Drainage Reports

Abbreveated Water & Sewer Need Reports

Water Study

Wastewater Study

Stormwater Waiver Application

J2 Engineering and Environmental Design, LLC
4649 E. Cotton Gin Loop
Suite B2
Phoenix, Arizona 85040
Phone: 602.438.2221
Fax: 602.438.2225

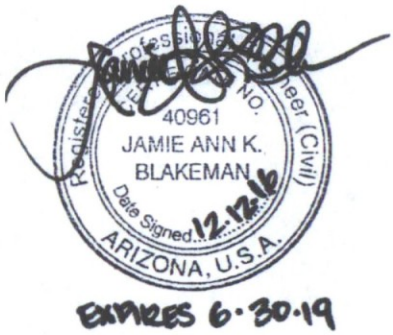
To: Oscar Dominguez
Toll Brothers

Date: December 12, 2016

From: Jamie Blakeman, PE, PTOE

Job Number: 16.0937.002

RE: NEC Jomax Road and 118th Street
Traffic Impact & Mitigation Analysis



INTRODUCTION

J2 Engineering and Environmental Design (J2) has prepared a Traffic Impact and Mitigation Analysis for the proposed development located on the northeast corner of Jomax Road and 118th Street in Scottsdale, Arizona. See **Figure 1** for a vicinity map.

The proposed development will include 52 single-family dwelling units. See **Attachment A** and **Figure 2** for the site map.

The objective of this Traffic Impact and Mitigation Analysis is to analyze the traffic related impacts of the proposed development to the adjacent roadway network.

EXISTING CONDITIONS

The study area is currently undeveloped land, with the west half of the site zoned for R1-190 development and the east half of the site zoned for R1-130 development. See **Attachment B** for detailed parcel information.

Figure 1 - Vicinity Map

25-ZN-2016
03/28/17

The proposed development is bordered by 118th Street to the west, Jomax Road to the south, and Red Bird Road to the north.

To the west of the proposed development are the Talon Ranch and Desert Summit residential developments. To the north are a number of developed residential lots with the majority of the land undeveloped. To the east and south are the McDowell Sonoran Preserve as well as State Land. See **Figure 3**.

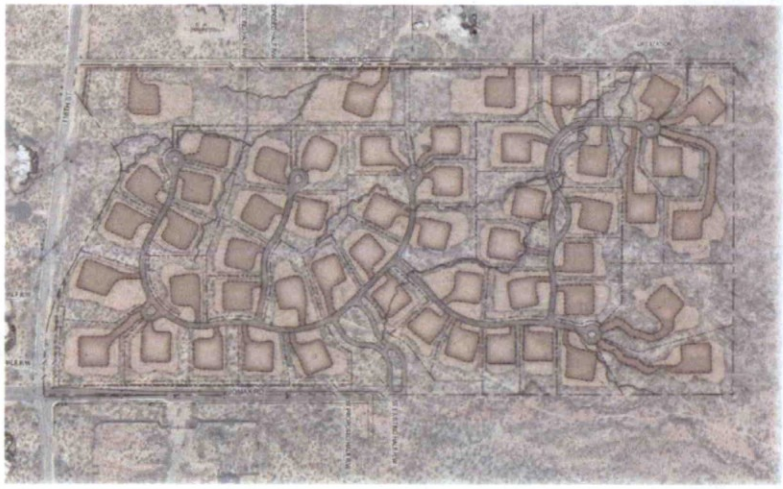


Figure 2 - Site Plan

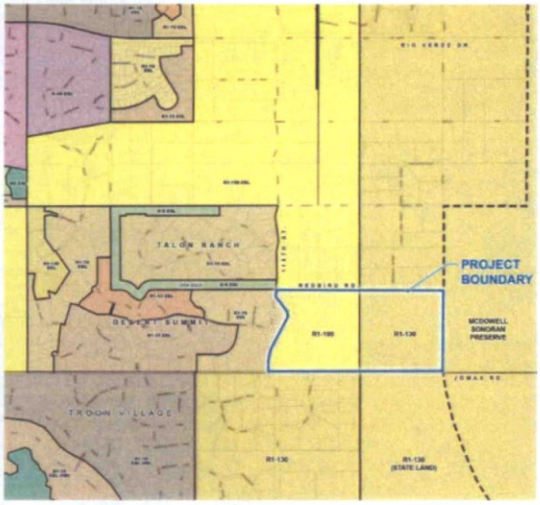


Figure 3 - Existing Zoning

STUDY ROADWAY SEGMENTS

Jomax Road is an east-west roadway. West of 118th Street, Jomax Road provides two (2) lanes for the westbound direction, and one (1) lane for the eastbound direction, with a raised center median. East of 118th Street, Jomax Road provides one (1) through lane for each direction of travel. Jomax Road terminates approximately 1,000 feet east of 118th Street. The City of Scottsdale classifies Jomax Road as a rural local collector. There is a posted speed limit of 40 mph west of 116th Street, and a posted speed limit of 30 mph east of 116th Street.

118th Street is a north-south roadway that provides one (1) lane for each direction of travel. The City of Scottsdale classifies 118th Street as a minor collector - rural. There is a posted speed limit of 30 mph north of Jomax Road, and a posted speed limit of 35 mph south of Jomax Road.

Red Bird Road is an east-west roadway that begins at 118th Street and continues to the east to approximately 120th Street. Red Bird Road is unpaved and provides one lane for each direction of travel. The City of Scottsdale classifies Red Bird Road as a local residential – rural.

EXISTING TRAFFIC COUNTS

A local traffic data collection firm, Field Data Services of Arizona, Inc was utilized to collect traffic counts. On Tuesday, September 20, 2016, bi-directional tube counts for 24-hours in 15-minute intervals were collected at the following five (5) locations:

- Jomax Road, just west of 118th Street
- Jomax Road, just east of 118th Street
- 118th Street, just north of Jomax Road
- 118th Street, just south of Jomax Road
- Red Bird Road, just east of 118th Street

See **Attachment C** for detailed 24-hour traffic count data.

Jomax Road, just west of 118th Street

The daily traffic along Jomax Road, west of 118th Street was 451 vehicles per day. The AM peak hour occurred from 8:00 am to 9:00 am, with 24 (57%) eastbound and 18 (43%) westbound vehicles. The PM peak hour occurred from 4:45 pm to 5:45 pm, with 15 (47%) eastbound and 17 (53%) westbound vehicles.

Jomax Road, just east of 118th Street

The daily traffic along Jomax Road, east of 118th Street was 98 vehicles per day. The AM peak hour occurred from 8:00 am to 9:00 am, with 4 (57%) eastbound and 3 (43%) westbound vehicles. The PM peak hour occurred from 4:00 pm to 5:00 pm, with 2 (33%) eastbound and 4 (66%) westbound vehicles.

118th Street, just north of Jomax Road

The daily traffic along 118th Street, north of Jomax Road was 222 vehicles per day. The AM peak hour occurred from 8:00 am to 9:00 am, with 9 (37.5%) northbound and 15 (62.5%) southbound vehicles. The PM peak hour occurred from 4:00 pm to 5:00 pm, with 10 (66%) northbound and 5 (33%) southbound vehicles.

118th Street, just south of Jomax Road

The daily traffic along 118th Street, south of Jomax Road was 290 vehicles per day. The AM peak hour occurred from 8:00 am to 9:00 am, with 11 (44%) northbound and 14 (56%) southbound vehicles. The PM peak hour occurred from 4:45 pm to 5:45 pm, with 16 (64%) northbound and 9 (36%) southbound vehicles.

Red Bird Road, just east of 118th Street
The daily traffic along Red Bird Road, east of 118th Street was 15 vehicles per day. The AM peak hour occurred from 7:45 am to 8:45 am, with 3 (75%) eastbound and 1 (25%) westbound vehicles. The PM peak hour occurred from 4:00 pm to 5:00 pm, with 1 (100%) eastbound and 0 (0%) westbound vehicles.

TRIP DISTRIBUTION
The trip distribution procedure determines the general pattern of travel for vehicles entering and leaving the proposed development. The general knowledge of the major destinations in the area was used to distribute trips for this proposed site. The assumed trip distribution is as follows:

- 10% to/from the north on 118th Street
- 30% to/from the south on 118th Street
- 60% to/from the west on Jomax Road

PROPOSED DEVELOPMENT
The proposed development located at the northeast corner of Jomax Road and 118th Street will consist of 52 single-family dwelling units. The main entry will serve 49 of the 52 units. This entry will be gated and located off of Jomax Road approximately one-quarter mile east of 118th Street. The remaining three units will have individual driveways off of Red Bird Road.

EXISTING TRIP GENERATION (R1-190 & R1-130 ZONING)
The trip generation for the existing two vacant parcels zoned for R1-190 and R1-130 single family residential development was calculated utilizing the Institute of Transportation Engineers (ITE) publication entitled *Trip Generation, 9th Edition*. The ITE rates and equations are based on studies that measured the trip generation characteristics for various types of land uses. The rates and equations are expressed in terms of trips per unit of land use type.

The number of potential dwelling units according to existing zoning were calculated by dividing the total parcel square footages (see the parcel information shown in Attachment B) by the allowed individual lot densities (see The City of Scottsdale Zoning District regulations).

The trip generation was calculated utilizing the ITE Land Use 210 Single-Family Detached Housing. See
Table 2 below.

Table 1 – Existing Zoning Trip Generation

Land Use	ITE Code	Qty	Unit	Weekday	AM Peak Hour			PM Peak Hour		
				Total	Total	In	Out	Total	In	Out
Single-Family Detached Housing (R1-190)	210	9	Dwelling Units	117	16	4	12	12	8	4
Single-Family Detached Housing (R1-130)	210	13	Dwelling Units	165	19	5	14	17	11	6
Total				**283**	**35**	9	26	**30**	19	11

PROPOSED TRIP GENERATION (52 DWELLING UNITS)

The trips generated by the proposed 52 single-family dwelling unit development were calculated utilizing the ITE Land Use 210 Single-Family Detached Housing. See Table 2 below. For detail trip generation calculations see **Attachment D**.

Table 2 – Proposed Zoning Trip Generation

Land Use	ITE Code	Qty	Unit	Weekday	AM Peak Hour			PM Peak Hour		
				Total	Total	In	Out	Total	In	Out
Single-Family Detached Housing	210	52	Dwelling Units	**575**	**46**	12	34	**58**	37	21

TRIP GENERATION COMPARISON

A comparison between the trips generated by the existing R1-190 and R1-130 parcels and the proposed 52 single-family dwelling units is shown in **Table 3**.

Table 3 – Trip Generation Comparison (Existing vs. Proposed Development)

Land Use	Weekday	AM Peak Hour			PM Peak Hour		
	Total	Total	In	Out	Total	In	Out
Existing Single Family (R1-190 and R1-130)	283	35	9	26	30	19	11
Proposed Single-Family (R1-43)	575	46	12	34	58	37	21
DIFFERENCE	**293**	**11**	3	8	**29**	18	11

The proposed residential development, with 52 single-family homes, is anticipated to generate 575 weekday daily trips with 46 occurring during the AM peak hour and 58 occurring during the PM peak hour. The development is anticipated to generate 293 more weekday daily trips than the existing zoning with larger residential parcels, which is an approximate increase of 104%. The AM and PM peak hour traffic volumes also increase by 31% and 97%, respectively.

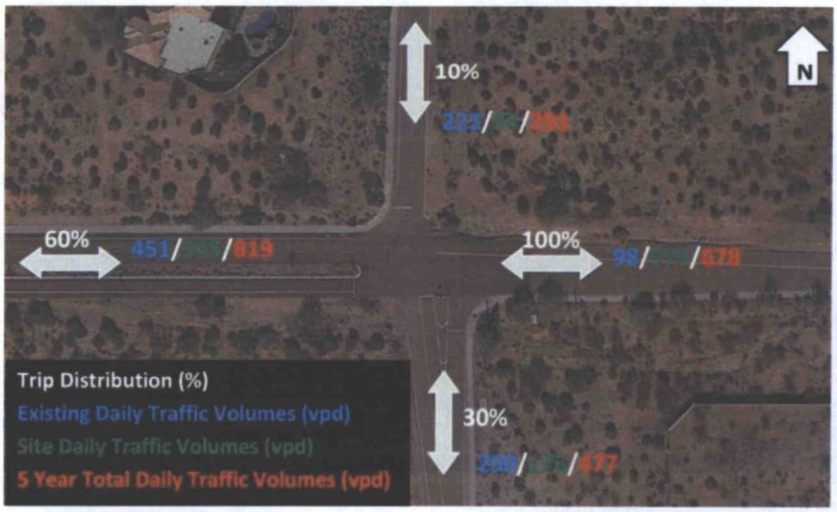


Figure 4 – Trip Distribution and Traffic Volumes

TRIP DISTRIBUTION AND ASSIGNMENT

An annual growth rate of 1% was applied to the existing daily traffic

volumes and used to estimate the five-year horizon background volumes. Trips generated by the proposed site were assigned to the adjacent roadways using the assumed trip distribution percentages. The resulting site traffic volumes were added to the future five-year horizon background traffic volumes to calculate the total traffic volumes on the adjacent roadways for the year 2021. See **Figure 4**.

FUTURE ROADWAY IMPROVEMENTS

With the build-out of proposed single-family residential development, the following improvements to the surrounding roadway network are anticipated to be completed:

Jomax Road is anticipated to be built per the City of Scottsdale's local collector rural/ESL character with trails cross-section between 118th Street and the entrance to the proposed residential development. This cross-section will provide one (1) travel lane for each direction of travel, and trail dedication on the north side of the roadway. See **Figure 5**.

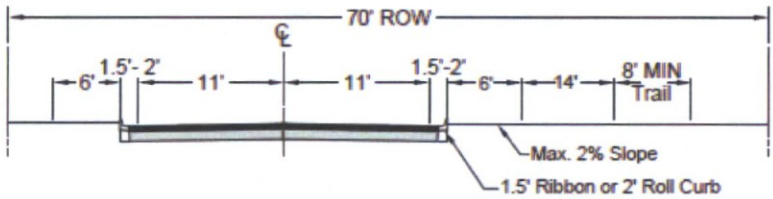


Figure 5 - Jomax Road - Rural/ESL Character with Trails

118th Street between Jomax Road and Red Bird Road will be widened by 6 feet to provide northbound bike lanes. This cross-section will provide one (1) travel lane and a bike lane for each direction of travel. The developer will also work with the City in an effort to extend this cross-section to Rio Verde Drive. The 118th Street cross-section will be a modified version of the City of Scottsdale's minor collector rural/ESL character with trails cross-section. See **Figure 6**.

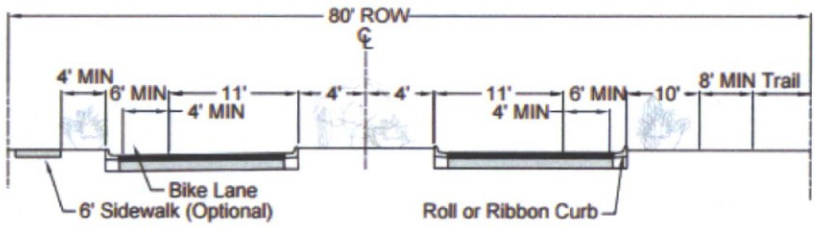


Figure 6 – 118th Street - Rural/ESL Character with Trails

The south half of **Red Bird Road** is anticipated to be built per the City of Scottsdale's local residential rural/ESL character cross-section, between 118th Street and 124th Street. This cross-section will provide

one (1) travel lane for each direction of travel, and a dedicated trail on the south side of the roadway between 118th Street and 120th Street. See **Figure 7**.

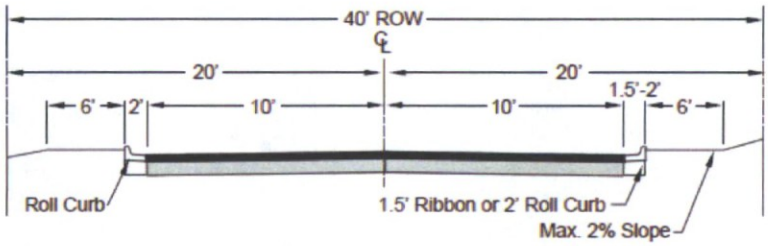


Figure 7 – Red Bird Road - Rural/ESL Character

118th STREET AND JOMAX ROAD INTERSECTION REALIGNMENT CONCEPT

This proposed site is located on the northeast corner of the 118th Street and Jomax Road intersection. Figure **8** shows the proposed striping modifications to better align the north-south and the east-west legs of the intersections and include bike lanes.

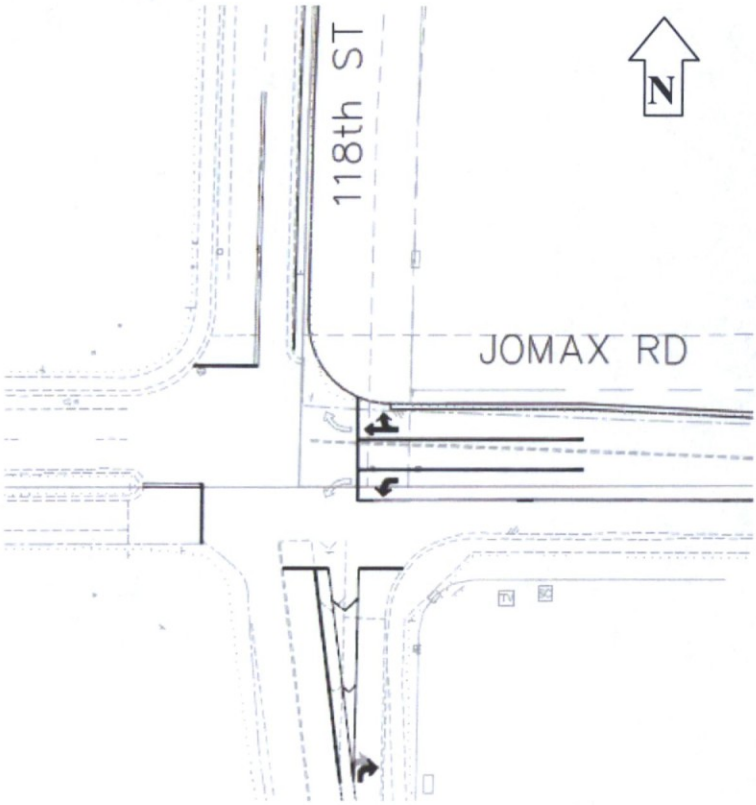


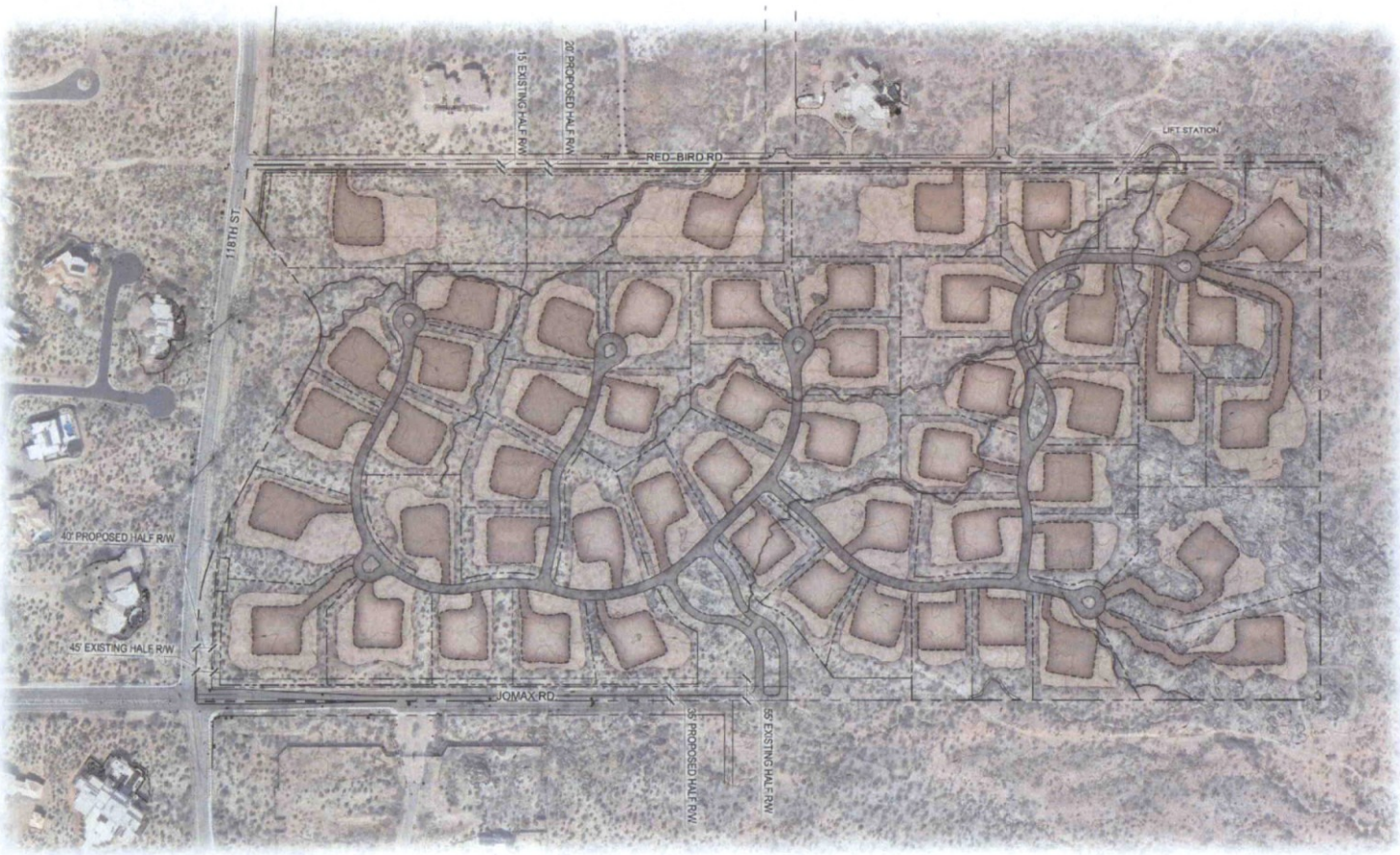
Figure 8 – Trip Distribution and Traffic Volumes

SUMMARY

The proposed single-family residential development will consist of 52 single-family dwelling units and will be located on the northeast corner of Jomax Road and 118th Street in Scottsdale, Arizona. The proposed development is anticipated to generate a total of 575 weekday trips with 46 and 58 occurring during the AM and PM pear hours, respectively.

The surrounding roadways, including Jomax Road, 118th Street, and Red Bird Road, are anticipated to have sufficient capacity and will operate efficiently with the build out of the proposed development.

Attachment A
Proposed Site Plan



Toll Brothers
America's Luxury Home Builder

118TH & JOMAX

Development Concept

plan scale 1:100
date: 10.12.16

andersonbaron
plan · design · achieve

Attachment B
Parcel Information

216-79-005 Land Parcel

This is a land parcel and the current owner is LETTIVILLE PARK PARTNERS LLC. It is located in the Goldie Brown Pinnacle Peak Ranch Unit 2 Survey subdivision and MCR 19426. Its current year full cash value is $1,938,300.

Property Information

MCR #	19426
Description:	THE GOLDIE BROWN PINNACLE PEAK RANCH UNIT TWO PER SURVEY MCR 194-26 PARCEL 12
Lat/Long	
Lot Size	1,752,854 sq ft.
Zoning	R1-190
Lot #	12
High School District	CAVE CREEK UNIFIED #93
Elementary School District	CAVE CREEK UNIFIED SCHOOL DISTRICT
Local Jurisdiction	SCOTTSDALE
S/T/R	34 5N 5E
Market Area/Neighborhood	07/005
Subdivision (76 Parcels)	GOLDIE BROWN PINNACLE PEAK RANCH UNIT 2 SURVEY

Owner Information

LETTIVILLE PARK PARTNERS LLC

Mailing Address	10801 E HAPPY VALLEY RD LOT 133 , SCOTTSDALE, AZ 85255
Deed Number	060025186
Last Deed Date	01/06/2006
Sale Date	n/a
Sale Price	n/a

Valuation Information

We provide valuation information for the past 5 years. For mobile display, we only show 1 year of valuation information. Should you need more data, please look at our data sales.

Tax Year	2017	2016	2015	2014	2013
Full Cash Value	$1,938,300	$1,984,600	$1,420,200	$575,700	$741,500
Limited Property Value	$666,444	$634,709	$604,485	$575,700	$741,400
Legal Class	2	2	2	2	2
Description	AG / VACANT LAND / NON-PROFIT R/P	AG / VACANT LAND / NON-PROFIT R/P	AG / VACANT LAND / NON-PROFIT R/P	AG / VACANT LAND / NON-PROFIT R/P	AG / VACANT LAND / NON-PROFIT R/P
Assessment Ratio	15%	15%	16%	16%	16%
Assessed FCV	n/a	n/a	n/a	$92,112	$118,640
Assessed LPV	$99,967	$95,206	$96,718	$92,112	$118,624
Property Use Code	0011	0011	0011	0011	0011
PU Description	Vacant Residential Land	Vacant Residential Land	Vacant Residential Land	Vacant Residential Land	Vacant Residential Land
Tax Area Code	931400	931400	931400	931400	931400
Valuation Source	Notice	Notice	Notice	Notice	Notice

Similar Parcels

Parcels that are similar to this one (known as the reference parcel) are displayed below.

APN Address Sale Info FCV Size Livable Sq Ft Year Built Pool Foreclosed

No similar parcels found.

216-78-002 Land Parcel

This is a land parcel and the current owner is RED BIRD VISTAS LLC. It is located in the Goldie Brown Pinnacle Peak Ranch Unit 2 Survey subdivision and MCR 19426. Its current year full cash value is $1,742,100.

Property Information

MCR #	19426
Description:	THE GOLDIE BROWN PINNACLE PEAK RANCH UNIT TWO PER SURVEY MCR 194-26 PARCEL 13
Lat/Long	
Lot Size	1,744,142 sq ft.
Zoning	R1-130
Lot #	13
High School District	CAVE CREEK UNIFIED #93
Elementary School District	CAVE CREEK UNIFIED SCHOOL DISTRICT
Local Jurisdiction	SCOTTSDALE
S/T/R	35 5N 5E
Market Area/Neighborhood	07/005
Subdivision (76 Parcels)	GOLDIE BROWN PINNACLE PEAK RANCH UNIT 2 SURVEY

Owner Information

RED BIRD VISTAS LLC

Mailing Address	PO BOX 44127 , PHOENIX, AZ 85064
Deed Number	150117289
Last Deed Date	02/24/2015
Sale Date	n/a
Sale Price	n/a

Valuation Information

We provide valuation information for the past 5 years. For mobile display, we only show 1 year of valuation information. Should you need more data, please look at our data sales.

Tax Year	2017	2016	2015	2014	2013
Full Cash Value	$1,742,100	$1,755,300	$1,221,400	$552,900	$706,500
Limited Property Value	$640,051	$609,572	$580,545	$552,900	$706,500
Legal Class	2	2	2	2	2
Description	AG / VACANT LAND / NON-PROFIT R/P	AG / VACANT LAND / NON-PROFIT R/P	AG / VACANT LAND / NON-PROFIT R/P	AG / VACANT LAND / NON-PROFIT R/P	AG / VACANT LAND / NON-PROFIT R/P
Assessment Ratio	15%	15%	16%	16%	16%
Assessed FCV	n/a	n/a	n/a	$88,464	$113,040
Assessed LPV	$96,008	$91,436	$92,887	$88,464	$113,040
Property Use Code	0014	0014	0014	0014	0014
PU Description	Vacant Residential Land	Vacant Residential Land	Vacant Residential Land	Vacant Residential Land	Vacant Residential Land
Tax Area Code	931400	931400	931400	931400	931400
Valuation Source	Notice	Notice	Notice	Notice	Notice

Similar Parcels

Parcels that are similar to this one (known as the reference parcel) are displayed below.

APN Address Sale Info FCV Size Livable Sq Ft Year Built Pool Foreclosed

No similar parcels found.

Attachment C
Existing Traffic Counts

Prepared by: Field Data Services of Arizona/Veracity Traffic Group (520) 316-6745

Volumes for: Tuesday, September 20, 2016 City: Scottsdale Project #: 16-1346-001

Location: Jomax Rd. west of 118th St.

AM Period	NB	SB	EB		WB			PM Period	NB	SB	EB		WB		
00:00			0		1			12:00			3		6		
00:15			0		0			12:15			2		2		
00:30			0		0			12:30			2		6		
00:45			0	0	0	1	1	12:45			0	7	4	18	25
01:00			0		0			13:00			5		5		
01:15			0		0			13:15			6		2		
01:30			0		0			13:30			5		6		
01:45			0	0	0	0		13:45			6	22	6	19	41
02:00			0		0			14:00			2		8		
02:15			0		0			14:15			10		2		
02:30			0		0			14:30			2		5		
02:45			0	0	0	0		14:45			1	15	1	16	31
03:00			0		0			15:00			4		5		
03:15			0		0			15:15			4		4		
03:30			0		0			15:30			1		2		
03:45			0	0	0	0		15:45			4	13	4	15	28
04:00			0		0			16:00			2		1		
04:15			0		0			16:15			1		1		
04:30			0		0			16:30			2		3		
04:45			2	2	0	0	2	16:45			3	8	6	11	19
05:00			0		1			17:00			4		2		
05:15			0		0			17:15			2		5		
05:30			0		2			17:30			6		4		
05:45			1	1	0	3	4	17:45			4	16	3	14	30
06:00			3		6			18:00			4		3		
06:15			4		3			18:15			7		3		
06:30			5		4			18:30			5		1		
06:45			4	16	5	18	34	18:45			1	17	2	9	26
07:00			4		0			19:00			1		3		
07:15			4		2			19:15			3		1		
07:30			2		5			19:30			0		0		
07:45			2	12	3	10	22	19:45			0	4	1	5	9
08:00			3		7			20:00			2		0		
08:15			6		5			20:15			2		0		
08:30			2		3			20:30			1		1		
08:45			13	24	3	18	42	20:45			0	5	1	2	7
09:00			3		5			21:00			3		0		
09:15			7		3			21:15			1		1		
09:30			4		6			21:30			2		1		
09:45			4	18	6	20	38	21:45			0	6	1	3	9
10:00			4		4			22:00			0		0		
10:15			7		6			22:15			0		0		
10:30			5		4			22:30			1		0		
10:45			5	21	3	17	38	22:45			0	1	1	1	2
11:00			6		5			23:00			1		0		
11:15			2		6			23:15			0		0		
11:30			2		7			23:30			0		0		
11:45			8	18	6	24	42	23:45			0	1	0	0	1
Total Vol.				112		111	**223**					115		113	**228**

GPS Coordinates: 33.726908, -111.827225

Daily Totals

NB	SB	EB	WB	Combined
		227	224	**451**

	AM			PM		
Split %	50.2%	49.8%	**49.4%**	50.4%	49.6%	**50.6%**
Peak Hour	08:45	11:15	**08:45**	13:30	13:15	**13:30**
Volume	27	25	**44**	23	22	**45**
P.H.F.	0.52	0.89	**0.69**	0.58	0.69	**0.94**

Prepared by: Field Data Services of Arizona/Veracity Traffic Group (520) 316-6745

Volumes for: Tuesday, September 20, 2016 City: Scottsdale Project #: 16-1346-002

Location: Jomax Rd. east of 118th St.

AM Period	NB	SB	EB		WB			PM Period	NB	SB	EB		WB		
00:00			0		0			12:00			0		0		
00:15			0		0			12:15			1		0		
00:30			0		0			12:30			2		2		
00:45			0	0	0	0		12:45			0	3	1	3	6
01:00			0		0			13:00			1		1		
01:15			0		0			13:15			1		1		
01:30			0		0			13:30			2		3		
01:45			0	0	0	0		13:45			3	7	1	6	13
02:00			0		0			14:00			0		3		
02:15			0		0			14:15			1		1		
02:30			0		0			14:30			1		0		
02:45			0	0	0	0		14:45			0	2	0	4	6
03:00			0		0			15:00			0		0		
03:15			0		0			15:15			0		0		
03:30			0		0			15:30			2		3		
03:45			0	0	0	0		15:45			1	3	3	6	9
04:00			0		0			16:00			1		0		
04:15			0		0			16:15			0		1		
04:30			0		0			16:30			0		1		
04:45			0	0	0	0		16:45			1	2	2	4	6
05:00			0		0			17:00			0		0		
05:15			0		0			17:15			0		0		
05:30			0		0			17:30			1		0		
05:45			2	2	0	0	2	17:45			0	1	0	0	1
06:00			0		2			18:00			1		0		
06:15			0		0			18:15			0		1		
06:30			1		0			18:30			2		1		
06:45			2	3	0	2	5	18:45			0	3	1	3	6
07:00			1		0			19:00			0		1		
07:15			0		0			19:15			0		0		
07:30			0		0			19:30			0		0		
07:45			1	2	2	2	4	19:45			0	0	0	1	1
08:00			1		0			20:00			0		0		
08:15			1		1			20:15			0		0		
08:30			0		0			20:30			0		0		
08:45			2	4	2	3	7	20:45			0	0	0	0	
09:00			0		1			21:00			0		0		
09:15			1		1			21:15			0		0		
09:30			2		0			21:30			2		1		
09:45			1	4	1	3	7	21:45			0	2	1	2	4
10:00			0		1			22:00			0		0		
10:15			1		0			22:15			0		0		
10:30			1		0			22:30			1		0		
10:45			3	5	1	2	7	22:45			0	1	1	1	2
11:00			0		2			23:00			1		0		
11:15			3		3			23:15			0		1		
11:30			1		0			23:30			0		0		
11:45			0	4	1	6	10	23:45			0	1	0	1	2
Total Vol.				24		18	**42**					25		31	**56**

GPS Coordinates: 33.726774, -111.825294

Daily Totals

NB	SB	EB	WB	Combined
		49	49	**98**

	AM			PM		
Split %	57.1%	42.9%	**42.9%**	44.6%	55.4%	**57.1%**
Peak Hour	10:30	10:30	**10:30**	13:00	13:15	**13:15**
Volume	7	6	**13**	7	8	**14**
P.H.F.	0.58	0.50	**0.54**	0.58	0.67	**0.70**

Prepared by: Field Data Services of Arizona/Veracity Traffic Group (520) 316-6745

Volumes for: Tuesday, September 20, 2016 City: Scottsdale Project #: 16-1346-004

Location: 118th St. north of Jomax Rd.

AM Period	NB		SB		EB	WB		PM Period	NB		SB		EB	WB	
00:00	0		0					12:00	5		2				
00:15	0		0					12:15	2		0				
00:30	0		0					12:30	4		1				
00:45	0	0	0	0				12:45	1	12	0	3			15
01:00	0		0					13:00	1		3				
01:15	0		0					13:15	0		2				
01:30	0		0					13:30	2		1				
01:45	0	0	0	0				13:45	3	6	1	7			13
02:00	0		0					14:00	4		1				
02:15	0		0					14:15	3		2				
02:30	0		0					14:30	4		3				
02:45	0	0	0	0				14:45	2	13	0	6			19
03:00	0		0					15:00	1		4				
03:15	0		0					15:15	2		3				
03:30	0		0					15:30	0		1				
03:45	0	0	0	0				15:45	2	5	1	9			14
04:00	0		0					16:00	0		2				
04:15	0		0					16:15	3		1				
04:30	0		0					16:30	1		1				
04:45	0	0	1	1			1	16:45	6	10	1	5			15
05:00	1		0					17:00	2		0				
05:15	0		0					17:15	3		1				
05:30	0		0					17:30	1		0				
05:45	0	1	1	1			2	17:45	1	7	0	1			8
06:00	4		3					18:00	0		0				
06:15	2		2					18:15	0		1				
06:30	0		3					18:30	0		1				
06:45	2	8	4	12			20	18:45	2	2	1	3			5
07:00	0		3					19:00	0		2				
07:15	1		5					19:15	1		2				
07:30	0		2					19:30	0		0				
07:45	3	4	2	12			16	19:45	0	1	0	4			5
08:00	5		1					20:00	0		0				
08:15	2		5					20:15	0		1				
08:30	1		2					20:30	0		0				
08:45	1	9	7	15			24	20:45	0	0	0	1			1
09:00	6		2					21:00	1		0				
09:15	2		4					21:15	0		0				
09:30	3		4					21:30	0		0				
09:45	2	13	4	14			27	21:45	0	1	0	0			1
10:00	1		3					22:00	0		0				
10:15	3		2					22:15	0		0				
10:30	3		2					22:30	0		1				
10:45	4	11	1	8			19	22:45	0	0	0	1			1
11:00	2		1					23:00	0		0				
11:15	2		0					23:15	0		0				
11:30	1		2					23:30	0		0				
11:45	3	8	5	8			16	23:45	0	0	0	0			
Total Vol.		54		71			**125**			57		40			**97**

GPS Coordinates: 33.727292, -111.826517

Daily Totals

NB	SB	EB	WB	Combined
111	111			**222**

	AM			PM		
Split %	43.2%	56.8%	**56.3%**	58.8%	41.2%	**43.7%**
Peak Hour	11:45	08:45	**08:45**	13:45	14:30	**13:45**
Volume	14	17	**29**	14	10	**21**
P.H.F.	0.70	0.61	**0.91**	0.88	0.63	**0.75**

Prepared by: Field Data Services of Arizona/Veracity Traffic Group (520) 316-6745

Volumes for: Tuesday, September 20, 2016 City: Scottsdale Project #: 16-1346-003

Location: 118th St. south of Jomax Rd.

