4379   .5814   .7600
                    .9780  1.1804  1.2649  1.3363  1.3997  1.4575  1.5106
                   1.5600  1.6061  1.6493  1.6900  1.7284  1.7646  1.7989
                   1.8314  1.8623  1.8915  1.9193  1.9456  1.9518  1.9576
                   1.9630  1.9682  1.9732  1.9780  1.9825  1.9869  1.9912
                   1.9953  1.9993  2.0031  2.0068  2.0104  2.0140  2.0174
                   2.0207  2.0240  2.0272  2.0303  2.0333  2.0363  2.0392
                   2.0420  2.0448  2.0475  2.0502  2.0528  2.0554  2.0580
                   2.0605  2.0629  2.0653  2.0677  2.0700  2.0723  2.0746
                   2.0768  2.0790  2.0812  2.0833  2.0855  2.0875  2.0896
                   2.0916  2.0936  2.0956  2.0976  2.0995  2.1014  2.1033
                   2.1051  2.1070  2.1088  2.1106  2.1124  2.1141  2.1159
                   2.1176  2.1193  2.1210  2.1227  2.1244  2.1260  2.1276
                   2.1292  2.1308  2.1324  2.1340  2.1355  2.1371  2.1386
                   2.1401  2.1416  2.1431  2.1446  2.1460  2.1475  2.1489
                   2.1504  2.1518  2.1532  2.1546  2.1560  2.1573  2.1587
                   2.1600  2.1614  2.1627  2.1640  2.1654  2.1667  2.1680
                   2.1692  2.1705  2.1718  2.1731  2.1743  2.1756  2.1768
                   2.1780  2.1792  2.1804  2.1817  2.1829  2.1840  2.1852
                   2.1864  2.1876  2.1887  2.1899  2.1910  2.1922  2.1933
                   2.1944  2.1956  2.1967  2.1978  2.1989  2.2000

*S BASIN 100 IS CURRENTLY UNDEVELOPED, ASSUME FUTURE DEVELOPMENT WILL
*S BE @ A DENSITY OF 4 DU/AC
COMPUTE NM HYD      ID=1 HYD NO=100.00 AREA=0.07150 SQ MI
                    PER A=0 PER B=29 PER C=29 PER D=42
                    TP=-0.1333 HR   MASS RAIN=-1

    K =    .072801HR    TP =    .133300HR    K/TP RATIO =    .546145     SHAPE CONSTANT, N =  7.087329
    UNIT PEAK =    118.36    CFS    UNIT VOLUME =     .9992       B =   525.38      P60 = 1.8700
    AREA =       .030030 SQ MI    IA =     .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330


    K =    .118190HR    TP =    .133300HR    K/TP RATIO =    .886648     SHAPE CONSTANT, N =  4.001119
    UNIT PEAK =    110.52    CFS    UNIT VOLUME =    1.000       B =   355.24      P60 = 1.8700
    AREA =       .041470 SQ MI    IA =     .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330
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PRINT HYD            ID=1   CODE=1

                                   PARTIAL HYDROGRAPH   100.00

    RUNOFF VOLUME =     1.29860 INCHES     =       4.9519 ACRE-FEET
    PEAK DISCHARGE RATE =     148.70 CFS  AT   1.500 HOURS   BASIN AREA =   .0715 SQ. MI.


*S BASIN 101 IS FULLY DEVELOPED WITH SINGLE FAMILY RESIDENTIAL HOMES
*S WITH A DENSTIY OF 4 DU/AC
COMPUTE NM HYD       ID=2 HYD NO=101.00 AREA=0.03700 SQ MI
                     PER A=33 PER B=19 PER C=19 PER D=29
                     TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   42.363    CFS   UNIT VOLUME =    .9991       B =   526.28      P60 = 1.8700
    AREA =      .010730 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .139463HR    TP =   .133300HR    K/TP RATIO =  1.046235     SHAPE CONSTANT, N =  3.374403
    UNIT PEAK =   61.299    CFS   UNIT VOLUME =    .9998       B =   311.05      P60 = 1.8700
    AREA =      .026270 SQ MI    IA =    .52958 INCHES    INF =   1.33282 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=2   CODE=1

                                   PARTIAL HYDROGRAPH   101.00

    RUNOFF VOLUME =     1.00753 INCHES     =       1.9882 ACRE-FEET
    PEAK DISCHARGE RATE =      60.90 CFS  AT   1.500 HOURS   BASIN AREA =   .0370 SQ. MI.


ADD HYD              ID=3 HYD NO=101.01 ID=1 ID=2
PRINT HYD            ID=3 CODE=1

                                   PARTIAL HYDROGRAPH   101.01

    RUNOFF VOLUME =     1.19933 INCHES     =       6.9401 ACRE-FEET
    PEAK DISCHARGE RATE =     209.60 CFS  AT   1.500 HOURS   BASIN AREA =   .1085 SQ. MI.


*S **AREA 102 IS A MIDDLE SCHOOL (ONSITE DETENTION TO REDUCE RUNOFF)
COMPUTE NM HYD       ID=4 HYD NO=102.00 AREA=0.04000 SQ MI
                     PER A=100 PER B=0 PER C=0 PER D=0
                     TP=-0.1333 HR   MASS RAIN=-1

    K =   .163684HR    TP =   .133300HR    K/TP RATIO =  1.227936     SHAPE CONSTANT, N =  2.899764
    UNIT PEAK =   82.084    CFS   UNIT VOLUME =    .9995       B =   273.54      P60 = 1.8700
    AREA =      .040000 SQ MI    IA =    .65000 INCHES    INF =   1.67000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330
```

PRINT HYD ID=4 CODE=1

PARTIAL HYDROGRAPH 102.00

RUNOFF VOLUME = .43925 INCHES = .9371 ACRE-FEET
PEAK DISCHARGE RATE = 33.21 CFS AT 1.533 HOURS BASIN AREA = .0400 SQ. MI.

*S ROUTE THE SCHOOL'S RUNOFF IN A 28' F-F RESIDENTIAL STREET, S=2%
*S ASSUME SECTION EXTENDS TO THE ROW LINE ON BOTH SIDES
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEG=1 MIN EL=100.00 MAX EL=101.00
CH SLOPE=0.02 FP SLOPE=0.02 N=0.017 DIST=48.0
DIST ELEV DIST ELEV DIST ELEV DIST ELEV
0 101.00 10.0 100.67 10.1 100.00 24.0 100.28
38.0 100.00 38.1 100.67 48.0 101.00

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
100.00	.00	.00	.00
100.05	.14	.15	5.26
100.11	.55	.95	10.52
100.16	1.25	2.80	15.78
100.21	2.22	6.03	21.04
100.26	3.46	10.94	26.30
100.32	4.92	18.84	27.99
100.37	6.39	29.08	28.01
100.42	7.87	41.00	28.03
100.47	9.34	54.46	28.04
100.53	10.82	69.37	28.06
100.58	12.30	85.66	28.07
100.63	13.78	103.24	28.09
100.68	15.26	119.89	28.96
100.74	16.87	132.52	32.13
100.79	18.64	147.34	35.31
100.84	20.59	164.39	38.48
100.89	22.69	183.72	41.66
100.95	24.97	205.41	44.83
101.00	27.41	229.56	48.00

COMPUTE TRAVEL TIME ID=5 REACH NO=1 NO VS=1 L=650 FT SLP=0.02

TRAVEL TIME TABLE
REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.053	.138	.15	.1670
.105	.554	.95	.1052
.158	1.246	2.80	.0803
.211	2.215	6.03	.0663
.263	3.461	10.94	.0571
.316	4.920	18.84	.0472
.368	6.394	29.08	.0397

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                                .421       7.869       41.00       .0347
                                .474       9.344       54.46       .0310
                                .526      10.821       69.37       .0282
                                .579      12.298       85.66       .0259
                                .632      13.776      103.24       .0241
                                .684      15.261      119.89       .0230
                                .737      16.869      132.52       .0230
                                .790      18.644      147.34       .0228
                                .842      20.586      164.39       .0226
                                .895      22.695      183.72       .0223
                                .947      24.971      205.41       .0219
                               1.000      27.414      229.56       .0216
ROUTE                 ID=5 HYD NO=102.1 INFLOW ID=4 DT=0.0
PRINT HYD             ID=5 CODE=1

                                PARTIAL HYDROGRAPH   102.10

    RUNOFF VOLUME =       .43927 INCHES     =        .9371 ACRE-FEET
    PEAK DISCHARGE RATE =      32.41 CFS  AT   1.567 HOURS   BASIN AREA =   .0400 SQ. MI.


*S ADD THE ROUTED FLOW FROM 102 TO THE EARLIER TOTAL
ADD HYD               ID=6 HYD NO=102.3 ID=3 ID=5
PRINT HYD             ID=6 CODE=1

                                PARTIAL HYDROGRAPH   102.30

    RUNOFF VOLUME =       .99460 INCHES     =       7.8772 ACRE-FEET
    PEAK DISCHARGE RATE =     236.14 CFS  AT   1.500 HOURS   BASIN AREA =   .1485 SQ. MI.


*S **BASIN 103 IS COMPLETELY DEVELOPED
COMPUTE NM HYD        ID=7 HYD NO=103.00 AREA=0.04400 SQ MI
                      PER A=33 PER B=19 PER C=19 PER D=29
                      TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   50.377    CFS   UNIT VOLUME =    .9992       B =   526.28      P60 = 1.8700
    AREA =      .012760 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .139463HR    TP =   .133300HR    K/TP RATIO =  1.046235     SHAPE CONSTANT, N =  3.374403
    UNIT PEAK =   72.896    CFS   UNIT VOLUME =    .9999       B =   311.05      P60 = 1.8700
    AREA =      .031240 SQ MI    IA =    .52958 INCHES    INF =   1.33282 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD             ID=7   CODE=1

                                PARTIAL HYDROGRAPH   103.00
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```
    RUNOFF VOLUME =      1.00753 INCHES      =       2.3643 ACRE-FEET
    PEAK DISCHARGE RATE =      72.42 CFS  AT   1.500 HOURS   BASIN AREA =   .0440 SQ. MI.


*S ADD 103 TO TOTAL
ADD HYD              ID=8 HYD NO=103.1 ID=6 ID=7
PRINT HYD            ID=8 CODE=1

                                PARTIAL HYDROGRAPH   103.10


    RUNOFF VOLUME =       .99755 INCHES      =      10.2415 ACRE-FEET
    PEAK DISCHARGE RATE =     308.56 CFS  AT   1.500 HOURS   BASIN AREA =   .1925 SQ. MI.


*S **ASSUME FLOW IS ROUTED IN 28' STREET AS EARLIER
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEG=1 MIN EL=100.00 MAX EL=101.00
                     CH SLOPE=0.02 FP SLOPE=0.02 N=0.017 DIST=48.0
                     DIST  ELEV  DIST  ELEV  DIST  ELEV  DIST  ELEV
                      0   101.00 10.0 100.67 10.1 100.00 24.0 100.28
                     38.0 100.00 38.1 100.67 48.0 101.00

                                RATING CURVE VALLEY SECTION  1.0
                                    WATER       FLOW        FLOW        TOP
                                   SURFACE      AREA        RATE        WIDTH
                                    ELEV        SQ FT       CFS         FT
                                   100.00         .00         .00         .00
                                   100.05         .14         .15        5.26
                                   100.11         .55         .95       10.52
                                   100.16        1.25        2.80       15.78
                                   100.21        2.22        6.03       21.04
                                   100.26        3.46       10.94       26.30
                                   100.32        4.92       18.84       27.99
                                   100.37        6.39       29.08       28.01
                                   100.42        7.87       41.00       28.03
                                   100.47        9.34       54.46       28.04
                                   100.53       10.82       69.37       28.06
                                   100.58       12.30       85.66       28.07
                                   100.63       13.78      103.24       28.09
                                   100.68       15.26      119.89       28.96
                                   100.74       16.87      132.52       32.13
                                   100.79       18.64      147.34       35.31
                                   100.84       20.59      164.39       38.48
                                   100.89       22.69      183.72       41.66
                                   100.95       24.97      205.41       44.83
                                   101.00       27.41      229.56       48.00
COMPUTE TRAVEL TIME  ID=9 REACH NO=1 NO VS=1 L=900 FT SLP=0.02

                            TRAVEL TIME TABLE
                                        REACH=  1.0
```

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.053	.138	.15	.2312
.105	.554	.95	.1457
.158	1.246	2.80	.1112
.211	2.215	6.03	.0918
.263	3.461	10.94	.0791
.316	4.920	18.84	.0653
.368	6.394	29.08	.0550
.421	7.869	41.00	.0480
.474	9.344	54.46	.0429
.526	10.821	69.37	.0390
.579	12.298	85.66	.0359
.632	13.776	103.24	.0334
.684	15.261	119.89	.0318
.737	16.869	132.52	.0318
.790	18.644	147.34	.0316
.842	20.586	164.39	.0313
.895	22.695	183.72	.0309
.947	24.971	205.41	.0304
1.000	27.414	229.56	.0299

```
    ROUTE                  ID=9 HYD NO=103.2 INFLOW ID=8 DT=0.0
TRAVEL TIME TABLE EXCEEDED
    PRINT HYD              ID=9 CODE=1

                                PARTIAL HYDROGRAPH   103.20

    RUNOFF VOLUME =       .99756 INCHES      =       10.2415 ACRE-FEET
    PEAK DISCHARGE RATE =     293.93 CFS  AT   1.533 HOURS   BASIN AREA =   .1925 SQ. MI.


*S **AREA 104 IS FULLY DEVELOPED
COMPUTE NM HYD       ID=10 HYD NO=104.00 AREA=0.04400 SQ MI
                     PER A=33 PER B=19 PER C=19 PER D=29
                     TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   50.377    CFS   UNIT VOLUME =    .9992       B =   526.28      P60 = 1.8700
    AREA =      .012760 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .139463HR    TP =   .133300HR    K/TP RATIO =  1.046235     SHAPE CONSTANT, N =  3.374403
    UNIT PEAK =   72.896    CFS   UNIT VOLUME =    .9999       B =   311.05      P60 = 1.8700
    AREA =      .031240 SQ MI    IA =    .52958 INCHES    INF =   1.33282 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=10   CODE=1

                                PARTIAL HYDROGRAPH   104.00


    RUNOFF VOLUME =     1.00753 INCHES      =        2.3643 ACRE-FEET
    PEAK DISCHARGE RATE =      72.42 CFS  AT   1.500 HOURS   BASIN AREA =   .0440 SQ. MI.
```

```
*S ADD THE FLOW TO THE TOTAL
ADD HYD              ID=11 HYD NO=104.01 ID=9 ID=10
PRINT HYD            ID=11 CODE=1

                                PARTIAL HYDROGRAPH   104.01

    RUNOFF VOLUME =      .99941 INCHES     =      12.6058 ACRE-FEET
    PEAK DISCHARGE RATE =     364.94 CFS  AT   1.533 HOURS   BASIN AREA =   .2365 SQ. MI.


*S AREA 105 IS A PARK & COA WELL SITE
COMPUTE NM HYD       ID=12 HYD NO=105.00 AREA=0.021 SQ MI
                     PER A=31 PER B=31 PER C=31 PER D=7
                     TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   5.8036    CFS   UNIT VOLUME =    .9973       B =   526.28      P60 = 1.8700
    AREA =      .001470 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .133514HR    TP =   .133300HR    K/TP RATIO =  1.001607     SHAPE CONSTANT, N =  3.524575
    UNIT PEAK =   47.194    CFS   UNIT VOLUME =    1.000       B =   322.12      P60 = 1.8700
    AREA =      .019530 SQ MI    IA =    .50000 INCHES    INF =   1.25000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=12   CODE=1

                                PARTIAL HYDROGRAPH   105.00

    RUNOFF VOLUME =      .75825 INCHES     =        .8492 ACRE-FEET
    PEAK DISCHARGE RATE =      29.05 CFS  AT   1.500 HOURS   BASIN AREA =   .0210 SQ. MI.


ADD HYD              ID=13 HYD NO=105.1 ID=11 ID=12
PRINT HYD            ID=13 CODE=1

                                PARTIAL HYDROGRAPH   105.10

    RUNOFF VOLUME =      .97974 INCHES     =      13.4550 ACRE-FEET
    PEAK DISCHARGE RATE =     393.90 CFS  AT   1.533 HOURS   BASIN AREA =   .2575 SQ. MI.


*S ROUTE THE FLOW TO THE EXISTING END OF SAPPHIRE ST.
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEG=1 MIN EL=100.00 MAX EL=101.00
                     CH SLOPE=0.02 FP SLOPE=0.02 N=0.017 DIST=48.0
                     DIST  ELEV  DIST  ELEV  DIST  ELEV  DIST  ELEV
                      0   101.00 10.0 100.67 10.1 100.00 24.0 100.28
                     38.0 100.00 38.1 100.67 48.0 101.00
```

RATING CURVE VALLEY SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	TOP WIDTH FT
100.00	.00	.00	.00
100.05	.14	.15	5.26
100.11	.55	.95	10.52
100.16	1.25	2.80	15.78
100.21	2.22	6.03	21.04
100.26	3.46	10.94	26.30
100.32	4.92	18.84	27.99
100.37	6.39	29.08	28.01
100.42	7.87	41.00	28.03
100.47	9.34	54.46	28.04
100.53	10.82	69.37	28.06
100.58	12.30	85.66	28.07
100.63	13.78	103.24	28.09
100.68	15.26	119.89	28.96
100.74	16.87	132.52	32.13
100.79	18.64	147.34	35.31
100.84	20.59	164.39	38.48
100.89	22.69	183.72	41.66
100.95	24.97	205.41	44.83
101.00	27.41	229.56	48.00

COMPUTE TRAVEL TIME ID=14 REACH NO=1 NO VS=1 L=1200 FT SLP=0.02

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.053	.138	.15	.3083
.105	.554	.95	.1942
.158	1.246	2.80	.1482
.211	2.215	6.03	.1223
.263	3.461	10.94	.1054
.316	4.920	18.84	.0871
.368	6.394	29.08	.0733
.421	7.869	41.00	.0640
.474	9.344	54.46	.0572
.526	10.821	69.37	.0520
.579	12.298	85.66	.0479
.632	13.776	103.24	.0445
.684	15.261	119.89	.0424
.737	16.869	132.52	.0424
.790	18.644	147.34	.0422
.842	20.586	164.39	.0417
.895	22.695	183.72	.0412
.947	24.971	205.41	.0405
1.000	27.414	229.56	.0398

ROUTE ID=14 HYD NO=105.2 INFLOW ID=13 DT=0.0

TRAVEL TIME TABLE EXCEEDED

PRINT HYD ID=14 CODE=1

PARTIAL HYDROGRAPH 105.20

```
    RUNOFF VOLUME =       .97974 INCHES     =      13.4550 ACRE-FEET
    PEAK DISCHARGE RATE =     364.47 CFS  AT   1.567 HOURS   BASIN AREA =   .2575 SQ. MI.


*S AREA 106 IS FULLY DEVELOPED
COMPUTE NM HYD      ID=15 HYD NO=106.00 AREA=0.02177 SQ MI
                    PER A=33 PER B=19 PER C=19 PER D=29
                    TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   24.925    CFS   UNIT VOLUME =    .9989       B =   526.28      P60 = 1.8700
    AREA =      .006313 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .139463HR    TP =   .133300HR    K/TP RATIO =  1.046235     SHAPE CONSTANT, N =  3.374403
    UNIT PEAK =   36.067    CFS   UNIT VOLUME =    .9997       B =   311.05      P60 = 1.8700
    AREA =      .015457 SQ MI    IA =    .52958 INCHES    INF =   1.33282 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=15   CODE=1

                                  PARTIAL HYDROGRAPH   106.00


    RUNOFF VOLUME =     1.00753 INCHES     =       1.1698 ACRE-FEET
    PEAK DISCHARGE RATE =      35.84 CFS  AT   1.500 HOURS   BASIN AREA =   .0218 SQ. MI.


*S BASIN 300.1 IS CURRENTLY UNDEVELOPED, ASSUME FUTURE DEVELOPMENT WILL BE @
*S A DENSITY OF 4 DU/AC
COMPUTE NM HYD      ID=16 HYD NO=300.1  AREA=0.0156 SQ MI
                    PER A=0  PER B=29  PER C=29  PER D=42
                    TP=-0.1333 HR  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   25.868    CFS   UNIT VOLUME =    .9989       B =   526.28      P60 = 1.8700
    AREA =      .006552 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   24.074    CFS   UNIT VOLUME =    .9999       B =   354.67      P60 = 1.8700
    AREA =      .009048 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=16  CODE=1

                                HYDROGRAPH FROM AREA   300.10


    RUNOFF VOLUME =     1.29860 INCHES     =       1.0804 ACRE-FEET
    PEAK DISCHARGE RATE =      32.45 CFS  AT   1.500 HOURS   BASIN AREA =   .0156 SQ. MI.
```

```
*S **ADD THE FLOWS FROM BASINS 106 AND 300.1
ADD HYD              ID=17  HYD NO=106.1  ID=15  ID=16
PRINT HYD            ID=17  CODE=1

                                PARTIAL HYDROGRAPH   106.10

    RUNOFF VOLUME =     1.12902 INCHES     =       2.2502 ACRE-FEET
    PEAK DISCHARGE RATE =      68.29 CFS  AT   1.500 HOURS   BASIN AREA =   .0374 SQ. MI.


*S **TOTAL FLOW IN SAPHIRE ST AT ANALYSIS POINT A
ADD HYD              ID=18 HYD NO=106.15 ID=14 ID=17
PRINT HYD            ID=18 CODE=1

                                PARTIAL HYDROGRAPH   106.15

    RUNOFF VOLUME =      .99866 INCHES     =      15.7052 ACRE-FEET
    PEAK DISCHARGE RATE =     423.63 CFS  AT   1.567 HOURS   BASIN AREA =   .2949 SQ. MI.


*S  **BASIN 401.12, 401.14, 401.17, 300.2 AND 400.2 DRAINS TO SAPPHIRE ST.
*S  **BASIN 401.12 IS PART OF SUNRISE ESTATES UNIT 1
COMPUTE NM HYD       ID=19 HYD NO=401.12 AREA=0.01126 SQ MI
                     PER A=0 PER B=29 PER C=29 PER D=42
                     TP=-0.1333 HR  MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   18.671    CFS   UNIT VOLUME =    .9988       B =   526.28      P60 = 1.8700
    AREA =      .004729 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   17.376    CFS   UNIT VOLUME =    .9997       B =   354.67      P60 = 1.8700
    AREA =      .006531 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=19  CODE=1

                                HYDROGRAPH FROM AREA   401.12

    RUNOFF VOLUME =     1.29860 INCHES     =        .7798 ACRE-FEET
    PEAK DISCHARGE RATE =      23.43 CFS  AT   1.500 HOURS   BASIN AREA =   .0113 SQ. MI.


*S  **ADD THE FLOWS FROM HYDROGRAPH NO 401.12 AND 106.15
ADD HYD              ID=20 HYD NO=401.13 ID=19 ID=18
PRINT HYD            ID=20  CODE=1

                                HYDROGRAPH FROM AREA   401.13
```

```
    RUNOFF VOLUME =      1.00969 INCHES      =       16.4850 ACRE-FEET
    PEAK DISCHARGE RATE =      443.65 CFS  AT   1.567 HOURS   BASIN AREA =   .3061 SQ. MI.


*S  **BASIN 300.2 IS CURRENTLY UNDEVELOPED, ASSUME FUTURE DEVELOPMENT WILL BE
*S  @ A DENSITY OF 4 DU/AC
COMPUTE NM HYD       ID=1 HYD NO=300.2 AREA=0.0118 SQ MI
                     PER A=0  PER B=29  PER C=29  PER D=42
                     TP=-0.1333 HR MASS RAIN=-1

    K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   19.567    CFS   UNIT VOLUME =     .9988       B =   526.28      P60 = 1.8700
    AREA =      .004956 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =    .118429HR    TP =    .133300HR    K/TP RATIO =    .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   18.210    CFS   UNIT VOLUME =     .9997       B =   354.67      P60 = 1.8700
    AREA =      .006844 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=1  CODE=1

                                    HYDROGRAPH FROM AREA   300.20


    RUNOFF VOLUME =      1.29859 INCHES      =         .8172 ACRE-FEET
    PEAK DISCHARGE RATE =      24.55 CFS  AT   1.500 HOURS   BASIN AREA =   .0118 SQ. MI.


*S ** BASIN 401.14 IS PART OF SUNRISE ESTATES UNIT 1
COMPUTE NM HYD       ID=2 HYD NO=401.14 AREA=0.01117 SQ MI
                     PER A=0 PER B=29 PER C=29 PER D=42
                     TP=-0.1333 HR MASS RAIN=-1

    K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   18.522    CFS   UNIT VOLUME =     .9988       B =   526.28      P60 = 1.8700
    AREA =      .004691 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =    .118429HR    TP =    .133300HR    K/TP RATIO =    .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   17.237    CFS   UNIT VOLUME =     .9997       B =   354.67      P60 = 1.8700
    AREA =      .006479 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=2 CODE=1

                                    HYDROGRAPH FROM AREA   401.14


    RUNOFF VOLUME =      1.29860 INCHES      =         .7736 ACRE-FEET
    PEAK DISCHARGE RATE =      23.24 CFS  AT   1.500 HOURS   BASIN AREA =   .0112 SQ. MI.
```