AM Period	NB		SB		EB	WB		PM Period	NB		SB		EB	WB	
00:00	0		0					12:00	4		5				
00:15	0		0					12:15	1		1				
00:30	0		0					12:30	3		3				
00:45	0	0	0	0				12:45	2	10	3	12			22
01:00	0		0					13:00	1		3				
01:15	0		0					13:15	3		4				
01:30	0		0					13:30	4		2				
01:45	0	0	0	0				13:45	3	11	3	12			23
02:00	0		0					14:00	2		2				
02:15	0		0					14:15	5		1				
02:30	0		0					14:30	0		3				
02:45	0	0	0	0				14:45	2	9	0	6			15
03:00	0		0					15:00	0		2				
03:15	0		0					15:15	2		1				
03:30	0		0					15:30	2		2				
03:45	0	0	0	0				15:45	3	7	0	5			12
04:00	0		0					16:00	0		2				
04:15	0		0					16:15	4		0				
04:30	0		0					16:30	2		2				
04:45	1	1	0	0			1	16:45	6	12	3	7			19
05:00	0		0					17:00	3		0				
05:15	0		0					17:15	2		2				
05:30	0		3					17:30	5		4				
05:45	1	1	2	5			6	17:45	4	14	4	10			24
06:00	2		2					18:00	2		3				
06:15	4		3					18:15	3		1				
06:30	1		6					18:30	3		1				
06:45	2	9	6	17			26	18:45	1	9	1	6			15
07:00	0		3					19:00	0		2				
07:15	0		1					19:15	2		1				
07:30	0		3					19:30	0		0				
07:45	3	3	2	9			12	19:45	0	2	1	4			6
08:00	1		2					20:00	1		0				
08:15	3		5					20:15	2		0				
08:30	1		3					20:30	0		0				
08:45	6	11	4	14			25	20:45	0	3	1	1			4
09:00	4		1					21:00	4		0				
09:15	3		2					21:15	1		1				
09:30	3		6					21:30	0		0				
09:45	3	13	5	14			27	21:45	0	5	0	1			6
10:00	1		2					22:00	0		0				
10:15	4		3					22:15	0		0				
10:30	3		2					22:30	1		2				
10:45	4	12	3	10			22	22:45	0	1	0	2			3
11:00	5		2					23:00	0		0				
11:15	0		2					23:15	1		0				
11:30	1		7					23:30	0		0				
11:45	2	8	2	13			21	23:45	0	1	0	0			1
Total Vol.		58		82			**140**			84		66			**150**

GPS Coordinates: 33.726257, -111.826560

Daily Totals

NB	SB	EB	WB	Combined
142	148			**290**

	AM			PM		
Split %	41.4%	58.6%	**48.3%**	56.0%	44.0%	**51.7%**
Peak Hour	08:45	06:15	**08:45**	16:45	12:30	**17:15**
Volume	16	18	**29**	16	13	**26**
P.H.F.	0.67	0.75	**0.73**	0.67	0.81	**0.72**

Prepared by: Field Data Services of Arizona/Veracity Traffic Group (520) 316-6745

Volumes for: Tuesday, September 20, 2016 City: Scottsdale Project #: 16-1346-005

Location: Red Bird Rd. east of 118th St.

AM Period	NB	SB	EB		WB			PM Period	NB	SB	EB		WB		
00:00			0		0			12:00			0		0		
00:15			0		0			12:15			0		0		
00:30			0		0			12:30			1		0		
00:45			0	0	0	0		12:45			0	1	0	0	1
01:00			0		0			13:00			0		0		
01:15			0		0			13:15			0		0		
01:30			0		0			13:30			0		0		
01:45			0	0	0	0		13:45			0	0	0	0	
02:00			0		0			14:00			0		0		
02:15			0		0			14:15			0		0		
02:30			0		0			14:30			1		0		
02:45			0	0	0	0		14:45			0	1	0	0	1
03:00			0		0			15:00			0		0		
03:15			0		0			15:15			0		1		
03:30			0		0			15:30			0		0		
03:45			0	0	0	0		15:45			0	0	0	1	1
04:00			0		0			16:00			0		0		
04:15			0		0			16:15			0		0		
04:30			0		0			16:30			0		0		
04:45			0	0	0	0		16:45			1	1	0	0	1
05:00			0		0			17:00			0		0		
05:15			0		0			17:15			0		0		
05:30			0		0			17:30			0		0		
05:45			0	0	0	0		17:45			0	0	1	1	1
06:00			0		1			18:00			0		0		
06:15			0		0			18:15			0		0		
06:30			0		1			18:30			0		0		
06:45			0	0	0	2	2	18:45			0	0	0	0	
07:00			0		0			19:00			0		1		
07:15			0		0			19:15			0		0		
07:30			0		0			19:30			0		0		
07:45			0	0	0	0		19:45			0	0	0	1	1
08:00			2		0			20:00			0		0		
08:15			0		1			20:15			0		0		
08:30			1		0			20:30			0		0		
08:45			0	3	0	1	4	20:45			0	0	0	0	
09:00			0		0			21:00			0		0		
09:15			0		0			21:15			0		0		
09:30			0		0			21:30			0		0		
09:45			1	1	0	0	1	21:45			0	0	0	0	
10:00			0		0			22:00			0		0		
10:15			0		0			22:15			0		0		
10:30			0		2			22:30			0		0		
10:45			0	0	0	2	2	22:45			0	0	0	0	
11:00			0		0			23:00			0		0		
11:15			0		0			23:15			0		0		
11:30			0		0			23:30			0		0		
11:45			0	0	0	0		23:45			0	0	0	0	
Total Vol.				4		5	**9**					3		3	**6**

GPS Coordinates:

Daily Totals

NB	SB	EB	WB	Combined
		7	8	**15**

	AM			PM		
Split %	44.4%	55.6%	**60.0%**	50.0%	50.0%	**40.0%**
Peak Hour	07:45	05:45	**07:45**	12:00	14:30	**14:30**
Volume	3	2	**4**	1	1	**2**
P.H.F.	0.38	0.50	**0.50**	0.25	0.25	**0.50**

Attachment D
Trip Generation

Jomax Rd & 118th St - Single-Family Residential Development

Toll Brothers

Completed: DT 9/19/2016

Checked: JEB 10/05/2016

engineering and environmental design

Trip Generation Calculations

Proposed Single Family Residential Zoning (R1-43)

Land Use	ITE Code	Qty	Unit	Weekday			AM Peak Hour			PM Peak Hour			Weekday			AM Peak Hour			PM Peak Hour		
				Rate	% In	% Out	Rate	% In	% Out	Rate	% In	% Out	Total	In	Out	Total	In	Out	Total	In	Out
Single-Family Detached Housing	210	52	DU	Ln(T)= 0.92Ln(X) + 2.72	50%	50%	T= 0.70(X) + 9.74	25%	75%	Ln(T)= 0.90Ln(X) + 0.51	63%	37%	575	288	287	46	12	34	58	37	21
												TOTAL	575	288	287	46	12	34	58	37	21

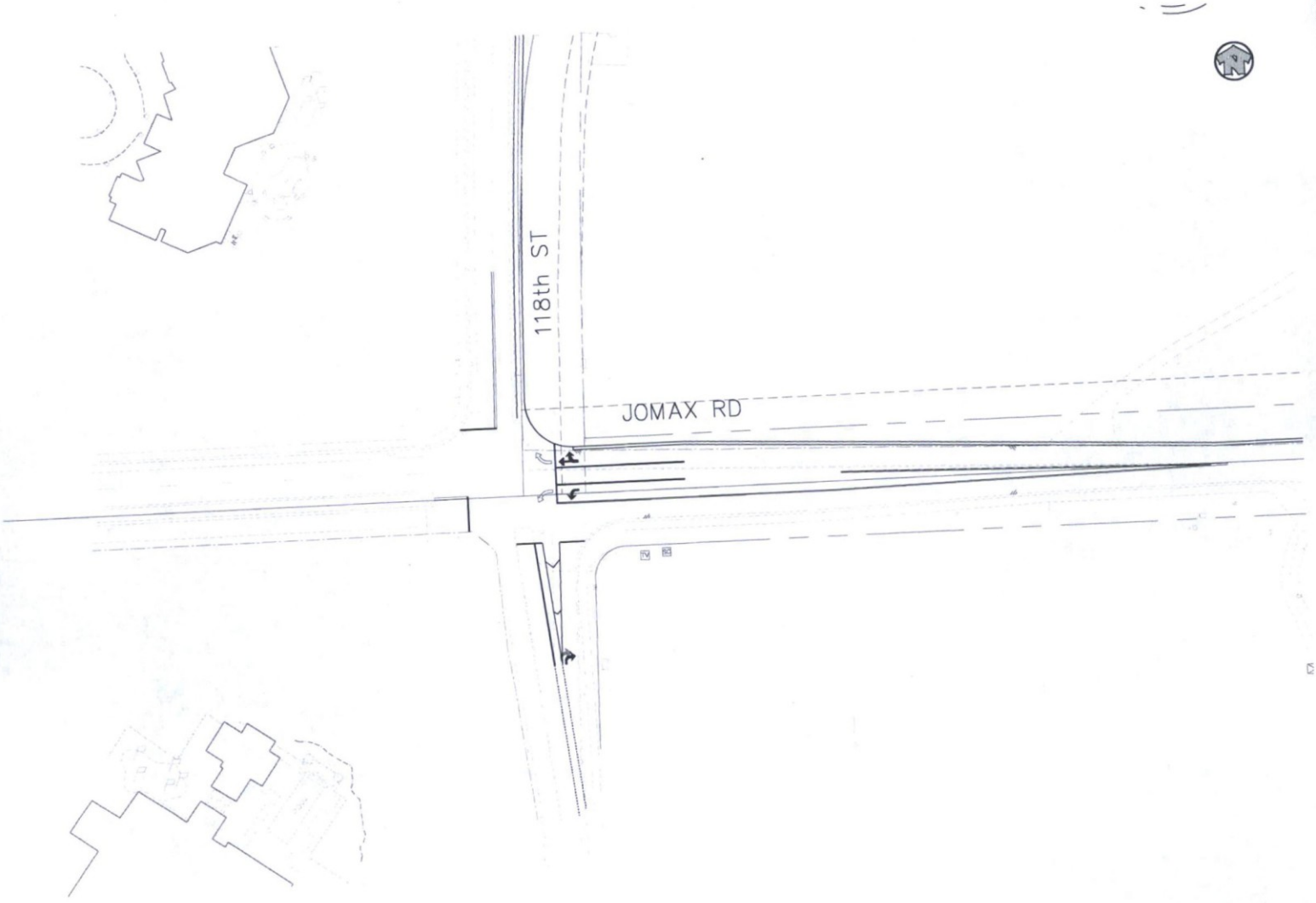
Existing Single Family Residential Zoning (R1-190 and R1-130)

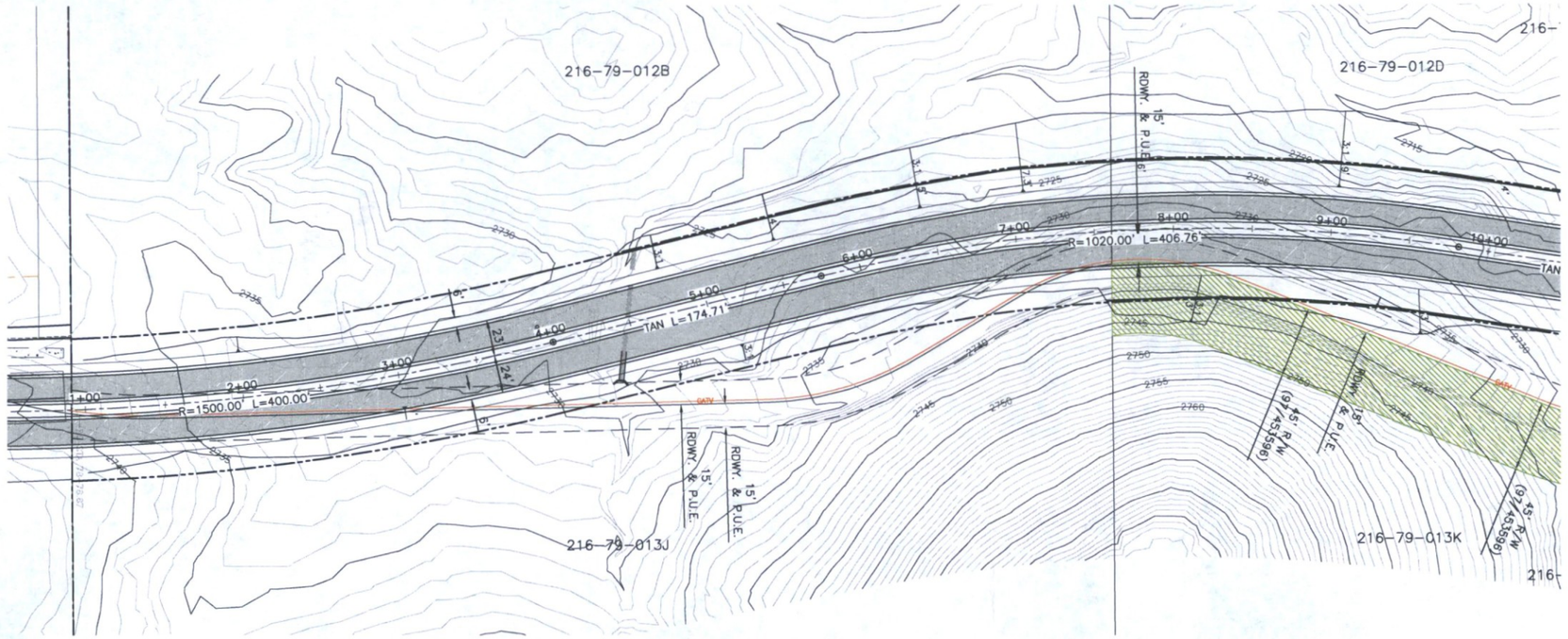
Land Use	ITE Code	Qty	Unit	Weekday			AM Peak Hour			PM Peak Hour			Weekday			AM Peak Hour			PM Peak Hour		
				Rate	% In	% Out	Rate	% In	% Out	Rate	% In	% Out	Total	In	Out	Total	In	Out	Total	In	Out
Single-Family Detached Housing (R1-190)	210	9	DU	Ln(T)= 0.92Ln(X) + 2.72	50%	50%	T= 0.70(X) + 9.74	25%	75%	Ln(T)= 0.90Ln(X) + 0.51	63%	37%	117	59	58	16	4	12	12	8	4
Single-Family Detached Housing (R1-130)	210	13	DU	Ln(T)= 0.92Ln(X) + 2.72	50%	50%	T= 0.70(X) + 9.74	25%	75%	Ln(T)= 0.90Ln(X) + 0.51	63%	37%	165	83	82	19	5	14	17	11	6
												TOTAL	283	142	141	35	9	26	30	19	11

Existing vs Proposed

Land Use	ITE Code	Qty	Unit		Weekday			AM Peak Hour			PM Peak Hour		
					Total	In	Out	Total	In	Out	Total	In	Out
Existing Single Family (R1-190 and R1-130)	210	-	DU		283	142	141	35	9	26	30	19	11
Proposed Single-Family (R1-43)	210	52	DU		575	288	287	46	12	34	58	37	21
				DIFFERENCE	293	146	147	11	3	8	29	18	11

Attachment E
Jomax Road and 118th Street Layout


118th ST
JOMAX RD

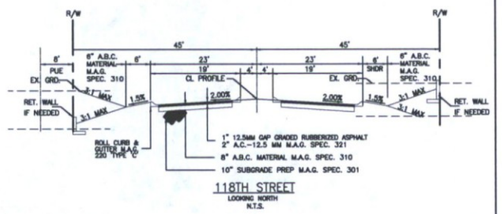


118TH STREET

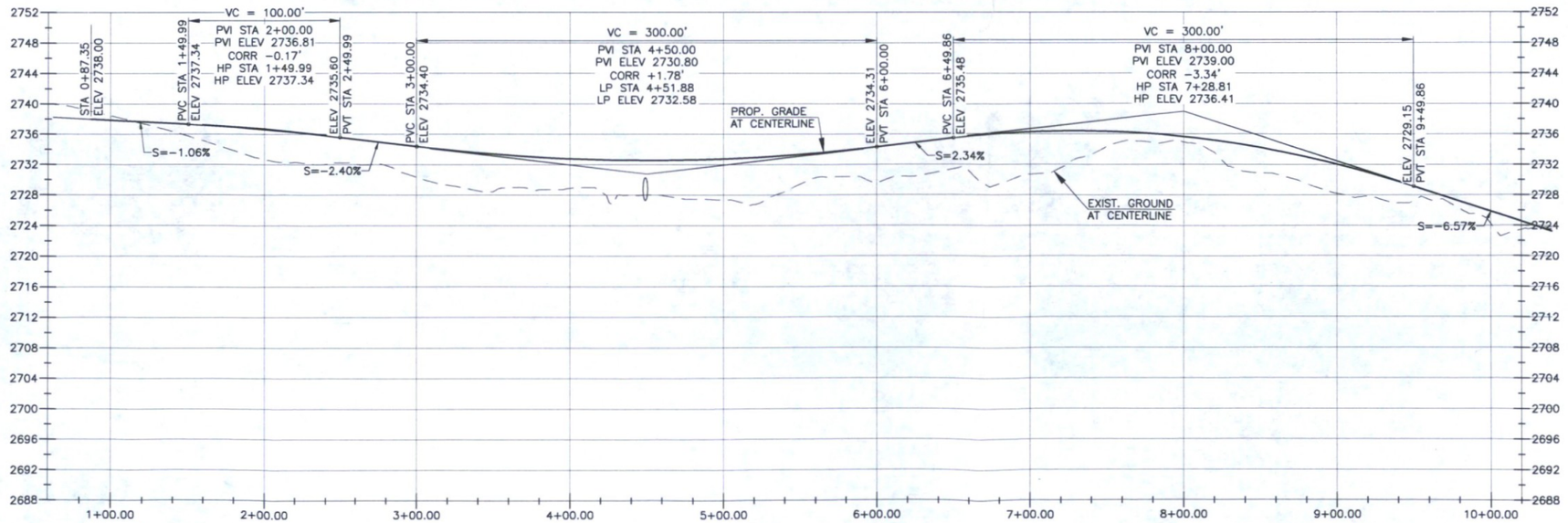
LEGEND

- PROPOSED CENTERLINE
- PROPOSED CURB
- PROPOSE EDGE OF PAVEMENT
- PROPOSED STORM DRAIN
- PROPOSED RETAINING WALL
- PROPOSED PAVEMENT
- EXISTING RECORDED R.O.W.

NOTE: POTENTIAL DRAINAGE EASEMENTS MAY BE REQUIRED PARALLEL TO RIGHT OF WAY NEAR FUTURE CULVERT CROSSINGS. EASEMENTS TO BE QUANTIFIED DURING FINAL DESIGN.



118TH STREET
LOOKING NORTH
N.T.S.



GRAPHIC SCALE
30 0 15 30 60
1 INCH = 30 FEET

PRELIMINARY NOT FOR CONSTRUCTION OR RECORDING

REVIEWED BY:

J2 engineering and environmental design
4649 east cotton gin loop, suite B2
phoenix, arizona 85040
phone: 602.438.2221
www.j2design.us

ARGUS CONSULTING
A CIVIL ENGINEERING COMPANY, P.C.
10115 E. Bell Road, Suite 107 - #104
Scottsdale, Arizona 85260 480-596-1131

118th STREET & JOMAX ROAD

118TH STREET EXTENSION
ALIGNMENT STUDY

Designed by	Drawn by	
Date 01-19-17	Job No. 365-16	Sheet 1 of 3

Q.S. 50-56

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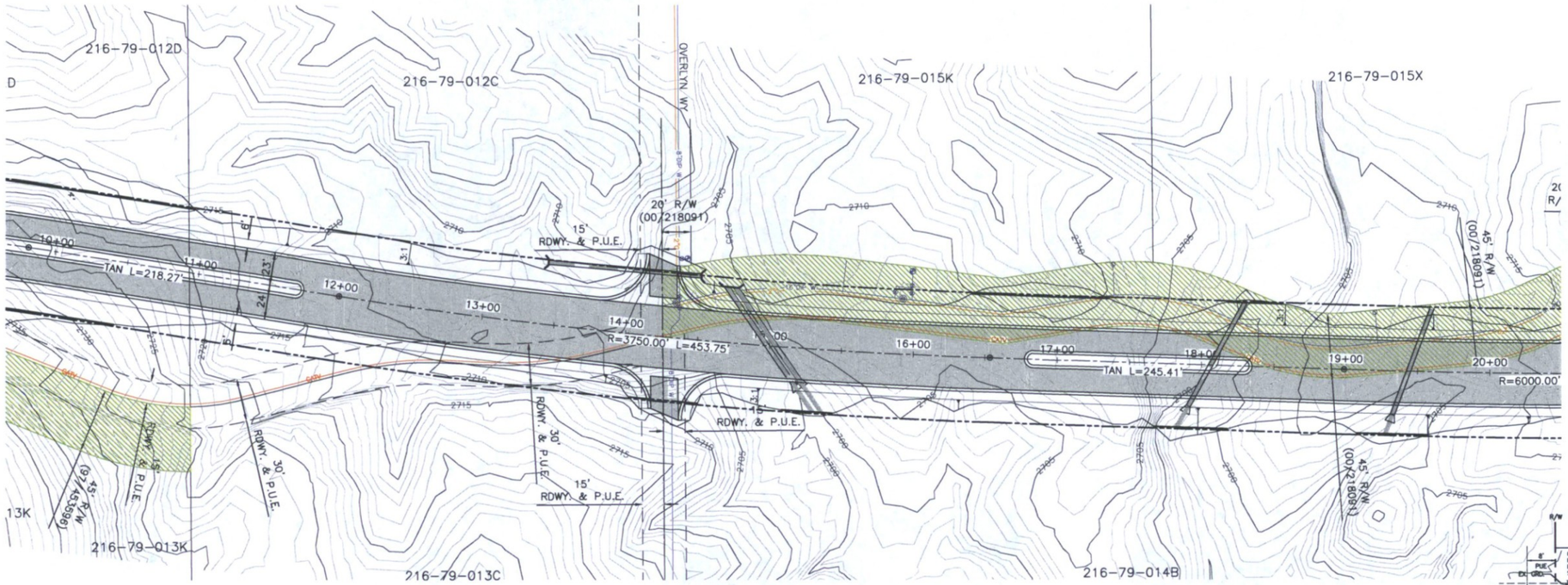
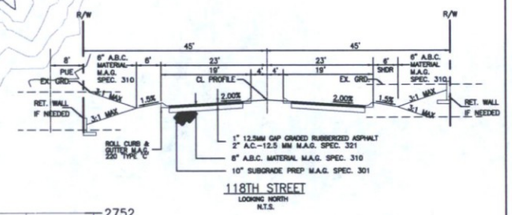


118TH STREET

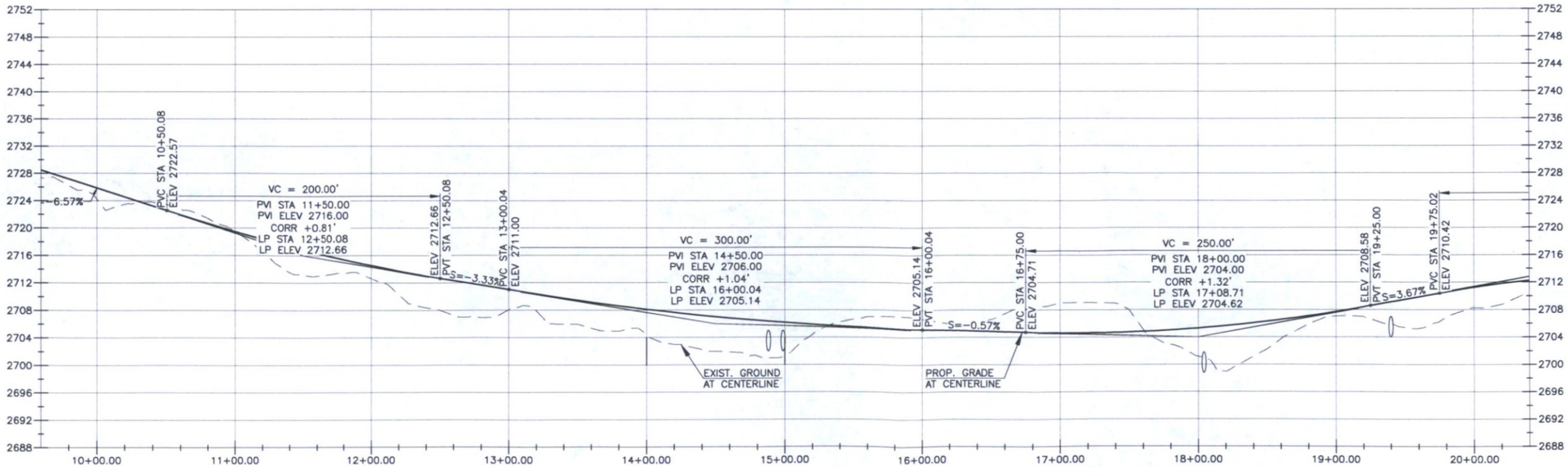
LEGEND

- PROPOSED CENTERLINE
- PROPOSED CURB
- PROPOSE EDGE OF PAVEMENT
- PROPOSED STORM DRAIN
- PROPOSED RETAINING WALL
- PROPOSED PAVEMENT
- EXISTING RECORDED R.O.W.

NOTE: POTENTIAL DRAINAGE EASEMENTS MAY BE REQUIRED PARALLEL TO RIGHT OF WAY NEAR FUTURE CULVERT CROSSINGS. EASEMENTS TO BE QUANTIFIED DURING FINAL DESIGN.



118TH STREET
LOOKING NORTH
N.T.S.



GRAPHIC SCALE
30 0 15 30 60
1 INCH = 30 FEET

PRELIMINARY NOT FOR CONSTRUCTION OR RECORDING

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ARGUS CONSULTING
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10115 E. Bell Road, Suite 107 - #104
Scottsdale, Arizona 85260 480-596-1131

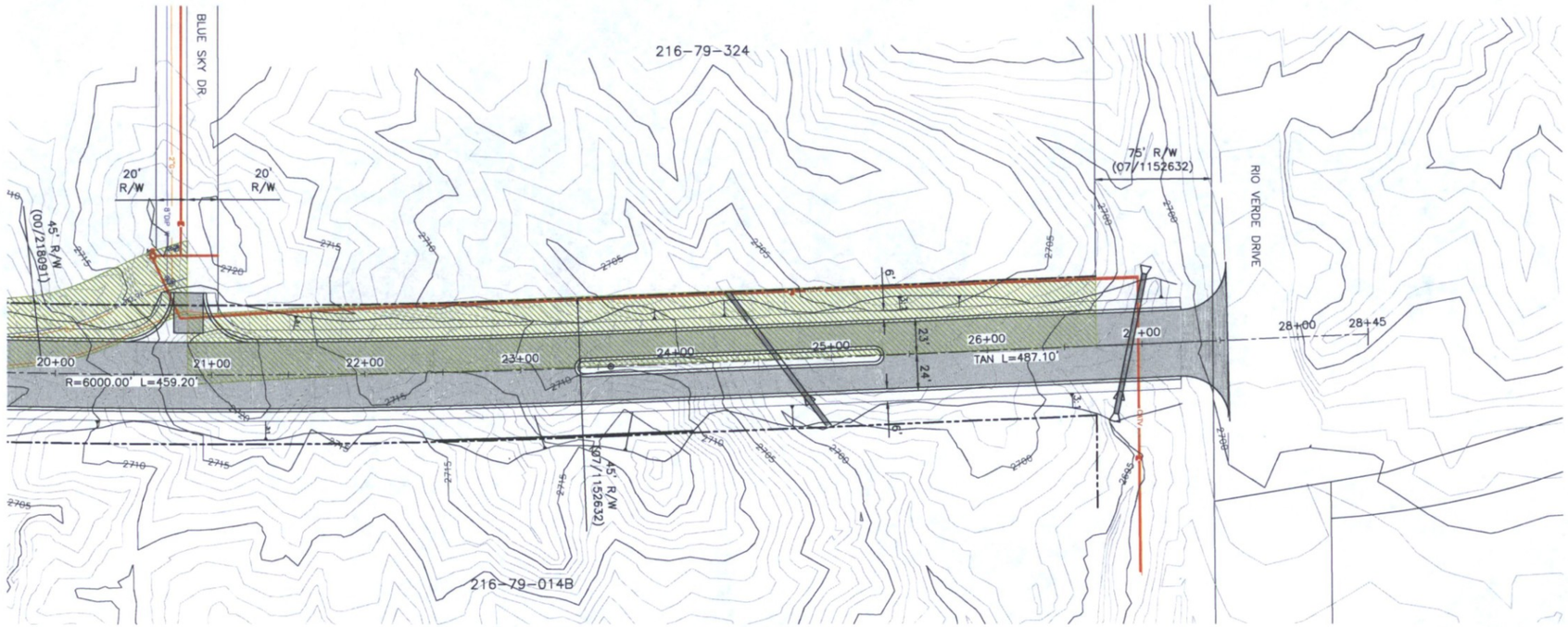
118th STREET & JOMAX ROAD

118TH STREET EXTENSION
ALIGNMENT STUDY

Designed by	Drawn by	
Date 01-18-17	Job No. 365-16	Sheet 2 of 3

Q.S. 55-56

C:\Jobs\118th & Jomax\dwg\118th Extension\J2 Roadway Layout.dwg Jan 19, 2017 Argus KYLE

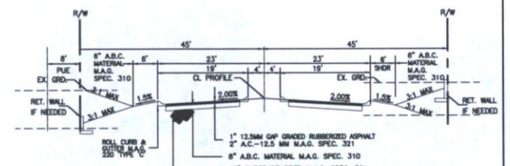


118TH STREET

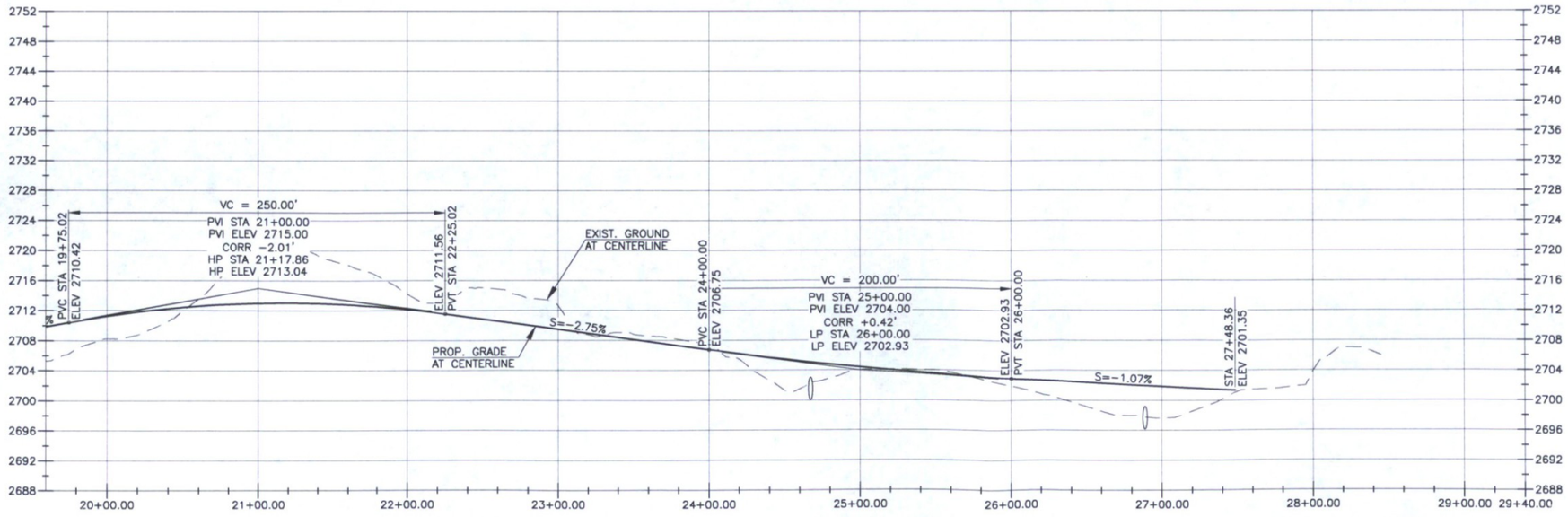
LEGEND

- PROPOSED CENTERLINE
- PROPOSED CURB
- PROPOSE EDGE OF PAVEMENT
- PROPOSED STORM DRAIN
- PROPOSED RETAINING WALL
- PROPOSED PAVEMENT
- EXISTING RECORDED R.O.W.

NOTE: POTENTIAL DRAINAGE EASEMENTS MAY BE REQUIRED PARALLEL TO RIGHT OF WAY NEAR FUTURE CULVERT CROSSINGS. EASEMENTS TO BE QUANTIFIED DURING FINAL DESIGN.



118TH STREET
LOOKING NORTH
N.T.S.



GRAPHIC SCALE
30 0 15 30 60
1 INCH = 30 FEET

PRELIMINARY NOT FOR CONSTRUCTION OR RECORDING

REVIEWED BY:

J2 engineering and environmental design
4649 east cotton gin loop, suite B2
phoenix, arizona 85040
phone: 602.438.2221
www.j2design.us

ARGUS CONSULTING
A CIVIL ENGINEERING COMPANY, P.C.
10115 E. Bell Road, Suite 107 - #104
Scottsdale, Arizona 85260 480-596-1131

118th STREET & JOMAX ROAD

118TH STREET EXTENSION
ALIGNMENT STUDY

Designed by	Drawn by	
Date 01-18-17	Job No. 365-16	Sheet 3 of 3

Q.S. 50-56

C:\Data\118th & Jomax\dwg\118th Extension\J2 Roadway Layout.dwg Jan 19, 2017 Argus

Drainage Report

118th & Jomax

(504-PA-16)

EXPIRES 12/31/18

Stormwater Review By:
Richard Anderson
Phone 480-312-2729
FAX 480-312-9202
E-MAIL rianderson@ScottsdaleAZ.gov
Review Cycle _____ Date 2/28/17

Approved

prepared for:

Toll Brothers Inc.
8767 E. Via de Ventura, Suite 390
Scottsdale, Arizona 85258
480 951 0782

prepared by:

ARGUS CONSULTING
A CIVIL ENGINEERING COMPANY, PC

10115 E. Bell Road, Suite 107 - #104
Scottsdale, Arizona 85260
480 596 1131

FEBRUARY 2017

25-ZN-2016
02/10/17

118th & Jomax
DRAINAGE REPORT

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EXPIRES 12/31/18

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The purpose of this report is to provide drainage data analyses to support the Rezoning Application for the **118th & Jomax** (80 acres) project currently known as Parcels 12 & 13 of Goldie Brown Pinnacle Peak Ranch, Unit 2 in Scottsdale, Arizona.

The project site is located within portions of Section 34 and 35 (T5N, R5E), of the Gila and Salt River Base and Meridian. **118th & Jomax** is bounded on the north by the Redbird Road, on the east by 122nd Street Alignment, on the south by Jomax Road, and on the west by 118th Street. Exhibit A shows a vicinity map.

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Zone X is defined as *"Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood"*.

Zone D is defined as *"Areas in which flood hazards are undetermined, but possible"*.

2.0 DESCRIPTION OF STUDY AREA

2.1 Existing Conditions

The site is currently undeveloped with the majority of the site flowing northeast and a small portion flowing east (across 122nd Street alignment) and southeast (across Jomax Road alignment). Vegetation is typical Sonoran Desert. The property is situated in a watershed divide between the Salt River and Verde River watersheds therefore excess runoff is mostly sheet flows with a few ephemeral washes traversing the property.

An offsite drainage area located to the west within Desert Summit subdivision directs stormwater runoff into 118th Street (Plate A). The identified offsite drainage area was subdivided into four subbasin (DS01/DS02/DS03/DS04) to better evaluate the impacts of offsite flows onto existing routing channels.

2.2 Proposed Development (Rezoning)

The proposed project will be developed as a single family residential land use with a mix of R1-43 (38 lots), R1-70 (7 lots), R1-130 (4 lot), and R1-190 (2 lots) categories. The site is located within the City of Scottsdale's Environmentally Sensitive Lands Ordinance (ESLO). Land development will be limited to the right-of-way and established building envelopes for each lot.

The proposed stormwater management plan will provide two storage areas (detention basins). Stormwater storage volume would be provided so that the estimated post-development peak flows would be less than or equal to the estimated pre-development peak flows for the 2-, 10-, and 100-Yr frequency event.

3.0 MAPPING AND SURVEYING INFORMATION

3.1 Mapping

The available mapping utilized in this study was as follows:

1. **Topographic Map:** A digital topographic map developed for the project site with contour interval of 1 foot was utilized for on-site drainage basin delineation and cross sections information used in the hydraulic analyses.

2. **Aerial Photos:** Aerial photograph developed for the project was used to provide vegetation cover patterns and identify existing flow path locations.