9 du/ac

```
*S  **ADD FLOWS FROM HYDROGRAPH NO 401.14 AND 300.2
ADD HYD              ID=3 HYD NO=401.15 ID=1 ID=2
PRINT HYD            ID=3 CODE=1

                                        HYDROGRAPH FROM AREA   401.15

    RUNOFF VOLUME =     1.29857 INCHES     =       1.5908 ACRE-FEET
    PEAK DISCHARGE RATE =      47.79 CFS  AT   1.500 HOURS   BASIN AREA =   .0230 SQ. MI.


*S **ADD FLOWS FROM HYDROGRAPH NO 401.15 AND 401.13
ADD HYD              ID=4 HYD NO=401.16 ID=3 ID=20
PRINT HYD            ID=4 CODE=1

                                        HYDROGRAPH FROM AREA   401.16

    RUNOFF VOLUME =     1.02985 INCHES     =      18.0759 ACRE-FEET
    PEAK DISCHARGE RATE =     484.48 CFS  AT   1.567 HOURS   BASIN AREA =   .3291 SQ. MI.


*S **BASIN 401.17 IS PART OF SUNRISE ESTATES UNIT 1
COMPUTE NM HYD       ID=5 HYD NO=401.17 AREA=0.00661 SQ MI
                     PER A=0 PER B=29 PER C=29 PER D=42
                     TP=-0.1333 HR MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   10.961    CFS   UNIT VOLUME =    .9984       B =   526.28      P60 = 1.8700
    AREA =      .002776 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   10.201    CFS   UNIT VOLUME =    .9992       B =   354.67      P60 = 1.8700
    AREA =      .003834 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=5 CODE=1

                                        HYDROGRAPH FROM AREA   401.17

    RUNOFF VOLUME =     1.29860 INCHES     =        .4578 ACRE-FEET
    PEAK DISCHARGE RATE =      13.76 CFS  AT   1.500 HOURS   BASIN AREA =   .0066 SQ. MI.


*S  **ADD FLOWS FROM HYDROGRAPH NO 401.16 AND 401.17
ADD HYD              ID=6 HYD NO=401.18 ID=4 ID=5
PRINT HYD            ID=6 CODE=1

                                        HYDROGRAPH FROM AREA   401.18
```

```
    RUNOFF VOLUME =      1.03514 INCHES      =       18.5337 ACRE-FEET
    PEAK DISCHARGE RATE =      496.23 CFS  AT   1.567 HOURS   BASIN AREA =   .3357 SQ. MI.


*S ** BASIN 405 DRAINS TO SAPPHIRE ST.
COMPUTE NM HYD       ID=7  HYD NO=405.0  AREA=0.013934 SQ MI
                     PER A=0 PER B=28 PER C=28 PER D=44
                     TP=-0.1333 HR MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   24.205    CFS   UNIT VOLUME =    .9989       B =   526.28      P60 = 1.8700
    AREA =      .006131 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   20.761    CFS   UNIT VOLUME =    .9998       B =   354.67      P60 = 1.8700
    AREA =      .007803 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=7 CODE=1

                                    HYDROGRAPH FROM AREA   405.00


    RUNOFF VOLUME =      1.32159 INCHES      =         .9821 ACRE-FEET
    PEAK DISCHARGE RATE =       29.33 CFS  AT   1.500 HOURS   BASIN AREA =   .0139 SQ. MI.


*S  **ADD FLOWS FROM HYDROGRAPH NO 401.18 AND 405
ADD HYD              ID=8 HYD NO=405.1  ID=6 ID=7
PRINT HYD            ID=8 CODE=1

                                    HYDROGRAPH FROM AREA   405.10


    RUNOFF VOLUME =      1.04656 INCHES      =       19.5158 ACRE-FEET
    PEAK DISCHARGE RATE =      521.25 CFS  AT   1.567 HOURS   BASIN AREA =   .3496 SQ. MI.


*S ** BASIN 403 DRAINS TO SAPPHIRE ST.
COMPUTE NM HYD       ID=9  HYD NO=403.0  AREA=0.0148 SQ MI
                     PER A=0 PER B=29 PER C=29 PER D=42
                     TP=-0.1333 HR MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   24.541    CFS   UNIT VOLUME =    .9989       B =   526.28      P60 = 1.8700
    AREA =      .006216 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330
```

```
    K =    .118429HR    TP =    .133300HR    K/TP RATIO =    .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =    22.839    CFS   UNIT VOLUME =     .9999       B =   354.67      P60 = 1.8700
    AREA =       .008584 SQ MI    IA =     .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330

PRINT HYD           ID=9 CODE=1

                                        HYDROGRAPH FROM AREA   403.00


    RUNOFF VOLUME =     1.29860 INCHES     =       1.0250 ACRE-FEET
    PEAK DISCHARGE RATE =      30.79 CFS  AT   1.500 HOURS   BASIN AREA =   .0148 SQ. MI.


*S  **ADD FLOWS FROM HYDROGRAPH NO 405.1 AND 403
ADD HYD             ID=10 HYD NO=405.15  ID=8 ID=9
PRINT HYD           ID=10 CODE=1

                                        HYDROGRAPH FROM AREA   405.15


    RUNOFF VOLUME =     1.05679 INCHES     =      20.5408 ACRE-FEET
    PEAK DISCHARGE RATE =     547.55 CFS  AT   1.567 HOURS   BASIN AREA =   .3644 SQ. MI.


*S ** BASIN 400.2 IS CURRENTLY UNDEVELOPED, ASSUME FUTURE DEVELOPMENT WILL BE
*S @ A DENSITY OF 4 DU/AC
COMPUTE NM HYD      ID=11  HYD NO=400.2  AREA=0.032215 SQ MI
                    PER A=0 PER B=28 PER C=28 PER D=44
                    TP=-0.1333 HR MASS RAIN=-1

    K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =    55.962    CFS   UNIT VOLUME =     .9992       B =   526.28      P60 = 1.8700
    AREA =       .014175 SQ MI    IA =     .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330


    K =    .118429HR    TP =    .133300HR    K/TP RATIO =    .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =    48.000    CFS   UNIT VOLUME =     1.000       B =   354.67      P60 = 1.8700
    AREA =       .018040 SQ MI    IA =     .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330

PRINT HYD           ID=11  CODE=1

                                        HYDROGRAPH FROM AREA   400.20


    RUNOFF VOLUME =     1.32159 INCHES     =       2.2707 ACRE-FEET
    PEAK DISCHARGE RATE =      67.80 CFS  AT   1.500 HOURS   BASIN AREA =   .0322 SQ. MI.
```

9 du/ac

```
*S  **ADD FLOWS FROM HYDROGRAPH NO 405.15 AND 400.2 TOGETHER TO GET THE FLOW
*S IN SAPPHIRE ST. @ ANALYSIS PT B
ADD HYD            ID=12 HYD NO=405.16  ID=10 ID=11
PRINT HYD          ID=12 CODE=1

                                    HYDROGRAPH FROM AREA   405.16

    RUNOFF VOLUME =     1.07830 INCHES     =      22.8114 ACRE-FEET
    PEAK DISCHARGE RATE =     607.35 CFS  AT   1.533 HOURS   BASIN AREA =   .3967 SQ. MI.


*S*************************************************************************
*S*************************************************************************
*S **BASINS 200,201, & 202 DRAIN TO KIMELA DR
COMPUTE NM HYD      ID=13 HYD NO=200.00 AREA=0.053 SQ MI
                    PER A=33 PER B=19 PER C=19 PER D=29
                    TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   60.682    CFS   UNIT VOLUME =    .9992       B =   526.28      P60 = 1.8700
    AREA =      .015370 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .139463HR    TP =   .133300HR    K/TP RATIO =  1.046235     SHAPE CONSTANT, N =  3.374403
    UNIT PEAK =   87.807    CFS   UNIT VOLUME =    .9999       B =   311.05      P60 = 1.8700
    AREA =      .037630 SQ MI    IA =    .52958 INCHES    INF =   1.33282 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=13   CODE=1

                                    PARTIAL HYDROGRAPH   200.00


    RUNOFF VOLUME =     1.00753 INCHES     =       2.8479 ACRE-FEET
    PEAK DISCHARGE RATE =      87.23 CFS  AT   1.500 HOURS   BASIN AREA =   .0530 SQ. MI.


*S **ROUTE FLOW TO THE END OF KIMELA DR.
COMPUTE RATING CURVE CID=1 VS NO=1 NO SEG=1 MIN EL=100.00 MAX EL=101.00
                    CH SLOPE=0.02 FP SLOPE=0.02 N=0.017 DIST=48.0
                    DIST  ELEV  DIST  ELEV  DIST  ELEV  DIST  ELEV
                     0   101.00 10.0 100.67 10.1 100.00 24.0 100.28
                    38.0 100.00 38.1 100.67 48.0 101.00

                                    RATING CURVE VALLEY SECTION  1.0
                                       WATER       FLOW        FLOW        TOP
                                      SURFACE      AREA        RATE       WIDTH
                                       ELEV        SQ FT       CFS        FT
                                      100.00        .00         .00        .00
                                      100.05        .14         .15       5.26
                                      100.11        .55         .95      10.52
                                      100.16       1.25        2.80      15.78
                                      100.21       2.22        6.03      21.04
                                      100.26       3.46       10.94      26.30
```

100.32	4.92	18.84	27.99
100.37	6.39	29.08	28.01
100.42	7.87	41.00	28.03
100.47	9.34	54.46	28.04
100.53	10.82	69.37	28.06
100.58	12.30	85.66	28.07
100.63	13.78	103.24	28.09
100.68	15.26	119.89	28.96
100.74	16.87	132.52	32.13
100.79	18.64	147.34	35.31
100.84	20.59	164.39	38.48
100.89	22.69	183.72	41.66
100.95	24.97	205.41	44.83
101.00	27.41	229.56	48.00

```
COMPUTE TRAVEL TIME  ID=14 REACH NO=1 NO VS=1 L=800 FT SLP=0.02
```

TRAVEL TIME TABLE

REACH= 1.0

WATER DEPTH FEET	AVERAGE AREA SQ.FT.	FLOW RATE CFS	TRAVEL TIME HRS
.053	.138	.15	.2055
.105	.554	.95	.1295
.158	1.246	2.80	.0988
.211	2.215	6.03	.0816
.263	3.461	10.94	.0703
.316	4.920	18.84	.0580
.368	6.394	29.08	.0489
.421	7.869	41.00	.0427
.474	9.344	54.46	.0381
.526	10.821	69.37	.0347
.579	12.298	85.66	.0319
.632	13.776	103.24	.0297
.684	15.261	119.89	.0283
.737	16.869	132.52	.0283
.790	18.644	147.34	.0281
.842	20.586	164.39	.0278
.895	22.695	183.72	.0275
.947	24.971	205.41	.0270
1.000	27.414	229.56	.0265

```
ROUTE                ID=14 HYD NO=200.1 INFLOW ID=13 DT=0.0
PRINT HYD            ID=14 CODE=1
```

PARTIAL HYDROGRAPH 200.10

```
RUNOFF VOLUME =     1.00753 INCHES     =       2.8479 ACRE-FEET
PEAK DISCHARGE RATE =      86.94 CFS  AT   1.533 HOURS   BASIN AREA =   .0530 SQ. MI.
```

```
COMPUTE NM HYD       ID=15 HYD NO=201.00 AREA=0.026 SQ MI
                     PER A=33 PER B=19 PER C=19 PER D=29
                     TP=-0.1333 HR   MASS RAIN=-1
```

```
    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   29.768    CFS   UNIT VOLUME =    .9990       B =   526.28      P60 = 1.8700
    AREA =      .007540 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .139463HR    TP =   .133300HR    K/TP RATIO =  1.046235     SHAPE CONSTANT, N =  3.374403
    UNIT PEAK =   43.075    CFS   UNIT VOLUME =    .9997       B =   311.05      P60 = 1.8700
    AREA =      .018460 SQ MI    IA =    .52958 INCHES    INF =   1.33282 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=15  CODE=1

                                PARTIAL HYDROGRAPH   201.00


    RUNOFF VOLUME =     1.00753 INCHES     =       1.3971 ACRE-FEET
    PEAK DISCHARGE RATE =      42.80 CFS  AT   1.500 HOURS   BASIN AREA =   .0260 SQ. MI.


ADD HYD             ID=16 HYD NO=201.1 ID=15 ID=14
PRINT HYD           ID=16 CODE=1

                                PARTIAL HYDROGRAPH   201.10


    RUNOFF VOLUME =     1.00752 INCHES     =       4.2450 ACRE-FEET
    PEAK DISCHARGE RATE =     128.91 CFS  AT   1.533 HOURS   BASIN AREA =   .0790 SQ. MI.


*S **BASIN 202 IS AN ELEMENTARY SCHOOL (ONSITE DETENTION TO REDUCE RUNOFF)
COMPUTE NM HYD      ID=17 HYD NO=202.00 AREA=0.009253 SQ MI
                    PER A=100 PER B=0 PER C=0 PER D=0
                    TP=-0.1333 HR   MASS RAIN=-1

    K =   .163684HR    TP =   .133300HR    K/TP RATIO =  1.227936     SHAPE CONSTANT, N =  2.899764
    UNIT PEAK =   18.988    CFS   UNIT VOLUME =    .9989       B =   273.54      P60 = 1.8700
    AREA =      .009253 SQ MI    IA =    .65000 INCHES    INF =   1.67000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=17   CODE=1

                                PARTIAL HYDROGRAPH   202.00


    RUNOFF VOLUME =      .43925 INCHES     =        .2168 ACRE-FEET
    PEAK DISCHARGE RATE =       7.69 CFS  AT   1.533 HOURS   BASIN AREA =   .0093 SQ. MI.


*S **BASIN 202.05 IS THE ELEMENTARY SCHOOL PARKING LOT THAT WILL DRAIN TO KIMELA
COMPUTE NM HYD      ID=18  HYD NO=202.05 AREA=0.003747 SQ MI
                    PER A=0  PER B=0  PER C=0  PER D=100
                    TP=-0.1333 HR  MASS RAIN=-1
```

```
    K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   14.793    CFS   UNIT VOLUME =    .9987       B =   526.28      P60 = 1.8700
    AREA =       .003747 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=18  CODE=1

                                PARTIAL HYDROGRAPH   202.05

    RUNOFF VOLUME =     1.96548 INCHES     =        .3928 ACRE-FEET
    PEAK DISCHARGE RATE =      10.49 CFS  AT   1.500 HOURS   BASIN AREA =   .0037 SQ. MI.


*S **ADD THE BASINS OF THE ELEMENTARY SCHOOL AND PARKING LOT
ADD HYD             ID=19  HYD NO=202.06 ID I=17  ID II=18
PRINT HYD           ID=19  CODE=1

                                PARTIAL HYDROGRAPH   202.06

    RUNOFF VOLUME =      .87913 INCHES     =        .6095 ACRE-FEET
    PEAK DISCHARGE RATE =      18.01 CFS  AT   1.500 HOURS   BASIN AREA =   .0130 SQ. MI.


*S **ADD THE BASINS TOGETHER TO GET THE FLOW IN KIMELA DR @ ANALYSIS PT C
ADD HYD             ID=20 HYD NO=202.1 ID=16 ID=19
PRINT HYD           ID=20 CODE=1

                                PARTIAL HYDROGRAPH   202.10

    RUNOFF VOLUME =      .98938 INCHES     =       4.8545 ACRE-FEET
    PEAK DISCHARGE RATE =     146.56 CFS  AT   1.533 HOURS   BASIN AREA =   .0920 SQ. MI.


*S*************************************************************************
*S*************************************************************************
*S **BASINS 402 THRU 404 ARE CURRENTLY UNDEVELOPED, FOR PURPOSES
*S OF THIS REPORT, ASSUME ALL BASINS WILL BE BUILT OUT @ THEIR CURRENT
*S ZONING
*S **BASIN 402 IS UNIT 2 OF SUNRISE ESTATES
COMPUTE NM HYD      ID=6 HYD NO=402.00 AREA=0.052 SQ MI
                    PER A=0 PER B=29 PER C=29 PER D=42
                    TP=-0.1333 HR   MASS RAIN=-1

    K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   86.225    CFS   UNIT VOLUME =    .9992       B =   526.28      P60 = 1.8700
    AREA =       .021840 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330
```

```
    K =    .118429HR    TP =    .133300HR    K/TP RATIO =    .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   80.246    CFS   UNIT VOLUME =    1.000       B =   354.67      P60 = 1.8700
    AREA =       .030160 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=6   CODE=1

                                        HYDROGRAPH FROM AREA   402.00


    RUNOFF VOLUME =     1.29860 INCHES     =       3.6014 ACRE-FEET
    PEAK DISCHARGE RATE =     108.14 CFS  AT   1.500 HOURS   BASIN AREA =   .0520 SQ. MI.


*S **ADD BASIN 402 TO THE TOTAL FLOW @ THE END OF EXTENDED KIMELA
ADD HYD             ID=7 HYD NO=402.1 ID=20 ID=6
PRINT HYD           ID=7 CODE=1

                                        HYDROGRAPH FROM AREA   402.10


    RUNOFF VOLUME =     1.10104 INCHES     =       8.4559 ACRE-FEET
    PEAK DISCHARGE RATE =     251.21 CFS  AT   1.533 HOURS   BASIN AREA =   .1440 SQ. MI.


COMPUTE NM HYD      ID=8 HYD NO=404.00 AREA=0.0108 SQ MI
                    PER A=0 PER B=29 PER C=29 PER D=42
                    TP=-0.1333 HR   MASS RAIN=-1

    K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   17.908    CFS   UNIT VOLUME =    .9988       B =   526.28      P60 = 1.8700
    AREA =       .004536 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =    .118429HR    TP =    .133300HR    K/TP RATIO =    .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   16.666    CFS   UNIT VOLUME =    .9997       B =   354.67      P60 = 1.8700
    AREA =       .006264 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=8   CODE=1

                                        HYDROGRAPH FROM AREA   404.00


    RUNOFF VOLUME =     1.29860 INCHES     =        .7480 ACRE-FEET
    PEAK DISCHARGE RATE =      22.47 CFS  AT   1.500 HOURS   BASIN AREA =   .0108 SQ. MI.


*S **ADD FLOW TO THAT IN KIMELA DR
ADD HYD             ID=9 HYD NO=404.1 ID=7 ID=8
PRINT HYD           ID=9 CODE=1

                                        HYDROGRAPH FROM AREA   404.10
```

```
    RUNOFF VOLUME =     1.11482 INCHES     =       9.2039 ACRE-FEET
    PEAK DISCHARGE RATE =     272.95 CFS  AT   1.533 HOURS   BASIN AREA =   .1548 SQ. MI.


*S **ADD TO FLOW IN SAPPHIRE @ ANALYSIS PT D
ADD HYD             ID=10 HYD NO=404.2 ID=9 ID=12
PRINT HYD           ID=10 CODE=1

                                    HYDROGRAPH FROM AREA   404.20


    RUNOFF VOLUME =     1.08855 INCHES     =      32.0153 ACRE-FEET
    PEAK DISCHARGE RATE =     880.30 CFS  AT   1.533 HOURS   BASIN AREA =   .5515 SQ. MI.


*S DESIGN A RETENTION FACILITY TO REDUCE TO FLOW TO THAT WHICH WILL
*S FIT IN A 48" RCP @ S=1.8%
ROUTE RESERVOIR     ID=11 HYD NO=405.4 INFLOW ID=10 CODE=1
                    OUTFLOW(CFS)  STORAGE(AF)  ELEV(FT)
                         0            0          0
                        46.2         0.77        0.5
                       104.75        1.91        1
                       120.95        3.93        2
                       135.23        6.06        3
                       148.14        8.30        4
                       160.00       10.66        5
                       171.05       13.14        6
                       181.43       15.74        7
                       191.24       18.47        8
                       200.58       21.33        9
                       209.50       24.32       10
                       218.05       27.44       11

* * * * * * * * * * * * * * * * *

  TIME      INFLOW    ELEV      VOLUME    OUTFLOW
  (HRS)     (CFS)     (FEET)    (AC-FT)   (CFS)

    .00        .00       .00       .000       .00
    .03        .00       .00       .000       .00
    .07        .00       .00       .000       .00
    .10        .00       .00       .000       .00
    .13        .00       .00       .000       .00
    .17        .00       .00       .000       .00
    .20        .00       .00       .000       .00
    .23        .00       .00       .000       .00
    .27        .00       .00       .000       .00
    .30        .00       .00       .000       .00
    .33        .00       .00       .000       .00
    .37        .00       .00       .000       .00
    .40        .00       .00       .000       .00
    .43        .00       .00       .000       .00
    .47        .00       .00       .000       .00
    .50        .00       .00       .000       .00
    .53        .00       .00       .000       .00
```