4.0 HYDROLOGIC ANALYSIS

Hydrologic calculations were prepared for *"Existing Conditions"* to establish the pre-development 100-Yr peak flow rates entering and exiting the property. Post-Development watershed conditions were evaluated to investigate the impact created by the proposed development land use and to determined stormwater runoff management measures.

NOAA Atlas 14 precipitation-frequency values were used for the hydrologic study. A rainfall depth value of 3.2 inches is recommended for the 100-year, 6-hour event (Appendix A).

Rainfall losses are generally considered to be the result of evaporation of water from the land surface, interception of rainfall by vegetal cover, depression storage on the land surface (paved or unpaved), and the infiltration of water into the soil matrix. The selection of parameters to simulate rainfall losses was performed using the *Drainage Design Management System for Windows* (DDMSW) computer program available through the FCD. Soil data were used with the DDMSW software to calculate Green and Ampt parameters. Urban development was represented by the proposed land use and adding a percentage of impervious cover to the drainage subbasin. HEC-1 computes 100% of runoff from the percent of subbasin indicated in the LG record (impervious area).

Appendix A & B contain the hydrologic parameters for rainfall, soils, and land use utilized in the HEC-1 model for *Existing* and *Proposed* conditions. Drainage areas are shown in Plate A (Existing Conditions) and Plate B (Proposed Conditions).

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Preliminary locations for proposed stormwater storage were identified (STOR1 & STOR2) and can be seen on Plate B. STOR1 will be located within a Tract while STOR2 will be placed within a drainage easement. Both facilities will have access from Redbird Road.

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Based on the results of the hydrologic models, the preliminary stormwater storage basins would effectively reduce the estimated 2-, 10-, and 100-Yr peak flow rates under the 'proposed' conditions of development. During the Preliminary Plan and Development Review process a 90% level of design and analysis will be presented for the proposed project therefore allowing for a more detailed design of the stormwater management system.

As indicated on Table 4.3, a few drainage areas show a very small peak flow increase on the proposed conditions (red values). These drainage areas will be analyzed in detail during the Preliminary Plan design process.

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5.1 General

The City of Scottsdale Environmentally Sensitive Lands Ordinance (ESLO) regulates the location and design of residential in the project's area. The ordinance requires that specific environmental features, such natural washes, be preserved in their native locations and conditions.

The ESLO is seeking to minimize modifications of the flow and natural features of "significant washes", which are defined as having a 100-year storm flow of 50 cfs or more.

Based on the results of the hydrologic analysis presented herein, Wash A & B have been identified as having a 100-year storm flow of 50 cfs or more (Plate C). A floodplain delineation will be prepared as part of the Preliminary and Final Plat design process to better represent the final design for roadways and building pads.

Culverts will be designed to pass the estimated 100-Yr/6-Hr peak flow rates underneath roadways and driveways. The minimum pipe size of culverts and storm drain laterals will be 18 inches in diameter.

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118th & Jomax proposed zoning for development will have a mix of R1-43 (38 lots), R1-70 (7 lots), R1-130 (4 lot), and R1-190 (2 lots) categories. The preliminary Natural Area Open Space (N.A.O.S.) allocation for the project is 29.24 acres, and preliminary Open Space/Landscape Areas is 26.73 acres. The remaining acres onsite will be disturbed due to a combination of grading operations, roadways and infrastructure construction.

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Based on the results of the study, it can be concluded that:

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Appendix A

Appendix B

Appendix C

Appendix D

Appendix E

118th & Jomax
DRAINAGE REPORT

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Registered Professional Engineer (Civil)
CERTIFICATE NO.
28638
JORGE R.
GARRE
Date Signed 2/6/17
ARIZONA, U.S.A.
EXPIRES 12/31/18

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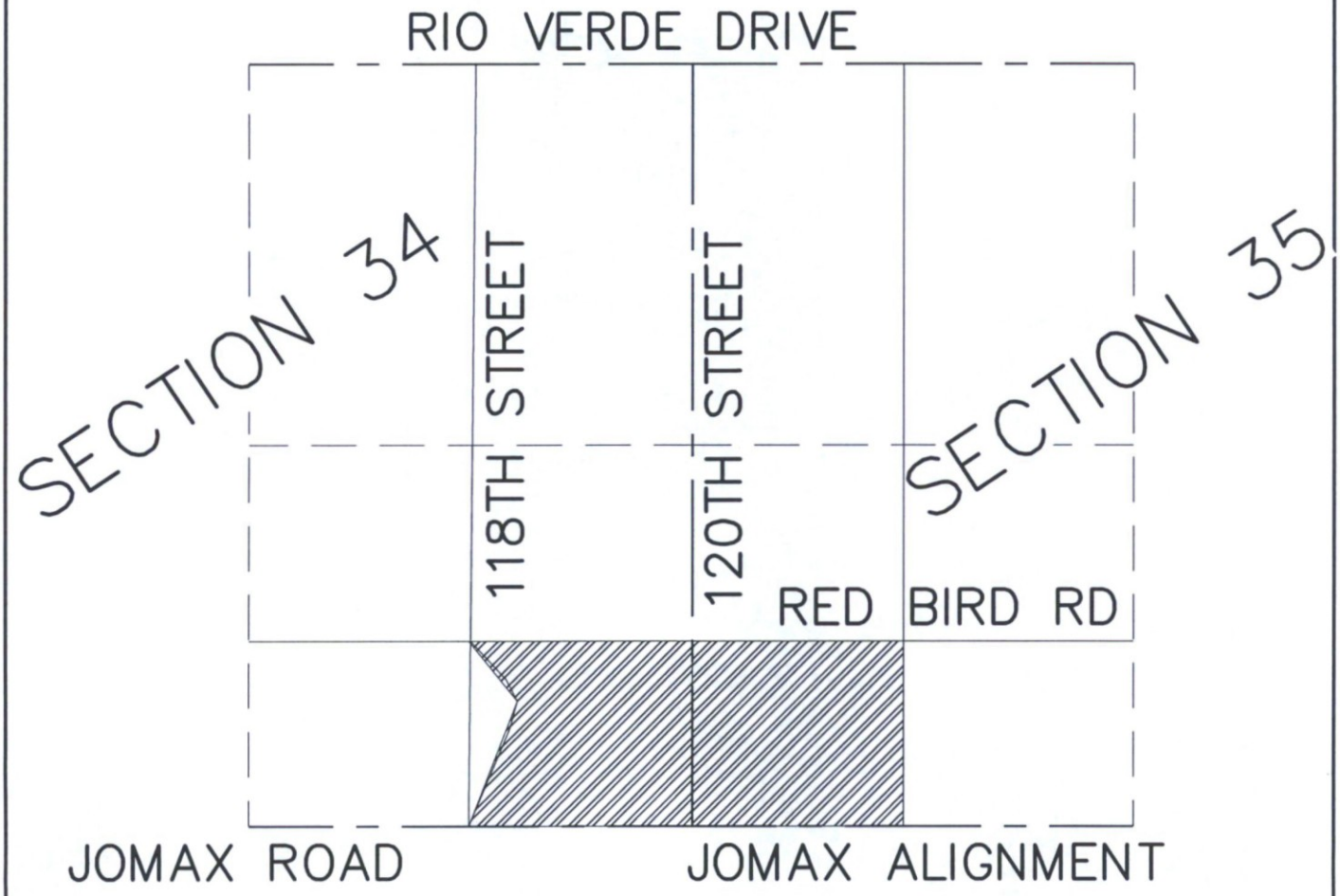
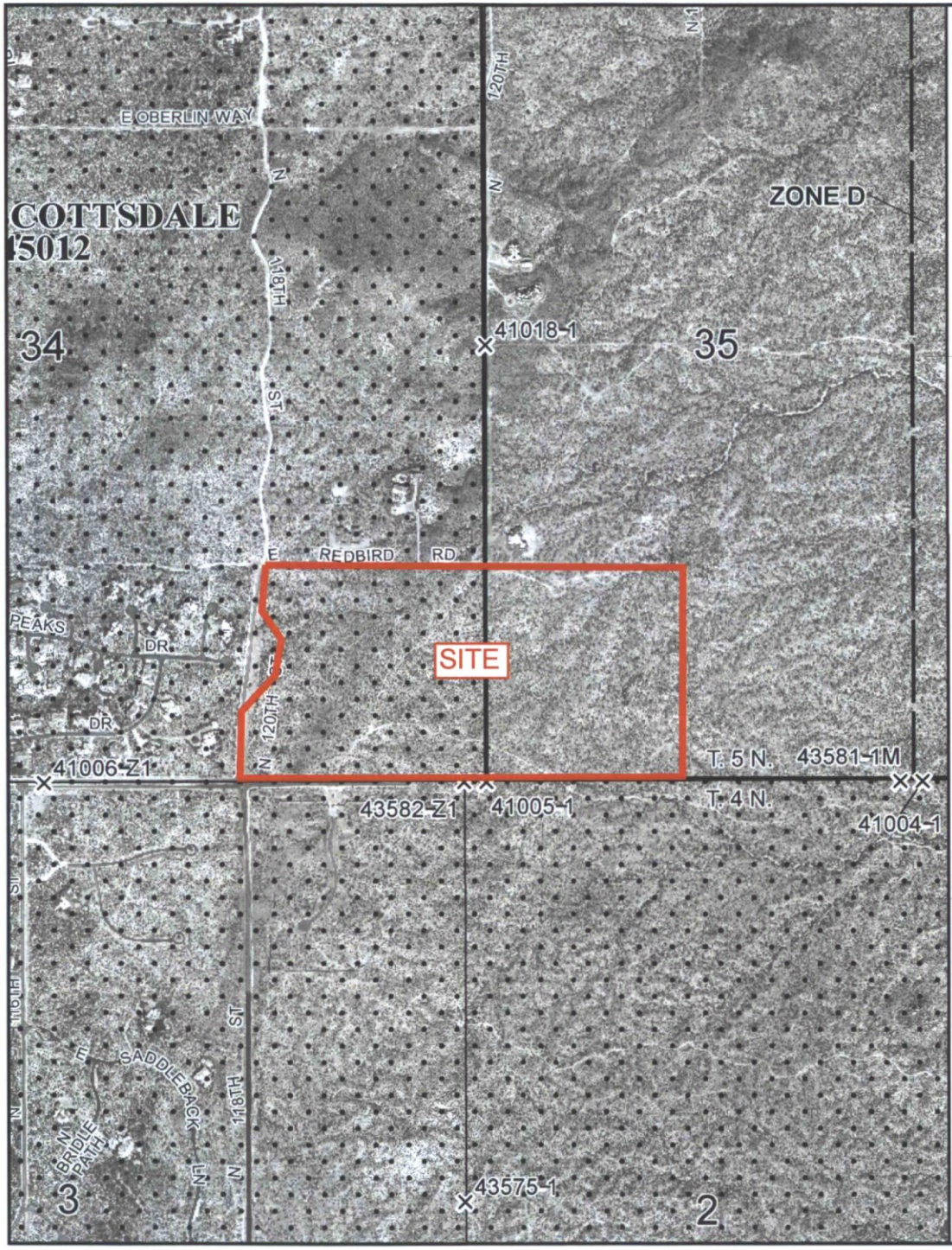


FIGURE 1
Vicinity Map

118th & Jomax–80

Scottsdale – Arizona

FILE NAME:
MACHINE NUMBER:
DATE PLOTTED:



MAP SCALE 1" = 1000'

500 0 1000 2000 FEET

METE

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 1330L

FIRM

FLOOD INSURANCE RATE MAP

MARICOPA COUNTY, ARIZONA

AND INCORPORATED AREAS

PANEL 1330 OF 4425

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
SCOTTSDALE, CITY OF	045012	1330	L

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
04013C1330L

MAP REVISED
OCTOBER 16, 2013

Federal Emergency Management Agency

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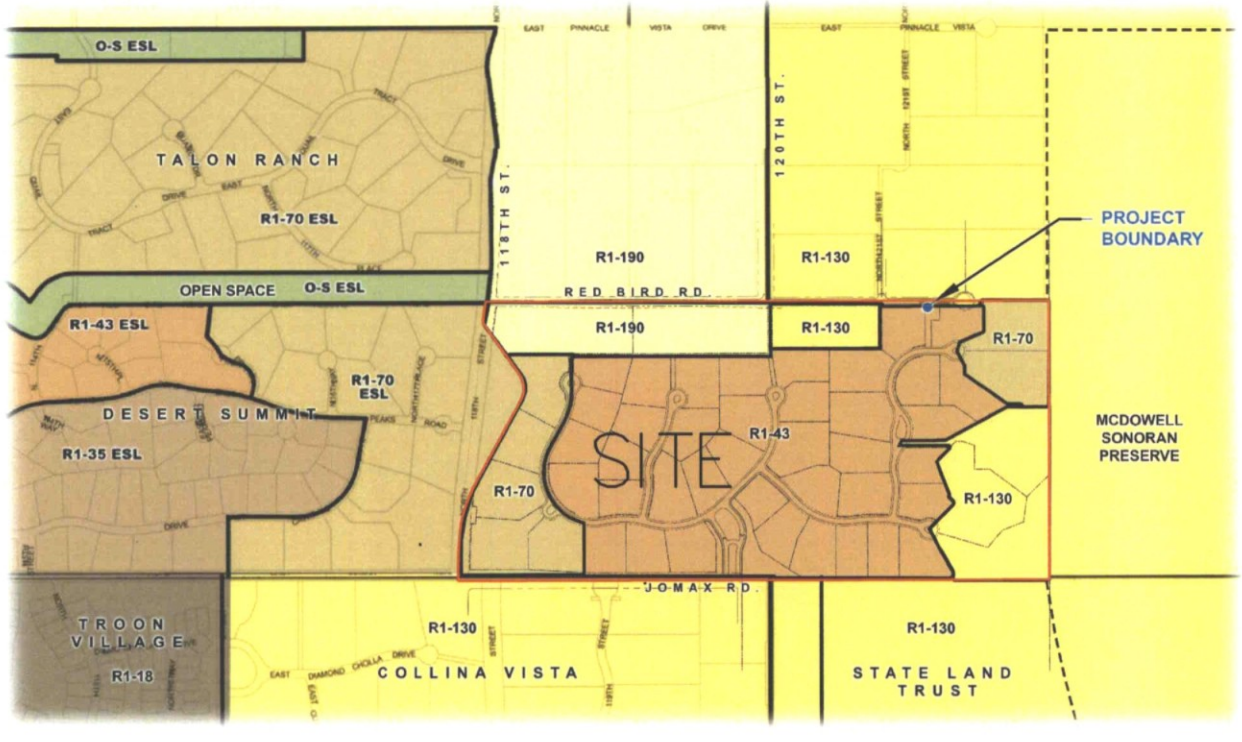

EXHIBIT C
LAND USE MAP

118TH & JOMAX

SCOTTSDALE – ARIZONA

FILE NAME:
MACHINE NUMBER:
DATE PLOTTED:

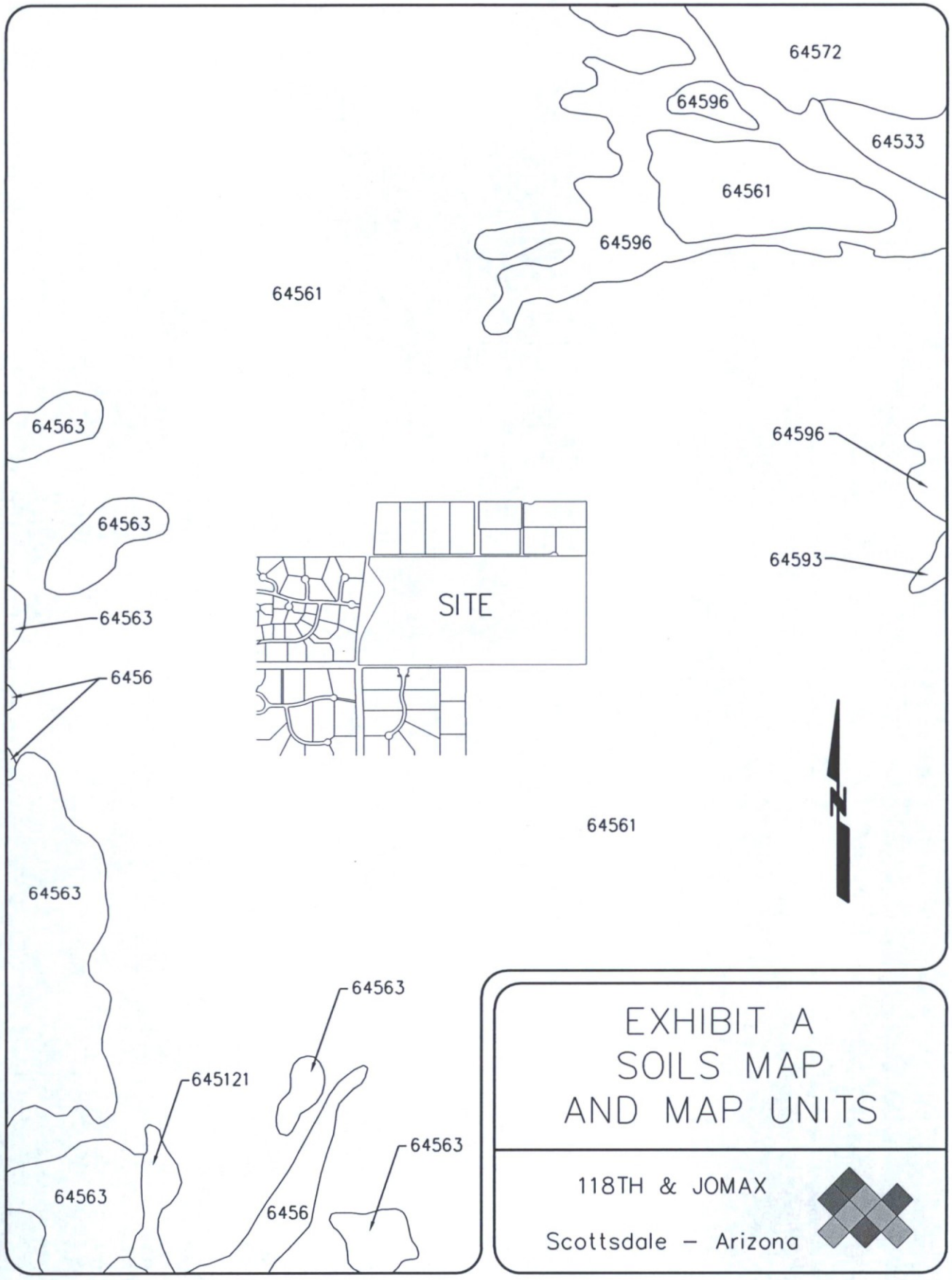

EXHIBIT A
SOILS MAP
AND MAP UNITS

118TH & JOMAX

Scottsdale – Arizona

FILE NAME:
MACHINE NUMBER:
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- Scuppers and catch basins will remove stormwater from the streets and convey it to existing washes.

Appendix A

Flood Control District of Maricopa County
Drainage Design Management System
RAINFALL DATA
Project Reference: 118TH&JOMAX EX.COND.

ID	Method	Duration	2 Yr	5 Yr	10 Yr	25 Yr	50 Yr	100 Yr
DEFAULT	NOAA14	5 MIN	0.318	0.428	0.510	0.618	0.699	0.781
	NOAA14	10 MIN	0.484	0.651	0.776	0.941	1.065	1.188
	NOAA14	15 MIN	0.600	0.807	0.962	1.167	1.320	1.473
	NOAA14	30 MIN	0.807	1.087	1.296	1.570	1.777	1.984
	NOAA14	1 HOUR	0.999	1.345	1.604	1.944	2.199	2.455
	NOAA14	2 HOUR	1.136	1.506	1.787	2.166	2.453	2.746
	NOAA14	3 HOUR	1.206	1.570	1.858	2.259	2.575	2.901
	NOAA14	6 HOUR	1.438	1.822	2.129	2.550	2.878	3.218
	NOAA14	12 HOUR	1.727	2.167	2.518	2.992	3.358	3.733
	NOAA14	24 HOUR	2.124	2.765	3.287	4.026	4.624	5.258

MAP: 64
CELLS: 300-301 / 340-341

Soil ID	Map Unit	XKSAT	Rock Percent	Description
Book Number: 645				
6451	1	0.410	0.00	Antho sandy loams
6452	2	0.410	0.00	Antho gravelly sandy loams
6453	3	0.580	0.00	Antho-Carrizo-Maripo complex
6454	4	0.580	0.00	Antho-Carrizo-Maripo complex, low precipitation
6455	5	0.430	0.00	Anthony sandy loam
6456	6	0.620	0.00	Anthony-Arizo complex
6457	7	0.620	0.00	Anthony-Arizo complex, low precipitation
6458	8	0.960	0.00	Arizo cobbly sandy loam
6459	9	0.270	0.00	Beeline-Cipriano complex, 3 to 45 percent slopes
64510	10	0.940	0.00	Brios-Carrizo complex, 1 to 5 percent slopes
64511	11	0.940	0.00	Brios-Carrizo complex, low precipitation, 1 to 5 percent slopes
64512	12	0.010	0.00	Carefree cobbly clay loam, 1 to 8 percent slopes
64513	13	0.010	0.00	Carefree-Beardsley complex
64514	14	1.040	0.00	Carrizo very gravelly sand
64515	15	0.540	0.00	Carrizo-Gunsight complex, 1 to 5 percent slopes
64516	16	0.440	15.00	Cellar-Rock outcrop complex, 10 to 70 percent slopes
64517	17	0.440	15.00	Cellar-Rock outcrop complex, low precipitation, 10 to 70 percent
64518	18	0.330	15.00	Cheriono-Rock outcrop complex, 5 to 60 percent slopes
64519	19	0.190	0.00	Chuckawalla-Gunsight complex, 1 to 8 percent slopes
64520	20	0.190	0.00	Chuckawalla-Gunsight complex, low precipitation, 1 to 8 percent
64521	21	0.380	0.00	Cipriano very gravelly loam
64522	22	0.040	0.00	Contine clay loam
64523	23	0.010	0.00	Contine clay
64524	24	0.020	0.00	continental clay loam, 0 to 3 percent slopes
64525	25	0.020	0.00	Continental clay, 0 to 3 percent slopes
64526	26	0.010	0.00	Continental cobbly clay loam, 1 to 8 percent slopes
64527	27	0.010	0.00	Continental-Mohave complex, 1 to 7 percent slopes
64528	28	0.020	0.00	Continental-Ohaco complex
64529	29	0.340	0.00	Denure-Momoli-Carrizo complex
64530	30	0.340	0.00	Denure-Momoli-Carrizo complex, low precipitation
64531	31	0.330	35.00	Dixaleta-Rock outcrop complex, 25 to 65 percent slopes
64532	32	0.330	35.00	Dixaleta-Rock outcrop complex, low precipitation, 25 to 65 percent
64533	33	0.230	0.00	Eba very gravelly loam, 1 to 8 percent slopes
64534	34	0.230	0.00	Eba very gravelly loam, 8 to 20 percent slopes
64535	35	0.230	0.00	Eba very gravelly loam, low precipitation, 8 to 20 percent slopes
64536	36	0.070	0.00	Eba-Continental complex, 1 to 8 percent slopes
64537	37	0.130	0.00	Eba-Continental-Cave association, 3 to 20 percent slopes
64538	38	0.130	0.00	Eba-Continental-Cave association, low precipitation, 3 to 20 percent
64539	39	0.290	0.00	Eba-Nickel-Cave association, 3 to 25 percent slopes
64540	40	0.170	0.00	Eba-Pinaleno complex, 3 to 20 percent slopes
64541	41	0.170	0.00	Eba-Pinaleno complex, 20 to 40 percent slopes
64542	42	0.170	0.00	Eba-Pinaleno complex, low precipitation, 3 to 20 percent slopes
64543	43	0.170	0.00	Eba-Pinaleno complex, low precipitation, 20 to 40 percent slopes
64544	44	0.030	0.00	Ebon very gravelly loam, 1 to 8 percent slopes
64545	45	0.030	0.00	Ebon very gravelly loam, 8 to 20 percent slopes
64546	46	0.030	0.00	Ebon-Contine complex, 1 to 8 percent
64547	47	0.110	0.00	Ebon-Gunsight-Cipriano association, 3 to 25 percent slopes
64548	48	0.060	0.00	Ebon-Pinamt complex, 3 to 20 percent slopes
64549	49	0.060	0.00	Ebon-Pinamt complex, 20 to 40 percent slopes
64550	50	0.260	0.00	Estrella loams
64551	51	0.240	0.00	Gachado-Lomitas complex, 8 to 25 percent slopes
64552	52	0.160	20.00	Gachado-Lomitas-Rock outcrop complex, 7 to 55 percent slopes
64553	53	0.020	0.00	Gadsden clay
64554	54	0.290	0.00	Gila fine sandy loams
64555	55	0.270	0.00	Gilman loams
64556	56	0.270	0.00	Gilman loams, low precipitation
64557	57	0.060	0.00	Gilman clay loam
64558	58	0.340	0.00	Gilman-Momoli-Denure complex

Soil ID	Map Unit	XKSAT	Rock Percent	Description
Book Number: 645				
64559	59	0.340	0.00	Gilman-Momoli-Denure complex, low precipitation
64560	60	0.260	0.00	Glenbar loams
64561	61	0.150	0.00	Gran-Wickenburg complex, 1 to 10 percent slopes
64562	62	0.150	0.00	Gran-Wickenburg complex, low precipitation, 1 to 10 percent slopes
64563	63	0.140	25.00	Gran-Wickenburg-Rock outcrop complex, 1 to 7 percent slopes
64564	64	0.140	25.00	Gran-Wickenburg-Rock outcrop complex, low precipitation, 10 to 65
64565	65	0.190	0.00	Greyeagle-Continental-Nickel association, 1 to 40 percent slopes
64566	66	0.230	0.00	Greyeagle-Suncity Variant complex, 1 to 7 percent slopes
64567	67	0.010	0.00	Guest clay
64568	68	0.630	0.00	Gunsight-Cipriano complex, 1 to 7 percent slopes
64569	69	0.630	0.00	Gunsight-Cipriano complex, low precipitation, 1 to 7 percent slopes
64570	70	0.360	0.00	Gunsight-Rillito complex, 1 to 25 percent slopes
64571	71	0.360	0.00	Gunsight-Rillito complex, low precipitation, 1 to 40 percent slopes
64572	72	0.090	30.00	Lehmans-Rock outcrop complex, 8 to 65 percent slopes
64573	73	0.090	30.00	Lehmans-Rock outcrop complex, low precipitation, 8 to 65 percent
64574	74	0.080	0.00	Luke-Cipriano association, 1 to 15 percent slopes
64575	75	0.230	0.00	Mohall loam
64576	76	0.230	0.00	Mohall loam, calcareous solum
64577	77	0.050	0.00	Mohall clay loam
64578	78	0.050	0.00	Mohall clay loam, calcareous solum
64579	79	0.020	0.00	Mohall clay
64580	80	0.080	0.00	Mohall-Tremant complex, 1 to 8 percent slopes
64581	81	0.080	0.00	Mohall-Tremant complex, low precipitation, 1 to 8 percent slopes
64582	82	0.040	0.00	Mohave sandy loam
64583	83	0.040	0.00	Mohave loam
64584	84	0.050	0.00	Mohave loam, calcareous solum
64585	85	0.040	0.00	Mohave clay loam
64586	86	0.050	0.00	Mohave clay loam, calcareous solum
64587	87	0.040	0.00	Mohave complex
64588	88	0.020	0.00	Mohave-Guest complex
64589	89	0.060	0.00	Mohave-Tres Hermanos complex, 1 to 8 percent slopes
64590	90	0.390	0.00	Momoli gravelly sandy loam, 1 to 5 percent slopes
64591	91	0.930	0.00	Momoli-Carrizo complex
64592	92	0.930	0.00	Momoli-Carrizo complex, low precipitation
64593	93	0.330	0.00	Nickel-Cave complex, 8 to 30 percent slopes
64594	94	0.330	0.00	Nickel-Cave complex, low precipitation, 8 to 30 percent slopes
64595	95	0.040	0.00	Ohaco gravelly loam
64596	96	0.070	0.00	Pinaleno-Tres Hermanos complex, 1 to 10 percent slopes
64597	97	0.070	0.00	Pinaleno-Tres Hermanos complex, low precipitation, 1 to 10 percent
64598	98	0.370	0.00	Pinamt-Tremant complex, 1 to 10 percent slopes
64599	99	0.370	0.00	Pinamt-Tremant complex, low precipitation, 1 to 10 percent slopes
645100	100	0.400	20.00	Quilotosa-Vaiva-Rock outcrop complex, 20 to 65 percent slopes
645101	101	0.280	0.00	Rillito loam, 0 to 3 percent slopes
645102	102	0.400	0.00	Rillito gravelly loam, 1 to 8 percent slopes
645103	103	0.100	65.00	Rock outcrop-Gachado complex, 5 to 55 percent slopes
645104	104	0.140	60.00	Rock outcrop-Lehmans complex, 15 to 65 percent slopes
645105	105	0.140	60.00	Rock outcrop-Lehmans complex, low precipitation, 15 to 65 percent
645106	106	0.180	0.00	Sal-Cipriano complex, 1 to 10 percent slopes
645107	107	0.180	0.00	Sal-Cipriano complex, low precipitation, 1 to 10 percent slopes
645108	108	0.310	30.00	Schenco-Rock outcrop complex, 3 to 25 percent slopes
645109	109	0.350	35.00	Schenco-Rock outcrop complex, 25 to 60 percent slopes
645110	110	0.130	0.00	Suncity-Cipriano complex, 1 to 7 percent slopes
645111	111	0.400	0.00	Torriorthents, 15 to 40 percent slopes
645112	112	0.390	0.00	Tremant gravelly sandy loams
645113	113	0.390	0.00	Tremant gravelly loams
645114	114	0.390	0.00	Tremant gravelly loams, low precipitation
645115	115	0.390	0.00	Tremant-Antho complex, 1 to 5 percent slopes
645116	116	0.230	0.00	Tremant-Gunsight-Rillito complex, 1 to 5 percent slopes

Soil ID	Map Unit	XKSAT	Rock Percent	Description
Book Number: 645				
645117	117	0.230	0.00	Tremant-Gunsight-Rillito complex, low precipitation, 1 to 5 percent s
645118	118	0.420	0.00	Tremant-Rillito complex
645119	119	0.140	0.00	Tremant-Suncity complex, 1 to 8 percent slopes
645120	120	0.060	0.00	Tres Hermanos gravelly sandy loams
645121	121	0.120	0.00	Tres Hermanos-Anthony complex, 1 to 5 percent slopes
645122	122	0.330	0.00	Vado gravelly sandy loam, 1 to 5 percent slopes
645123	123	0.370	0.00	Vaiva very gravelly loam, 1 to 20 percent slopes
645124	124	0.390	0.00	Valencia sandy loams
645125	125	0.430	0.00	Vint loamy fine sand
645126	126	0.000	0.00	Water
Book Number: 651				
65164	W	0.000	0.00	Lakes, ponds, reservoirs - perennial
6512021	Aa	0.260	0.00	Agualt loam
6512025	Ac	0.390	0.00	Antho sandy loam, saline-alkali
6512029	Ae	0.390	0.00	Antho-Brios sandy loams
6512042	AL	0.400	0.00	Antho association
6512044	AM	0.390	0.00	Antho-Valencia association
6512047	An	0.050	0.00	Avonda clay loam
6512049	Ao	0.040	0.00	Avondale clay loam
6512051	Ap	0.040	0.00	Avondale clay loam, saline-alkali
6512228	BE	0.240	0.00	Beardsley loam
6512255	Br	1.050	0.00	Brios loamy sand
6512257	Bs	0.390	0.00	Brios sandy loam
6512259	Bt	0.250	0.00	Brios loam
6512423	Cb	0.400	0.00	Carrizo gravelly sandy loam
6512430	CF	0.500	0.00	Carrizo and Brios soils
6512433	Cg	0.240	0.00	Casa Grande Sandy loam
6512435	Ch	0.240	0.00	Casa Grande loam
6512441	Ck	0.300	0.00	Casa Grande complex
6512445	Cm	0.260	0.00	Casa Grande-Leveen complex, alkali
6512447	Cn	0.010	0.00	Cashion clay, saline-alkali
6512448	CO	0.290	20.00	Cheriono-Rock outcrop complex
6512451	Cp	0.400	0.00	Coolidge sandy loam
6512457	Cs	0.190	0.00	Coolidge-Tremant complex
6512462	CV	0.390	0.00	Coolidge-Laveen association
6512647	Dn	1.200	0.00	Dune land
6512857	Es	0.250	0.00	Estrella loam
6512859	Et	0.250	0.00	Estrella loam, saline-alkali
6513220	GA	0.100	40.00	Gachado-Rock outcrop complex
6513223	Gb	0.040	0.00	Gadsden clay loam
6513225	Gc	0.010	0.00	Gadsden clay
6513227	Gd	0.010	0.00	Gadsden clay, saline-alkali
6513229	Ge	0.260	0.00	Gilman fine sandy loam
6513231	Gf	0.240	0.00	Gilman fine sandy loam, saline-alkali
6513235	Gh	0.240	0.00	Gilman loam, saline-alkali
6513242	GL	0.250	0.00	Gilman complex, saline-alkali
6513244	GM	0.290	0.00	Gilman-Antho association
6513246	GN	0.250	0.00	Gilman-Laveen association
6513251	Gp	0.240	0.00	Gilman loam, clayey subsoil variant, moderately saline
6513255	Gr	0.230	0.00	Glenbar loam
6513257	Gs	0.230	0.00	Glenbar loam, saline-alkali
6513259	Gt	0.040	0.00	Glenbar clay loam
6513261	Gu	0.040	0.00	Glenbar clay loam, saline-alkali
6513263	Gv	0.010	0.00	Glenbar clay
6513444	HM	0.150	0.00	Harqua-Laveen complex
6514221	La	0.260	0.00	La Palma very fine sandy loam
6514223	Lb	0.400	0.00	Laveen sandy loam
6514227	Ld	0.250	0.00	Laveen loam, saline-alkali

Soil ID	Map Unit	XKSAT	Rock Percent	Description
Book Number: 651				
6514229	Le	0.040	0.00	Laveen clay loam
6514231	Lf	0.330	0.00	Laveen-Antho complex, saline-alkali
6514421	Ma	0.400	0.00	Maripo sandy loam
6514449	Mo	0.390	0.00	Mohall sandy loam
6514451	Mp	0.250	0.00	Mohall loam
6514455	Mr	0.050	0.00	Mohall clay loam
6514457	Ms	0.010	0.00	Mohall clay
6514462	MV	0.150	0.00	Mohall-Laveen association
6515021	Pa	0.400	0.00	Perryville sandy loam
6515023	Pb	0.380	0.00	Perryville loam, saline-alkali
6515058	PT	0.400	0.00	Pinal gravelly loam
6515456	RS	0.400	65.00	Rock outcrop-Cherioni complex
6515821	Ta	0.250	0.00	Toltec loam
6515822	TB	0.400	0.00	Torrifluvents
6515825	Tc	0.400	0.00	Torriorthents
6515826	TD	1.200	0.00	Torripsamments and Torrifluvents, frequently flooded
6515829	Te	0.250	0.00	Tremant loam
6515833	Tg	0.040	0.00	Tremant clay loam
6515835	Th	0.040	0.00	Tremant gravelly clay loam
6515859	Tt	0.040	0.00	Trix clay loam
6515861	Tu	0.250	0.00	Tucson loam
6515865	Tw	0.050	0.00	Tucson clay loam
6516221	Va	0.390	0.00	Valencia sandy loam
6516223	Vb	0.390	0.00	Valencia sandy loam, saline-alkali
6516225	Vc	0.390	0.00	Valencia gravelly sandy loam
6516229	Ve	0.250	0.00	Vecont loam
6516231	Vf	0.010	0.00	Vecont clay
6516233	Vg	0.910	0.00	Vint loamy fine sand
6516235	Vh	0.270	0.00	Vint fine sandy loam
6516241	Vk	0.260	0.00	Vint loam
6516247	Vn	0.040	0.00	Vint clay loam
6516255	Vr	0.630	0.00	Vint-Carrizo complex
6516433	Wg	0.030	0.00	Wintersburg complex
65124202	CA2	0.380	0.00	Calciorthids and Torriorthents, eroded
65132493	Go3	0.190	0.00	Gilman,Antho and Glenbar soils, severely eroded
651202320	AbA	0.380	0.00	Anthosandy loam, 0 to 1 percent slopes
651202322	AbB	0.390	0.00	Antho sandy loam, 1 to 3 percent slopes
651202720	AdA	0.400	0.00	Antho gravelly sandy loam, 0 to 1 percent slopes
651202722	AdB	0.400	0.00	Antho gravelly sandy loam, 1 to 3 percent slopes
651203120	AfA	0.380	0.00	Antho-Carrizo complex, 0 to 1 percent slopes
651203122	AfB	0.400	0.00	Antho-Carrizo complex, 1 to 3 percent slopes
651203222	AGB	0.400	0.00	Antho-Carrizo complex, 0 to 3 percent slopes
651203424	AHC	0.380	0.00	Antho-Tremant complex, 1 to 5 percent slopes
651204122	AkB	0.270	0.00	Antho-Tremant-Mohall complex, 1 to 5 percent slopes
651225036	BPI	0.000	0.00	Borrow pit
651242926	CeD	0.190	0.00	Carrizo-Ebon complex, 3 to 12 percent slopes
651245522	CrB	0.400	0.00	Coolidge gravelly sandy loam, 1 to 3 percent slopes
651282326	EbD	0.100	0.00	Ebon gravelly loam, 0 to 8 percent slopes
651285026	EPD	0.120	0.00	Ebon-Pinamt complex, 0 to 10 percent slopes
651323320	GgA	0.250	0.00	Gilman loan, 0 to 1 percent slopes
651323322	GgB	0.260	0.00	Gilman loam, 1 to 3 percent slopes
651325036	GPI	0.000	0.00	Gravel pit
651326426	GWD	0.350	0.00	Gunsight-Pinal complex, 1 to 10 percent slopes
651326720	GxA	0.230	0.00	Gunsight-Rillito complex, 0 to 1 percent slopes
651326722	GxB	0.240	0.00	Gunsight-Rillito complex, 1 to 3 percent slopes
651326826	GYD	0.260	0.00	Gunsight-Rillito complex, 0 to 10 percent slopes
651342022	HAB	0.070	0.00	Harqua complex, 0 to 3 percent slopes
651342024	HAC	0.050	0.00	Harqua complex, 3 to 8 percent slopes