.57	.00	.00	.000	.00
.60	.00	.00	.000	.00
.63	.00	.00	.000	.00
.67	.00	.00	.000	.00
.70	.00	.00	.000	.00
.73	.00	.00	.000	.00
.77	.00	.00	.000	.00
.80	.00	.00	.000	.00
.83	.00	.00	.000	.00
.87	.00	.00	.000	.00
.90	.00	.00	.000	.00
.93	.00	.00	.000	.00
.97	.00	.00	.000	.00
1.00	.00	.00	.000	.00
1.03	.00	.00	.000	.00
1.07	.00	.00	.000	.00
1.10	.00	.00	.000	.00
1.13	.03	.00	.000	.00
1.17	.74	.00	.001	.06
1.20	4.90	.01	.008	.48
1.23	15.78	.02	.033	1.99
1.27	34.67	.06	.092	5.53
1.30	63.45	.13	.203	12.18
1.33	110.17	.26	.393	23.57
1.37	193.52	.47	.719	43.15
1.40	330.78	.72	1.282	72.50
1.43	518.14	1.15	2.204	107.11
1.47	698.75	1.82	3.570	118.06
1.50	831.94	2.66	5.336	130.37
1.53	880.30	3.56	7.318	142.48
1.57	852.46	4.42	9.297	153.15
1.60	780.96	5.18	11.113	162.02
1.63	696.22	5.82	12.692	169.05
1.67	610.62	6.34	14.018	174.56
1.70	541.62	6.76	15.118	178.95
1.73	461.68	7.10	16.002	182.37
1.77	395.56	7.34	16.677	184.80
1.80	343.50	7.53	17.184	186.62
1.83	301.71	7.67	17.557	187.96

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
1.87	267.03	7.76	17.821	188.91
1.90	237.86	7.83	17.995	189.53
1.93	214.21	7.86	18.095	189.89
1.97	195.23	7.88	18.136	190.04
2.00	179.72	7.87	18.129	190.01
2.03	166.54	7.86	18.082	189.85
2.07	152.59	7.83	17.999	189.55
2.10	135.39	7.78	17.874	189.10
2.13	116.39	7.72	17.701	188.48
2.17	98.60	7.64	17.479	187.68
2.20	84.03	7.54	17.215	186.73
2.23	72.59	7.43	16.918	185.66
2.27	63.63	7.31	16.596	184.50
2.30	56.55	7.19	16.255	183.28

2.33	50.88	7.06	15.900	182.00
2.37	46.15	6.92	15.534	180.61
2.40	42.08	6.78	15.160	179.11
2.43	38.50	6.63	14.780	177.60
2.47	35.28	6.48	14.394	176.06
2.50	32.37	6.33	14.004	174.50
2.53	29.81	6.18	13.612	172.93
2.57	27.55	6.03	13.216	171.36
2.60	25.49	5.87	12.820	169.62
2.63	23.61	5.71	12.423	167.85
2.67	21.91	5.55	12.025	166.08
2.70	20.37	5.39	11.629	164.32
2.73	18.94	5.23	11.233	162.55
2.77	17.63	5.07	10.838	160.79
2.80	16.43	4.91	10.444	158.92
2.83	15.33	4.74	10.053	156.95
2.87	14.32	4.58	9.664	155.00
2.90	13.37	4.41	9.278	153.05
2.93	12.50	4.25	8.895	151.13
2.97	11.71	4.09	8.514	149.22
3.00	10.97	3.93	8.137	147.20
3.03	10.29	3.76	7.764	145.05
3.07	9.70	3.60	7.395	142.92
3.10	9.14	3.43	7.030	140.82
3.13	8.61	3.27	6.670	138.74
3.17	8.14	3.11	6.313	136.69
3.20	7.71	2.95	5.962	134.57
3.23	7.33	2.79	5.615	132.25
3.27	6.98	2.63	5.273	129.96
3.30	6.65	2.47	4.937	127.70
3.33	6.35	2.32	4.606	125.49
3.37	6.06	2.16	4.281	123.30
3.40	5.81	2.01	3.961	121.15
3.43	5.58	1.86	3.646	118.67
3.47	5.36	1.71	3.338	116.20
3.50	5.15	1.56	3.035	113.77
3.53	4.96	1.41	2.739	111.40
3.57	4.79	1.27	2.449	109.07
3.60	4.63	1.13	2.164	106.79
3.63	4.50	.99	1.887	103.58
3.67	4.37	.88	1.632	90.48
3.70	4.24	.78	1.411	79.10

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
3.73	4.12	.70	1.218	69.20
3.77	4.01	.62	1.050	60.59
3.80	3.90	.56	.905	53.11
3.83	3.82	.50	.778	46.60
3.87	3.74	.43	.669	40.13
3.90	3.66	.37	.576	34.57
3.93	3.59	.32	.497	29.84
3.97	3.52	.28	.431	25.83
4.00	3.46	.24	.374	22.42
4.03	3.41	.21	.325	19.52
4.07	3.35	.18	.284	17.06

4.10	3.31	.16	.249	14.96
4.13	3.28	.14	.220	13.18
4.17	3.24	.13	.194	11.67
4.20	3.20	.11	.173	10.38
4.23	3.15	.10	.155	9.28
4.27	3.11	.09	.139	8.34
4.30	3.08	.08	.126	7.54
4.33	3.06	.07	.114	6.85
4.37	3.04	.07	.105	6.27
4.40	3.02	.06	.096	5.78
4.43	3.00	.06	.089	5.36
4.47	2.98	.05	.083	4.99
4.50	2.95	.05	.078	4.68
4.53	2.94	.05	.074	4.42
4.57	2.93	.05	.070	4.19
4.60	2.92	.04	.067	4.00
4.63	2.91	.04	.064	3.83
4.67	2.90	.04	.062	3.69
4.70	2.91	.04	.060	3.57
4.73	2.91	.04	.058	3.47
4.77	2.92	.04	.056	3.39
4.80	2.91	.04	.055	3.31
4.83	2.92	.04	.054	3.25
4.87	2.91	.03	.053	3.20
4.90	2.91	.03	.053	3.16
4.93	2.91	.03	.052	3.12
4.97	2.91	.03	.051	3.09
5.00	2.93	.03	.051	3.06
5.03	2.94	.03	.051	3.04
5.07	2.95	.03	.050	3.03
5.10	2.98	.03	.050	3.02
5.13	3.00	.03	.050	3.01
5.17	3.01	.03	.050	3.01
5.20	3.01	.03	.050	3.01
5.23	3.02	.03	.050	3.01
5.27	3.04	.03	.050	3.01
5.30	3.07	.03	.050	3.02
5.33	3.09	.03	.051	3.03
5.37	3.11	.03	.051	3.04
5.40	3.12	.03	.051	3.05
5.43	3.13	.03	.051	3.06
5.47	3.14	.03	.051	3.07
5.50	3.16	.03	.051	3.09
5.53	3.20	.03	.052	3.10
5.57	3.23	.03	.052	3.12

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
5.60	3.24	.03	.052	3.14
5.63	3.25	.03	.053	3.15
5.67	3.28	.03	.053	3.17
5.70	3.31	.03	.053	3.19
5.73	3.33	.03	.053	3.21
5.77	3.35	.03	.054	3.23
5.80	3.37	.04	.054	3.25
5.83	3.40	.04	.054	3.27

5.87	3.42	.04	.055	3.29
5.90	3.45	.04	.055	3.31
5.93	3.49	.04	.056	3.34
5.97	3.52	.04	.056	3.36
6.00	3.54	.04	.056	3.39
6.03	3.56	.04	.057	3.41
6.07	3.45	.04	.057	3.43
6.10	3.12	.04	.057	3.40
6.13	2.66	.04	.055	3.33
6.17	2.22	.03	.053	3.19
6.20	1.85	.03	.050	3.01
6.23	1.57	.03	.047	2.81
6.27	1.36	.03	.043	2.61
6.30	1.19	.03	.040	2.40
6.33	1.06	.02	.037	2.21
6.37	.95	.02	.034	2.03
6.40	.86	.02	.031	1.86
6.43	.78	.02	.028	1.70
6.47	.71	.02	.026	1.55
6.50	.64	.02	.024	1.42
6.53	.58	.01	.022	1.29
6.57	.53	.01	.020	1.18
6.60	.48	.01	.018	1.08
6.63	.44	.01	.016	.98
6.67	.40	.01	.015	.90
6.70	.37	.01	.014	.82
6.73	.34	.01	.012	.75
6.77	.31	.01	.011	.68
6.80	.28	.01	.010	.62
6.83	.26	.01	.009	.57
6.87	.23	.01	.009	.52
6.90	.21	.01	.008	.47
6.93	.19	.00	.007	.43
6.97	.17	.00	.007	.39
7.00	.16	.00	.006	.36
7.03	.15	.00	.005	.33
7.07	.13	.00	.005	.30
7.10	.12	.00	.005	.27
7.13	.11	.00	.004	.25
7.17	.10	.00	.004	.23
7.20	.09	.00	.003	.21
7.23	.08	.00	.003	.19
7.27	.08	.00	.003	.17
7.30	.07	.00	.003	.16
7.33	.06	.00	.002	.14
7.37	.06	.00	.002	.13
7.40	.05	.00	.002	.12
7.43	.05	.00	.002	.11

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
7.47	.04	.00	.002	.10
7.50	.04	.00	.002	.09
7.53	.04	.00	.001	.08
7.57	.03	.00	.001	.08
7.60	.03	.00	.001	.07

7.63	.03	.00	.001	.06
7.67	.02	.00	.001	.06
7.70	.02	.00	.001	.05
7.73	.02	.00	.001	.05
7.77	.02	.00	.001	.04
7.80	.02	.00	.001	.04
7.83	.01	.00	.001	.04
7.87	.01	.00	.001	.03
7.90	.01	.00	.000	.03
7.93	.01	.00	.000	.03
7.97	.01	.00	.000	.02
8.00	.01	.00	.000	.02
8.03	.01	.00	.000	.02
8.07	.01	.00	.000	.02
8.10	.01	.00	.000	.02
8.13	.01	.00	.000	.01
8.17	.01	.00	.000	.01
8.20	.00	.00	.000	.01
8.23	.00	.00	.000	.01
8.27	.00	.00	.000	.01
8.30	.00	.00	.000	.01
8.33	.00	.00	.000	.01
8.37	.00	.00	.000	.01
8.40	.00	.00	.000	.01
8.43	.00	.00	.000	.01
8.47	.00	.00	.000	.01
8.50	.00	.00	.000	.01
8.53	.00	.00	.000	.00

PEAK DISCHARGE = 190.038 CFS - PEAK OCCURS AT HOUR 1.97
MAXIMUM WATER SURFACE ELEVATION = 7.878
MAXIMUM STORAGE = 18.1356 AC-FT , INCREMENTAL TIME= .033330HRS

*S ROUTE FLOW FROM THE DETENTION POND TO THE AMOLE DEL NORTE CHANNEL
COMPUTE RATING CURVE CID=1 VS NO=1 CODE=-1 SLOPE=0.0180
DIA=4.0 FT N=0.013

RATING CURVE PIPE SECTION 1.0

WATER SURFACE ELEV	FLOW AREA SQ FT	FLOW RATE CFS	MAX WIDTH FT
.00	.00	.00	.00
.21	.25	1.01	1.78
.42	.69	4.39	2.44
.63	1.25	10.20	2.91
.83	1.90	18.35	3.25
1.04	2.60	28.65	3.51
1.25	3.36	40.88	3.71
1.46	4.15	54.76	3.85
1.67	4.96	70.02	3.94
1.88	5.79	86.31	3.99
2.08	6.62	103.30	4.00
2.29	7.45	120.60	4.00
2.50	8.27	137.80	4.00
2.71	9.06	154.44	4.00
2.92	9.82	170.03	4.00
3.13	10.54	183.98	4.00
3.34	11.20	195.59	4.00

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                                        3.54        11.77       203.89        4.00
                                        3.75        12.24       207.31        4.00
                                        4.00        12.57       207.31        4.00
COMPUTE TRAVEL TIME  ID=12 REACH NO=1 NO VS=1 L=1150 FT SLP=0.018

                         TRAVEL TIME TABLE
                                   REACH=  1.0

                         WATER       AVERAGE     FLOW        TRAVEL
                         DEPTH       AREA        RATE        TIME
                         FEET        SQ.FT.      CFS         HRS
                            .208        .250        1.01       .0789
                            .417        .695        4.39       .0506
                            .625       1.255       10.20       .0393
                            .834       1.898       18.35       .0330
                           1.042       2.604       28.65       .0290
                           1.251       3.358       40.88       .0262
                           1.459       4.146       54.76       .0242
                           1.668       4.960       70.02       .0226
                           1.876       5.788       86.31       .0214
                           2.084       6.621      103.30       .0205
                           2.293       7.451      120.60       .0197
                           2.501       8.267      137.80       .0192
                           2.710       9.062      154.44       .0187
                           2.918       9.823      170.03       .0185
                           3.127      10.539      183.98       .0183
                           3.335      11.195      195.59       .0183
                           3.544      11.773      203.89       .0184
                           3.752      12.243      207.31       .0189
                           4.000      12.566      207.31       .0194
ROUTE                 ID=12 HYD NO=405.3 INFLOW ID=11 DT=0.0
PRINT HYD             ID=12 CODE=1

                                   HYDROGRAPH FROM AREA   405.30

    RUNOFF VOLUME =     1.08855 INCHES      =      32.0153 ACRE-FEET
    PEAK DISCHARGE RATE =     190.02 CFS  AT  2.000 HOURS  BASIN AREA =   .5515 SQ. MI.


*S*****************************************************************************
*S*****************************************************************************
*S **CALC BASIN 406
COMPUTE NM HYD        ID=13 HYD NO=406.00 AREA=0.057434 SQ MI
                      PER A=4 PER B=27 PER C=27 PER D=42
                      TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   95.236    CFS   UNIT VOLUME =    .9993       B =   526.28      P60 = 1.8700
    AREA =      .024122 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330
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880 cfs in

18.14 ac ft

190 cfs out

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K =    .121550HR    TP =    .133300HR    K/TP RATIO =    .911856     SHAPE CONSTANT, N =  3.883611
UNIT PEAK =    86.799    CFS    UNIT VOLUME =    1.000       B =   347.33      P60 = 1.8700
AREA =       .033312 SQ MI    IA =    .44052 INCHES    INF =   1.08345 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=13   CODE=1

                                    HYDROGRAPH FROM AREA   406.00


RUNOFF VOLUME =     1.27968 INCHES     =       3.9198 ACRE-FEET
PEAK DISCHARGE RATE =     117.49 CFS  AT   1.500 HOURS   BASIN AREA =   .0574 SQ. MI.


*S **CALC BASIN 407
COMPUTE NM HYD       ID=14 HYD NO=407.00 AREA=0.0504 SQ MI
                     PER A=0 PER B=29 PER C=29 PER D=42
                     TP=-0.1333 HR   MASS RAIN=-1

K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
UNIT PEAK =    83.572    CFS    UNIT VOLUME =    .9992       B =   526.28      P60 = 1.8700
AREA =       .021168 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

K =    .118429HR    TP =    .133300HR    K/TP RATIO =    .888442     SHAPE CONSTANT, N =  3.992480
UNIT PEAK =    77.777    CFS    UNIT VOLUME =    1.000       B =   354.67      P60 = 1.8700
AREA =       .029232 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=14   CODE=1

                                    HYDROGRAPH FROM AREA   407.00


RUNOFF VOLUME =     1.29860 INCHES     =       3.4906 ACRE-FEET
PEAK DISCHARGE RATE =     104.81 CFS  AT   1.500 HOURS   BASIN AREA =   .0504 SQ. MI.


*S **CALC BASIN 408
COMPUTE NM HYD       ID=15  HYD NO=408.00  AREA=0.15736 SQ MI
                     PER A=0  PER B=29  PER C=29  PER D=42
                     TP=-0.1333 HR  MASS RAIN=-1

K =    .074258HR    TP =    .133300HR    K/TP RATIO =    .557073     SHAPE CONSTANT, N =  6.910316
UNIT PEAK =    256.33    CFS    UNIT VOLUME =    .9995       B =   516.99      P60 = 1.8700
AREA =       .066091 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

K =    .115909HR    TP =    .133300HR    K/TP RATIO =    .869534     SHAPE CONSTANT, N =  4.085829
UNIT PEAK =    247.07    CFS    UNIT VOLUME =    1.000       B =   360.85      P60 = 1.8700
AREA =       .091269 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330
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PRINT HYD            ID=15  CODE=1

                                    HYDROGRAPH FROM AREA   408.00

    RUNOFF VOLUME =     1.29860 INCHES     =      10.8984 ACRE-FEET
    PEAK DISCHARGE RATE =     327.60 CFS  AT   1.500 HOURS   BASIN AREA =   .1574 SQ. MI.


*S*************************************************************************
*S*************************************************************************
*S **BASIN 500 IS UNIT ONE OF THE PROPOSED LONGFORD SD
COMPUTE NM HYD       ID=16 HYD NO=500.00 AREA=0.024905 SQ MI
                     PER A=0 PER B=29 PER C=29 PER D=42
                     TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   41.297    CFS   UNIT VOLUME =    .9991       B =   526.28      P60 = 1.8700
    AREA =      .010460 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   38.433    CFS   UNIT VOLUME =    1.000       B =   354.67      P60 = 1.8700
    AREA =      .014445 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=16   CODE=1

                                  OUTFLOW HYDROGRAPH RESERVOIR   500.00

    RUNOFF VOLUME =     1.29860 INCHES     =       1.7249 ACRE-FEET
    PEAK DISCHARGE RATE =      51.80 CFS  AT   1.500 HOURS   BASIN AREA =   .0249 SQ. MI.


*S **BASIN 501 IS THE AREA PROPOSED AS FUTURE LONGFORD SD DRAINING
*S **DIRECTLY TO THE AMOLE CHANNEL
COMPUTE NM HYD       ID=17 HYD NO=501.00 AREA=0.03663 SQ MI
                     PER A=0 PER B=29 PER C=29 PER D=42
                     TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   60.739    CFS   UNIT VOLUME =    .9992       B =   526.28      P60 = 1.8700
    AREA =      .015385 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   56.527    CFS   UNIT VOLUME =    1.000       B =   354.67      P60 = 1.8700
    AREA =      .021245 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD            ID=17   CODE=1
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                                OUTFLOW HYDROGRAPH RESERVOIR   501.00

    RUNOFF VOLUME =     1.29860 INCHES     =       2.5369 ACRE-FEET
    PEAK DISCHARGE RATE =      76.18 CFS  AT   1.500 HOURS   BASIN AREA =   .0366 SQ. MI.


*S **COMBINE BASINS 500 AND 501 TOGETHER TO REPRESENT THE NORTHERN PART OF THE
*S **LONGFORD SD
ADD HYD             ID=18  HYD NO=501.1  ID I=16  ID II=17
PRINT HYD           ID=18  CODE=1

                                OUTFLOW HYDROGRAPH RESERVOIR   501.10

    RUNOFF VOLUME =     1.29859 INCHES     =       4.2618 ACRE-FEET
    PEAK DISCHARGE RATE =     127.98 CFS  AT   1.500 HOURS   BASIN AREA =   .0615 SQ. MI.


*S **BASIN 502 IS THE SOUTHERN PART OF THE LONGFORD SD
COMPUTE NM HYD      ID=19 HYD NO=502.00 AREA=0.05788 SQ MI
                    PER A=0 PER B=28 PER C=28 PER D=44
                    TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   100.55    CFS   UNIT VOLUME =    .9993       B =   526.28      P60 = 1.8700
    AREA =      .025467 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330


    K =   .118429HR    TP =   .133300HR    K/TP RATIO =   .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =   86.240    CFS   UNIT VOLUME =   1.000       B =   354.67      P60 = 1.8700
    AREA =      .032413 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=19  CODE=1

                                OUTFLOW HYDROGRAPH RESERVOIR   502.00

    RUNOFF VOLUME =     1.32159 INCHES     =       4.0796 ACRE-FEET
    PEAK DISCHARGE RATE =     121.79 CFS  AT   1.500 HOURS   BASIN AREA =   .0579 SQ. MI.


*S **BASIN 503 IS CURRENTLY UNDEVELOPED, ASSUME FUTURE DEVELOPMENT WILL BE @
*S **A DENSITY OF 4 DU/AC
COMPUTE NM HYD      ID=20 HYD NO=503.00 AREA=0.03752 SQ MI
                    PER A=0 PER B=29 PER C=29 PER D=42
                    TP=-0.1333 HR   MASS RAIN=-1

    K =   .072649HR    TP =   .133300HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =   62.215    CFS   UNIT VOLUME =    .9992       B =   526.28      P60 = 1.8700
    AREA =      .015758 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330
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    K =    .118429HR    TP =    .133300HR    K/TP RATIO =    .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =    57.901    CFS   UNIT VOLUME =    1.000       B =   354.67      P60 = 1.8700
    AREA =       .021762 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   ..033330

PRINT HYD           ID=20  CODE=1

                                OUTFLOW HYDROGRAPH RESERVOIR   503.00


    RUNOFF VOLUME =     1.29860 INCHES     =       2.5986 ACRE-FEET
    PEAK DISCHARGE RATE =      78.03 CFS  AT   1.500 HOURS   BASIN AREA =   .0375 SQ. MI.


*S*************************************************************************
*S **BASIN 504 IS CURRENTLY UNDEVELOPED, ASSUME FUTURE DEVELOPMENT WILL BE @
*S **A DENSITY OF 4 DU/AC
COMPUTE NM HYD      ID=1 HYD NO=504.00 AREA=0.036668 MI
                    PER A=0 PER B=28 PER C=28 PER D=44
                    TP=-0.1333 HR   MASS RAIN=-1

    K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =    63.698    CFS   UNIT VOLUME =    .9992       B =   526.28      P60 = 1.8700
    AREA =       .016134 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

    K =    .118429HR    TP =    .133300HR    K/TP RATIO =    .888442     SHAPE CONSTANT, N =  3.992480
    UNIT PEAK =    54.635    CFS   UNIT VOLUME =    1.000       B =   354.67      P60 = 1.8700
    AREA =       .020534 SQ MI    IA =    .42500 INCHES    INF =   1.04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330

PRINT HYD           ID=1  CODE=1

                                OUTFLOW HYDROGRAPH RESERVOIR   504.00


    RUNOFF VOLUME =     1.32159 INCHES     =       2.5845 ACRE-FEET
    PEAK DISCHARGE RATE =      77.16 CFS  AT   1.500 HOURS   BASIN AREA =   .0367 SQ. MI.