Soil ID	Map Unit	XKSAT	Rock Percent	Description
Book Number: 651				
651344224	HLC	0.140	0.00	Harqua-Gunsight complex, 0 to 5 percent slopes
651345522	HrB	0.120	0.00	Harqua-Rillito complex, 1 to 3 percent slopes
651422520	LcA	0.250	0.00	Laveen loam, 0 to 1 percent slopes
651422522	LcB	0.250	0.00	Laveen loam, 1 to 3 percent slopes
651441064	M-W	0.000	0.00	Waste stabilization pond
651445822	MTB	0.150	0.00	Mohall-Tremant complex, 0 to 3 percent slopes
651502920	PeA	0.370	0.00	Perryville gravelly loam, 0 to 1 percent slopes
651502922	PeB	0.380	0.00	Perryville gravelly loam, 1 to 3 percent slopes
651505422	PRB	0.280	0.00	Perryville-Rillito complex, 0 to 3 percent slopes
651505720	PsA	0.250	0.00	Pinal loam, 0 to 1 percent slopes
651505722	PsB	0.260	0.00	Pinal loam, 1 to 3 percent slopes
651506322	PvB	0.250	0.00	Pinal-La Palma loams, 1 to 3 percent slopes
651506422	PWB	0.380	0.00	Pinal-Suncity complex, 0 to 3 percent slopes
651506826	PYD	0.200	0.00	Pinamt-Tremant complex, 1 to 10 percent slopes
651542120	RaA	0.390	0.00	Rillito sandy loam, 0 to 1 percent slopes
651542122	RaB	0.390	0.00	Rillito sandy loam, 1 to 3 percent slopes
651542320	RbA	0.260	0.00	Rillito loam, 0 to 1 percent slopes
651542322	RbB	0.250	0.00	Rillito loam, 1 to 3 percent slopes
651543522	RhB	0.230	0.00	Rillito-Harqua complex, 1 to 3 percent slopes
651545128	RpE	0.290	0.00	Rillito-Perryville complex, 5 to 20 percent slopes
651583120	TfA	0.370	0.00	Tremant gravelly loam, 0 to 1 percent slopes
651583122	TfB	0.360	0.00	Tremant gravelly loam 1 to 3 percent slopes
651585022	TPB	0.120	0.00	Tremant complex, 0 to 3 percent slopes
651585520	TrA	0.110	0.00	Tremant-Rillito complex, 0 to 1 percent slopes
651585522	TrB	0.130	0.00	Tremant-Rillito complex, 1 to 3 percent slopes
651585624	TSC	0.140	0.00	Tremant-Rillito complex, 0 to 5 percent slopes
6514228622830	LEVEE	0.000	0.00	Levee
Book Number: 653				
6531	1	0.230	0.00	Agualt and Ripley soils
6532	2	0.210	0.00	Agualt and Ripley soils, saline-sodic
6533	3	0.530	0.00	Ajo-Gunsight-Pompeii complex, 3 to 25 percent slopes
6534	4	0.400	40.00	Akela-Rock outcrop complex, 15 to 65 percent slopes
6535	5	0.790	0.00	Carrizo-Dateland complex, 0 to 3 percent slopes
6536	6	1.170	0.00	Carrizo-Momoli complex, 0 to 3 percent slopes
6537	7	0.420	0.00	Cherioni very cobbly fine sandy loam, 3 to 10 percent slopes
6538	8	0.770	0.00	Cherioni-Coolidge complex, 1 to 15 percent slopes
6539	9	1.050	15.00	Cipriano-Hyder-Rock outcrop complex, 15 to 65 percent slopes
65310	10	1.010	0.00	Cipriano-Momoli complex, 1 to 7 percent slopes
65311	11	0.610	0.00	Coolidge complex, 0 to 3 percent slopes
65312	12	0.330	0.00	Cuerda-Why-Lagunita complex
65313	13	0.330	0.00	Dateland very fine sandy loam
65314	14	0.270	0.00	Dateland-Cuerda complex, 0 to 3 percent slopes
65315	15	0.500	0.00	Dateland-Denure fine sandy loams, saline-Sodic, 0 to 3 percent slo
65316	16	0.920	0.00	Denure sandy loam
65317	17	0.990	0.00	Denure gravelly fine sandy loam, 1 to 3 percent slopes
65318	18	1.050	0.00	Denure-Carrizo, bench, gravelly fine sandy loams
65319	19	0.680	0.00	Denure-Cavelt complex, 0 to 3 percent slopes
65320	20	0.670	0.00	Denure-Coolidge complex, 1 to 3 percent slopes
65321	21	0.700	0.00	Denure-Rillito-Why complex, 1 to 5 percent slopes
65322	22	0.810	0.00	Denure-Why complex, 1 to 5 percent slopes
65323	23	0.000	0.00	Dumps-Pits Association
65324	24	0.040	0.00	Gadsden clay loam, 0 to 3 percent slopes
65325	25	0.060	0.00	Gadsden and Kofa silty clay loams, saline-sodic
65326	26	0.400	20.00	Garzona-Rock outcrop-Winkel complex, 15 to 65 percent slopes
65327	27	0.240	0.00	Gilman very fine sandy loam
65328	28	0.230	0.00	Gilman very fine sandy loam, saline-sodic
65329	29	0.050	0.00	Glenbar silty clay loam
65330	30	0.050	0.00	Glenbar silty clay loam, saline-sodic

Soil ID	Map Unit	XKSAT	Rock Percent	Description
Book Number: 653				
65331	31	0.550	0.00	Growler-Momoli complex, 1 to 3 percent slopes
65332	32	0.320	0.00	Growler-Wellton complex, 1 to 3 percent slopes
65333	33	0.770	0.00	Gunsight-Ajolito extremely gravelly sandy loams, 1 to 15 percent sl
65334	34	0.750	0.00	Gunsight-Chuckawalla complex, 1 to 15 percent slopes
65335	35	1.120	0.00	Gunsight-Cipriano complex, 1 to 15 percent slopes
65336	36	0.390	0.00	Gunsight-Pinamt complex, 1 to 15 percent slopes
65337	37	0.790	0.00	Gunsight-Rillito-Carrizo complex, 1 to 15 percent slopes
65338	38	0.290	0.00	Harqua fine sandy loam, 0 to 3 percent slopes
65339	39	0.340	0.00	Harqua-Cavelt complex, 1 to 10 percent slopes
65340	40	0.460	0.00	Hyder-Gachado-Gunsight extremely gravelly sandy loams, 1 to 25 p
65341	41	0.160	0.00	Indio silt loam
65342	42	0.140	0.00	Indio silt loam, saline-sodic
65343	43	0.870	0.00	Lagunita-Vint complex
65344	44	0.250	0.00	Mohall fine sandy loam
65345	45	0.260	0.00	Mohall loam
65346	46	0.260	0.00	Mohall loam, occasionally flooded
65347	47	0.060	0.00	Mohall clay loam
65348	48	0.270	0.00	Mohall complex, 0 to 3 percent slopes
65349	49	0.740	0.00	Momoli-Carrizo extremely gravelly sandy loams, 1 to 10 percent sl
65350	50	1.060	0.00	Momoli-Carrizo, bench, very gravelly sandy loams, 1 to 3 percent s
65351	51	0.950	0.00	Momoli-Comobabi association, 5 to 15 percent slopes
65352	52	0.980	0.00	Pits
65353	53	0.910	0.00	Quilotosa-Momoli-Carrizo complex, 1 to 15 percent slopes
65354	54	0.860	25.00	Quilotosa-Rock outcrop complex, 15 to 55 percent slopes
65355	55	1.200	0.00	Riverwash
65356	56	0.940	40.00	Rock outcrop-Hyder complex, 25 to 65 percent slopes
65357	57	0.760	0.00	Rositas-Denure loamy fine sands, 1 to 10 percent slopes
65358	58	0.350	20.00	Schenco-Laposa-Rock outcrop complex, 10 to 55 percent slopes
65359	59	0.280	0.00	Tremant gravelly fine sandy loam
65360	60	0.280	0.00	Tucson loam
65361	61	0.290	0.00	Vaiva-Quilotosa extremely gravelly sandy loams, 3 to 25 percent slo
65362	62	0.190	0.00	Vaiva-Quilotosa extremely stony sandy loams, 25 to 55 percent slop
65363	63	0.630	0.00	Vint very fine sandy loam
65364	64	0.360	0.00	Wellton loam
65365	65	0.630	0.00	Wellton complex
65366	66	0.400	0.00	Why gravelly fine sandy loam
65367	67	0.580	0.00	Why-Carrizo complex, 0 to 3 percent slopes
65368	68	0.000	100.00	Water
65369	69	0.000	0.00	Dam
Book Number: 655				
65564	W	0.000	0.00	Lakes, ponds, reservoirs - perennial
6552031	Af	0.250	0.00	Agualt fine sandy loam
6552033	Ag	0.250	0.00	Agualt loam
6552045	Am	1.200	0.00	Alluvial land
6552063	Av	0.040	0.00	Avondale clay loam
6552421	Ca	1.200	0.00	Carrizo gravelly loamy sand
6552423	Cb	0.250	0.00	Carrizo fine sandy loam
6552425	Cc	0.010	0.00	Cashion clay
6552449	Co	0.040	0.00	Contine clay loam
6552857	Es	0.250	0.00	Estrella loam
6553231	Gf	0.250	0.00	Gilman fine sandy loam
6553245	Gm	0.250	0.00	Gilman loam
6553247	Gn	0.040	0.00	Glenbar clay loam
6553255	Gr	1.200	0.00	Gravelly alluvial land
6554449	Mo	0.400	0.00	Mohall sandy loam
6554463	Mv	0.250	0.00	Mohall loam
6555045	Pm	0.040	0.00	Pimer clay loam
6555049	Po	0.250	0.00	Pinal loam, moderately deep variant

Soil ID	Map Unit	XKSAT	Rock Percent	Description
Book Number: 655				
6555449	Ro	0.250	65.00	Rock land
6555461	Ru	0.400	20.00	Rough broken land
6555463	Rv	0.000	0.00	Riverwash
6555867	Tx	0.040	0.00	Trix clay loam
6556221	Va	0.400	0.00	Valencia sandy loam
6556229	Ve	0.010	0.00	Vecont clay
6556231	Vf	1.200	0.00	Vint loamy fine sand
655204720	AnA	0.400	0.00	Antho sandy loam, 0 to 1 percent slopes
655204722	AnB	0.400	0.00	Antho sandy loam, 1 to 3 percent slopes
655204922	AoB	0.400	0.00	Antho gravelly sandy loam, 1 to 3 percent slopes
655242924	CeC	0.400	0.00	Cavelt gravelly loam, 1 to 5 percent slopes
655325036	GPI	0.000	0.00	Gravel Pits
655422120	LaA	0.250	0.00	Laveen loam, 0 to 1 percent slopes
655422122	LaB	0.250	0.00	Laveen loam, 1 to 3 percent slopes
655422920	LeA	0.040	0.00	Laveen clay loam, 0 to 1 percent slopes
655504720	PnA	0.400	0.00	Pinal gravelly loam, 0 to 1 percent slopes
655504724	PnC	0.400	0.00	Pinal gravelly loam, 1 to 3 percent slopes
655506320	PvA	0.400	0.00	Pinamt very gravelly loam, 0 to 1 percent slopes
655506324	PvC	0.400	0.00	Pinamt very gravelly loam, 3 to 5 percent slopes
655543720	RiA	0.400	0.00	Rillito gravelly loam, 0 to 1 percent slopes
655543722	RiB	0.400	0.00	Rillito gravelly loam, 1 to 3 percent slopes
655585522	TrB	0.100	0.00	Tremant gravelly loam, 1 to 3 percent slopes
Book Number: 658				
6581	1	9,999.000	0.00	Brios gravelly loamy sand,3 to 5 percent slopes
6582	2	9,999.000	0.00	Brios very fine sandy loam,0 to 2 percent slopes
6583	3	9,999.000	0.00	Carrizo-Momoli complex, 1 to 3 percent slopes
6584	4	9,999.000	0.00	Carrizo-Pinamt complex, 1 to 5 percent slopes
6585	5	9,999.000	0.00	Carrizo very gravelly coarse sand, 0 to 1 percent slopes
6586	6	9,999.000	0.00	Casa Grande clay loam, 0 to 1 percent slopes
6587	7	9,999.000	0.00	Casa Grande complex, 0 to 5 percent slopes
6588	8	9,999.000	0.00	Casa Grande fine sandy loam, 0 to 3 percent slopes
6589	9	9,999.000	0.00	Cavelt-Carrizo-Gunsight complex, 1 to 10 percent slopes
65810	10	9,999.000	0.00	Chuckwalla-Gunsight complex, 1 to 5 percent slopes
65811	11	9,999.000	0.00	Cristobal-Gunsight complex, 3 to 15 percent slopes
65812	12	9,999.000	0.00	Dateland-Cuerda complex, saline-sodic, 0 to 3 percent slopes
65813	13	9,999.000	0.00	Denure-Pahaka complex, 1 to 3 percent slopes
65814	14	9,999.000	0.00	Denure-Pahaka complex, 3 to 5 percent slopes
65815	15	9,999.000	0.00	Gadsden, Glenbar and Vint soils, saline-sodic, 0 to 2 percent slopes
65816	16	9,999.000	0.00	Gadsden silty clay loam, saline-sodic, 0 to 2 percent slopes
65817	17	9,999.000	0.00	Glenbar silt loam, saline-sodic, 0 to 2 percent slopes
65818	18	9,999.000	0.00	Indio silt loam, saline-sodic, 0 to 2 percent slopes
65819	19	9,999.000	0.00	Indio-Vint complex, saline-sodic, 0 to 3 percent slopes
65820	20	9,999.000	0.00	Kamato complex, 0 to 5 percent slopes
65821	21	9,999.000	0.00	Kamato loam, 0 to 2 percent slopes
65822	22	9,999.000	0.00	Lagunita silt loam, 0 to 2 percent slopes
65823	23	9,999.000	0.00	Laveen fine sandy loam, saline-sodic, 0 to 2 percent slopes
65824	24	9,999.000	0.00	Momoli cobbly sandy loam, 5 to 15 percent slopes
65825	25	9,999.000	0.00	Pompeii-Lomitas-Rock outcrop complex, 15 to 65 percent slopes
65826	26	9,999.000	0.00	Quilotosa-Momoli-Vaiva complex, 1 to 15 percent slopes
65827	27	9,999.000	0.00	Quilotosa-Rock outcrop-Vaiva complex, 20 to 65 percent slopes
65828	28	9,999.000	0.00	Redun-Shontik complex, 1 to 3 percent slopes
65829	29	9,999.000	0.00	Rillito-Gunsight complex, 3 to 15 percent slopes
65830	30	9,999.000	0.00	Rositas-Casa Grande-Slickspots complex, 1 to 15 percent slopes
65831	31	9,999.000	0.00	Rositas loamy fine sand, sodic, 0 to 3 percent slopes
65832	32	9,999.000	0.00	Shontik-Redun complex, 0 to 3 percent slopes
65833	33	9,999.000	0.00	Talai silt loam, 0 to 2 percent slopes
65834	34	9,999.000	0.00	Trix loam, saline-sodic, 0 to 1 percent slopes
65835	35	9,999.000	0.00	Vint-Yahana complex, saline-sodic, 0 to 10 percent slopes

Soil ID	Map Unit	XKSAT	Rock Percent	Description
Book Number: 658				
65836	36	9,999.000	0.00	Why-Brios complex, 0 to 2 percent slopes
65837	37	9,999.000	0.00	Yahana-Indio complex, saline-sodic, 0 to 3 percent slopes
65838	38	9,999.000	0.00	Yahana silty clay loam, 0 to 2 percent slopes
Book Number: 703				
7031	1	9,999.000	0.00	Ajo-pinamt, deep, complex, 3 to 15 percent slopes
7032	2	9,999.000	0.00	Anklam-cellar-rock outcrop complex, 15 to 55 percent slopes
7033	3	9,999.000	0.00	Anklam very gravelly sandy loam, 3 to 15 percent slopes
7034	4	9,999.000	0.00	Arizo-riverwash complex, 0 to 3 percent slopes
7035	5	9,999.000	0.00	Baboquivari-combate complex, 1 to 8 percent slopes
7036	6	9,999.000	0.00	Bucklebar-hayhook-tubac complex, 0 to 3 percent slopes
7037	7	9,999.000	0.00	Caralampi-selevin-kimrose complex, 5 to 50 percent slopes
7038	8	9,999.000	0.00	Casa grande-kamato complex, 0 to 1 percent slopes
7039	9	9,999.000	0.00	Casa grande-rositas-valencia complex, 0 to 5 percent slopes
70310	10	9,999.000	0.00	Cellar-lampshire-rock outcrop complex, 15 to 60 percent slopes
70311	11	9,999.000	0.00	Chiricahua-lampshire complex, 15 to 45 percent slopes
70312	12	9,999.000	0.00	Chuichu-rock outcrop complex, 15 to 45 percent slopes
70313	13	9,999.000	0.00	Chutum loam, 1 to 3 percent slopes
70314	14	9,999.000	0.00	Combate gravelly loamy coarse sand, 2 to 8 percent slopes
70315	15	9,999.000	0.00	Dateland-denure association, 1 to 3 percent slopes
70316	16	9,999.000	0.00	Delnorte-stagecoach complex, 1 to 20 percent slopes
70317	17	9,999.000	0.00	Delthorny-caracara complex, 3 to 25 percent slopes
70318	18	9,999.000	0.00	Delthorny-garzona-rock outcrop complex, 15 to 60 percent slopes
70319	19	9,999.000	0.00	Denure-momoli complex, 1 to 5 percent slopes
70320	20	9,999.000	0.00	Denure-pahaka complex, 1 to 3 percent slopes
70321	21	9,999.000	0.00	Dixaleta-rock outcrop complex, 15 to 70 percent slopes
70322	22	9,999.000	0.00	Far-spudrock-rock outcrop complex, 35 to 85 percent slopes
70323	23	9,999.000	0.00	Gachado-lomitas-rock outcrop complex, 15 to 45 percent slopes
70324	24	9,999.000	0.00	Gadsden silty clay loam, 0 to 1 percent slopes
70325	25	9,999.000	0.00	Gilman very fine sandy loam, 0 to 1 percent slopes
70326	26	9,999.000	0.00	Ginland silty clay, 0 to 1 percent slopes
70327	27	9,999.000	0.00	Glenbar loam, 0 to 1 percent slopes
70328	28	9,999.000	0.00	Glendale clay loam, 0 to 2 percent slopes, flooded
70329	29	9,999.000	0.00	Glendale silt loam, 1 to 3 percent slopes
70330	30	9,999.000	0.00	Glendale-pajarito complex, 1 to 3 percent slopes
70331	31	9,999.000	0.00	Grabe-vado complex, 1 to 5 percent slopes
70332	32	9,999.000	0.00	Granolite-rock outcrop complex, 15 to 65 percent slopes
70333	33	9,999.000	0.00	Gunsight-rillito complex, 1 to 8 percent slopes
70334	34	9,999.000	0.00	Hantz clay loam, 0 to 1 percent slopes
70335	35	9,999.000	0.00	Hayhook sandy loam, 1 to 5 percent slopes
70336	36	9,999.000	0.00	Hickiwan-gunsight-momoli complex, 3 to 15 percent slopes
70337	37	9,999.000	0.00	Hyder-rock outcrop-guvo complex, 10 to 45 percent slopes
70338	38	9,999.000	0.00	Keysto-riverwash complex, 0 to 5 percent slopes
70339	39	9,999.000	0.00	Kohatk-rock outcrop complex, 10 to 45 percent slopes
70340	40	9,999.000	0.00	Lajitas-bosa-rock outcrop complex, 15 to 50 percent slopes
70341	41	9,999.000	0.00	Lampshire-pantak-rock outcrop complex, 25 to 60 percent slopes
70342	42	9,999.000	0.00	Mohall loam, 0 to 2 percent slopes
70343	43	9,999.000	0.00	Mohall-pahaka complex, 1 to 3 percent slopes
70344	44	9,999.000	0.00	Mohall-trix complex, 0 to 1 percent slopes
70345	45	9,999.000	0.00	Nahda-stagecoach complex, 1 to 15 percent slopes
70346	46	9,999.000	0.00	Oracle-romero-rock outcrop complex, 5 to 35 percent slopes
70347	47	9,999.000	0.00	Pajarito-sahuarita complex, 1 to 3 percent slopes
70348	48	9,999.000	0.00	Pantano-granolite complex, 5 to 25 percent slopes
70349	49	9,999.000	0.00	Pinamt-momoli complex, 1 to 10 percent slopes
70350	50	9,999.000	0.00	Quilotosa extremely gravelly coarse sandy loam, 3 to 15 percent sl
70351	51	9,999.000	0.00	Quilotosa-rock outcrop-vaiva complex, 15 to 45 percent slopes
70352	52	9,999.000	0.00	Romero-lampshire-rock outcrop complex, 15 to 65 percent slopes
70353	53	9,999.000	0.00	Romero-rock outcrop complex, 10 to 40 percent slopes
70354	54	9,999.000	0.00	Rositas loamy fine sand, 2 to 5 percent slopes

Soil ID	Map Unit	XKSAT	Rock Percent	Description
Book Number: 703				
70355	55	9,999.000	0.00	Sasco loam, 0 to 1 percent slopes
70356	56	9,999.000	0.00	Soledad-topawa complex, 1 to 5 percent slopes
70357	57	9,999.000	0.00	Tatai silt loam, 0 to 2 percent slopes
70358	58	9,999.000	0.00	Tubac complex, 0 to 2 percent slopes
70359	59	9,999.000	0.00	Tucson-mohall-valencia complex, 1 to 3 percent slopes
70360	60	9,999.000	0.00	Vado-agustin complex, 1 to 8 percent slopes
70361	61	9,999.000	0.00	Vecont clay loam, 0 to 1 percent slopes
70362	62	9,999.000	0.00	Wintersburg loam, 0 to 1 percent slopes

Flood Control District of Maricopa County
Drainage Design Management System
Agency: FCDMC - LAND USE DEFAULTS
Project Reference: 118TH&JOMAX FU.COND.

Code	Description	Initial Abstraction IA	Percent Impervious RTIMP	Vegetation Cover	Moisture Deficit DTHETA	Resistance Coefficient Kb
Agriculture						
750	Agriculture	0.50	-	85.0	ORMAL	LOW
Commercial						
200	General Commercial (Commercial where no detail available)	0.10	80	60.0	ORMAL	MIN
210	Specialty Commercial (<=50,000 sq. ft.)	0.10	80	65.0	ORMAL	MIN
220	Neighborhood Commercial (50,000 to 100,000 sq. ft.)	0.10	80	65.0	ORMAL	MIN
230	Community Commercial (100,000 to 500,000 sq. ft.)	0.10	80	75.0	ORMAL	MIN
240	Regional Commercial (500,000 to 1,000,000 sq. ft.)	0.10	80	65.0	ORMAL	MIN
250	Super-Regional Commercial (>= 1,000,000 sq. ft.)	0.10	80	70.0	ORMAL	MIN
Industrial						
300	General Industrial (Industrial where no detail available)	0.15	55	60.0	ORMAL	MIN
310	Warehouse/Distribution Centers	0.10	80	75.0	ORMAL	MIN
320	Industrial	0.15	55	60.0	ORMAL	MIN
Institutional						
520	Educational (Public schools, private schools and universitie	0.29	45	80.0	ORMAL	MIN
530	Institutional (Includes hospitals and churches)	0.10	80	75.0	ORMAL	MIN
550	Public Facilities(Include community centers, power substatio	0.10	80	75.0	ORMAL	MIN
Landscaping						
2000	Landscaping with impervious under treatment	0.10	95	30.0	ORMAL	MIN
2001	Landscaping w/o impervious under treatment	0.20	-	30.0	ORMAL	MIN
Office						
400	Office General (Office where no detail available)	0.10	80	75.0	ORMAL	MIN
410	Office Low Rise (1-4 stories)	0.10	80	75.0	ORMAL	MIN
420	Office Mid Rise (5-12 stories)	0.10	80	75.0	ORMAL	MIN
430	Office High Rise (13 stories or more)	0.10	80	75.0	ORMAL	MIN
810	Business Park (Includes enclosed industrial, office or retai	0.10	80	75.0	ORMAL	MIN
Open Space						
540	Cemeteries	0.10	5	90.0	ORMAL	LOW
700	General Open Space (Open space where no detail available)	0.10	5	90.0	ORMAL	LOW
710	Active Open Space (Includes parks)	0.10	5	90.0	ORMAL	MIN
720	Golf courses	0.10	5	90.0	ORMAL	MIN
730	Passive Open Space (Includes mountain preserves and washes)	0.10	-	90.0	ORMAL	MAX
740	Water	0.00	-	0.0	WET	MIN
900	Vacant (Existing land use database only)	0.35	-	25.0	DRY	LOW
NDR	Undeveloped Desert Rangeland, Little topographic relief, slopes < 5%	0.35	-	9,999.0	DRY	LOW
UNDEVELOPED	Undeveloped Desert Land (Scottsdale)	0.30	1	30.0	ORMAL	MIN
NHS	Hillslopes, Sonoran Desert, Moderate topographic relief, slopes > 5%	0.15	-	9,999.0	DRY	HI
NMT	Mountain Terrain, High topographic relief, slopes > 10%	0.25	-	9,999.0	DRY	MAX
Other						
560	Special Events (Includes stadiums, sports complexes and fair	0.10	80	75.0	ORMAL	MIN
Other Employment						
570	Other Employment - low (Proving grounds and land fills)	0.10	80	75.0	ORMAL	MIN
580	Other Employment - medium	0.10	80	75.0	ORMAL	MIN
590	Other Employment - high	0.10	80	75.0	ORMAL	MIN
Residential						

Flood Control District of Maricopa County
Drainage Design Management System
Agency: FCDMC - LAND USE DEFAULTS
Project Reference: 118TH&JOMAX FU.COND.

Code	Description	Initial Abstraction IA	Percent Impervious RTIMP	Vegetation Cover	Moisture Deficit DTHETA	Resistance Coefficient Kb
Residential						
110	Rural Residential (<= 1/5 du per acre)	0.30	5	30.0	ORMAL	MIN
120	Estate Residential (1/5 du per acre to 1 du per acre)	0.30	5	30.0	ORMAL	MIN
130	Large Lot Residential - Single Family (1 du per acre to 2 du	0.30	15	50.0	ORMAL	MIN
140	Medium Lot Residential - Single Family (2-4 du per acre)	0.25	20	50.0	ORMAL	MIN
150	Small Lot Residential - Single Family (4-6 du per acre)	0.25	30	50.0	ORMAL	MIN
160	Very Small Lot Residential - Single Family (>6 du per acre-i	0.25	40	50.0	ORMAL	MIN
170	Medium Density Residential - Muli Family (5-10 du per acre)	0.25	45	50.0	ORMAL	MIN
180	High Density Residential - Multi Family (10-15 du per acre)	0.25	45	50.0	ORMAL	MIN
190	Very High Density Residential - Multi Family (> 15 du per ac	0.25	45	50.0	ORMAL	MIN
Tourist						
510	Tourist and Visitor Accommodations (Hotels, motels and resor	0.10	80	75.0	ORMAL	MIN
Transportation						
600	General Transportation (Transportation where no detail avail	0.10	80	75.0	ORMAL	MIN
610	Transportation (Includes railroads, railyards, transit cente	0.10	80	75.0	ORMAL	MIN
620	Airports (Includes public use airports)	0.15	55	60.0	ORMAL	MIN
630	Transportation	0.10	80	75.0	ORMAL	MIN
2002	Pavement and Rooftops	0.05	95	0.0	DRY	MIN
2003	Gravel Vehicular travel lanes and shoulders	0.10	5	0.0	DRY	MIN

Area ID	Book Number	Map Unit	Soil ID	Area (sq mi)	Area (%)	XKSAT	Rock Percent (%)	Effective Rock (%)	Comments
Major Basin ID: 01									
01	645	61	64561	0.017	100.00	0.150	-	100	
010	645	61	64561	0.001	100.00	0.150	-	100	
011	645	61	64561	0.018	100.00	0.150	-	100	
012	645	61	64561	0.012	100.00	0.150	-	100	
013	645	61	64561	0.010	100.00	0.150	-	100	
014	645	61	64561	0.007	100.00	0.150	-	100	
015	645	61	64561	0.002	100.00	0.150	-	100	
016	645	61	64561	0.001	100.00	0.150	-	100	
017	645	61	64561	0.006	100.00	0.150	-	100	
018	645	61	64561	0.007	100.00	0.150	-	100	
019	645	61	64561	0.001	100.00	0.150	-	100	
02	645	61	64561	0.002	100.00	0.150	-	100	
020	645	61	64561	0.003	100.00	0.150	-	100	
021	645	61	64561	0.003	100.00	0.150	-	100	
022	645	61	64561	0.009	100.00	0.150	-	100	
023	645	61	64561	0.003	100.00	0.150	-	100	
03	645	61	64561	0.003	100.00	0.150	-	100	
04	645	61	64561	0.003	100.00	0.150	-	100	
05	645	61	64561	0.003	100.00	0.150	-	100	
06	645	61	64561	0.003	100.00	0.150	-	100	
07	645	61	64561	0.002	100.00	0.150	-	100	
08	645	61	64561	0.002	100.00	0.150	-	100	
09	645	61	64561	0.002	100.00	0.150	-	100	
DS01	645	61	64561	0.009	100.00	0.150	-	100	
DS02	645	61	64561	0.003	100.00	0.150	-	100	
DS03	645	61	64561	0.006	100.00	0.150	-	100	
DS04	645	61	64561	0.003	100.00	0.150	-	100	

Flood Control District of Maricopa County
Drainage Design Management System
LAND USE
Project Reference: 118TH&JOMAX EX.COND.

Sub Basin	Land Use Code	Area (sq mi)	Area (%)	Initial Loss (IA)	Percent Impervious (RTIMP)	Vegetation Cover (%)	DTHETA	Kb	Description
Major Basin ID: 01									
01	UNDEVELOPED	0.0170	100.0	0.30	1	30.0	NORMAL	0.034	Undeveloped Desert Land (Scottsdale)
		0.0170	**100.0**						
010	UNDEVELOPED	0.0010	100.0	0.30	1	30.0	NORMAL	0.041	Undeveloped Desert Land (Scottsdale)
		0.0010	**100.0**						
011	UNDEVELOPED	0.0180	100.0	0.30	1	30.0	NORMAL	0.033	Undeveloped Desert Land (Scottsdale)
		0.0180	**100.0**						
012	UNDEVELOPED	0.0120	100.0	0.30	1	30.0	NORMAL	0.034	Undeveloped Desert Land (Scottsdale)
		0.0120	**100.0**						
013	UNDEVELOPED	0.0100	100.0	0.30	1	30.0	NORMAL	0.035	Undeveloped Desert Land (Scottsdale)
		0.0100	**100.0**						
014	UNDEVELOPED	0.0070	100.0	0.30	1	30.0	NORMAL	0.036	Undeveloped Desert Land (Scottsdale)
		0.0070	**100.0**						
015	UNDEVELOPED	0.0020	100.0	0.30	1	30.0	NORMAL	0.039	Undeveloped Desert Land (Scottsdale)
		0.0020	**100.0**						
016	UNDEVELOPED	0.0010	100.0	0.30	1	30.0	NORMAL	0.041	Undeveloped Desert Land (Scottsdale)
		0.0010	**100.0**						
017	UNDEVELOPED	0.0060	100.0	0.30	1	30.0	NORMAL	0.036	Undeveloped Desert Land (Scottsdale)
		0.0060	**100.0**						
018	UNDEVELOPED	0.0070	100.0	0.30	1	30.0	NORMAL	0.036	Undeveloped Desert Land (Scottsdale)
		0.0070	**100.0**						
019	UNDEVELOPED	0.0010	100.0	0.30	1	30.0	NORMAL	0.041	Undeveloped Desert Land (Scottsdale)

* Non default value

Sub Basin	Land Use Code	Area (sq mi)	Area (%)	Initial Loss (IA)	Percent Impervious (RTIMP)	Vegetation Cover (%)	DTHETA	Kb	Description
Major Basin ID: 01									
		0.0010	**100.0**						
02	UNDEVELOPED	0.0020	100.0	0.30	1	30.0	NORMAL	0.039	Undeveloped Desert Land (Scottsdale)
		0.0020	**100.0**						
020	UNDEVELOPED	0.0030	100.0	0.30	1	30.0	NORMAL	0.038	Undeveloped Desert Land (Scottsdale)
		0.0030	**100.0**						
021	UNDEVELOPED	0.0030	100.0	0.30	1	30.0	NORMAL	0.038	Undeveloped Desert Land (Scottsdale)
		0.0030	**100.0**						
022	UNDEVELOPED	0.0090	100.0	0.30	1	30.0	NORMAL	0.035	Undeveloped Desert Land (Scottsdale)
		0.0090	**100.0**						
023	UNDEVELOPED	0.0030	100.0	0.30	1	30.0	NORMAL	0.038	Undeveloped Desert Land (Scottsdale)
		0.0030	**100.0**						
03	UNDEVELOPED	0.0020	100.0	0.30	1	30.0	NORMAL	0.039	Undeveloped Desert Land (Scottsdale)
		0.0020	**100.0**						
04	UNDEVELOPED	0.0030	100.0	0.30	1	30.0	NORMAL	0.038	Undeveloped Desert Land (Scottsdale)
		0.0030	**100.0**						
05	UNDEVELOPED	0.0030	100.0	0.30	1	30.0	NORMAL	0.038	Undeveloped Desert Land (Scottsdale)
		0.0030	**100.0**						
06	UNDEVELOPED	0.0030	100.0	0.30	1	30.0	NORMAL	0.038	Undeveloped Desert Land (Scottsdale)
		0.0030	**100.0**						
07	UNDEVELOPED	0.0020	100.0	0.30	1	30.0	NORMAL	0.039	Undeveloped Desert Land (Scottsdale)

* Non default value

Flood Control District of Maricopa County
Drainage Design Management System
LAND USE
Project Reference: 118TH&JOMAX EX.COND.

Sub Basin	Land Use Code	Area (sq mi)	Area (%)	Initial Loss (IA)	Percent Impervious (RTIMP)	Vegetation Cover (%)	DTHETA	Kb	Description
Major Basin ID: 01									
		0.0020	**100.0**						
08	UNDEVELOPED	0.0020	100.0	0.30	1	30.0	NORMAL	0.039	Undeveloped Desert Land (Scottsdale)
		0.0020	**100.0**						
09	UNDEVELOPED	0.0020	100.0	0.30	1	30.0	NORMAL	0.039	Undeveloped Desert Land (Scottsdale)
		0.0020	**100.0**						
DS01	120	0.0090	100.0	0.30	15 *	30.0	NORMAL	0.035	Estate Residential (1/5 du per acre to 1 du per acre)
		0.0090	**100.0**						
DS02	120	0.0030	100.0	0.30	15 *	30.0	NORMAL	0.038	Estate Residential (1/5 du per acre to 1 du per acre)
		0.0030	**100.0**						
DS03	120	0.0060	100.0	0.30	15 *	30.0	NORMAL	0.036	Estate Residential (1/5 du per acre to 1 du per acre)
		0.0060	**100.0**						
DS04	120	0.0030	100.0	0.30	15 *	30.0	NORMAL	0.038	Estate Residential (1/5 du per acre to 1 du per acre)
		0.0030	**100.0**						

* Non default value

Flood Control District of Maricopa County
Drainage Design Management System
SUB BASINS
Project Reference: 118TH&JOMAX EX.COND.