*S **BASIN 505 IS FULLY DEVELOPED AND DRAINS SOUTH TO BLAKE RD.
COMPUTE NM HYD      ID=2 HYD NO=505.00 AREA=0.02618 SQ MI
                    PER A=33 PER B=19 PER C=19 PER D=29
                    TP=-0.1333 HR   MASS RAIN=-1

    K =    .072649HR    TP =    .133300HR    K/TP RATIO =    .545000     SHAPE CONSTANT, N =  7.106420
    UNIT PEAK =    29.974    CFS   UNIT VOLUME =    .9990       B =   526.28      P60 = 1.8700
    AREA =       .007592 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
    RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033330
```

```
K =    .139463HR    TP =    .133300HR    K/TP RATIO =  1.046235     SHAPE CONSTANT, N =  3.374403
UNIT PEAK =    43.373    CFS   UNIT VOLUME =    .9997       B =   311.05      P60 = 1.8700
AREA =       .018588 SQ MI    IA =    .52958 INCHES    INF =   1.33282 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =    .033330

PRINT HYD           ID=2   CODE=1

                                OUTFLOW HYDROGRAPH RESERVOIR   505.00


RUNOFF VOLUME =     1.00753 INCHES     =       1.4068 ACRE-FEET
PEAK DISCHARGE RATE =      43.10 CFS  AT   1.500 HOURS   BASIN AREA =   .0262 SQ. MI.


FINISH

NORMAL PROGRAM FINISH          END TIME (HR:MIN:SEC) = 11:10:28
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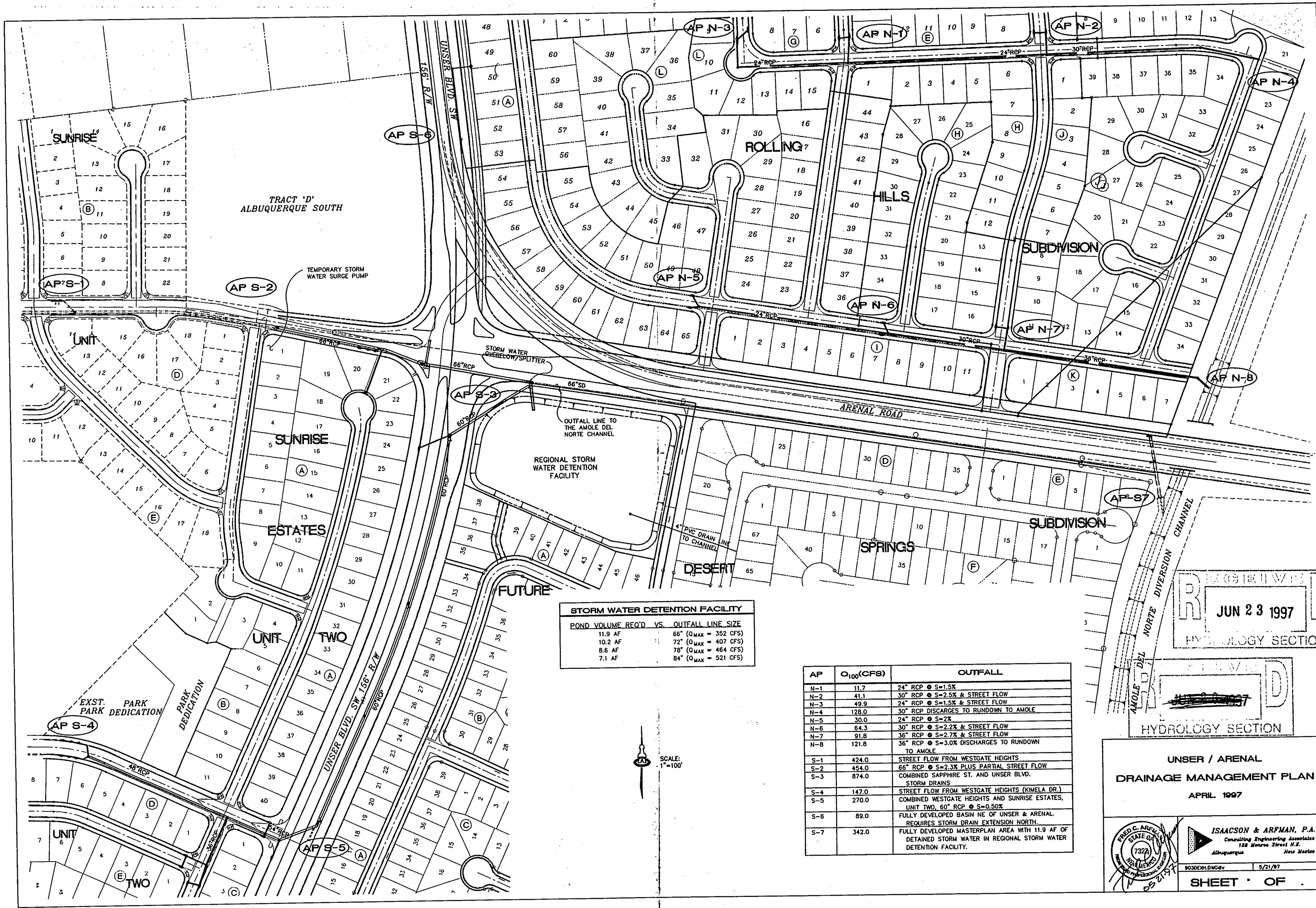

STORM WATER DETENTION FACILITY	
POND VOLUME REQ'D VS.	OUTFALL LINE SIZE
11.9 AF	66" (Q_{MAX} = 352 CFS)
10.2 AF	72" (Q_{MAX} = 407 CFS)
8.6 AF	78" (Q_{MAX} = 464 CFS)
7.1 AF	84" (Q_{MAX} = 521 CFS)

AP	Q_{100}(CFS)	OUTFALL
N-1	11.7	24" RCP @ S=1.5%
N-2	41.1	30" RCP @ S=2.5% & STREET FLOW
N-3	49.9	24" RCP @ S=1.5% & STREET FLOW
N-4	128.0	30" RCP DISCARGES TO RUNDOWN TO AMOLE
N-5	30.0	24" RCP @ S=2%
N-6	64.3	30" RCP @ S=2.2% & STREET FLOW
N-7	91.8	36" RCP @ S=2.7% & STREET FLOW
N-8	121.8	36" RCP @ S=3.0% DISCHARGES TO RUNDOWN TO AMOLE
S-1	424.0	STREET FLOW FROM WESTGATE HEIGHTS
S-2	454.0	66" RCP @ S=2.3% PLUS PARTIAL STREET FLOW
S-3	874.0	COMBINED SAPPHIRE ST. AND UNSER BLVD. STORM DRAINS
S-4	147.0	STREET FLOW FROM WESTGATE HEIGHTS (KIMELA DR.)
S-5	270.0	COMBINED WESTGATE HEIGHTS AND SUNRISE ESTATES, UNIT TWO, 60" RCP @ S=0.50%
S-6	89.0	FULLY DEVELOPED BASIN NE OF UNSER & ARENAL. REQUIRES STORM DRAIN EXTENSION NORTH.
S-7	342.0	FULLY DEVELOPED MASTERPLAN AREA WITH 11.9 AF OF DETAINED STORM WATER IN REGIONAL STORM WATER DETENTION FACILITY.

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JUN 23 1997
HYDROLOGY SECTION

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UNSER / ARENAL
DRAINAGE MANAGEMENT PLAN
APRIL 1997

FRED C. ARFMAN STATE OF NEW MEXICO 7322 REGISTERED PROFESSIONAL ENGINEER
5/21/97

ISAACSON & ARFMAN, P.A.
Consulting Engineering Associates
128 Monroe Street N.E.
Albuquerque New Mexico

903DEXH.DWG dv | 5/21/97

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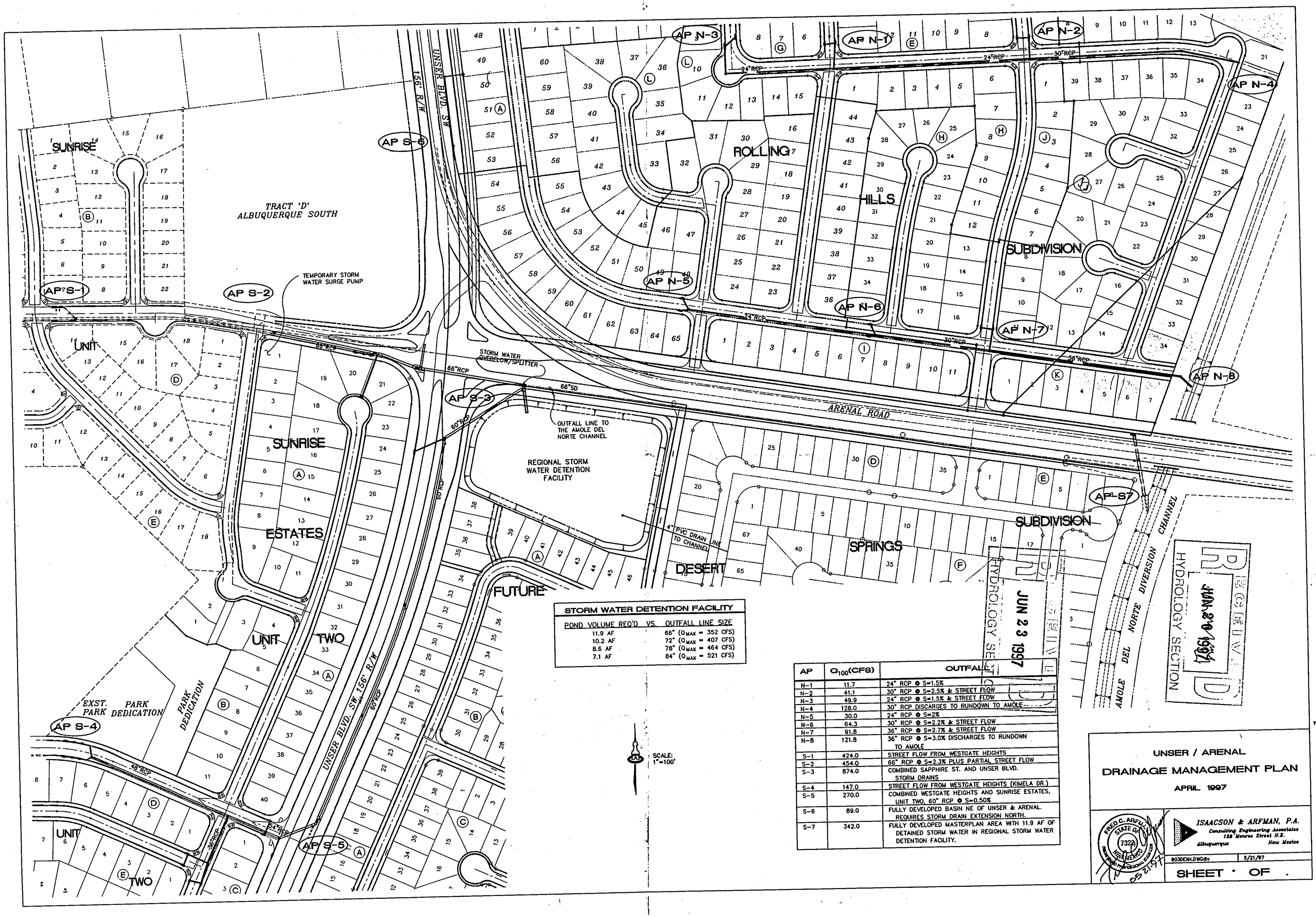