Area ID	Sub Basin Parameters						Rainfall Losses						Return Period Parameters					
	Area (sq mi)	Length (mi)	Slope (ft/mi)	Adj Slope	Time-Area	Kb	IA (in)	DTHETA	PSIF (in)	XKSAT (in/hr)	RTIMP (%)		2 Yr	5 Yr	10 Yr	25 Yr	50 Yr	100 Yr
Major Basin ID: 01																		
DS01	0.009	0.12	201.7	201.6	HEC1 DEFAULT	0.035	0.30	0.25	6.00	0.183	15	**Tc (Hrs)**	0.147	0.138	0.125	0.112	0.105	0.098
												Vel (f/s)	1.20	1.28	1.41	1.57	1.68	1.80
												R (Hrs)	0.119	0.111	0.099	0.088	0.081	0.076
DS02	0.003	0.18	135.6	135.6	HEC1 DEFAULT	0.038	0.30	0.25	6.00	0.183	15	**Tc (Hrs)**	0.213	0.200	0.181	0.162	0.151	0.142
												Vel (f/s)	1.24	1.32	1.46	1.63	1.75	1.86
												R (Hrs)	0.462	0.431	0.386	0.341	0.316	0.296
DS03	0.006	0.13	134.9	134.9	HEC1 DEFAULT	0.036	0.30	0.25	6.00	0.183	15	**Tc (Hrs)**	0.176	0.166	0.150	0.134	0.125	0.118
												Vel (f/s)	1.08	1.15	1.27	1.42	1.53	1.62
												R (Hrs)	0.194	0.182	0.163	0.144	0.133	0.124
DS04	0.003	0.13	166.7	166.7	HEC1 DEFAULT	0.038	0.30	0.25	6.00	0.183	15	**Tc (Hrs)**	0.170	0.160	0.144	0.129	0.120	0.113
												Vel (f/s)	1.12	1.19	1.32	1.48	1.59	1.69
												R (Hrs)	0.277	0.259	0.232	0.204	0.189	0.177
01	0.017	0.26	137.4	137.4	HEC1 DEFAULT	0.034	0.30	0.25	6.00	0.183	1	**Tc (Hrs)**	0.255*	0.238	0.212	0.188	0.174	0.163
												Vel (f/s)	1.50	1.60	1.80	2.03	2.19	2.34
												R (Hrs)	0.281	0.261	0.230	0.201	0.185	0.172
02	0.002	0.08	185.2	185.2	HEC1 DEFAULT	0.039	0.30	0.25	6.00	0.183	1	**Tc (Hrs)**	0.138	0.129	0.115	0.102	0.095	0.089
												Vel (f/s)	0.85	0.91	1.02	1.15	1.24	1.32
												R (Hrs)	0.188	0.174	0.154	0.134	0.124	0.115
03	0.002	0.09	188.2	188.2	HEC1 DEFAULT	0.039	0.30	0.25	6.00	0.183	1	**Tc (Hrs)**	0.146	0.136	0.122	0.108	0.100	0.094
												Vel (f/s)	0.90	0.97	1.08	1.22	1.32	1.40
												R (Hrs)	0.220	0.204	0.180	0.157	0.144	0.134
04	0.003	0.11	181.0	181.0	HEC1 DEFAULT	0.038	0.30	0.25	6.00	0.183	1	**Tc (Hrs)**	0.161	0.150	0.134	0.119	0.110	0.103
												Vel (f/s)	1.00	1.08	1.20	1.36	1.47	1.57
												R (Hrs)	0.229	0.212	0.187	0.163	0.150	0.140
05	0.003	0.10	195.9	195.9	HEC1 DEFAULT	0.038	0.30	0.25	6.00	0.183	1	**Tc (Hrs)**	0.150	0.140	0.125	0.110	0.103	0.096
												Vel (f/s)	0.98	1.05	1.17	1.33	1.42	1.53
												R (Hrs)	0.195	0.181	0.160	0.139	0.128	0.120

* Non default value or value out of range

Area ID	Sub Basin Parameters						Rainfall Losses						Return Period Parameters					
	Area (sq mi)	Length (mi)	Slope (ft/mi)	Adj Slope	Time-Area	Kb	IA (in)	DTHETA	PSIF (in)	XKSAT (in/hr)	RTIMP (%)		2 Yr	5 Yr	10 Yr	25 Yr	50 Yr	100 Yr
Major Basin ID: 01																		
06	0.003	0.15	176.5	176.5	HEC1 DEFAULT	0.038	0.30	0.25	6.00	0.183	1	**Tc (Hrs)**	0.190	0.177	0.158	0.140	0.130	0.122
												Vel (f/s)	1.16	1.24	1.39	1.57	1.69	1.80
												R (Hrs)	0.351	0.325	0.287	0.250	0.230	0.215
07	0.002	0.06	285.7	257.9	HEC1 DEFAULT	0.039	0.30	0.25	6.00	0.183	1	**Tc (Hrs)**	0.108	0.101	0.090	0.080	0.074	0.069
												Vel (f/s)	0.81	0.87	0.98	1.10	1.19	1.28
												R (Hrs)	0.114	0.105	0.093	0.081	0.075	0.070
08	0.002	0.12	156.5	156.5	HEC1 DEFAULT	0.039	0.30	0.25	6.00	0.183	1	**Tc (Hrs)**	0.178	0.166	0.149	0.132	0.122	0.115
												Vel (f/s)	0.99	1.06	1.18	1.33	1.44	1.53
												R (Hrs)	0.346	0.320	0.283	0.247	0.227	0.212
09	0.002	0.13	186.6	186.6	HEC1 DEFAULT	0.039	0.30	0.25	6.00	0.183	1	**Tc (Hrs)**	0.176	0.164	0.147	0.130	0.120	0.113
												Vel (f/s)	1.08	1.16	1.30	1.47	1.59	1.69
												R (Hrs)	0.363	0.336	0.297	0.259	0.238	0.222
010	0.001	0.03	172.4	172.4	HEC1 DEFAULT	0.041	0.30	0.25	6.00	0.183	1	**Tc (Hrs)**	0.089	0.083	0.074	0.065	0.061	0.057
												Vel (f/s)	0.49	0.53	0.59	0.68	0.72	0.77
												R (Hrs)	0.078	0.072	0.064	0.056	0.051	0.048
011	0.018	0.39	117.0	117.0	HEC1 DEFAULT	0.033	0.30	0.25	6.00	0.183	1	**Tc (Hrs)**	0.323*	0.301*	0.269*	0.238	0.221	0.207
												Vel (f/s)	1.77	1.90	2.13	2.40	2.59	2.76
												R (Hrs)	0.490	0.454	0.401	0.349	0.322	0.300
012	0.012	0.32	129.6	129.6	HEC1 DEFAULT	0.034	0.30	0.25	6.00	0.183	1	**Tc (Hrs)**	0.288*	0.268*	0.240	0.212	0.197	0.185
												Vel (f/s)	1.63	1.75	1.96	2.21	2.38	2.54
												R (Hrs)	0.464	0.429	0.380	0.331	0.304	0.284
013	0.010	0.19	139.9	139.9	HEC1 DEFAULT	0.035	0.30	0.25	6.00	0.183	1	**Tc (Hrs)**	0.220	0.205	0.183	0.162	0.150	0.141
												Vel (f/s)	1.27	1.36	1.52	1.72	1.86	1.98
												R (Hrs)	0.251	0.233	0.206	0.179	0.165	0.154
014	0.007	0.20	167.5	167.5	HEC1 DEFAULT	0.036	0.30	0.25	6.00	0.183	1	**Tc (Hrs)**	0.216	0.202	0.181	0.159	0.148	0.139
												Vel (f/s)	1.36	1.45	1.62	1.84	1.98	2.11
												R (Hrs)	0.316	0.292	0.258	0.225	0.207	0.193

* Non default value or value out of range

Flood Control District of Maricopa County
Drainage Design Management System
SUB BASINS
Project Reference: 118TH&JOMAX EX.COND.

Area ID	Sub Basin Parameters						Rainfall Losses						Return Period Parameters					
	Area (sq mi)	Length (mi)	Slope (ft/mi)	Adj Slope	Time-Area	Kb	IA (in)	DTHETA	PSIF (in)	XKSAT (in/hr)	RTIMP (%)		2 Yr	5 Yr	10 Yr	25 Yr	50 Yr	100 Yr
Major Basin ID: 01																		
015	0.002	0.05	296.3	262.0	HEC1 DEFAULT	0.039	0.30	0.25	6.00	0.183	1	**Tc (Hrs)**	0.098	0.092	0.082	0.072	0.067	0.063
												Vel (f/s)	0.75	0.80	0.89	1.02	1.09	1.16
												R (Hrs)	0.088	0.082	0.072	0.063	0.058	0.054
016	0.001	0.03	323.5	270.9	HEC1 DEFAULT	0.041	0.30	0.25	6.00	0.183	1	**Tc (Hrs)**	0.077	0.072	0.064	0.057	0.053	0.050
												Vel (f/s)	0.57	0.61	0.69	0.77	0.83	0.88
												R (Hrs)	0.067	0.062	0.055	0.048	0.044	0.041
017	0.006	0.13	223.1	220.8	HEC1 DEFAULT	0.036	0.30	0.25	6.00	0.183	1	**Tc (Hrs)**	0.160	0.149	0.134	0.118	0.110	0.103
												Vel (f/s)	1.19	1.28	1.42	1.62	1.73	1.85
												R (Hrs)	0.175	0.162	0.143	0.125	0.115	0.107
018	0.007	0.25	122.4	122.4	HEC1 DEFAULT	0.036	0.30	0.25	6.00	0.183	1	**Tc (Hrs)**	0.266*	0.249	0.222	0.196	0.182	0.171
												Vel (f/s)	1.38	1.47	1.65	1.87	2.01	2.14
												R (Hrs)	0.476	0.441	0.389	0.339	0.312	0.291
019	0.001	0.05	226.4	223.4	HEC1 DEFAULT	0.041	0.30	0.25	6.00	0.183	1	**Tc (Hrs)**	0.106	0.099	0.088	0.078	0.072	0.068
												Vel (f/s)	0.69	0.74	0.83	0.94	1.02	1.08
												R (Hrs)	0.143	0.132	0.117	0.102	0.094	0.087
020	0.003	0.12	172.1	172.1	HEC1 DEFAULT	0.038	0.30	0.25	6.00	0.183	1	**Tc (Hrs)**	0.171	0.159	0.143	0.126	0.117	0.110
												Vel (f/s)	1.03	1.11	1.23	1.40	1.50	1.60
												R (Hrs)	0.262	0.242	0.214	0.187	0.172	0.160
021	0.003	0.11	166.7	166.7	HEC1 DEFAULT	0.038	0.30	0.25	6.00	0.183	1	**Tc (Hrs)**	0.165	0.154	0.138	0.122	0.113	0.106
												Vel (f/s)	0.98	1.05	1.17	1.32	1.43	1.52
												R (Hrs)	0.235	0.218	0.192	0.168	0.154	0.144
022	0.009	0.15	142.9	142.9	HEC1 DEFAULT	0.035	0.30	0.25	6.00	0.183	1	**Tc (Hrs)**	0.194	0.181	0.162	0.143	0.133	0.125
												Vel (f/s)	1.13	1.22	1.36	1.54	1.65	1.76
												R (Hrs)	0.192	0.178	0.157	0.137	0.126	0.118
023	0.003	0.10	313.1	267.8	HEC1 DEFAULT	0.038	0.30	0.25	6.00	0.183	1	**Tc (Hrs)**	0.136	0.127	0.114	0.100	0.093	0.087
												Vel (f/s)	1.08	1.15	1.29	1.47	1.58	1.69
												R (Hrs)	0.176	0.163	0.144	0.125	0.115	0.107

* Non default value or value out of range

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1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             JUN  1998                 *
*           VERSION 4.1                 *
*                                       *
*  RUN DATE   03FEB17  TIME  10:03:54   *
*                                       *
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*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*         609 SECOND STREET             *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 756-1104              *
*                                       *
*****************************************
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X     X  XXXXXXX   XXXXX           X
X     X  X        X     X         XX
X     X  X        X                X
XXXXXXX  XXXX     X        XXXXX   X
X     X  X        X                X
X     X  X        X     X          X
X     X  XXXXXXX   XXXXX          XXX
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THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM


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LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

   1          ID        Flood Control District of Maricopa County
   2          ID        118TH & JOMAX - EXISTING CONDITIONS
   3          ID        2 YEAR
   4          ID        6 Hour  Storm
   5          ID        Unit Hydrograph: Clark
   6          ID        Storm: Multiple
   7          ID        12/28/2016
              *DIAGRAM
   8          IT       1  1JAN99       0    2000
   9          IO       5
  10          IN      15
              *
  11          JD   1.438  0.0001
  12          PC   0.000   0.008   0.016   0.025   0.033   0.041   0.050   0.058   0.066   0.074
  13          PC   0.087   0.099   0.118   0.138   0.216   0.377   0.834   0.911   0.931   0.950
  14          PC   0.962   0.972   0.983   0.991   1.000
  15          JD   1.429  0.5000
  16          PC   0.000   0.008   0.016   0.025   0.033   0.041   0.050   0.058   0.066   0.074
  17          PC   0.087   0.099   0.118   0.138   0.216   0.377   0.834   0.911   0.931   0.950
  18          PC   0.962   0.972   0.983   0.991   1.000
              *

  19          KK    DS01   BASIN
  20          BA   0.009
  21          LG    0.30    0.25    6.00    0.18      15
  22          UC   0.147   0.119
  23          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  24          UA     100
              *

  25          KK   RDS01   ROUTE
  26          RD     226  0.0265   0.035            TRAP   2.500   10.00
              *

  27          KK    DS02   BASIN
  28          BA   0.003
  29          LG    0.30    0.25    6.00    0.18      15
  30          UC   0.213   0.462
  31          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  32          UA     100
              *

  33          KK   CDS12 COMBINE
  34          HC       2
              *

  35          KK  RCDS12   ROUTE
  36          RD     209  0.0143   0.035            TRAP   4.000   10.00
              *
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LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  37          KK    DS03   BASIN
  38          BA   0.006
  39          LG    0.30    0.25    6.00    0.18      15
  40          UC   0.176   0.194
  41          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  42          UA     100
              *

  43          KK   RDS03   ROUTE
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 44          RD     467  0.0230   0.035           TRAP   3.500   10.00
             *

 45          KK    DS04   BASIN
 46          BA   0.003
 47          LG    0.30    0.25    6.00    0.18      15
 48          UC   0.170   0.277
 49          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 50          UA     100
             *

 51          KK    CDS34 COMBINE
 52          HC        2
             *

 53          KK   RCDS34   ROUTE
 54          RD     232  0.0172   0.035           TRAP   3.000   10.00
             *

 55          KK       02   BASIN
 56          BA   0.002
 57          LG    0.30    0.25    6.00    0.18       1
 58          UC   0.138   0.188
 59          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 60          UA     100
             *

 61          KK       03   BASIN
 62          BA   0.002
 63          LG    0.30    0.25    6.00    0.18       1
 64          UC   0.146   0.220
 65          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 66          UA     100
             *

 67          KK    CO23 COMBINE
 68          HC        4
             *

 69          KK   RC023   ROUTE
 70          RD     449  0.0178   0.035           TRAP   4.000   10.00
             *
                                        HEC-1 INPUT                                          PAGE  3
LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 71          KK       01   BASIN
 72          BA   0.017
 73          LG    0.30    0.25    6.00    0.18       1
 74          UC   0.255   0.281
 75          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 76          UA     100
             *

 77          KK       04   BASIN
 78          BA   0.003
 79          LG    0.30    0.25    6.00    0.18       1
 80          UC   0.161   0.229
 81          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 82          UA     100
             *

 83          KK    CO14 COMBINE
 84          HC        3
             *

 85          KK   RC014   ROUTE
 86          RD     412  0.0194   0.035           TRAP   5.000   10.00
             *

 87          KK       05   BASIN
 88          BA   0.003
 89          LG    0.30    0.25    6.00    0.18       1
 90          UC   0.150   0.195
 91          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 92          UA     100
             *

 93          KK       06   BASIN
 94          BA   0.003
 95          LG    0.30    0.25    6.00    0.18       1
 96          UC   0.190   0.351
 97          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 98          UA     100
             *

 99          KK    CO56 COMBINE
100          HC        3
             *

101          KK   RC056   ROUTE
102          RD     195  0.0154   0.035           TRAP   5.000   10.00
             *

103          KK       07   BASIN
104          BA   0.002
105          LG    0.30    0.25    6.00    0.18       1
106          UC   0.108   0.114
107          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
108          UA     100
```

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
  109     KK     C07 COMBINE
  110     HC       2
          *
  111     KK     011   BASIN
  112     BA   0.018
  113     LG    0.30    0.25    6.00    0.18       1
  114     UC   0.323   0.490
  115     UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  116     UA     100
          *
  117     KK     012   BASIN
  118     BA   0.012
  119     LG    0.30    0.25    6.00    0.18       1
  120     UC   0.288   0.464
  121     UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  122     UA     100
          *
  123     KK   C1112 COMBINE
  124     HC       2
          *
  125     KK  RC1112   ROUTE
  126     RD     645  0.0170   0.035            TRAP   8.000   10.00
          *
  127     KK     013   BASIN
  128     BA   0.010
  129     LG    0.30    0.25    6.00    0.18       1
  130     UC   0.220   0.251
  131     UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  132     UA     100
          *
  133     KK     014   BASIN
  134     BA   0.007
  135     LG    0.30    0.25    6.00    0.18       1
  136     UC   0.216   0.316
  137     UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  138     UA     100
          *
  139     KK    R014   ROUTE
  140     RD     242  0.0165   0.035            TRAP   7.000   10.00
          *
  141     KK   C1314 COMBINE
  142     HC       3
          *
```



```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
  143     KK      08   BASIN
  144     BA   0.002
  145     LG    0.30    0.25    6.00    0.18       1
  146     UC   0.178   0.346
  147     UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  148     UA     100
          *
  149     KK      09   BASIN
  150     BA   0.002
  151     LG    0.30    0.25    6.00    0.18       1
  152     UC   0.176   0.363
  153     UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  154     UA     100
          *
  155     KK     010   BASIN
  156     BA   0.001
  157     LG    0.30    0.25    6.00    0.18       1
  158     UC   0.089   0.078
  159     UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  160     UA     100
          *
  161     KK     015   BASIN
  162     BA   0.002
  163     LG    0.30    0.25    6.00    0.18       1
  164     UC   0.098   0.088
  165     UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  166     UA     100
          *
  167     KK     016   BASIN
  168     BA   0.001
  169     LG    0.30    0.25    6.00    0.18       1
  170     UC   0.077   0.067
  171     UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  172     UA     100
          *
```

```
 173          KK     017   BASIN
 174          BA   0.006
 175          LG    0.30    0.25    6.00    0.18       1
 176          UC   0.160   0.175
 177          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 178          UA     100
              *

 179          KK     018   BASIN
 180          BA   0.007
 181          LG    0.30    0.25    6.00    0.18       1
 182          UC   0.266   0.476
 183          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 184          UA     100
              *
```



```
LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 185          KK     019   BASIN
 186          BA   0.001
 187          LG    0.30    0.25    6.00    0.18       1
 188          UC   0.106   0.143
 189          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 190          UA     100
              *

 191          KK     020   BASIN
 192          BA   0.003
 193          LG    0.30    0.25    6.00    0.18       1
 194          UC   0.171   0.262
 195          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 196          UA     100
              *

 197          KK     021   BASIN
 198          BA   0.003
 199          LG    0.30    0.25    6.00    0.18       1
 200          UC   0.165   0.235
 201          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 202          UA     100
              *

 203          KK     022   BASIN
 204          BA   0.009
 205          LG    0.30    0.25    6.00    0.18       1
 206          UC   0.194   0.192
 207          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 208          UA     100
              *

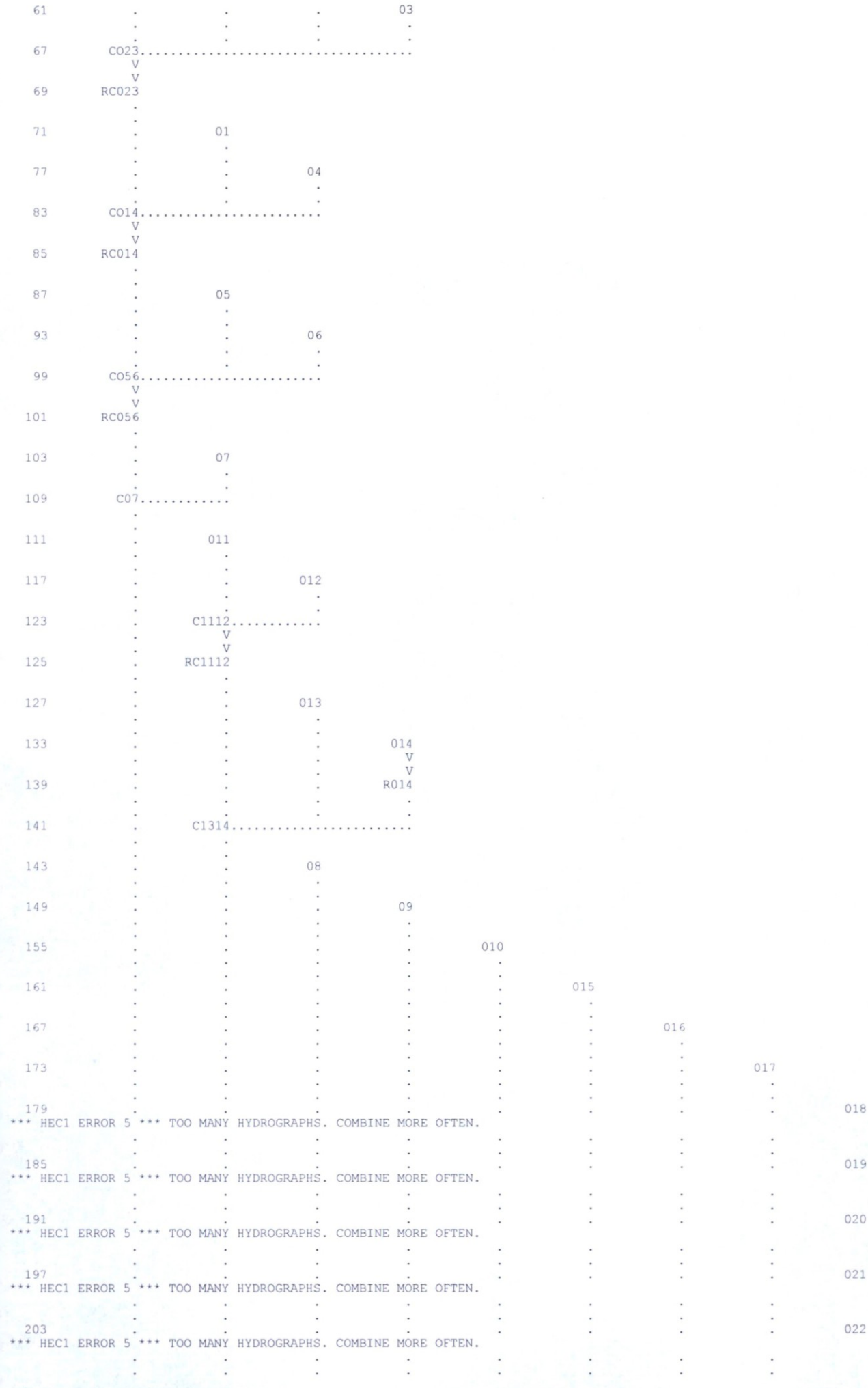
 209          KK     023   BASIN
 210          BA   0.003
 211          LG    0.30    0.25    6.00    0.18       1
 212          UC   0.136   0.176
 213          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 214          UA     100
              *
 215          ZZ
```

SCHEMATIC DIAGRAM OF STREAM NETWORK

```
INPUT
 LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

  NO.      (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

   19        DS01
              V
              V
   25       RDS01
              .
              .
   27          .        DS02
               .          .
               .          .
   33       CDS12.............
              V
              V
   35      RCDS12
              .
              .
   37          .        DS03
               .          V
               .          V
   43          .       RDS03
               .          .
               .          .
   45          .          .        DS04
               .          .          .
               .          .          .
   51          .       CDS34.............
               .          V
               .          V
   53          .      RCDS34
               .          .
               .          .
   55          .          .          02
               .          .          .
               .          .          .
```



*** HEC1 ERROR 5 *** TOO MANY HYDROGRAPHS. COMBINE MORE OFTEN.

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*** HEC1 ERROR 5 *** TOO MANY HYDROGRAPHS. COMBINE MORE OFTEN.

```
  209         .           .           .           .           .           .           .           .           023

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

      5 ERRORS IN STREAM SYSTEM
1*****************************************                                                          ***************************************
 *                                       *                                                          *                                     *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *                                                          *  U.S. ARMY CORPS OF ENGINEERS       *
 *              JUN   1998               *                                                          *  HYDROLOGIC ENGINEERING CENTER      *
 *            VERSION 4.1                *                                                          *        609 SECOND STREET            *
 *                                       *                                                          *     DAVIS, CALIFORNIA 95616         *
 * RUN DATE   03FEB17  TIME  10:03:54    *                                                          *        (916) 756-1104               *
 *                                       *                                                          *                                     *
*****************************************                                                          ***************************************




                                   Flood Control District of Maricopa County
                                   118TH & JOMAX - EXISTING CONDITIONS
                                   2 YEAR
                                   6 Hour  Storm
                                   Unit Hydrograph: Clark
                                   Storm: Multiple
                                   12/28/2016

    9 IO          OUTPUT CONTROL VARIABLES
                        IPRNT           5  PRINT CONTROL
                        IPLOT           0  PLOT CONTROL
                        QSCAL          0.  HYDROGRAPH PLOT SCALE

      IT          HYDROGRAPH TIME DATA
                         NMIN           1  MINUTES IN COMPUTATION INTERVAL
                        IDATE      1JAN99  STARTING DATE
                        ITIME        0000  STARTING TIME
                           NQ        2000  NUMBER OF HYDROGRAPH ORDINATES
                       NDDATE      2JAN99  ENDING DATE
                       NDTIME        0919  ENDING TIME
                       ICENT           19  CENTURY MARK

                    COMPUTATION INTERVAL     .02 HOURS
                         TOTAL TIME BASE   33.32 HOURS

             ENGLISH UNITS
                  DRAINAGE AREA         SQUARE MILES
                  PRECIPITATION DEPTH   INCHES
                  LENGTH, ELEVATION     FEET
                  FLOW                  CUBIC FEET PER SECOND
                  STORAGE VOLUME        ACRE-FEET
                  SURFACE AREA          ACRES
                  TEMPERATURE           DEGREES FAHRENHEIT

   11 JD          INDEX STORM NO. 1
                         STRM        1.44  PRECIPITATION DEPTH
                         TRDA         .00  TRANSPOSITION DRAINAGE AREA

   12 PI            PRECIPITATION PATTERN
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .01       .01       .01       .01       .01
                        .01       .01       .01       .01       .01       .01       .01       .01       .01       .01
                        .01       .01       .01       .01       .01       .01       .01       .01       .01       .01
                        .01       .01       .01       .01       .01       .03       .03       .03       .03       .03
                        .03       .03       .03       .03       .03       .03       .03       .03       .03       .03
                        .01       .01       .01       .01       .01       .01       .01       .01       .01       .01
                        .01       .01       .01       .01       .01       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00

   15 JD          INDEX STORM NO. 2
                         STRM        1.43  PRECIPITATION DEPTH
                         TRDA         .50  TRANSPOSITION DRAINAGE AREA

   16 PI            PRECIPITATION PATTERN
                        .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
```

```
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .01       .01       .01       .01       .01
                    .01       .01       .01       .01       .01       .01       .01       .01       .01       .01
                    .01       .01       .01       .01       .01       .01       .01       .01       .01       .01
                    .01       .01       .01       .01       .01       .03       .03       .03       .03       .03
                    .03       .03       .03       .03       .03       .03       .03       .03       .03       .03
                    .01       .01       .01       .01       .01       .01       .01       .01       .01       .01
                    .01       .01       .01       .01       .01       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
1

                                                         RUNOFF SUMMARY
                                                 FLOW IN CUBIC FEET PER SECOND
                                              TIME IN HOURS,  AREA IN SQUARE MILES

                                         PEAK     TIME OF      AVERAGE FLOW FOR MAXIMUM PERIOD         BASIN     MAXIMUM     TIME OF
            OPERATION       STATION      FLOW      PEAK                                                 AREA      STAGE     MAX STAGE
+                                                                6-HOUR       24-HOUR       72-HOUR

            HYDROGRAPH AT
+                              DS01         9.     4.05          1.            0.            0.          .01

            ROUTED TO
+                             RDS01         9.     4.07          1.            0.            0.          .01

            HYDROGRAPH AT
+                              DS02         1.     4.13          0.            0.            0.          .00

            2 COMBINED AT
+                             CDS12        10.     4.07          1.            0.            0.          .01

            ROUTED TO
+                            RCDS12        10.     4.08          1.            0.            0.          .01

            HYDROGRAPH AT
+                              DS03         5.     4.07          0.            0.            0.          .01

            ROUTED TO
+                             RDS03         5.     4.12          0.            0.            0.          .01

            HYDROGRAPH AT
+                              DS04         2.     4.08          0.            0.            0.          .00

            2 COMBINED AT
+                             CDS34         7.     4.10          1.            0.            0.          .01

            ROUTED TO
+                            RCDS34         7.     4.13          1.            0.            0.          .01

            HYDROGRAPH AT
+                                02         1.     4.05          0.            0.            0.          .00

            HYDROGRAPH AT
+                                03         1.     4.07          0.            0.            0.          .00

            4 COMBINED AT
+                              CO23        19.     4.10          1.            0.            0.          .03

            ROUTED TO
+                             RCO23        19.     4.12          1.            0.            0.          .03

            HYDROGRAPH AT
+                                01         9.     4.13          1.            0.            0.          .02

            HYDROGRAPH AT
+                                04         2.     4.07          0.            0.            0.          .00

            3 COMBINED AT
+                              CO14        30.     4.12          2.            1.            0.          .05

            ROUTED TO
+                             RCO14        30.     4.15          2.            1.            0.          .05

            HYDROGRAPH AT
+                                05         2.     4.07          0.            0.            0.          .00
```

HYDROGRAPH AT	06	2.	4.10	0.	0.	0.	.00
3 COMBINED AT	CO56	33.	4.15	3.	1.	0.	.05
ROUTED TO	RC056	33.	4.15	3.	1.	0.	.05
HYDROGRAPH AT	07	2.	4.03	0.	0.	0.	.00
2 COMBINED AT	C07	34.	4.15	3.	1.	0.	.05
HYDROGRAPH AT	011	7.	4.20	1.	0.	0.	.02
HYDROGRAPH AT	012	5.	4.18	1.	0.	0.	.01
2 COMBINED AT	C1112	11.	4.20	1.	0.	0.	.03
ROUTED TO	RC1112	11.	4.25	1.	0.	0.	.03
HYDROGRAPH AT	013	6.	4.12	0.	0.	0.	.01
HYDROGRAPH AT	014	4.	4.12	0.	0.	0.	.01
ROUTED TO	R014	4.	4.15	0.	0.	0.	.01
3 COMBINED AT	C1314	19.	4.18	2.	1.	0.	.05
HYDROGRAPH AT	08	1.	4.10	0.	0.	0.	.00
HYDROGRAPH AT	09	1.	4.10	0.	0.	0.	.00
HYDROGRAPH AT	010	1.	4.02	0.	0.	0.	.00
HYDROGRAPH AT	015	2.	4.02	0.	0.	0.	.00
HYDROGRAPH AT	016	1.	4.02	0.	0.	0.	.00
HYDROGRAPH AT	017	5.	4.07	0.	0.	0.	.01
HYDROGRAPH AT	018	3.	4.17	0.	0.	0.	.01
HYDROGRAPH AT	019	1.	4.03	0.	0.	0.	.00
HYDROGRAPH AT	020	2.	4.08	0.	0.	0.	.00
HYDROGRAPH AT	021	2.	4.08	0.	0.	0.	.00
HYDROGRAPH AT	022	6.	4.08	0.	0.	0.	.01
HYDROGRAPH AT	023	2.	4.05	0.	0.	0.	.00

SUMMARY OF KINEMATIC WAVE - MUSKINGUM-CUNGE ROUTING
(FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)

ISTAQ	ELEMENT	DT	PEAK	TIME TO PEAK	VOLUME	INTERPOLATED TO COMPUTATION INTERVAL DT	PEAK	TIME TO PEAK	VOLUME
		(MIN)	(CFS)	(MIN)	(IN)	(MIN)	(CFS)	(MIN)	(IN)
FOR STORM = 1 STORM AREA (SQ MI) =				.00					
RDS01	MANE	1.00	8.81	244.00	.57	1.00	8.81	244.00	.57

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2748E+00 EXCESS= .0000E+00 OUTFLOW= .2748E+00 BASIN STORAGE= .1065E-03 PERCENT ERROR= .0

FOR STORM = 2 STORM AREA (SQ MI) =				.50					
RDS01	MANE	1.00	8.72	244.00	.57	1.00	8.72	244.00	.57

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2719E+00 EXCESS= .0000E+00 OUTFLOW= .2719E+00 BASIN STORAGE= .1060E-03 PERCENT ERROR= .0

FOR STORM = 1 STORM AREA (SQ MI) =				.00					
RCDS12	MANE	1.00	10.13	245.00	.57	1.00	10.13	245.00	.57

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3664E+00 EXCESS= .0000E+00 OUTFLOW= .3664E+00 BASIN STORAGE= .1276E-03 PERCENT ERROR= .0

FOR STORM = 2 STORM AREA (SQ MI) = .50

RCDS12	MANE	1.00	10.02	245.00	.57	1.00	10.02	245.00	.57	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3625E+00 EXCESS= .0000E+00 OUTFLOW= .3625E+00 BASIN STORAGE= .1270E-03 PERCENT ERROR= .0

FOR STORM = 1 STORM AREA (SQ MI) = .00

RDS03	MANE	1.00	4.75	247.00	.57	1.00	4.75	247.00	.57	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1832E+00 EXCESS= .0000E+00 OUTFLOW= .1832E+00 BASIN STORAGE= .2358E-03 PERCENT ERROR= -.1

FOR STORM = 2 STORM AREA (SQ MI) = .50

RDS03	MANE	1.00	4.70	247.00	.57	1.00	4.70	247.00	.57	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1813E+00 EXCESS= .0000E+00 OUTFLOW= .1812E+00 BASIN STORAGE= .2347E-03 PERCENT ERROR= -.1

FOR STORM = 1 STORM AREA (SQ MI) = .00

RCDS34	MANE	1.00	6.70	248.00	.57	1.00	6.70	248.00	.57	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2748E+00 EXCESS= .0000E+00 OUTFLOW= .2747E+00 BASIN STORAGE= .1267E-03 PERCENT ERROR= .0

FOR STORM = 2 STORM AREA (SQ MI) = .50

RCDS34	MANE	1.00	6.62	248.00	.57	1.00	6.62	248.00	.57	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2719E+00 EXCESS= .0000E+00 OUTFLOW= .2718E+00 BASIN STORAGE= .1261E-03 PERCENT ERROR= .0

FOR STORM = 1 STORM AREA (SQ MI) = .00

RC023	MANE	1.00	19.25	247.00	.55	1.00	19.25	247.00	.55	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .7331E+00 EXCESS= .0000E+00 OUTFLOW= .7330E+00 BASIN STORAGE= .2466E-03 PERCENT ERROR= .0

FOR STORM = 2 STORM AREA (SQ MI) = .50

RC023	MANE	1.00	19.03	247.00	.54	1.00	19.03	247.00	.54	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .7251E+00 EXCESS= .0000E+00 OUTFLOW= .7251E+00 BASIN STORAGE= .2455E-03 PERCENT ERROR= .0

FOR STORM = 1 STORM AREA (SQ MI) = .00

RC014	MANE	1.00	30.48	249.00	.50	1.00	30.48	249.00	.50	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1193E+01 EXCESS= .0000E+00 OUTFLOW= .1193E+01 BASIN STORAGE= .2181E-03 PERCENT ERROR= .0

FOR STORM = 2 STORM AREA (SQ MI) = .50

RC014	MANE	1.00	30.12	249.00	.49	1.00	30.12	249.00	.49	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1179E+01 EXCESS= .0000E+00 OUTFLOW= .1179E+01 BASIN STORAGE= .2157E-03 PERCENT ERROR= .0

FOR STORM = 1 STORM AREA (SQ MI) = .00

RC056	MANE	.89	33.61	248.79	.49	1.00	33.60	249.00	.49	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1331E+01 EXCESS= .0000E+00 OUTFLOW= .1331E+01 BASIN STORAGE= .1152E-03 PERCENT ERROR= .0

FOR STORM = 2 STORM AREA (SQ MI) = .50

RC056	MANE	.89	33.20	249.55	.48	1.00	33.16	249.00	.48	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1315E+01 EXCESS= .0000E+00 OUTFLOW= .1315E+01 BASIN STORAGE= .1105E-03 PERCENT ERROR= .0

FOR STORM = 1 STORM AREA (SQ MI) = .00

RC1112	MANE	1.00	11.45	255.00	.43	1.00	11.45	255.00	.43	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .6896E+00 EXCESS= .0000E+00 OUTFLOW= .6895E+00 BASIN STORAGE= .3781E-03 PERCENT ERROR= -.1

FOR STORM = 2 STORM AREA (SQ MI) = .50

RC1112	MANE	1.00	11.30	255.00	.43	1.00	11.30	255.00	.43	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .6807E+00 EXCESS= .0000E+00 OUTFLOW= .6806E+00 BASIN STORAGE= .3758E-03 PERCENT ERROR= -.1

FOR STORM = 1 STORM AREA (SQ MI) = .00

R014	MANE	1.00	3.71	249.00	.43	1.00	3.71	249.00	.43	

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1609E+00 EXCESS= .0000E+00 OUTFLOW= .1609E+00 BASIN STORAGE= .1470E-03 PERCENT ERROR= -.1

FOR STORM = 2 STORM AREA (SQ MI) = .50

R014	MANE	1.00	3.66	249.00	.43	1.00	3.66	249.00	.43

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1588E+00 EXCESS= .0000E+00 OUTFLOW= .1588E+00 BASIN STORAGE= .1460E-03 PERCENT ERROR= -.1

*** NORMAL END OF HEC-1 ***

```
1****************************************
*                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*              JUN  1998               *
*           VERSION 4.1                *
*                                      *
*  RUN DATE   03FEB17  TIME  10:07:07  *
*                                      *
****************************************
```

```
****************************************
*                                      *
*    U.S. ARMY CORPS OF ENGINEERS      *
*    HYDROLOGIC ENGINEERING CENTER     *
*          609 SECOND STREET           *
*       DAVIS, CALIFORNIA 95616        *
*          (916) 756-1104              *
*                                      *
****************************************
```

```
X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X              X
XXXXXXX  XXXX     X        XXXXX  X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX   XXXXX         XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM


```
LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

   1          ID        Flood Control District of Maricopa County
   2          ID        118TH & JOMAX - EXISTING CONDITIONS
   3          ID        10 YEAR
   4          ID        6 Hour  Storm
   5          ID        Unit Hydrograph: Clark
   6          ID        Storm: Multiple
   7          ID        12/28/2016
              *DIAGRAM
   8          IT       1  1JAN99       0    2000
   9          IO       5
  10          IN      15
              *
  11          JD   2.129  0.0001
  12          PC   0.000   0.008   0.016   0.025   0.033   0.041   0.050   0.058   0.066   0.074
  13          PC   0.087   0.099   0.118   0.138   0.216   0.377   0.834   0.911   0.931   0.950
  14          PC   0.962   0.972   0.983   0.991   1.000
  15          JD   2.116  0.5000
  16          PC   0.000   0.008   0.016   0.025   0.033   0.041   0.050   0.058   0.066   0.074
  17          PC   0.087   0.099   0.118   0.138   0.216   0.377   0.834   0.911   0.931   0.950
  18          PC   0.962   0.972   0.983   0.991   1.000
              *

  19          KK    DS01   BASIN
  20          BA   0.009
  21          LG    0.30    0.25    6.00    0.18      15
  22          UC   0.125   0.099
  23          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  24          UA     100
              *

  25          KK   RDS01   ROUTE
  26          RD     226  0.0265   0.035           TRAP   2.500   10.00
              *

  27          KK    DS02   BASIN
  28          BA   0.003
  29          LG    0.30    0.25    6.00    0.18      15
  30          UC   0.181   0.386
  31          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  32          UA     100
              *

  33          KK   CDS12 COMBINE
  34          HC       2
              *

  35          KK  RCDS12   ROUTE
  36          RD     209  0.0143   0.035           TRAP   4.000   10.00
              *
```



```
LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  37          KK    DS03   BASIN
  38          BA   0.006
  39          LG    0.30    0.25    6.00    0.18      15
  40          UC   0.150   0.163
  41          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  42          UA     100
              *

  43          KK   RDS03   ROUTE
```

```
 44          RD     467  0.0230   0.035           TRAP   3.500   10.00
             *

 45          KK    DS04   BASIN
 46          BA   0.003
 47          LG    0.30    0.25    6.00    0.18      15
 48          UC   0.144   0.232
 49          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 50          UA     100
             *

 51          KK   CDS34 COMBINE
 52          HC       2
             *

 53          KK  RCDS34   ROUTE
 54          RD     232  0.0172   0.035           TRAP   3.000   10.00
             *

 55          KK      02   BASIN
 56          BA   0.002
 57          LG    0.30    0.25    6.00    0.18       1
 58          UC   0.115   0.154
 59          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 60          UA     100
             *

 61          KK      03   BASIN
 62          BA   0.002
 63          LG    0.30    0.25    6.00    0.18       1
 64          UC   0.122   0.180
 65          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 66          UA     100
             *

 67          KK    CO23 COMBINE
 68          HC       4
             *

 69          KK   RC023   ROUTE
 70          RD     449  0.0178   0.035           TRAP   4.000   10.00
             *
                                        HEC-1 INPUT                                          PAGE  3
LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 71          KK      01   BASIN
 72          BA   0.017
 73          LG    0.30    0.25    6.00    0.18       1
 74          UC   0.212   0.230
 75          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 76          UA     100
             *

 77          KK      04   BASIN
 78          BA   0.003
 79          LG    0.30    0.25    6.00    0.18       1
 80          UC   0.134   0.187
 81          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 82          UA     100
             *

 83          KK    CO14 COMBINE
 84          HC       3
             *

 85          KK   RC014   ROUTE
 86          RD     412  0.0194   0.035           TRAP   5.000   10.00
             *

 87          KK      05   BASIN
 88          BA   0.003
 89          LG    0.30    0.25    6.00    0.18       1
 90          UC   0.125   0.160
 91          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 92          UA     100
             *

 93          KK      06   BASIN
 94          BA   0.003
 95          LG    0.30    0.25    6.00    0.18       1
 96          UC   0.158   0.287
 97          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 98          UA     100
             *

 99          KK    CO56 COMBINE
100          HC       3
             *

101          KK   RC056   ROUTE
102          RD     195  0.0154   0.035           TRAP   5.000   10.00
             *

103          KK      07   BASIN
104          BA   0.002
105          LG    0.30    0.25    6.00    0.18       1
106          UC   0.090   0.093
107          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
108          UA     100
```

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  109     KK     C07 COMBINE
  110     HC       2
          *
  111     KK     011   BASIN
  112     BA   0.018
  113     LG    0.30    0.25    6.00    0.18       1
  114     UC   0.269   0.401
  115     UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  116     UA     100
          *
  117     KK     012   BASIN
  118     BA   0.012
  119     LG    0.30    0.25    6.00    0.18       1
  120     UC   0.240   0.380
  121     UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  122     UA     100
          *
  123     KK   C1112 COMBINE
  124     HC       2
          *
  125     KK  RC1112   ROUTE
  126     RD     645  0.0170   0.035            TRAP   8.000   10.00
          *
  127     KK     013   BASIN
  128     BA   0.010
  129     LG    0.30    0.25    6.00    0.18       1
  130     UC   0.183   0.206
  131     UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  132     UA     100
          *
  133     KK     014   BASIN
  134     BA   0.007
  135     LG    0.30    0.25    6.00    0.18       1
  136     UC   0.181   0.258
  137     UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  138     UA     100
          *
  139     KK    R014   ROUTE
  140     RD     242  0.0165   0.035            TRAP   7.000   10.00
          *
  141     KK   C1314 COMBINE
  142     HC       3
          *
```



```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  143     KK      08   BASIN
  144     BA   0.002
  145     LG    0.30    0.25    6.00    0.18       1
  146     UC   0.149   0.283
  147     UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  148     UA     100
          *
  149     KK      09   BASIN
  150     BA   0.002
  151     LG    0.30    0.25    6.00    0.18       1
  152     UC   0.147   0.297
  153     UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  154     UA     100
          *
  155     KK     010   BASIN
  156     BA   0.001
  157     LG    0.30    0.25    6.00    0.18       1
  158     UC   0.074   0.064
  159     UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  160     UA     100
          *
  161     KK     015   BASIN
  162     BA   0.002
  163     LG    0.30    0.25    6.00    0.18       1
  164     UC   0.082   0.072
  165     UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  166     UA     100
          *
  167     KK     016   BASIN
  168     BA   0.001
  169     LG    0.30    0.25    6.00    0.18       1
  170     UC   0.064   0.055
  171     UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  172     UA     100
          *
```

```
 173          KK     017   BASIN
 174          BA   0.006
 175          LG    0.30    0.25    6.00    0.18       1
 176          UC   0.134   0.143
 177          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 178          UA     100
              *

 179          KK     018   BASIN
 180          BA   0.007
 181          LG    0.30    0.25    6.00    0.18       1
 182          UC   0.222   0.389
 183          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 184          UA     100
              *
```



```
LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 185          KK     019   BASIN
 186          BA   0.001
 187          LG    0.30    0.25    6.00    0.18       1
 188          UC   0.088   0.117
 189          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 190          UA     100
              *

 191          KK     020   BASIN
 192          BA   0.003
 193          LG    0.30    0.25    6.00    0.18       1
 194          UC   0.143   0.214
 195          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 196          UA     100
              *

 197          KK     021   BASIN
 198          BA   0.003
 199          LG    0.30    0.25    6.00    0.18       1
 200          UC   0.138   0.192
 201          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 202          UA     100
              *

 203          KK     022   BASIN
 204          BA   0.009
 205          LG    0.30    0.25    6.00    0.18       1
 206          UC   0.162   0.157
 207          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 208          UA     100
              *

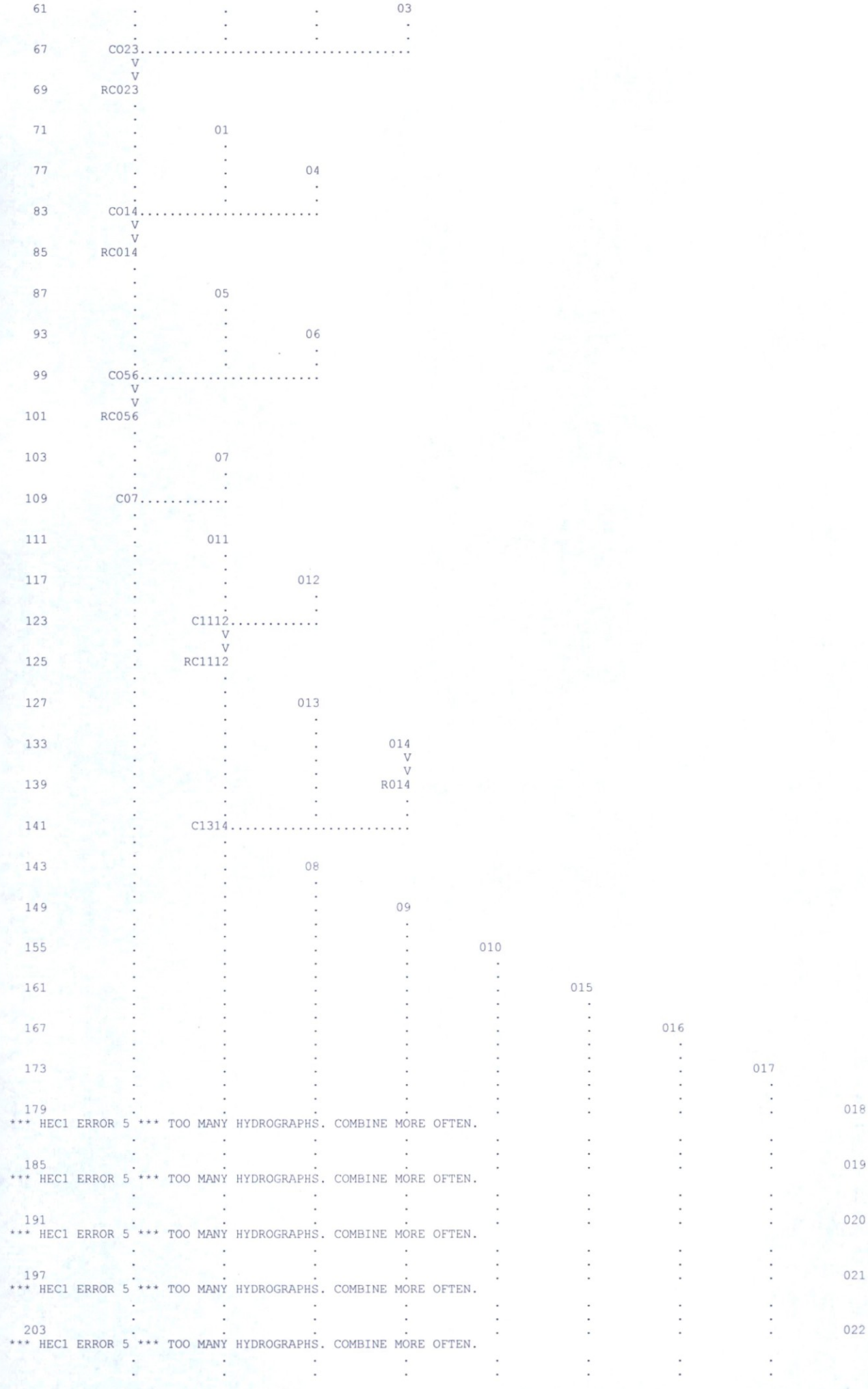
 209          KK     023   BASIN
 210          BA   0.003
 211          LG    0.30    0.25    6.00    0.18       1
 212          UC   0.114   0.144
 213          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 214          UA     100
              *
 215          ZZ
```

SCHEMATIC DIAGRAM OF STREAM NETWORK

```
INPUT
 LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW

  NO.      (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

   19        DS01
             V
             V
   25       RDS01
             .
             .
   27        .        DS02
             .          .
             .          .
   33       CDS12.............
             V
             V
   35      RCDS12
             .
             .
   37        .        DS03
             .          V
             .          V
   43        .       RDS03
             .          .
             .          .
   45        .          .        DS04
             .          .          .
             .          .          .
   51        .       CDS34.............
             .          V
             .          V
   53        .      RCDS34
             .          .
             .          .
   55        .          .          02
             .          .          .
             .          .          .
```



*** HEC1 ERROR 5 *** TOO MANY HYDROGRAPHS. COMBINE MORE OFTEN.

*** HEC1 ERROR 5 *** TOO MANY HYDROGRAPHS. COMBINE MORE OFTEN.

*** HEC1 ERROR 5 *** TOO MANY HYDROGRAPHS. COMBINE MORE OFTEN.

*** HEC1 ERROR 5 *** TOO MANY HYDROGRAPHS. COMBINE MORE OFTEN.

*** HEC1 ERROR 5 *** TOO MANY HYDROGRAPHS. COMBINE MORE OFTEN.

```
  209         .           .           .           .           .           .           .           .           .           023

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

       5 ERRORS IN STREAM SYSTEM
1*****************************************                                                             ****************************************
 *                                       *                                                             *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *                                                             *   U.S. ARMY CORPS OF ENGINEERS       *
 *              JUN   1998               *                                                             *   HYDROLOGIC ENGINEERING CENTER      *
 *           VERSION 4.1                 *                                                             *         609 SECOND STREET            *
 *                                       *                                                             *      DAVIS, CALIFORNIA 95616         *
 *  RUN DATE   03FEB17  TIME  10:07:07   *                                                             *          (916) 756-1104              *
 *                                       *                                                             *                                      *
*****************************************                                                              ****************************************




                                   Flood Control District of Maricopa County
                                   118TH & JOMAX - EXISTING CONDITIONS
                                   10 YEAR
                                   6 Hour  Storm
                                   Unit Hydrograph: Clark
                                   Storm: Multiple
                                   12/28/2016

    9 IO            OUTPUT CONTROL VARIABLES
                          IPRNT           5  PRINT CONTROL
                          IPLOT           0  PLOT CONTROL
                          QSCAL          0.  HYDROGRAPH PLOT SCALE

      IT            HYDROGRAPH TIME DATA
                           NMIN           1  MINUTES IN COMPUTATION INTERVAL
                          IDATE      1JAN99  STARTING DATE
                          ITIME        0000  STARTING TIME
                             NQ        2000  NUMBER OF HYDROGRAPH ORDINATES
                         NDDATE      2JAN99  ENDING DATE
                         NDTIME        0919  ENDING TIME
                          ICENT          19  CENTURY MARK

                     COMPUTATION INTERVAL      .02 HOURS
                          TOTAL TIME BASE    33.32 HOURS

             ENGLISH UNITS
                  DRAINAGE AREA          SQUARE MILES
                  PRECIPITATION DEPTH    INCHES
                  LENGTH, ELEVATION      FEET
                  FLOW                   CUBIC FEET PER SECOND
                  STORAGE VOLUME         ACRE-FEET
                  SURFACE AREA           ACRES
                  TEMPERATURE            DEGREES FAHRENHEIT

   11 JD            INDEX STORM NO. 1
                           STRM        2.13  PRECIPITATION DEPTH
                           TRDA         .00  TRANSPOSITION DRAINAGE AREA

   12 PI              PRECIPITATION PATTERN
                           .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                           .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                           .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                           .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                           .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                           .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                           .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                           .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                           .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                           .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                           .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                           .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                           .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
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                           .01       .01       .01       .01       .01       .01       .01       .01       .01       .01
                           .01       .01       .01       .01       .01       .03       .03       .03       .03       .03
                           .03       .03       .03       .03       .03       .03       .03       .03       .03       .03
                           .01       .01       .01       .01       .01       .01       .01       .01       .01       .01
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   15 JD            INDEX STORM NO. 2
                           STRM        2.12  PRECIPITATION DEPTH
                           TRDA         .50  TRANSPOSITION DRAINAGE AREA

   16 PI              PRECIPITATION PATTERN
                           .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
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.03	.03	.03	.03	.03	.03	.03	.03	.03	.03
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RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	DS01	17.	4.02	1.	0.	0.	.01		
ROUTED TO	RDS01	17.	4.03	1.	0.	0.	.01		
HYDROGRAPH AT	DS02	3.	4.10	0.	0.	0.	.00		
2 COMBINED AT	CDS12	20.	4.05	1.	0.	0.	.01		
ROUTED TO	RCDS12	20.	4.07	1.	0.	0.	.01		
HYDROGRAPH AT	DS03	9.	4.05	1.	0.	0.	.01		
ROUTED TO	RDS03	9.	4.08	1.	0.	0.	.01		
HYDROGRAPH AT	DS04	4.	4.07	0.	0.	0.	.00		
2 COMBINED AT	CDS34	13.	4.08	1.	0.	0.	.01		
ROUTED TO	RCDS34	13.	4.10	1.	0.	0.	.01		
HYDROGRAPH AT	02	3.	4.03	0.	0.	0.	.00		
HYDROGRAPH AT	03	3.	4.05	0.	0.	0.	.00		
4 COMBINED AT	CO23	39.	4.07	3.	1.	1.	.03		
ROUTED TO	RC023	38.	4.08	3.	1.	1.	.03		
HYDROGRAPH AT	01	21.	4.10	2.	0.	0.	.02		
HYDROGRAPH AT	04	4.	4.05	0.	0.	0.	.00		
3 COMBINED AT	CO14	64.	4.08	5.	1.	1.	.05		
ROUTED TO	RC014	63.	4.12	5.	1.	1.	.05		
HYDROGRAPH AT	05	5.	4.03	0.	0.	0.	.00		

HYDROGRAPH AT	06	3.	4.07	0.	0.	0.	.00
3 COMBINED AT	CO56	71.	4.10	5.	1.	1.	.05
ROUTED TO	RC056	70.	4.12	5.	1.	1.	.05
HYDROGRAPH AT	07	4.	4.02	0.	0.	0.	.00
2 COMBINED AT	C07	72.	4.10	5.	1.	1.	.05
HYDROGRAPH AT	011	16.	4.15	2.	0.	0.	.02
HYDROGRAPH AT	012	11.	4.13	1.	0.	0.	.01
2 COMBINED AT	C1112	27.	4.15	3.	1.	1.	.03
ROUTED TO	RC1112	27.	4.18	3.	1.	1.	.03
HYDROGRAPH AT	013	13.	4.07	1.	0.	0.	.01
HYDROGRAPH AT	014	8.	4.08	1.	0.	0.	.01
ROUTED TO	R014	8.	4.10	1.	0.	0.	.01
3 COMBINED AT	C1314	46.	4.13	4.	1.	1.	.05
HYDROGRAPH AT	08	2.	4.07	0.	0.	0.	.00
HYDROGRAPH AT	09	2.	4.07	0.	0.	0.	.00
HYDROGRAPH AT	010	2.	4.00	0.	0.	0.	.00
HYDROGRAPH AT	015	4.	4.00	0.	0.	0.	.00
HYDROGRAPH AT	016	2.	4.00	0.	0.	0.	.00
HYDROGRAPH AT	017	10.	4.03	1.	0.	0.	.01
HYDROGRAPH AT	018	6.	4.12	1.	0.	0.	.01
HYDROGRAPH AT	019	2.	4.02	0.	0.	0.	.00
HYDROGRAPH AT	020	4.	4.05	0.	0.	0.	.00
HYDROGRAPH AT	021	4.	4.05	0.	0.	0.	.00
HYDROGRAPH AT	022	14.	4.05	1.	0.	0.	.01
HYDROGRAPH AT	023	5.	4.03	0.	0.	0.	.00

SUMMARY OF KINEMATIC WAVE - MUSKINGUM-CUNGE ROUTING
(FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)

ISTAQ	ELEMENT	DT	PEAK	TIME TO PEAK	VOLUME	INTERPOLATED TO COMPUTATION INTERVAL DT	PEAK	TIME TO PEAK	VOLUME
		(MIN)	(CFS)	(MIN)	(IN)	(MIN)	(CFS)	(MIN)	(IN)
FOR STORM = 1 STORM AREA (SQ MI) = .00									
RDS01	MANE	.99	16.91	242.44	1.07	1.00	16.85	242.00	1.07

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5138E+00 EXCESS= .0000E+00 OUTFLOW= .5138E+00 BASIN STORAGE= .9933E-04 PERCENT ERROR= .0

FOR STORM = 2 STORM AREA (SQ MI) = .50									
RDS01	MANE	.99	16.79	241.94	1.06	1.00	16.78	242.00	1.06

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5088E+00 EXCESS= .0000E+00 OUTFLOW= .5088E+00 BASIN STORAGE= .1027E-03 PERCENT ERROR= .0

FOR STORM = 1 STORM AREA (SQ MI) = .00									
RCDS12	MANE	1.00	19.61	244.00	1.07	1.00	19.61	244.00	1.07

CONTINUITY SUMMARY (AC-FT) - INFLOW= .6849E+00 EXCESS= .0000E+00 OUTFLOW= .6849E+00 BASIN STORAGE= .1227E-03 PERCENT ERROR= .0

FOR STORM = 2 STORM AREA (SQ MI) = .50

RCDS12	MANE	1.00	19.52	244.00	1.06	1.00	19.52	244.00	1.06

CONTINUITY SUMMARY (AC-FT) - INFLOW= .6785E+00 EXCESS= .0000E+00 OUTFLOW= .6784E+00 BASIN STORAGE= .1221E-03 PERCENT ERROR= .0

FOR STORM = 1 STORM AREA (SQ MI) = .00

RDS03	MANE	1.00	9.52	245.00	1.07	1.00	9.52	245.00	1.07

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3425E+00 EXCESS= .0000E+00 OUTFLOW= .3425E+00 BASIN STORAGE= .2385E-03 PERCENT ERROR= -.1

FOR STORM = 2 STORM AREA (SQ MI) = .50

RDS03	MANE	1.00	9.44	245.00	1.06	1.00	9.44	245.00	1.06

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3390E+00 EXCESS= .0000E+00 OUTFLOW= .3390E+00 BASIN STORAGE= .2375E-03 PERCENT ERROR= -.1

FOR STORM = 1 STORM AREA (SQ MI) = .00

RCDS34	MANE	1.00	13.54	246.00	1.07	1.00	13.54	246.00	1.07

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5137E+00 EXCESS= .0000E+00 OUTFLOW= .5137E+00 BASIN STORAGE= .1223E-03 PERCENT ERROR= .0

FOR STORM = 2 STORM AREA (SQ MI) = .50

RCDS34	MANE	1.00	13.42	246.00	1.06	1.00	13.42	246.00	1.06

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5085E+00 EXCESS= .0000E+00 OUTFLOW= .5085E+00 BASIN STORAGE= .1218E-03 PERCENT ERROR= .0

FOR STORM = 1 STORM AREA (SQ MI) = .00

RC023	MANE	1.00	38.62	245.00	1.04	1.00	38.62	245.00	1.04

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1390E+01 EXCESS= .0000E+00 OUTFLOW= .1390E+01 BASIN STORAGE= .2456E-03 PERCENT ERROR= .0

FOR STORM = 2 STORM AREA (SQ MI) = .50

RC023	MANE	1.00	38.36	245.00	1.03	1.00	38.36	245.00	1.03

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1376E+01 EXCESS= .0000E+00 OUTFLOW= .1376E+01 BASIN STORAGE= .2445E-03 PERCENT ERROR= .0

FOR STORM = 1 STORM AREA (SQ MI) = .00

RC014	MANE	1.00	63.75	247.00	.98	1.00	63.75	247.00	.98

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2347E+01 EXCESS= .0000E+00 OUTFLOW= .2347E+01 BASIN STORAGE= .2149E-03 PERCENT ERROR= .0

FOR STORM = 2 STORM AREA (SQ MI) = .50

RC014	MANE	1.00	63.27	247.00	.97	1.00	63.27	247.00	.97

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2322E+01 EXCESS= .0000E+00 OUTFLOW= .2322E+01 BASIN STORAGE= .2140E-03 PERCENT ERROR= .0

FOR STORM = 1 STORM AREA (SQ MI) = .00

RC056	MANE	.73	71.01	246.62	.97	1.00	70.89	247.00	.97

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2634E+01 EXCESS= .0000E+00 OUTFLOW= .2634E+01 BASIN STORAGE= .1161E-03 PERCENT ERROR= .0

FOR STORM = 2 STORM AREA (SQ MI) = .50

RC056	MANE	.74	70.33	247.13	.96	1.00	70.33	247.00	.96

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2606E+01 EXCESS= .0000E+00 OUTFLOW= .2606E+01 BASIN STORAGE= .1147E-03 PERCENT ERROR= .0

FOR STORM = 1 STORM AREA (SQ MI) = .00

RC1112	MANE	1.00	26.76	251.00	.90	1.00	26.76	251.00	.90

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1436E+01 EXCESS= .0000E+00 OUTFLOW= .1436E+01 BASIN STORAGE= .3841E-03 PERCENT ERROR= .0

FOR STORM = 2 STORM AREA (SQ MI) = .50

RC1112	MANE	1.00	26.49	251.00	.89	1.00	26.49	251.00	.89

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1419E+01 EXCESS= .0000E+00 OUTFLOW= .1419E+01 BASIN STORAGE= .3766E-03 PERCENT ERROR= .0

FOR STORM = 1 STORM AREA (SQ MI) = .00

R014	MANE	1.00	8.37	246.00	.90	1.00	8.37	246.00	.90

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3351E+00 EXCESS= .0000E+00 OUTFLOW= .3350E+00 BASIN STORAGE= .1575E-03 PERCENT ERROR= .0

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          FOR STORM = 2  STORM AREA (SQ MI) =        .50
              RO14  MANE          1.00      8.29    246.00       .89      1.00      8.29    246.00         .89

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3311E+00 EXCESS= .0000E+00 OUTFLOW= .3311E+00 BASIN STORAGE= .1554E-03 PERCENT ERROR=     .0


*** NORMAL END OF HEC-1 ***
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1****************************************
*                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*             JUN  1998                *
*          VERSION 4.1                 *
*                                      *
*  RUN DATE   03FEB17  TIME  10:09:06  *
*                                      *
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*                                      *
*    U.S. ARMY CORPS OF ENGINEERS      *
*    HYDROLOGIC ENGINEERING CENTER     *
*         609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616        *
*           (916) 756-1104             *
*                                      *
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X     X  XXXXXXX   XXXXX          X
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X     X  X        X              X
XXXXXXX  XXXX     X        XXXXX  X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX   XXXXX         XXX
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THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM


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LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

   1          ID        Flood Control District of Maricopa County
   2          ID        118TH & JOMAX - EXISTING CONDITIONS
   3          ID        100 YEAR
   4          ID        6 Hour  Storm
   5          ID        Unit Hydrograph: Clark
   6          ID        Storm: Multiple
   7          ID        12/28/2016
              *DIAGRAM
   8          IT       1  1JAN99       0    2000
   9          IO       5
  10          IN      15
              *
  11          JD   3.218  0.0001
  12          PC   0.000   0.008   0.016   0.025   0.033   0.041   0.050   0.058   0.066   0.074
  13          PC   0.087   0.099   0.118   0.138   0.216   0.377   0.834   0.911   0.931   0.950
  14          PC   0.962   0.972   0.983   0.991   1.000
  15          JD   3.199  0.5000
  16          PC   0.000   0.008   0.016   0.025   0.033   0.041   0.050   0.058   0.066   0.074
  17          PC   0.087   0.099   0.118   0.138   0.216   0.377   0.834   0.911   0.931   0.950
  18          PC   0.962   0.972   0.983   0.991   1.000
              *
  19          KK    DS01   BASIN
  20          BA   0.009
  21          LG    0.30    0.25    6.00    0.18      15
  22          UC   0.098   0.076
  23          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  24          UA     100
              *
  25          KK   RDS01   ROUTE
  26          RD     226  0.0265   0.035           TRAP   2.500   10.00
              *
  27          KK    DS02   BASIN
  28          BA   0.003
  29          LG    0.30    0.25    6.00    0.18      15
  30          UC   0.142   0.296
  31          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  32          UA     100
              *
  33          KK   CDS12 COMBINE
  34          HC       2
              *
  35          KK  RCDS12   ROUTE
  36          RD     209  0.0143   0.035           TRAP   4.000   10.00
              *
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LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  37          KK    DS03   BASIN
  38          BA   0.006
  39          LG    0.30    0.25    6.00    0.18      15
  40          UC   0.118   0.124
  41          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  42          UA     100
              *
  43          KK   RDS03   ROUTE
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 44          RD     467  0.0230   0.035           TRAP   3.500   10.00
             *

 45          KK    DS04   BASIN
 46          BA   0.003
 47          LG    0.30    0.25    6.00    0.18      15
 48          UC   0.113   0.177
 49          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 50          UA     100
             *

 51          KK    CDS34 COMBINE
 52          HC        2
             *

 53          KK   RCDS34   ROUTE
 54          RD     232  0.0172   0.035           TRAP   3.000   10.00
             *

 55          KK       02   BASIN
 56          BA   0.002
 57          LG    0.30    0.25    6.00    0.18       1
 58          UC   0.089   0.115
 59          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 60          UA     100
             *

 61          KK       03   BASIN
 62          BA   0.002
 63          LG    0.30    0.25    6.00    0.18       1
 64          UC   0.094   0.134
 65          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 66          UA     100
             *

 67          KK    CO23 COMBINE
 68          HC        4
             *

 69          KK   RC023   ROUTE
 70          RD     449  0.0178   0.035           TRAP   4.000   10.00
             *
                                        HEC-1 INPUT                                          PAGE  3
LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 71          KK       01   BASIN
 72          BA   0.017
 73          LG    0.30    0.25    6.00    0.18       1
 74          UC   0.163   0.172
 75          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 76          UA     100
             *

 77          KK       04   BASIN
 78          BA   0.003
 79          LG    0.30    0.25    6.00    0.18       1
 80          UC   0.103   0.140
 81          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 82          UA     100
             *

 83          KK    CO14 COMBINE
 84          HC        3
             *

 85          KK   RC014   ROUTE
 86          RD     412  0.0194   0.035           TRAP   5.000   10.00
             *

 87          KK       05   BASIN
 88          BA   0.003
 89          LG    0.30    0.25    6.00    0.18       1
 90          UC   0.096   0.120
 91          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 92          UA     100
             *

 93          KK       06   BASIN
 94          BA   0.003
 95          LG    0.30    0.25    6.00    0.18       1
 96          UC   0.122   0.215
 97          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 98          UA     100
             *

 99          KK    CO56 COMBINE
100          HC        3
             *

101          KK   RC056   ROUTE
102          RD     195  0.0154   0.035           TRAP   5.000   10.00
             *

103          KK       07   BASIN
104          BA   0.002
105          LG    0.30    0.25    6.00    0.18       1
106          UC   0.069   0.070
107          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
108          UA     100
```

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  109     KK     C07 COMBINE
  110     HC       2
          *

  111     KK     011   BASIN
  112     BA   0.018
  113     LG    0.30    0.25    6.00    0.18       1
  114     UC   0.207   0.300
  115     UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  116     UA     100
          *

  117     KK     012   BASIN
  118     BA   0.012
  119     LG    0.30    0.25    6.00    0.18       1
  120     UC   0.185   0.284
  121     UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  122     UA     100
          *

  123     KK   C1112 COMBINE
  124     HC       2
          *

  125     KK  RC1112   ROUTE
  126     RD     645  0.0170   0.035            TRAP   8.000   10.00
          *

  127     KK     013   BASIN
  128     BA   0.010
  129     LG    0.30    0.25    6.00    0.18       1
  130     UC   0.141   0.154
  131     UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  132     UA     100
          *

  133     KK     014   BASIN
  134     BA   0.007
  135     LG    0.30    0.25    6.00    0.18       1
  136     UC   0.139   0.193
  137     UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  138     UA     100
          *

  139     KK    R014   ROUTE
  140     RD     242  0.0165   0.035            TRAP   7.000   10.00
          *

  141     KK   C1314 COMBINE
  142     HC       3
          *
```



```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  143     KK      08   BASIN
  144     BA   0.002
  145     LG    0.30    0.25    6.00    0.18       1
  146     UC   0.115   0.212
  147     UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  148     UA     100
          *

  149     KK      09   BASIN
  150     BA   0.002
  151     LG    0.30    0.25    6.00    0.18       1
  152     UC   0.113   0.222
  153     UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  154     UA     100
          *

  155     KK     010   BASIN
  156     BA   0.001
  157     LG    0.30    0.25    6.00    0.18       1
  158     UC   0.057   0.048
  159     UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  160     UA     100
          *

  161     KK     015   BASIN
  162     BA   0.002
  163     LG    0.30    0.25    6.00    0.18       1
  164     UC   0.063   0.054
  165     UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  166     UA     100
          *

  167     KK     016   BASIN
  168     BA   0.001
  169     LG    0.30    0.25    6.00    0.18       1
  170     UC   0.050   0.041
  171     UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  172     UA     100
          *
```

```
 173          KK     017   BASIN
 174          BA   0.006
 175          LG    0.30    0.25    6.00    0.18       1
 176          UC   0.103   0.107
 177          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 178          UA     100
              *

 179          KK     018   BASIN
 180          BA   0.007
 181          LG    0.30    0.25    6.00    0.18       1
 182          UC   0.171   0.291
 183          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 184          UA     100
              *
```



```
LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 185          KK     019   BASIN
 186          BA   0.001
 187          LG    0.30    0.25    6.00    0.18       1
 188          UC   0.068   0.087
 189          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 190          UA     100
              *

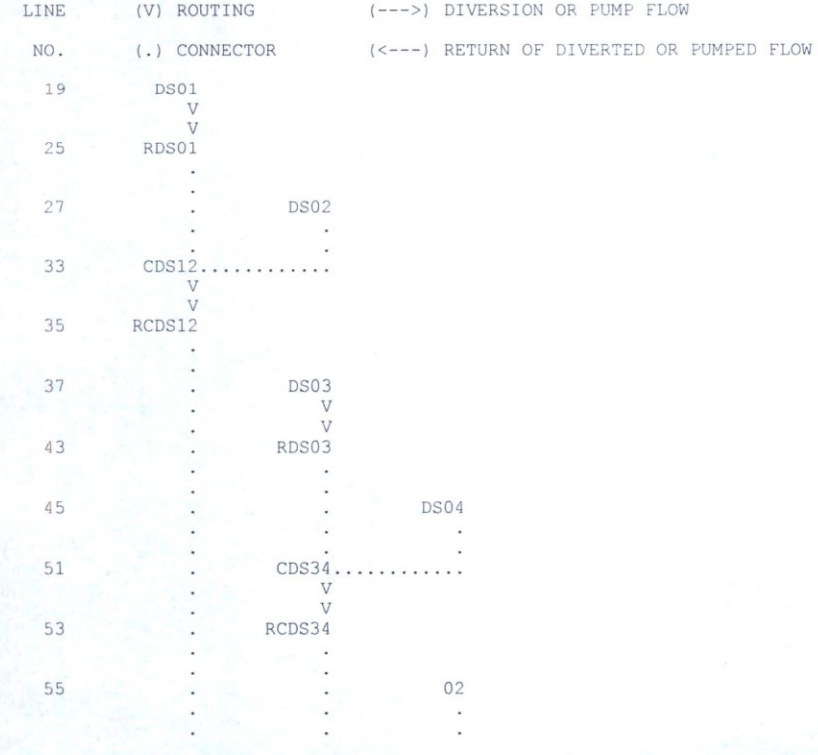
 191          KK     020   BASIN
 192          BA   0.003
 193          LG    0.30    0.25    6.00    0.18       1
 194          UC   0.110   0.160
 195          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 196          UA     100
              *

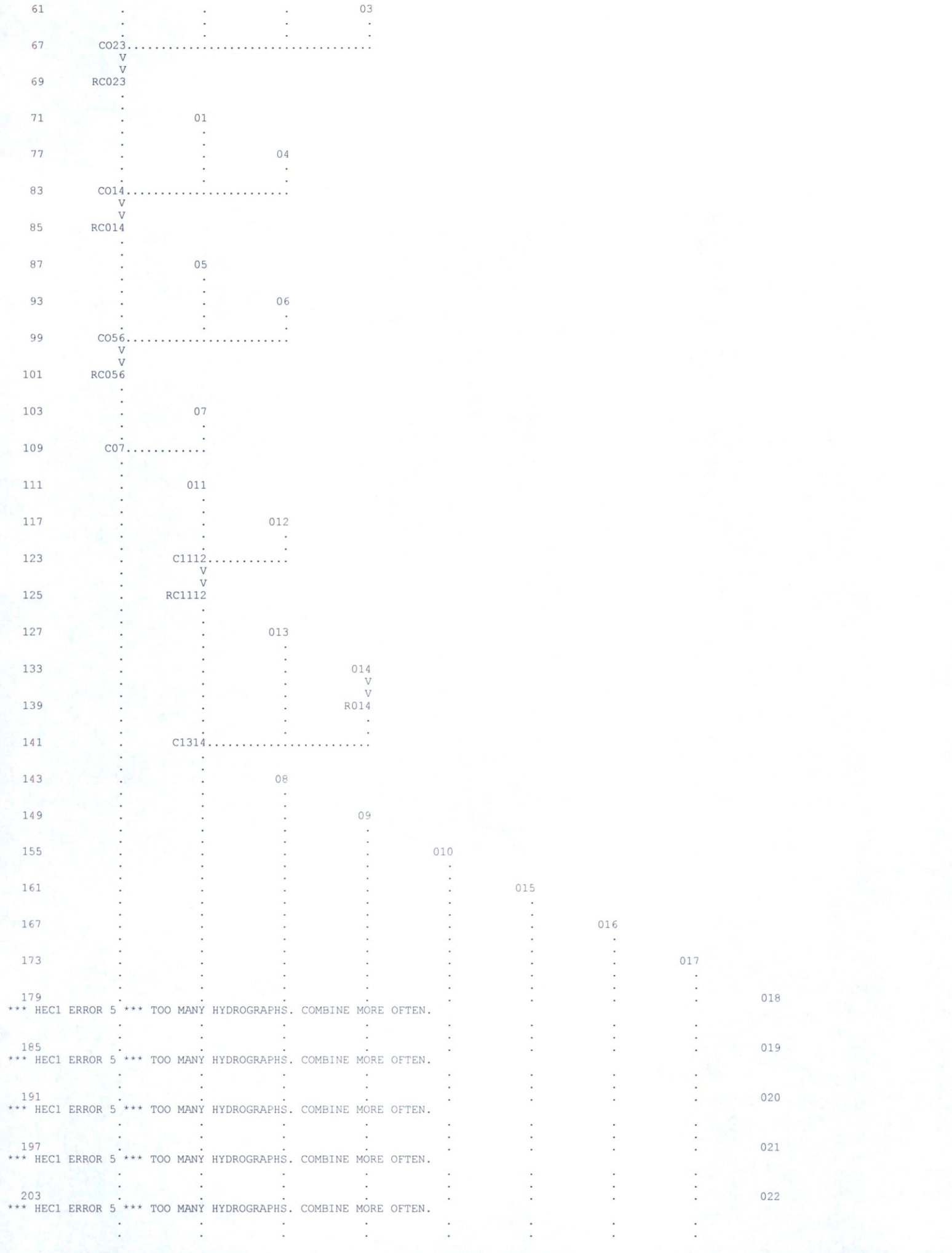
 197          KK     021   BASIN
 198          BA   0.003
 199          LG    0.30    0.25    6.00    0.18       1
 200          UC   0.106   0.144
 201          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 202          UA     100
              *

 203          KK     022   BASIN
 204          BA   0.009
 205          LG    0.30    0.25    6.00    0.18       1
 206          UC   0.125   0.118
 207          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 208          UA     100
              *

 209          KK     023   BASIN
 210          BA   0.003
 211          LG    0.30    0.25    6.00    0.18       1
 212          UC   0.087   0.107
 213          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 214          UA     100
              *
 215          ZZ
```

SCHEMATIC DIAGRAM OF STREAM NETWORK





*** HEC1 ERROR 5 *** TOO MANY HYDROGRAPHS. COMBINE MORE OFTEN.

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*** HEC1 ERROR 5 *** TOO MANY HYDROGRAPHS. COMBINE MORE OFTEN.