STORM WATER DETENTION FACILITY		
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UNSER / ARENAL
DRAINAGE MANAGEMENT PLAN

APRIL 1997

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128 Monroe Street N.E.
Albuquerque New Mexico

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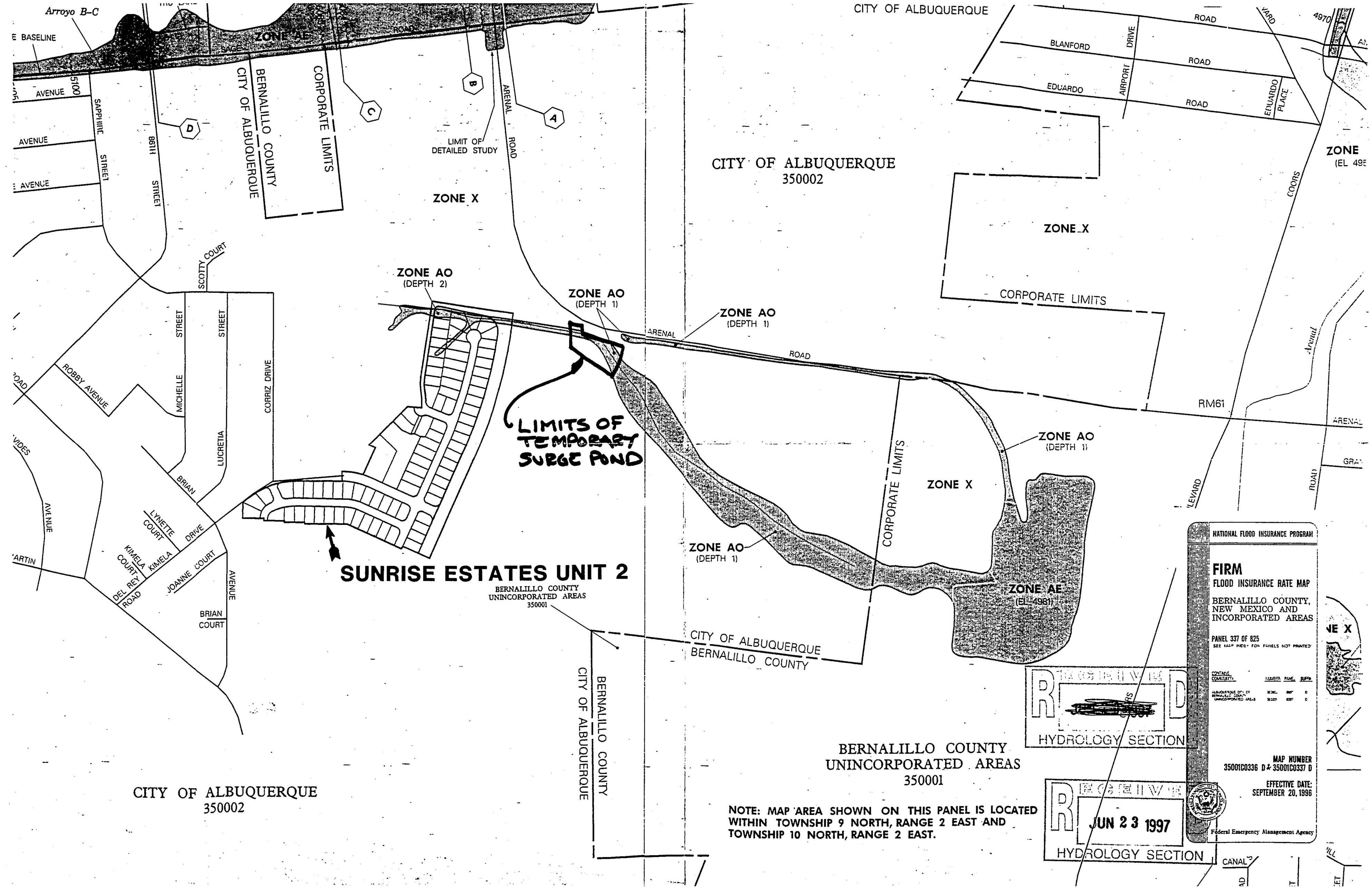
Arroyo B-C
BASELINE
ZONE AE
CITY OF ALBUQUERQUE
BLANFORD
DRIVE
ROAD
EDUARDO
AIRPORT
EDUARDO PLACE
YARD
4970
AVENUE
5100
SAPPHIRE
STREET
86TH
BERNALILLO COUNTY
CITY OF ALBUQUERQUE
CORPORATE LIMITS
LIMIT OF DETAILED STUDY
ARENAL
ROAD
A
B
C
D
ZONE X
CITY OF ALBUQUERQUE
350002
ZONE X
CORPORATE LIMITS
COORS
ZONE
(EL 49
SCOTTY COURT
ZONE AO
(DEPTH 2)
ZONE AO
(DEPTH 1)
ZONE AO
(DEPTH 1)
ARENAL
ROAD
RM61
ARENAL
ROBBY AVENUE
MICHELLE
STREET
LUCRETIA
STREET
CORRIZ DRIVE
LIMITS OF TEMPORARY SURGE POND
ZONE AO
(DEPTH 1)
CORPORATE LIMITS
ZONE X
BRIAN
LYNETTE COURT
DRIVE
KIMELA COURT
KIMELA
JOANNE COURT
DEL REY ROAD
AVENUE
BRIAN COURT
ZONE AO
(DEPTH 1)
ZONE AE
(EL 4981)
SUNRISE ESTATES UNIT 2
BERNALILLO COUNTY
UNINCORPORATED AREAS
350001
CITY OF ALBUQUERQUE
BERNALILLO COUNTY
BERNALILLO COUNTY
CITY OF ALBUQUERQUE
CITY OF ALBUQUERQUE
350002
BERNALILLO COUNTY
UNINCORPORATED AREAS
350001
NOTE: MAP AREA SHOWN ON THIS PANEL IS LOCATED WITHIN TOWNSHIP 9 NORTH, RANGE 2 EAST AND TOWNSHIP 10 NORTH, RANGE 2 EAST.
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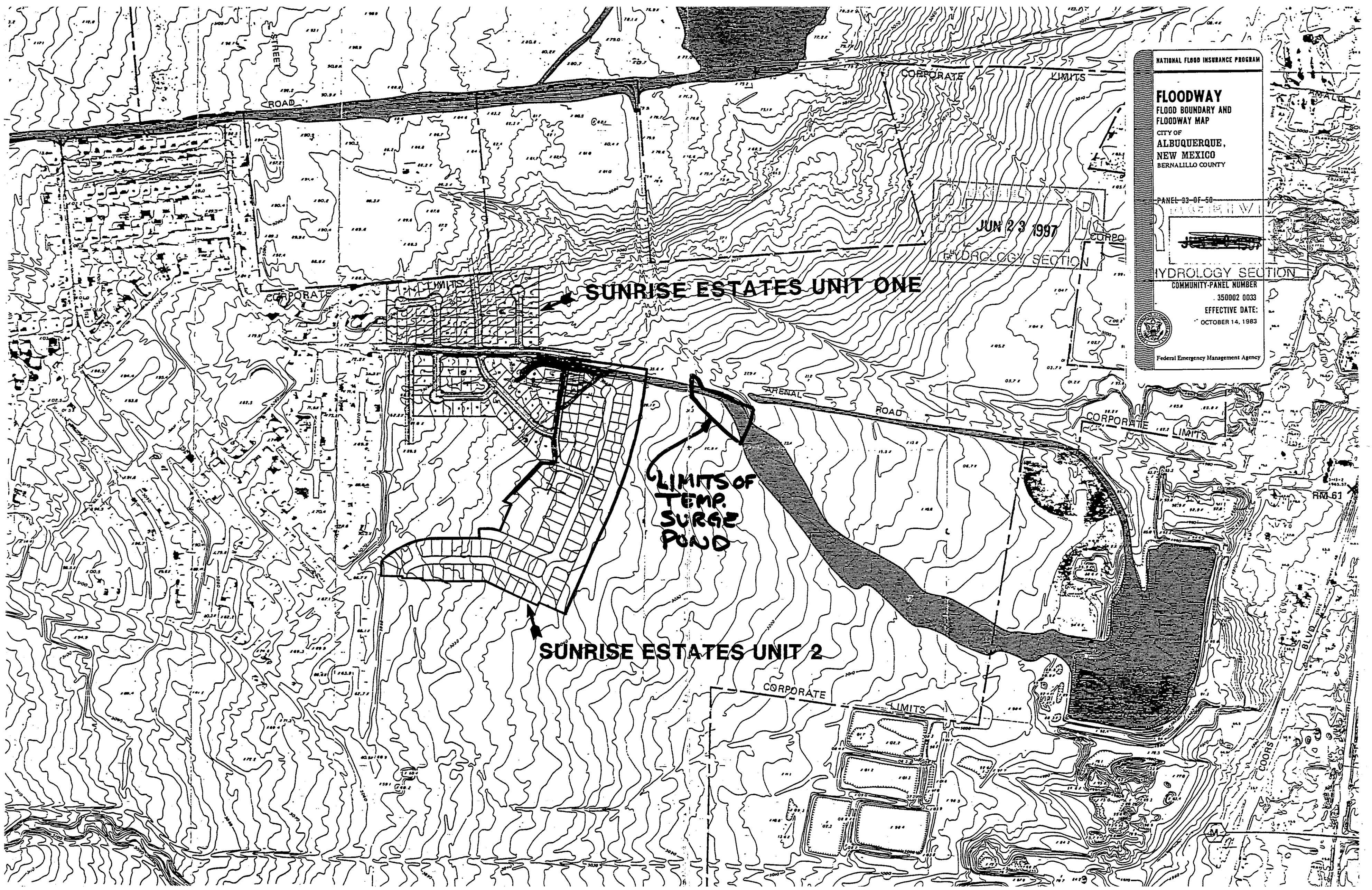
HYDROLOGY SECTION
RECEIVED
JUN 23 1997
HYDROLOGY SECTION
NATIONAL FLOOD INSURANCE PROGRAM
FIRM
FLOOD INSURANCE RATE MAP
BERNALILLO COUNTY, NEW MEXICO AND INCORPORATED AREAS
PANEL 337 OF 825
SEE MAP INDEX FOR PANELS NOT PRINTED
MAP NUMBER
35001C0336 D & 35001C0337 D
EFFECTIVE DATE:
SEPTEMBER 20, 1996
Federal Emergency Management Agency
CANAL


NATIONAL FLOOD INSURANCE PROGRAM
FLOODWAY
FLOOD BOUNDARY AND FLOODWAY MAP
CITY OF
ALBUQUERQUE, NEW MEXICO
BERNALILLO COUNTY
PANEL 33 OF 50
COMMUNITY-PANEL NUMBER
350002 0033
EFFECTIVE DATE:
OCTOBER 14, 1983
Federal Emergency Management Agency
JUN 23 1997
HYDROLOGY SECTION
SUNRISE ESTATES UNIT ONE
SUNRISE ESTATES UNIT 2
LIMITS OF TEMP. SURGE POND
CORPORATE LIMITS
ARENAL ROAD
COORS BLVD
RM 61