```
  209        .          .          .          .          .          .          .          .          023

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

       5 ERRORS IN STREAM SYSTEM
1****************************************                                                  ****************************************
 *                                      *                                                  *                                      *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                                                  *   U.S. ARMY CORPS OF ENGINEERS       *
 *              JUN   1998              *                                                  *   HYDROLOGIC ENGINEERING CENTER      *
 *           VERSION 4.1                *                                                  *        609 SECOND STREET             *
 *                                      *                                                  *     DAVIS, CALIFORNIA 95616          *
 * RUN DATE   03FEB17  TIME  10:09:06   *                                                  *          (916) 756-1104              *
 *                                      *                                                  *                                      *
****************************************                                                   ****************************************




                                    Flood Control District of Maricopa County
                                    118TH & JOMAX - EXISTING CONDITIONS
                                    100 YEAR
                                    6 Hour  Storm
                                    Unit Hydrograph: Clark
                                    Storm: Multiple
                                    12/28/2016

    9 IO          OUTPUT CONTROL VARIABLES
                        IPRNT          5  PRINT CONTROL
                        IPLOT          0  PLOT CONTROL
                        QSCAL         0.  HYDROGRAPH PLOT SCALE

      IT          HYDROGRAPH TIME DATA
                         NMIN          1  MINUTES IN COMPUTATION INTERVAL
                        IDATE      1JAN99  STARTING DATE
                        ITIME       0000  STARTING TIME
                           NQ       2000  NUMBER OF HYDROGRAPH ORDINATES
                       NDDATE      2JAN99  ENDING DATE
                       NDTIME       0919  ENDING TIME
                        ICENT         19  CENTURY MARK

                    COMPUTATION INTERVAL     .02 HOURS
                         TOTAL TIME BASE   33.32 HOURS

       ENGLISH UNITS
            DRAINAGE AREA           SQUARE MILES
            PRECIPITATION DEPTH     INCHES
            LENGTH, ELEVATION       FEET
            FLOW                    CUBIC FEET PER SECOND
            STORAGE VOLUME          ACRE-FEET
            SURFACE AREA            ACRES
            TEMPERATURE             DEGREES FAHRENHEIT

   11 JD          INDEX STORM NO. 1
                         STRM       3.22  PRECIPITATION DEPTH
                         TRDA        .00  TRANSPOSITION DRAINAGE AREA

   12 PI            PRECIPITATION PATTERN
                         .00        .00        .00        .00        .00        .00        .00        .00        .00        .00
                         .00        .00        .00        .00        .00        .00        .00        .00        .00        .00
                         .00        .00        .00        .00        .00        .00        .00        .00        .00        .00
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                         .01        .01        .01        .01        .01        .01        .01        .01        .01        .01
                         .01        .01        .01        .01        .01        .01        .01        .01        .01        .01
                         .01        .01        .01        .01        .01        .03        .03        .03        .03        .03
                         .03        .03        .03        .03        .03        .03        .03        .03        .03        .03
                         .01        .01        .01        .01        .01        .01        .01        .01        .01        .01
                         .01        .01        .01        .01        .01        .00        .00        .00        .00        .00
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                         .00        .00        .00        .00        .00        .00        .00        .00        .00        .00

   15 JD          INDEX STORM NO. 2
                         STRM       3.20  PRECIPITATION DEPTH
                         TRDA        .50  TRANSPOSITION DRAINAGE AREA

   16 PI            PRECIPITATION PATTERN
                         .00        .00        .00        .00        .00        .00        .00        .00        .00        .00
```

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.01	.01	.01	.01	.01	.03	.03	.03	.03	.03
.03	.03	.03	.03	.03	.03	.03	.03	.03	.03
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.01	.01	.01	.01	.01	.00	.00	.00	.00	.00
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RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

	OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
	HYDROGRAPH AT	DS01	30.	4.02	2.	0.	0.	.01		
+	ROUTED TO	RDS01	29.	4.02	2.	0.	0.	.01		
	HYDROGRAPH AT	DS02	6.	4.07	1.	0.	0.	.00		
	2 COMBINED AT	CDS12	35.	4.03	3.	1.	0.	.01		
	ROUTED TO	RCDS12	35.	4.03	3.	1.	0.	.01		
+	HYDROGRAPH AT	DS03	18.	4.03	1.	0.	0.	.01		
	ROUTED TO	RDS03	18.	4.05	1.	0.	0.	.01		
	HYDROGRAPH AT	DS04	8.	4.03	1.	0.	0.	.00		
	2 COMBINED AT	CDS34	26.	4.05	2.	0.	0.	.01		
+	ROUTED TO	RCDS34	25.	4.07	2.	0.	0.	.01		
	HYDROGRAPH AT	02	6.	4.02	0.	0.	0.	.00		
	HYDROGRAPH AT	03	6.	4.02	0.	0.	0.	.00		
	4 COMBINED AT	CO23	71.	4.03	5.	1.	1.	.03		
+	ROUTED TO	RC023	71.	4.07	5.	1.	1.	.03		
	HYDROGRAPH AT	01	43.	4.05	3.	1.	1.	.02		
	HYDROGRAPH AT	04	8.	4.03	1.	0.	0.	.00		
	3 COMBINED AT	CO14	122.	4.05	9.	2.	2.	.05		
+	ROUTED TO	RC014	122.	4.07	9.	2.	2.	.05		
	HYDROGRAPH AT	05	9.	4.02	1.	0.	0.	.00		

HYDROGRAPH AT	06	7.	4.05	1.	0.	0.	.00
3 COMBINED AT	CO56	137.	4.07	10.	3.	2.	.05
ROUTED TO	RC056	137.	4.08	10.	3.	2.	.05
HYDROGRAPH AT	07	7.	4.00	0.	0.	0.	.00
2 COMBINED AT	C07	141.	4.07	11.	3.	2.	.05
HYDROGRAPH AT	011	35.	4.10	3.	1.	1.	.02
HYDROGRAPH AT	012	24.	4.08	2.	1.	0.	.01
2 COMBINED AT	C1112	59.	4.10	6.	1.	1.	.03
ROUTED TO	RC1112	59.	4.13	6.	1.	1.	.03
HYDROGRAPH AT	013	27.	4.05	2.	0.	0.	.01
HYDROGRAPH AT	014	17.	4.05	1.	0.	0.	.01
ROUTED TO	R014	17.	4.07	1.	0.	0.	.01
3 COMBINED AT	C1314	98.	4.08	9.	2.	2.	.05
HYDROGRAPH AT	08	5.	4.05	0.	0.	0.	.00
HYDROGRAPH AT	09	5.	4.05	0.	0.	0.	.00
HYDROGRAPH AT	010	3.	4.00	0.	0.	0.	.00
HYDROGRAPH AT	015	7.	4.00	0.	0.	0.	.00
HYDROGRAPH AT	016	3.	4.00	0.	0.	0.	.00
HYDROGRAPH AT	017	18.	4.02	1.	0.	0.	.01
HYDROGRAPH AT	018	14.	4.08	1.	0.	0.	.01
HYDROGRAPH AT	019	3.	4.00	0.	0.	0.	.00
HYDROGRAPH AT	020	8.	4.03	1.	0.	0.	.00
HYDROGRAPH AT	021	8.	4.03	1.	0.	0.	.00
HYDROGRAPH AT	022	26.	4.03	2.	0.	0.	.01
HYDROGRAPH AT	023	9.	4.02	1.	0.	0.	.00

SUMMARY OF KINEMATIC WAVE - MUSKINGUM-CUNGE ROUTING
(FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)

ISTAQ	ELEMENT	DT	PEAK	TIME TO PEAK	VOLUME	INTERPOLATED TO COMPUTATION INTERVAL DT	PEAK	TIME TO PEAK	VOLUME
		(MIN)	(CFS)	(MIN)	(IN)	(MIN)	(CFS)	(MIN)	(IN)
FOR STORM = 1 STORM AREA (SQ MI) =				.00					
RDS01	MANE	.86	29.55	241.41	1.98	1.00	29.49	241.00	1.98

CONTINUITY SUMMARY (AC-FT) - INFLOW= .9525E+00 EXCESS= .0000E+00 OUTFLOW= .9525E+00 BASIN STORAGE= .1122E-03 PERCENT ERROR= .0

FOR STORM = 2 STORM AREA (SQ MI) =				.50					
RDS01	MANE	.86	29.36	240.97	1.97	1.00	29.36	241.00	1.97

CONTINUITY SUMMARY (AC-FT) - INFLOW= .9448E+00 EXCESS= .0000E+00 OUTFLOW= .9448E+00 BASIN STORAGE= .9931E-04 PERCENT ERROR= .0

FOR STORM = 1 STORM AREA (SQ MI) =				.00					
RCDS12	MANE	.96	35.34	242.15	1.98	1.00	35.28	242.00	1.98

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1270E+01 EXCESS= .0000E+00 OUTFLOW= .1270E+01 BASIN STORAGE= .1237E-03 PERCENT ERROR= .0

FOR STORM = 2 STORM AREA (SQ MI) = .50

RCDS12	MANE	.96	35.13	242.43	1.97	1.00	35.04	242.00	1.97

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1259E+01 EXCESS= .0000E+00 OUTFLOW= .1259E+01 BASIN STORAGE= .1195E-03 PERCENT ERROR= .0

FOR STORM = 1 STORM AREA (SQ MI) = .00

RDS03	MANE	1.00	17.70	243.00	1.98	1.00	17.70	243.00	1.98

CONTINUITY SUMMARY (AC-FT) - INFLOW= .6349E+00 EXCESS= .0000E+00 OUTFLOW= .6348E+00 BASIN STORAGE= .2349E-03 PERCENT ERROR= .0

FOR STORM = 2 STORM AREA (SQ MI) = .50

RDS03	MANE	1.00	17.58	243.00	1.97	1.00	17.58	243.00	1.97

CONTINUITY SUMMARY (AC-FT) - INFLOW= .6298E+00 EXCESS= .0000E+00 OUTFLOW= .6297E+00 BASIN STORAGE= .2324E-03 PERCENT ERROR= .0

FOR STORM = 1 STORM AREA (SQ MI) = .00

RCDS34	MANE	1.00	25.58	244.00	1.98	1.00	25.58	244.00	1.98

CONTINUITY SUMMARY (AC-FT) - INFLOW= .9521E+00 EXCESS= .0000E+00 OUTFLOW= .9521E+00 BASIN STORAGE= .1217E-03 PERCENT ERROR= .0

FOR STORM = 2 STORM AREA (SQ MI) = .50

RCDS34	MANE	1.00	25.40	244.00	1.97	1.00	25.40	244.00	1.97

CONTINUITY SUMMARY (AC-FT) - INFLOW= .9445E+00 EXCESS= .0000E+00 OUTFLOW= .9444E+00 BASIN STORAGE= .1209E-03 PERCENT ERROR= .0

FOR STORM = 1 STORM AREA (SQ MI) = .00

RC023	MANE	1.00	71.78	244.00	1.95	1.00	71.78	244.00	1.95

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2603E+01 EXCESS= .0000E+00 OUTFLOW= .2603E+01 BASIN STORAGE= .2436E-03 PERCENT ERROR= .0

FOR STORM = 2 STORM AREA (SQ MI) = .50

RC023	MANE	1.00	71.24	244.00	1.93	1.00	71.24	244.00	1.93

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2580E+01 EXCESS= .0000E+00 OUTFLOW= .2580E+01 BASIN STORAGE= .2426E-03 PERCENT ERROR= .0

FOR STORM = 1 STORM AREA (SQ MI) = .00

RC014	MANE	1.00	122.82	244.00	1.88	1.00	122.82	244.00	1.88

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4504E+01 EXCESS= .0000E+00 OUTFLOW= .4504E+01 BASIN STORAGE= .2246E-03 PERCENT ERROR= .0

FOR STORM = 2 STORM AREA (SQ MI) = .50

RC014	MANE	1.00	121.94	244.00	1.86	1.00	121.94	244.00	1.86

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4464E+01 EXCESS= .0000E+00 OUTFLOW= .4464E+01 BASIN STORAGE= .2237E-03 PERCENT ERROR= .0

FOR STORM = 1 STORM AREA (SQ MI) = .00

RC056	MANE	.62	137.50	244.25	1.87	1.00	137.26	245.00	1.87

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5074E+01 EXCESS= .0000E+00 OUTFLOW= .5074E+01 BASIN STORAGE= .1115E-03 PERCENT ERROR= .0

FOR STORM = 2 STORM AREA (SQ MI) = .50

RC056	MANE	.62	136.59	244.70	1.85	1.00	136.27	245.00	1.85

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5030E+01 EXCESS= .0000E+00 OUTFLOW= .5030E+01 BASIN STORAGE= .1098E-03 PERCENT ERROR= .0

FOR STORM = 1 STORM AREA (SQ MI) = .00

RC1112	MANE	1.00	58.81	248.00	1.78	1.00	58.81	248.00	1.78

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2852E+01 EXCESS= .0000E+00 OUTFLOW= .2852E+01 BASIN STORAGE= .3881E-03 PERCENT ERROR= .0

FOR STORM = 2 STORM AREA (SQ MI) = .50

RC1112	MANE	1.00	58.37	248.00	1.77	1.00	58.37	248.00	1.77

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2827E+01 EXCESS= .0000E+00 OUTFLOW= .2827E+01 BASIN STORAGE= .3865E-03 PERCENT ERROR= .0

FOR STORM = 1 STORM AREA (SQ MI) = .00

R014	MANE	1.00	17.26	244.00	1.78	1.00	17.26	244.00	1.78

CONTINUITY SUMMARY (AC-FT) - INFLOW= .6654E+00 EXCESS= .0000E+00 OUTFLOW= .6654E+00 BASIN STORAGE= .1405E-03 PERCENT ERROR= .0

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 FOR STORM = 2  STORM AREA (SQ MI) =        .50
     R014  MANE          1.00     17.14    244.00      1.77      1.00     17.14    244.00        1.77

CONTINUITY SUMMARY (AC-FT) - INFLOW= .6596E+00 EXCESS= .0000E+00 OUTFLOW= .6597E+00 BASIN STORAGE= .1396E-03 PERCENT ERROR=     .0


*** NORMAL END OF HEC-1 ***
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Appendix B

Flood Control District of Maricopa County
Drainage Design Management System
RAINFALL DATA
Project Reference: 118TH&JOMAX FU.COND.

ID	Method	Duration	2 Yr	5 Yr	10 Yr	25 Yr	50 Yr	100 Yr
DEFAULT	NOAA14	5 MIN	0.318	0.428	0.510	0.618	0.699	0.781
	NOAA14	10 MIN	0.484	0.651	0.776	0.941	1.065	1.188
	NOAA14	15 MIN	0.600	0.807	0.962	1.167	1.320	1.473
	NOAA14	30 MIN	0.807	1.087	1.296	1.570	1.777	1.984
	NOAA14	1 HOUR	0.999	1.345	1.604	1.944	2.199	2.455
	NOAA14	2 HOUR	1.136	1.506	1.787	2.166	2.453	2.746
	NOAA14	3 HOUR	1.206	1.570	1.858	2.259	2.575	2.901
	NOAA14	6 HOUR	1.438	1.822	2.129	2.550	2.878	3.218
	NOAA14	12 HOUR	1.727	2.167	2.518	2.992	3.358	3.733
	NOAA14	24 HOUR	2.124	2.765	3.287	4.026	4.624	5.258

MAP: 64
CELLS: 300-301 / 340-341

Soil ID	Map Unit	XKSAT	Rock Percent	Description
Book Number: 645				
6451	1	0.410	0.00	Antho sandy loams
6452	2	0.410	0.00	Antho gravelly sandy loams
6453	3	0.580	0.00	Antho-Carrizo-Maripo complex
6454	4	0.580	0.00	Antho-Carrizo-Maripo complex, low precipitation
6455	5	0.430	0.00	Anthony sandy loam
6456	6	0.620	0.00	Anthony-Arizo complex
6457	7	0.620	0.00	Anthony-Arizo complex, low precipitation
6458	8	0.960	0.00	Arizo cobbly sandy loam
6459	9	0.270	0.00	Beeline-Cipriano complex, 3 to 45 percent slopes
64510	10	0.940	0.00	Brios-Carrizo complex, 1 to 5 percent slopes
64511	11	0.940	0.00	Brios-Carrizo complex, low precipitation, 1 to 5 percent slopes
64512	12	0.010	0.00	Carefree cobbly clay loam, 1 to 8 percent slopes
64513	13	0.010	0.00	Carefree-Beardsley complex
64514	14	1.040	0.00	Carrizo very gravelly sand
64515	15	0.540	0.00	Carrizo-Gunsight complex, 1 to 5 percent slopes
64516	16	0.440	15.00	Cellar-Rock outcrop complex, 10 to 70 percent slopes
64517	17	0.440	15.00	Cellar-Rock outcrop complex, low precipitation, 10 to 70 percent
64518	18	0.330	15.00	Cheriono-Rock outcrop complex, 5 to 60 percent slopes
64519	19	0.190	0.00	Chuckawalla-Gunsight complex, 1 to 8 percent slopes
64520	20	0.190	0.00	Chuckawalla-Gunsight complex, low precipitation, 1 to 8 percent
64521	21	0.380	0.00	Cipriano very gravelly loam
64522	22	0.040	0.00	Contine clay loam
64523	23	0.010	0.00	Contine clay
64524	24	0.020	0.00	continental clay loam, 0 to 3 percent slopes
64525	25	0.020	0.00	Continental clay, 0 to 3 percent slopes
64526	26	0.010	0.00	Continental cobbly clay loam, 1 to 8 percent slopes
64527	27	0.010	0.00	Continental-Mohave complex, 1 to 7 percent slopes
64528	28	0.020	0.00	Continental-Ohaco complex
64529	29	0.340	0.00	Denure-Momoli-Carrizo complex
64530	30	0.340	0.00	Denure-Momoli-Carrizo complex, low precipitation
64531	31	0.330	35.00	Dixaleta-Rock outcrop complex, 25 to 65 percent slopes
64532	32	0.330	35.00	Dixaleta-Rock outcrop complex, low precipitation, 25 to 65 percent
64533	33	0.230	0.00	Eba very gravelly loam, 1 to 8 percent slopes
64534	34	0.230	0.00	Eba very gravelly loam, 8 to 20 percent slopes
64535	35	0.230	0.00	Eba very gravelly loam, low precipitation, 8 to 20 percent slopes
64536	36	0.070	0.00	Eba-Continental complex, 1 to 8 percent slopes
64537	37	0.130	0.00	Eba-Continental-Cave association, 3 to 20 percent slopes
64538	38	0.130	0.00	Eba-Continental-Cave association, low precipitation, 3 to 20 percent
64539	39	0.290	0.00	Eba-Nickel-Cave association, 3 to 25 percent slopes
64540	40	0.170	0.00	Eba-Pinaleno complex, 3 to 20 percent slopes
64541	41	0.170	0.00	Eba-Pinaleno complex, 20 to 40 percent slopes
64542	42	0.170	0.00	Eba-Pinaleno complex, low precipitation, 3 to 20 percent slopes
64543	43	0.170	0.00	Eba-Pinaleno complex, low precipitation, 20 to 40 percent slopes
64544	44	0.030	0.00	Ebon very gravelly loam, 1 to 8 percent slopes
64545	45	0.030	0.00	Ebon very gravelly loam, 8 to 20 percent slopes
64546	46	0.030	0.00	Ebon-Contine complex, 1 to 8 percent
64547	47	0.110	0.00	Ebon-Gunsight-Cipriano association, 3 to 25 percent slopes
64548	48	0.060	0.00	Ebon-Pinamt complex, 3 to 20 percent slopes
64549	49	0.060	0.00	Ebon-Pinamt complex, 20 to 40 percent slopes
64550	50	0.260	0.00	Estrella loams
64551	51	0.240	0.00	Gachado-Lomitas complex, 8 to 25 percent slopes
64552	52	0.160	20.00	Gachado-Lomitas-Rock outcrop complex, 7 to 55 percent slopes
64553	53	0.020	0.00	Gadsden clay
64554	54	0.290	0.00	Gila fine sandy loams
64555	55	0.270	0.00	Gilman loams
64556	56	0.270	0.00	Gilman loams, low precipitation
64557	57	0.060	0.00	Gilman clay loam
64558	58	0.340	0.00	Gilman-Momoli-Denure complex

Soil ID	Map Unit	XKSAT	Rock Percent	Description
Book Number: 645				
64559	59	0.340	0.00	Gilman-Momoli-Denure complex, low precipitation
64560	60	0.260	0.00	Glenbar loams
64561	61	0.150	0.00	Gran-Wickenburg complex, 1 to 10 percent slopes
64562	62	0.150	0.00	Gran-Wickenburg complex, low precipitation, 1 to 10 percent slopes
64563	63	0.140	25.00	Gran-Wickenburg-Rock outcrop complex, 1 to 7 percent slopes
64564	64	0.140	25.00	Gran-Wickenburg-Rock outcrop complex, low precipitation, 10 to 65
64565	65	0.190	0.00	Greyeagle-Continental-Nickel association, 1 to 40 percent slopes
64566	66	0.230	0.00	Greyeagle-Suncity Variant complex, 1 to 7 percent slopes
64567	67	0.010	0.00	Guest clay
64568	68	0.630	0.00	Gunsight-Cipriano complex, 1 to 7 percent slopes
64569	69	0.630	0.00	Gunsight-Cipriano complex, low precipitation, 1 to 7 percent slopes
64570	70	0.360	0.00	Gunsight-Rillito complex, 1 to 25 percent slopes
64571	71	0.360	0.00	Gunsight-Rillito complex, low precipitation, 1 to 40 percent slopes
64572	72	0.090	30.00	Lehmans-Rock outcrop complex, 8 to 65 percent slopes
64573	73	0.090	30.00	Lehmans-Rock outcrop complex, low precipitation, 8 to 65 percent
64574	74	0.080	0.00	Luke-Cipriano association, 1 to 15 percent slopes
64575	75	0.230	0.00	Mohall loam
64576	76	0.230	0.00	Mohall loam, calcareous solum
64577	77	0.050	0.00	Mohall clay loam
64578	78	0.050	0.00	Mohall clay loam, calcareous solum
64579	79	0.020	0.00	Mohall clay
64580	80	0.080	0.00	Mohall-Tremant complex, 1 to 8 percent slopes
64581	81	0.080	0.00	Mohall-Tremant complex, low precipitation, 1 to 8 percent slopes
64582	82	0.040	0.00	Mohave sandy loam
64583	83	0.040	0.00	Mohave loam
64584	84	0.050	0.00	Mohave loam, calcareous solum
64585	85	0.040	0.00	Mohave clay loam
64586	86	0.050	0.00	Mohave clay loam, calcareous solum
64587	87	0.040	0.00	Mohave complex
64588	88	0.020	0.00	Mohave-Guest complex
64589	89	0.060	0.00	Mohave-Tres Hermanos complex, 1 to 8 percent slopes
64590	90	0.390	0.00	Momoli gravelly sandy loam, 1 to 5 percent slopes
64591	91	0.930	0.00	Momoli-Carrizo complex
64592	92	0.930	0.00	Momoli-Carrizo complex, low precipitation
64593	93	0.330	0.00	Nickel-Cave complex, 8 to 30 percent slopes
64594	94	0.330	0.00	Nickel-Cave complex, low precipitation, 8 to 30 percent slopes
64595	95	0.040	0.00	Ohaco gravelly loam
64596	96	0.070	0.00	Pinaleno-Tres Hermanos complex, 1 to 10 percent slopes
64597	97	0.070	0.00	Pinaleno-Tres Hermanos complex, low precipitation, 1 to 10 percent
64598	98	0.370	0.00	Pinamt-Tremant complex, 1 to 10 percent slopes
64599	99	0.370	0.00	Pinamt-Tremant complex, low precipitation, 1 to 10 percent slopes
645100	100	0.400	20.00	Quilotosa-Vaiva-Rock outcrop complex, 20 to 65 percent slopes
645101	101	0.280	0.00	Rillito loam, 0 to 3 percent slopes
645102	102	0.400	0.00	Rillito gravelly loam, 1 to 8 percent slopes
645103	103	0.100	65.00	Rock outcrop-Gachado complex, 5 to 55 percent slopes
645104	104	0.140	60.00	Rock outcrop-Lehmans complex, 15 to 65 percent slopes
645105	105	0.140	60.00	Rock outcrop-Lehmans complex, low precipitation, 15 to 65 percent
645106	106	0.180	0.00	Sal-Cipriano complex, 1 to 10 percent slopes
645107	107	0.180	0.00	Sal-Cipriano complex, low precipitation, 1 to 10 percent slopes
645108	108	0.310	30.00	Schenco-Rock outcrop complex, 3 to 25 percent slopes
645109	109	0.350	35.00	Schenco-Rock outcrop complex, 25 to 60 percent slopes
645110	110	0.130	0.00	Suncity-Cipriano complex, 1 to 7 percent slopes
645111	111	0.400	0.00	Torriorthents, 15 to 40 percent slopes
645112	112	0.390	0.00	Tremant gravelly sandy loams
645113	113	0.390	0.00	Tremant gravelly loams
645114	114	0.390	0.00	Tremant gravelly loams, low precipitation
645115	115	0.390	0.00	Tremant-Antho complex, 1 to 5 percent slopes
645116	116	0.230	0.00	Tremant-Gunsight-Rillito complex, 1 to 5 percent slopes

Soil ID	Map Unit	XKSAT	Rock Percent	Description
Book Number: 645				
645117	117	0.230	0.00	Tremant-Gunsight-Rillito complex, low precipitation, 1 to 5 percent s
645118	118	0.420	0.00	Tremant-Rillito complex
645119	119	0.140	0.00	Tremant-Suncity complex, 1 to 8 percent slopes
645120	120	0.060	0.00	Tres Hermanos gravelly sandy loams
645121	121	0.120	0.00	Tres Hermanos-Anthony complex, 1 to 5 percent slopes
645122	122	0.330	0.00	Vado gravelly sandy loam, 1 to 5 percent slopes
645123	123	0.370	0.00	Vaiva very gravelly loam, 1 to 20 percent slopes
645124	124	0.390	0.00	Valencia sandy loams
645125	125	0.430	0.00	Vint loamy fine sand
645126	126	0.000	0.00	Water
Book Number: 651				
65164	W	0.000	0.00	Lakes, ponds, reservoirs - perennial
6512021	Aa	0.260	0.00	Agualt loam
6512025	Ac	0.390	0.00	Antho sandy loam, saline-alkali
6512029	Ae	0.390	0.00	Antho-Brios sandy loams
6512042	AL	0.400	0.00	Antho association
6512044	AM	0.390	0.00	Antho-Valencia association
6512047	An	0.050	0.00	Avonda clay loam
6512049	Ao	0.040	0.00	Avondale clay loam
6512051	Ap	0.040	0.00	Avondale clay loam, saline-alkali
6512228	BE	0.240	0.00	Beardsley loam
6512255	Br	1.050	0.00	Brios loamy sand
6512257	Bs	0.390	0.00	Brios sandy loam
6512259	Bt	0.250	0.00	Brios loam
6512423	Cb	0.400	0.00	Carrizo gravelly sandy loam
6512430	CF	0.500	0.00	Carrizo and Brios soils
6512433	Cg	0.240	0.00	Casa Grande Sandy loam
6512435	Ch	0.240	0.00	Casa Grande loam
6512441	Ck	0.300	0.00	Casa Grande complex
6512445	Cm	0.260	0.00	Casa Grande-Leveen complex, alkali
6512447	Cn	0.010	0.00	Cashion clay, saline-alkali
6512448	CO	0.290	20.00	Cheriono-Rock outcrop complex
6512451	Cp	0.400	0.00	Coolidge sandy loam
6512457	Cs	0.190	0.00	Coolidge-Tremant complex
6512462	CV	0.390	0.00	Coolidge-Laveen association
6512647	Dn	1.200	0.00	Dune land
6512857	Es	0.250	0.00	Estrella loam
6512859	Et	0.250	0.00	Estrella loam, saline-alkali
6513220	GA	0.100	40.00	Gachado-Rock outcrop complex
6513223	Gb	0.040	0.00	Gadsden clay loam
6513225	Gc	0.010	0.00	Gadsden clay
6513227	Gd	0.010	0.00	Gadsden clay, saline-alkali
6513229	Ge	0.260	0.00	Gilman fine sandy loam
6513231	Gf	0.240	0.00	Gilman fine sandy loam, saline-alkali
6513235	Gh	0.240	0.00	Gilman loam, saline-alkali
6513242	GL	0.250	0.00	Gilman complex, saline-alkali
6513244	GM	0.290	0.00	Gilman-Antho association
6513246	GN	0.250	0.00	Gilman-Laveen association
6513251	Gp	0.240	0.00	Gilman loam, clayey subsoil variant, moderately saline
6513255	Gr	0.230	0.00	Glenbar loam
6513257	Gs	0.230	0.00	Glenbar loam, saline-alkali
6513259	Gt	0.040	0.00	Glenbar clay loam
6513261	Gu	0.040	0.00	Glenbar clay loam, saline-alkali
6513263	Gv	0.010	0.00	Glenbar clay
6513444	HM	0.150	0.00	Harqua-Laveen complex
6514221	La	0.260	0.00	La Palma very fine sandy loam
6514223	Lb	0.400	0.00	Laveen sandy loam
6514227	Ld	0.250	0.00	Laveen loam, saline-alkali

Soil ID	Map Unit	XKSAT	Rock Percent	Description
Book Number: 651				
6514229	Le	0.040	0.00	Laveen clay loam
6514231	Lf	0.330	0.00	Laveen-Antho complex, saline-alkali
6514421	Ma	0.400	0.00	Maripo sandy loam
6514449	Mo	0.390	0.00	Mohall sandy loam
6514451	Mp	0.250	0.00	Mohall loam
6514455	Mr	0.050	0.00	Mohall clay loam
6514457	Ms	0.010	0.00	Mohall clay
6514462	MV	0.150	0.00	Mohall-Laveen association
6515021	Pa	0.400	0.00	Perryville sandy loam
6515023	Pb	0.380	0.00	Perryville loam, saline-alkali
6515058	PT	0.400	0.00	Pinal gravelly loam
6515456	RS	0.400	65.00	Rock outcrop-Cherioni complex
6515821	Ta	0.250	0.00	Toltec loam
6515822	TB	0.400	0.00	Torrifluvents
6515825	Tc	0.400	0.00	Torriorthents
6515826	TD	1.200	0.00	Torripsamments and Torrifluvents, frequently flooded
6515829	Te	0.250	0.00	Tremant loam
6515833	Tg	0.040	0.00	Tremant clay loam
6515835	Th	0.040	0.00	Tremant gravelly clay loam
6515859	Tt	0.040	0.00	Trix clay loam
6515861	Tu	0.250	0.00	Tucson loam
6515865	Tw	0.050	0.00	Tucson clay loam
6516221	Va	0.390	0.00	Valencia sandy loam
6516223	Vb	0.390	0.00	Valencia sandy loam, saline-alkali
6516225	Vc	0.390	0.00	Valencia gravelly sandy loam
6516229	Ve	0.250	0.00	Vecont loam
6516231	Vf	0.010	0.00	Vecont clay
6516233	Vg	0.910	0.00	Vint loamy fine sand
6516235	Vh	0.270	0.00	Vint fine sandy loam
6516241	Vk	0.260	0.00	Vint loam
6516247	Vn	0.040	0.00	Vint clay loam
6516255	Vr	0.630	0.00	Vint-Carrizo complex
6516433	Wg	0.030	0.00	Wintersburg complex
65124202	CA2	0.380	0.00	Calciorthids and Torriorthents, eroded
65132493	Go3	0.190	0.00	Gilman,Antho and Glenbar soils, severely eroded
651202320	AbA	0.380	0.00	Anthosandy loam, 0 to 1 percent slopes
651202322	AbB	0.390	0.00	Antho sandy loam, 1 to 3 percent slopes
651202720	AdA	0.400	0.00	Antho gravelly sandy loam, 0 to 1 percent slopes
651202722	AdB	0.400	0.00	Antho gravelly sandy loam, 1 to 3 percent slopes
651203120	AfA	0.380	0.00	Antho-Carrizo complex, 0 to 1 percent slopes
651203122	AfB	0.400	0.00	Antho-Carrizo complex, 1 to 3 percent slopes
651203222	AGB	0.400	0.00	Antho-Carrizo complex, 0 to 3 percent slopes
651203424	AHC	0.380	0.00	Antho-Tremant complex, 1 to 5 percent slopes
651204122	AkB	0.270	0.00	Antho-Tremant-Mohall complex, 1 to 5 percent slopes
651225036	BPI	0.000	0.00	Borrow pit
651242926	CeD	0.190	0.00	Carrizo-Ebon complex, 3 to 12 percent slopes
651245522	CrB	0.400	0.00	Coolidge gravelly sandy loam, 1 to 3 percent slopes
651282326	EbD	0.100	0.00	Ebon gravelly loam, 0 to 8 percent slopes
651285026	EPD	0.120	0.00	Ebon-Pinamt complex, 0 to 10 percent slopes
651323320	GgA	0.250	0.00	Gilman loan, 0 to 1 percent slopes
651323322	GgB	0.260	0.00	Gilman loam, 1 to 3 percent slopes
651325036	GPI	0.000	0.00	Gravel pit
651326426	GWD	0.350	0.00	Gunsight-Pinal complex, 1 to 10 percent slopes
651326720	GxA	0.230	0.00	Gunsight-Rillito complex, 0 to 1 percent slopes
651326722	GxB	0.240	0.00	Gunsight-Rillito complex, 1 to 3 percent slopes
651326826	GYD	0.260	0.00	Gunsight-Rillito complex, 0 to 10 percent slopes
651342022	HAB	0.070	0.00	Harqua complex, 0 to 3 percent slopes
651342024	HAC	0.050	0.00	Harqua complex, 3 to 8 percent slopes

Soil ID	Map Unit	XKSAT	Rock Percent	Description
Book Number: 651				
651344224	HLC	0.140	0.00	Harqua-Gunsight complex, 0 to 5 percent slopes
651345522	HrB	0.120	0.00	Harqua-Rillito complex, 1 to 3 percent slopes
651422520	LcA	0.250	0.00	Laveen loam, 0 to 1 percent slopes
651422522	LcB	0.250	0.00	Laveen loam, 1 to 3 percent slopes
651441064	M-W	0.000	0.00	Waste stabilization pond
651445822	MTB	0.150	0.00	Mohall-Tremant complex, 0 to 3 percent slopes
651502920	PeA	0.370	0.00	Perryville gravelly loam, 0 to 1 percent slopes
651502922	PeB	0.380	0.00	Perryville gravelly loam, 1 to 3 percent slopes
651505422	PRB	0.280	0.00	Perryville-Rillito complex, 0 to 3 percent slopes
651505720	PsA	0.250	0.00	Pinal loam, 0 to 1 percent slopes
651505722	PsB	0.260	0.00	Pinal loam, 1 to 3 percent slopes
651506322	PvB	0.250	0.00	Pinal-La Palma loams, 1 to 3 percent slopes
651506422	PWB	0.380	0.00	Pinal-Suncity complex, 0 to 3 percent slopes
651506826	PYD	0.200	0.00	Pinamt-Tremant complex, 1 to 10 percent slopes
651542120	RaA	0.390	0.00	Rillito sandy loam, 0 to 1 percent slopes
651542122	RaB	0.390	0.00	Rillito sandy loam, 1 to 3 percent slopes
651542320	RbA	0.260	0.00	Rillito loam, 0 to 1 percent slopes
651542322	RbB	0.250	0.00	Rillito loam, 1 to 3 percent slopes
651543522	RhB	0.230	0.00	Rillito-Harqua complex, 1 to 3 percent slopes
651545128	RpE	0.290	0.00	Rillito-Perryville complex, 5 to 20 percent slopes
651583120	TfA	0.370	0.00	Tremant gravelly loam, 0 to 1 percent slopes
651583122	TfB	0.360	0.00	Tremant gravelly loam 1 to 3 percent slopes
651585022	TPB	0.120	0.00	Tremant complex, 0 to 3 percent slopes
651585520	TrA	0.110	0.00	Tremant-Rillito complex, 0 to 1 percent slopes
651585522	TrB	0.130	0.00	Tremant-Rillito complex, 1 to 3 percent slopes
651585624	TSC	0.140	0.00	Tremant-Rillito complex, 0 to 5 percent slopes
6514228622830	LEVEE	0.000	0.00	Levee
Book Number: 653				
6531	1	0.230	0.00	Agualt and Ripley soils
6532	2	0.210	0.00	Agualt and Ripley soils, saline-sodic
6533	3	0.530	0.00	Ajo-Gunsight-Pompeii complex, 3 to 25 percent slopes
6534	4	0.400	40.00	Akela-Rock outcrop complex, 15 to 65 percent slopes
6535	5	0.790	0.00	Carrizo-Dateland complex, 0 to 3 percent slopes
6536	6	1.170	0.00	Carrizo-Momoli complex, 0 to 3 percent slopes
6537	7	0.420	0.00	Cherioni very cobbly fine sandy loam, 3 to 10 percent slopes
6538	8	0.770	0.00	Cherioni-Coolidge complex, 1 to 15 percent slopes
6539	9	1.050	15.00	Cipriano-Hyder-Rock outcrop complex, 15 to 65 percent slopes
65310	10	1.010	0.00	Cipriano-Momoli complex, 1 to 7 percent slopes
65311	11	0.610	0.00	Coolidge complex, 0 to 3 percent slopes
65312	12	0.330	0.00	Cuerda-Why-Lagunita complex
65313	13	0.330	0.00	Dateland very fine sandy loam
65314	14	0.270	0.00	Dateland-Cuerda complex, 0 to 3 percent slopes
65315	15	0.500	0.00	Dateland-Denure fine sandy loams, saline-Sodic, 0 to 3 percent slo
65316	16	0.920	0.00	Denure sandy loam
65317	17	0.990	0.00	Denure gravelly fine sandy loam, 1 to 3 percent slopes
65318	18	1.050	0.00	Denure-Carrizo, bench, gravelly fine sandy loams
65319	19	0.680	0.00	Denure-Cavelt complex, 0 to 3 percent slopes
65320	20	0.670	0.00	Denure-Coolidge complex, 1 to 3 percent slopes
65321	21	0.700	0.00	Denure-Rillito-Why complex, 1 to 5 percent slopes
65322	22	0.810	0.00	Denure-Why complex, 1 to 5 percent slopes
65323	23	0.000	0.00	Dumps-Pits Association
65324	24	0.040	0.00	Gadsden clay loam, 0 to 3 percent slopes
65325	25	0.060	0.00	Gadsden and Kofa silty clay loams, saline-sodic
65326	26	0.400	20.00	Garzona-Rock outcrop-Winkel complex, 15 to 65 percent slopes
65327	27	0.240	0.00	Gilman very fine sandy loam
65328	28	0.230	0.00	Gilman very fine sandy loam, saline-sodic
65329	29	0.050	0.00	Glenbar silty clay loam
65330	30	0.050	0.00	Glenbar silty clay loam, saline-sodic

Soil ID	Map Unit	XKSAT	Rock Percent	Description
Book Number: 653				
65331	31	0.550	0.00	Growler-Momoli complex, 1 to 3 percent slopes
65332	32	0.320	0.00	Growler-Wellton complex, 1 to 3 percent slopes
65333	33	0.770	0.00	Gunsight-Ajolito extremely gravelly sandy loams, 1 to 15 percent sl
65334	34	0.750	0.00	Gunsight-Chuckawalla complex, 1 to 15 percent slopes
65335	35	1.120	0.00	Gunsight-Cipriano complex, 1 to 15 percent slopes
65336	36	0.390	0.00	Gunsight-Pinamt complex, 1 to 15 percent slopes
65337	37	0.790	0.00	Gunsight-Rillito-Carrizo complex, 1 to 15 percent slopes
65338	38	0.290	0.00	Harqua fine sandy loam, 0 to 3 percent slopes
65339	39	0.340	0.00	Harqua-Cavelt complex, 1 to 10 percent slopes
65340	40	0.460	0.00	Hyder-Gachado-Gunsight extremely gravelly sandy loams, 1 to 25 p
65341	41	0.160	0.00	Indio silt loam
65342	42	0.140	0.00	Indio silt loam, saline-sodic
65343	43	0.870	0.00	Lagunita-Vint complex
65344	44	0.250	0.00	Mohall fine sandy loam
65345	45	0.260	0.00	Mohall loam
65346	46	0.260	0.00	Mohall loam, occasionally flooded
65347	47	0.060	0.00	Mohall clay loam
65348	48	0.270	0.00	Mohall complex, 0 to 3 percent slopes
65349	49	0.740	0.00	Momoli-Carrizo extremely gravelly sandy loams, 1 to 10 percent sl
65350	50	1.060	0.00	Momoli-Carrizo, bench, very gravelly sandy loams, 1 to 3 percent s
65351	51	0.950	0.00	Momoli-Comobabi association, 5 to 15 percent slopes
65352	52	0.980	0.00	Pits
65353	53	0.910	0.00	Quilotosa-Momoli-Carrizo complex, 1 to 15 percent slopes
65354	54	0.860	25.00	Quilotosa-Rock outcrop complex, 15 to 55 percent slopes
65355	55	1.200	0.00	Riverwash
65356	56	0.940	40.00	Rock outcrop-Hyder complex, 25 to 65 percent slopes
65357	57	0.760	0.00	Rositas-Denure loamy fine sands, 1 to 10 percent slopes
65358	58	0.350	20.00	Schenco-Laposa-Rock outcrop complex, 10 to 55 percent slopes
65359	59	0.280	0.00	Tremant gravelly fine sandy loam
65360	60	0.280	0.00	Tucson loam
65361	61	0.290	0.00	Vaiva-Quilotosa extremely gravelly sandy loams, 3 to 25 percent slo
65362	62	0.190	0.00	Vaiva-Quilotosa extremely stony sandy loams, 25 to 55 percent slop
65363	63	0.630	0.00	Vint very fine sandy loam
65364	64	0.360	0.00	Wellton loam
65365	65	0.630	0.00	Wellton complex
65366	66	0.400	0.00	Why gravelly fine sandy loam
65367	67	0.580	0.00	Why-Carrizo complex, 0 to 3 percent slopes
65368	68	0.000	100.00	Water
65369	69	0.000	0.00	Dam
Book Number: 655				
65564	W	0.000	0.00	Lakes, ponds, reservoirs - perennial
6552031	Af	0.250	0.00	Agualt fine sandy loam
6552033	Ag	0.250	0.00	Agualt loam
6552045	Am	1.200	0.00	Alluvial land
6552063	Av	0.040	0.00	Avondale clay loam
6552421	Ca	1.200	0.00	Carrizo gravelly loamy sand
6552423	Cb	0.250	0.00	Carrizo fine sandy loam
6552425	Cc	0.010	0.00	Cashion clay
6552449	Co	0.040	0.00	Contine clay loam
6552857	Es	0.250	0.00	Estrella loam
6553231	Gf	0.250	0.00	Gilman fine sandy loam
6553245	Gm	0.250	0.00	Gilman loam
6553247	Gn	0.040	0.00	Glenbar clay loam
6553255	Gr	1.200	0.00	Gravelly alluvial land
6554449	Mo	0.400	0.00	Mohall sandy loam
6554463	Mv	0.250	0.00	Mohall loam
6555045	Pm	0.040	0.00	Pimer clay loam
6555049	Po	0.250	0.00	Pinal loam, moderately deep variant

Soil ID	Map Unit	XKSAT	Rock Percent	Description
Book Number: 655				
6555449	Ro	0.250	65.00	Rock land
6555461	Ru	0.400	20.00	Rough broken land
6555463	Rv	0.000	0.00	Riverwash
6555867	Tx	0.040	0.00	Trix clay loam
6556221	Va	0.400	0.00	Valencia sandy loam
6556229	Ve	0.010	0.00	Vecont clay
6556231	Vf	1.200	0.00	Vint loamy fine sand
655204720	AnA	0.400	0.00	Antho sandy loam, 0 to 1 percent slopes
655204722	AnB	0.400	0.00	Antho sandy loam, 1 to 3 percent slopes
655204922	AoB	0.400	0.00	Antho gravelly sandy loam, 1 to 3 percent slopes
655242924	CeC	0.400	0.00	Cavelt gravelly loam, 1 to 5 percent slopes
655325036	GPI	0.000	0.00	Gravel Pits
655422120	LaA	0.250	0.00	Laveen loam, 0 to 1 percent slopes
655422122	LaB	0.250	0.00	Laveen loam, 1 to 3 percent slopes
655422920	LeA	0.040	0.00	Laveen clay loam, 0 to 1 percent slopes
655504720	PnA	0.400	0.00	Pinal gravelly loam, 0 to 1 percent slopes
655504724	PnC	0.400	0.00	Pinal gravelly loam, 1 to 3 percent slopes
655506320	PvA	0.400	0.00	Pinamt very gravelly loam, 0 to 1 percent slopes
655506324	PvC	0.400	0.00	Pinamt very gravelly loam, 3 to 5 percent slopes
655543720	RiA	0.400	0.00	Rillito gravelly loam, 0 to 1 percent slopes
655543722	RiB	0.400	0.00	Rillito gravelly loam, 1 to 3 percent slopes
655585522	TrB	0.100	0.00	Tremant gravelly loam, 1 to 3 percent slopes
Book Number: 658				
6581	1	9,999.000	0.00	Brios gravelly loamy sand,3 to 5 percent slopes
6582	2	9,999.000	0.00	Brios very fine sandy loam,0 to 2 percent slopes
6583	3	9,999.000	0.00	Carrizo-Momoli complex, 1 to 3 percent slopes
6584	4	9,999.000	0.00	Carrizo-Pinamt complex, 1 to 5 percent slopes
6585	5	9,999.000	0.00	Carrizo very gravelly coarse sand, 0 to 1 percent slopes
6586	6	9,999.000	0.00	Casa Grande clay loam, 0 to 1 percent slopes
6587	7	9,999.000	0.00	Casa Grande complex, 0 to 5 percent slopes
6588	8	9,999.000	0.00	Casa Grande fine sandy loam, 0 to 3 percent slopes
6589	9	9,999.000	0.00	Cavelt-Carrizo-Gunsight complex, 1 to 10 percent slopes
65810	10	9,999.000	0.00	Chuckwalla-Gunsight complex, 1 to 5 percent slopes
65811	11	9,999.000	0.00	Cristobal-Gunsight complex, 3 to 15 percent slopes
65812	12	9,999.000	0.00	Dateland-Cuerda complex, saline-sodic, 0 to 3 percent slopes
65813	13	9,999.000	0.00	Denure-Pahaka complex, 1 to 3 percent slopes
65814	14	9,999.000	0.00	Denure-Pahaka complex, 3 to 5 percent slopes
65815	15	9,999.000	0.00	Gadsden, Glenbar and Vint soils, saline-sodic, 0 to 2 percent slopes
65816	16	9,999.000	0.00	Gadsden silty clay loam, saline-sodic, 0 to 2 percent slopes
65817	17	9,999.000	0.00	Glenbar silt loam, saline-sodic, 0 to 2 percent slopes
65818	18	9,999.000	0.00	Indio silt loam, saline-sodic, 0 to 2 percent slopes
65819	19	9,999.000	0.00	Indio-Vint complex, saline-sodic, 0 to 3 percent slopes
65820	20	9,999.000	0.00	Kamato complex, 0 to 5 percent slopes
65821	21	9,999.000	0.00	Kamato loam, 0 to 2 percent slopes
65822	22	9,999.000	0.00	Lagunita silt loam, 0 to 2 percent slopes
65823	23	9,999.000	0.00	Laveen fine sandy loam, saline-sodic, 0 to 2 percent slopes
65824	24	9,999.000	0.00	Momoli cobbly sandy loam, 5 to 15 percent slopes
65825	25	9,999.000	0.00	Pompeii-Lomitas-Rock outcrop complex, 15 to 65 percent slopes
65826	26	9,999.000	0.00	Quilotosa-Momoli-Vaiva complex, 1 to 15 percent slopes
65827	27	9,999.000	0.00	Quilotosa-Rock outcrop-Vaiva complex, 20 to 65 percent slopes
65828	28	9,999.000	0.00	Redun-Shontik complex, 1 to 3 percent slopes
65829	29	9,999.000	0.00	Rillito-Gunsight complex, 3 to 15 percent slopes
65830	30	9,999.000	0.00	Rositas-Casa Grande-Slickspots complex, 1 to 15 percent slopes
65831	31	9,999.000	0.00	Rositas loamy fine sand, sodic, 0 to 3 percent slopes
65832	32	9,999.000	0.00	Shontik-Redun complex, 0 to 3 percent slopes
65833	33	9,999.000	0.00	Talai silt loam, 0 to 2 percent slopes
65834	34	9,999.000	0.00	Trix loam, saline-sodic, 0 to 1 percent slopes
65835	35	9,999.000	0.00	Vint-Yahana complex, saline-sodic, 0 to 10 percent slopes

Soil ID	Map Unit	XKSAT	Rock Percent	Description
Book Number: 658				
65836	36	9,999.000	0.00	Why-Brios complex, 0 to 2 percent slopes
65837	37	9,999.000	0.00	Yahana-Indio complex, saline-sodic, 0 to 3 percent slopes
65838	38	9,999.000	0.00	Yahana silty clay loam, 0 to 2 percent slopes
Book Number: 703				
7031	1	9,999.000	0.00	Ajo-pinamt, deep, complex, 3 to 15 percent slopes
7032	2	9,999.000	0.00	Anklam-cellar-rock outcrop complex, 15 to 55 percent slopes
7033	3	9,999.000	0.00	Anklam very gravelly sandy loam, 3 to 15 percent slopes
7034	4	9,999.000	0.00	Arizo-riverwash complex, 0 to 3 percent slopes
7035	5	9,999.000	0.00	Baboquivari-combate complex, 1 to 8 percent slopes
7036	6	9,999.000	0.00	Bucklebar-hayhook-tubac complex, 0 to 3 percent slopes
7037	7	9,999.000	0.00	Caralampi-selevin-kimrose complex, 5 to 50 percent slopes
7038	8	9,999.000	0.00	Casa grande-kamato complex, 0 to 1 percent slopes
7039	9	9,999.000	0.00	Casa grande-rositas-valencia complex, 0 to 5 percent slopes
70310	10	9,999.000	0.00	Cellar-lampshire-rock outcrop complex, 15 to 60 percent slopes
70311	11	9,999.000	0.00	Chiricahua-lampshire complex, 15 to 45 percent slopes
70312	12	9,999.000	0.00	Chuichu-rock outcrop complex, 15 to 45 percent slopes
70313	13	9,999.000	0.00	Chutum loam, 1 to 3 percent slopes
70314	14	9,999.000	0.00	Combate gravelly loamy coarse sand, 2 to 8 percent slopes
70315	15	9,999.000	0.00	Dateland-denure association, 1 to 3 percent slopes
70316	16	9,999.000	0.00	Delnorte-stagecoach complex, 1 to 20 percent slopes
70317	17	9,999.000	0.00	Delthorny-caracara complex, 3 to 25 percent slopes
70318	18	9,999.000	0.00	Delthorny-garzona-rock outcrop complex, 15 to 60 percent slopes
70319	19	9,999.000	0.00	Denure-momoli complex, 1 to 5 percent slopes
70320	20	9,999.000	0.00	Denure-pahaka complex, 1 to 3 percent slopes
70321	21	9,999.000	0.00	Dixaleta-rock outcrop complex, 15 to 70 percent slopes
70322	22	9,999.000	0.00	Far-spudrock-rock outcrop complex, 35 to 85 percent slopes
70323	23	9,999.000	0.00	Gachado-lomitas-rock outcrop complex, 15 to 45 percent slopes
70324	24	9,999.000	0.00	Gadsden silty clay loam, 0 to 1 percent slopes
70325	25	9,999.000	0.00	Gilman very fine sandy loam, 0 to 1 percent slopes
70326	26	9,999.000	0.00	Ginland silty clay, 0 to 1 percent slopes
70327	27	9,999.000	0.00	Glenbar loam, 0 to 1 percent slopes
70328	28	9,999.000	0.00	Glendale clay loam, 0 to 2 percent slopes, flooded
70329	29	9,999.000	0.00	Glendale silt loam, 1 to 3 percent slopes
70330	30	9,999.000	0.00	Glendale-pajarito complex, 1 to 3 percent slopes
70331	31	9,999.000	0.00	Grabe-vado complex, 1 to 5 percent slopes
70332	32	9,999.000	0.00	Granolite-rock outcrop complex, 15 to 65 percent slopes
70333	33	9,999.000	0.00	Gunsight-rillito complex, 1 to 8 percent slopes
70334	34	9,999.000	0.00	Hantz clay loam, 0 to 1 percent slopes
70335	35	9,999.000	0.00	Hayhook sandy loam, 1 to 5 percent slopes
70336	36	9,999.000	0.00	Hickiwan-gunsight-momoli complex, 3 to 15 percent slopes
70337	37	9,999.000	0.00	Hyder-rock outcrop-guvo complex, 10 to 45 percent slopes
70338	38	9,999.000	0.00	Keysto-riverwash complex, 0 to 5 percent slopes
70339	39	9,999.000	0.00	Kohatk-rock outcrop complex, 10 to 45 percent slopes
70340	40	9,999.000	0.00	Lajitas-bosa-rock outcrop complex, 15 to 50 percent slopes
70341	41	9,999.000	0.00	Lampshire-pantak-rock outcrop complex, 25 to 60 percent slopes
70342	42	9,999.000	0.00	Mohall loam, 0 to 2 percent slopes
70343	43	9,999.000	0.00	Mohall-pahaka complex, 1 to 3 percent slopes
70344	44	9,999.000	0.00	Mohall-trix complex, 0 to 1 percent slopes
70345	45	9,999.000	0.00	Nahda-stagecoach complex, 1 to 15 percent slopes
70346	46	9,999.000	0.00	Oracle-romero-rock outcrop complex, 5 to 35 percent slopes
70347	47	9,999.000	0.00	Pajarito-sahuarita complex, 1 to 3 percent slopes
70348	48	9,999.000	0.00	Pantano-granolite complex, 5 to 25 percent slopes
70349	49	9,999.000	0.00	Pinamt-momoli complex, 1 to 10 percent slopes
70350	50	9,999.000	0.00	Quilotosa extremely gravelly coarse sandy loam, 3 to 15 percent sl
70351	51	9,999.000	0.00	Quilotosa-rock outcrop-vaiva complex, 15 to 45 percent slopes
70352	52	9,999.000	0.00	Romero-lampshire-rock outcrop complex, 15 to 65 percent slopes
70353	53	9,999.000	0.00	Romero-rock outcrop complex, 10 to 40 percent slopes
70354	54	9,999.000	0.00	Rositas loamy fine sand, 2 to 5 percent slopes

Soil ID	Map Unit	XKSAT	Rock Percent	Description
Book Number: 703				
70355	55	9,999.000	0.00	Sasco loam, 0 to 1 percent slopes
70356	56	9,999.000	0.00	Soledad-topawa complex, 1 to 5 percent slopes
70357	57	9,999.000	0.00	Tatai silt loam, 0 to 2 percent slopes
70358	58	9,999.000	0.00	Tubac complex, 0 to 2 percent slopes
70359	59	9,999.000	0.00	Tucson-mohall-valencia complex, 1 to 3 percent slopes
70360	60	9,999.000	0.00	Vado-agustin complex, 1 to 8 percent slopes
70361	61	9,999.000	0.00	Vecont clay loam, 0 to 1 percent slopes
70362	62	9,999.000	0.00	Wintersburg loam, 0 to 1 percent slopes

Flood Control District of Maricopa County
Drainage Design Management System
Agency: FCDMC - LAND USE DEFAULTS
Project Reference: 118TH&JOMAX FU.COND.

Code	Description	Initial Abstraction IA	Percent Impervious RTIMP	Vegetation Cover	Moisture Deficit DTHETA	Resistance Coefficient Kb
Agriculture						
750	Agriculture	0.50	-	85.0	ORMAL	LOW
Commercial						
200	General Commercial (Commercial where no detail available)	0.10	80	60.0	ORMAL	MIN
210	Specialty Commercial (<=50,000 sq. ft.)	0.10	80	65.0	ORMAL	MIN
220	Neighborhood Commercial (50,000 to 100,000 sq. ft.)	0.10	80	65.0	ORMAL	MIN
230	Community Commercial (100,000 to 500,000 sq. ft.)	0.10	80	75.0	ORMAL	MIN
240	Regional Commercial (500,000 to 1,000,000 sq. ft.)	0.10	80	65.0	ORMAL	MIN
250	Super-Regional Commercial (>= 1,000,000 sq. ft.)	0.10	80	70.0	ORMAL	MIN
Industrial						
300	General Industrial (Industrial where no detail available)	0.15	55	60.0	ORMAL	MIN
310	Warehouse/Distribution Centers	0.10	80	75.0	ORMAL	MIN
320	Industrial	0.15	55	60.0	ORMAL	MIN
Institutional						
520	Educational (Public schools, private schools and universitie	0.29	45	80.0	ORMAL	MIN
530	Institutional (Includes hospitals and churches)	0.10	80	75.0	ORMAL	MIN
550	Public Facilities(Include community centers, power substatio	0.10	80	75.0	ORMAL	MIN
Landscaping						
2000	Landscaping with impervious under treatment	0.10	95	30.0	ORMAL	MIN
2001	Landscaping w/o impervious under treatment	0.20	-	30.0	ORMAL	MIN
Office						
400	Office General (Office where no detail available)	0.10	80	75.0	ORMAL	MIN
410	Office Low Rise (1-4 stories)	0.10	80	75.0	ORMAL	MIN
420	Office Mid Rise (5-12 stories)	0.10	80	75.0	ORMAL	MIN
430	Office High Rise (13 stories or more)	0.10	80	75.0	ORMAL	MIN
810	Business Park (Includes enclosed industrial, office or retai	0.10	80	75.0	ORMAL	MIN
Open Space						
540	Cemeteries	0.10	5	90.0	ORMAL	LOW
700	General Open Space (Open space where no detail available)	0.10	5	90.0	ORMAL	LOW
710	Active Open Space (Includes parks)	0.10	5	90.0	ORMAL	MIN
720	Golf courses	0.10	5	90.0	ORMAL	MIN
730	Passive Open Space (Includes mountain preserves and washes)	0.10	-	90.0	ORMAL	MAX
740	Water	0.00	-	0.0	WET	MIN
900	Vacant (Existing land use database only)	0.35	-	25.0	DRY	LOW
NDR	Undeveloped Desert Rangeland, Little topographic relief, slopes < 5%	0.35	-	9,999.0	DRY	LOW
UNDEVELOPED	Undeveloped Desert Land (Scottsdale)	0.30	1	30.0	ORMAL	MIN
NHS	Hillslopes, Sonoran Desert, Moderate topographic relief, slopes > 5%	0.15	-	9,999.0	DRY	HI
NMT	Mountain Terrain, High topographic relief, slopes > 10%	0.25	-	9,999.0	DRY	MAX
Other						
560	Special Events (Includes stadiums, sports complexes and fair	0.10	80	75.0	ORMAL	MIN
Other Employment						
570	Other Employment - low (Proving grounds and land fills)	0.10	80	75.0	ORMAL	MIN
580	Other Employment - medium	0.10	80	75.0	ORMAL	MIN
590	Other Employment - high	0.10	80	75.0	ORMAL	MIN
Residential						

Flood Control District of Maricopa County
Drainage Design Management System
Agency: FCDMC - LAND USE DEFAULTS
Project Reference: 118TH&JOMAX FU.COND.

Code	Description	Initial Abstraction IA	Percent Impervious RTIMP	Vegetation Cover	Moisture Deficit DTHETA	Resistance Coefficient Kb
Residential						
110	Rural Residential (<= 1/5 du per acre)	0.30	5	30.0	ORMAL	MIN
120	Estate Residential (1/5 du per acre to 1 du per acre)	0.30	5	30.0	ORMAL	MIN
130	Large Lot Residential - Single Family (1 du per acre to 2 du	0.30	15	50.0	ORMAL	MIN
140	Medium Lot Residential - Single Family (2-4 du per acre)	0.25	20	50.0	ORMAL	MIN
150	Small Lot Residential - Single Family (4-6 du per acre)	0.25	30	50.0	ORMAL	MIN
160	Very Small Lot Residential - Single Family (>6 du per acre-i	0.25	40	50.0	ORMAL	MIN
170	Medium Density Residential - Muli Family (5-10 du per acre)	0.25	45	50.0	ORMAL	MIN
180	High Density Residential - Multi Family (10-15 du per acre)	0.25	45	50.0	ORMAL	MIN
190	Very High Density Residential - Multi Family (> 15 du per ac	0.25	45	50.0	ORMAL	MIN
Tourist						
510	Tourist and Visitor Accommodations (Hotels, motels and resor	0.10	80	75.0	ORMAL	MIN
Transportation						
600	General Transportation (Transportation where no detail avail	0.10	80	75.0	ORMAL	MIN
610	Transportation (Includes railroads, railyards, transit cente	0.10	80	75.0	ORMAL	MIN
620	Airports (Includes public use airports)	0.15	55	60.0	ORMAL	MIN
630	Transportation	0.10	80	75.0	ORMAL	MIN
2002	Pavement and Rooftops	0.05	95	0.0	DRY	MIN
2003	Gravel Vehicular travel lanes and shoulders	0.10	5	0.0	DRY	MIN

Area ID	Book Number	Map Unit	Soil ID	Area (sq mi)	Area (%)	XKSAT	Rock Percent (%)	Effective Rock (%)	Comments
Major Basin ID: 01									
01	645	61	64561	0.017	100.00	0.150	-	100	
010	645	61	64561	0.001	100.00	0.150	-	100	
011	645	61	64561	0.018	100.00	0.150	-	100	
012	645	61	64561	0.012	100.00	0.150	-	100	
013	645	61	64561	0.010	100.00	0.150	-	100	
014	645	61	64561	0.007	100.00	0.150	-	100	
015	645	61	64561	0.002	100.00	0.150	-	100	
016	645	61	64561	0.001	100.00	0.150	-	100	
017	645	61	64561	0.006	100.00	0.150	-	100	
018	645	61	64561	0.007	100.00	0.150	-	100	
019	645	61	64561	0.001	100.00	0.150	-	100	
02	645	61	64561	0.002	100.00	0.150	-	100	
020	645	61	64561	0.003	100.00	0.150	-	100	
021	645	61	64561	0.003	100.00	0.150	-	100	
022	645	61	64561	0.009	100.00	0.150	-	100	
023	645	61	64561	0.003	100.00	0.150	-	100	
03	645	61	64561	0.003	100.00	0.150	-	100	
04	645	61	64561	0.003	100.00	0.150	-	100	
05	645	61	64561	0.003	100.00	0.150	-	100	
06	645	61	64561	0.003	100.00	0.150	-	100	
07	645	61	64561	0.002	100.00	0.150	-	100	
08	645	61	64561	0.002	100.00	0.150	-	100	
09	645	61	64561	0.002	100.00	0.150	-	100	
DS01	645	61	64561	0.009	100.00	0.150	-	100	
DS02	645	61	64561	0.003	100.00	0.150	-	100	
DS03	645	61	64561	0.006	100.00	0.150	-	100	
DS04	645	61	64561	0.003	100.00	0.150	-	100	

Flood Control District of Maricopa County
Drainage Design Management System
LAND USE
Project Reference: 118TH&JOMAX FU.COND.

Sub Basin	Land Use Code	Area (sq mi)	Area (%)	Initial Loss (IA)	Percent Impervious (RTIMP)	Vegetation Cover (%)	DTHETA	Kb	Description
Major Basin ID: 01									
01	120	0.0170	100.0	0.30	15 *	30.0	NORMAL	0.034	Estate Residential (1/5 du per acre to 1 du per acre)
		0.0170	**100.0**						
010	110	0.0010	100.0	0.30	15 *	30.0	NORMAL	0.041	Rural Residential (<= 1/5 du per acre)
		0.0010	**100.0**						
011	120	0.0180	100.0	0.30	15 *	30.0	NORMAL	0.033	Estate Residential (1/5 du per acre to 1 du per acre)
		0.0180	**100.0**						
012	120	0.0120	100.0	0.30	15 *	30.0	NORMAL	0.034	Estate Residential (1/5 du per acre to 1 du per acre)
		0.0120	**100.0**						
013	120	0.0100	100.0	0.30	15 *	30.0	NORMAL	0.035	Estate Residential (1/5 du per acre to 1 du per acre)
		0.0100	**100.0**						
014	120	0.0070	100.0	0.30	15 *	30.0	NORMAL	0.036	Estate Residential (1/5 du per acre to 1 du per acre)
		0.0070	**100.0**						
015	120	0.0020	100.0	0.30	15 *	30.0	NORMAL	0.039	Estate Residential (1/5 du per acre to 1 du per acre)
		0.0020	**100.0**						
016	120	0.0010	100.0	0.30	15 *	30.0	NORMAL	0.041	Estate Residential (1/5 du per acre to 1 du per acre)
		0.0010	**100.0**						
017	120	0.0060	100.0	0.30	15 *	30.0	NORMAL	0.036	Estate Residential (1/5 du per acre to 1 du per acre)
		0.0060	**100.0**						
018	120	0.0070	100.0	0.30	15 *	30.0	NORMAL	0.036	Estate Residential (1/5 du per acre to 1 du per acre)
		0.0070	**100.0**						
019	120	0.0010	100.0	0.30	15 *	30.0	NORMAL	0.041	Estate Residential (1/5 du per acre to 1 du per acre)

* Non default value

Flood Control District of Maricopa County
Drainage Design Management System
LAND USE
Project Reference: 118TH&JOMAX FU.COND.

Sub Basin	Land Use Code	Area (sq mi)	Area (%)	Initial Loss (IA)	Percent Impervious (RTIMP)	Vegetation Cover (%)	DTHETA	Kb	Description
Major Basin ID: 01									
		0.0010	**100.0**						
02	120	0.0020	100.0	0.30	15 *	30.0	NORMAL	0.039	Estate Residential (1/5 du per acre to 1 du per acre)
		0.0020	**100.0**						
020	120	0.0030	100.0	0.30	15 *	30.0	NORMAL	0.038	Estate Residential (1/5 du per acre to 1 du per acre)
		0.0030	**100.0**						
021	120	0.0030	100.0	0.30	15 *	30.0	NORMAL	0.038	Estate Residential (1/5 du per acre to 1 du per acre)
		0.0030	**100.0**						
022	120	0.0090	100.0	0.30	15 *	30.0	NORMAL	0.035	Estate Residential (1/5 du per acre to 1 du per acre)
		0.0090	**100.0**						
023	120	0.0030	100.0	0.30	15 *	30.0	NORMAL	0.038	Estate Residential (1/5 du per acre to 1 du per acre)
		0.0030	**100.0**						
03	110	0.0020	100.0	0.30	15 *	30.0	NORMAL	0.039	Rural Residential (<= 1/5 du per acre)
		0.0020	**100.0**						
04	110	0.0020	66.7	0.30	15 *	30.0	NORMAL	0.038	Rural Residential (<= 1/5 du per acre)
	120	0.0010	33.3	0.30	15 *	30.0	NORMAL	0.038	Estate Residential (1/5 du per acre to 1 du per acre)
		0.0030	**100.0**						
05	120	0.0030	75.0	0.30	15 *	30.0	NORMAL	0.038	Estate Residential (1/5 du per acre to 1 du per acre)
	UNDEVELOPED	0.0010	25.0	0.30	1	30.0	NORMAL	0.038	Undeveloped Desert Land (Scottsdale)
		0.0040	**100.0**						
06	110	0.0030	100.0	0.30	15 *	30.0	NORMAL	0.038	Rural Residential (<= 1/5 du per acre)

* Non default value

Flood Control District of Maricopa County
Drainage Design Management System
LAND USE
Project Reference: 118TH&JOMAX FU.COND.

Sub Basin	Land Use Code	Area (sq mi)	Area (%)	Initial Loss (IA)	Percent Impervious (RTIMP)	Vegetation Cover (%)	DTHETA	Kb	Description
Major Basin ID: 01									
		0.0030	**100.0**						
07	110	0.0020	100.0	0.30	15 *	30.0	NORMAL	0.039	Rural Residential (<= 1/5 du per acre)
		0.0020	**100.0**						
08	120	0.0020	66.7	0.30	15 *	30.0	NORMAL	0.039	Estate Residential (1/5 du per acre to 1 du per acre)
	UNDEVELOPED	0.0010	33.3	0.30	1	30.0	NORMAL	0.039	Undeveloped Desert Land (Scottsdale)
		0.0030	**100.0**						
09	110	0.0020	100.0	0.30	15 *	30.0	NORMAL	0.039	Rural Residential (<= 1/5 du per acre)
		0.0020	**100.0**						
DS01	120	0.0090	100.0	0.30	15 *	30.0	NORMAL	0.035	Estate Residential (1/5 du per acre to 1 du per acre)
		0.0090	**100.0**						
DS02	120	0.0030	100.0	0.30	15 *	30.0	NORMAL	0.038	Estate Residential (1/5 du per acre to 1 du per acre)
		0.0030	**100.0**						
DS03	120	0.0060	100.0	0.30	15 *	30.0	NORMAL	0.036	Estate Residential (1/5 du per acre to 1 du per acre)
		0.0060	**100.0**						
DS04	120	0.0030	100.0	0.30	15 *	30.0	NORMAL	0.038	Estate Residential (1/5 du per acre to 1 du per acre)
		0.0030	**100.0**						

* Non default value

Area ID	Area (sq mi)	Length (mi)	Slope (ft/mi)	Adj Slope	Time-Area	Kb	IA (in)	DTHETA	PSIF (in)	XKSAT (in/hr)	RTIMP (%)		2 Yr	5 Yr	10 Yr	25 Yr	50 Yr	100 Yr
	Sub Basin Parameters						Rainfall Losses						Return Period Parameters					
Major Basin ID: 01																		
DS01	0.009	0.12	201.7	201.6	HEC1 DEFAULT	0.035	0.30	0.25	6.00	0.183	15	**Tc (Hrs)**	0.147	0.138	0.125	0.112	0.105	0.098
												Vel (f/s)	1.20	1.28	1.41	1.57	1.68	1.80
												R (Hrs)	0.119	0.111	0.099	0.088	0.081	0.076
DS02	0.003	0.18	135.6	135.6	HEC1 DEFAULT	0.038	0.30	0.25	6.00	0.183	15	**Tc (Hrs)**	0.213	0.200	0.181	0.162	0.151	0.142
												Vel (f/s)	1.24	1.32	1.46	1.63	1.75	1.86
												R (Hrs)	0.462	0.431	0.386	0.341	0.316	0.296
DS03	0.006	0.13	134.9	134.9	HEC1 DEFAULT	0.036	0.30	0.25	6.00	0.183	15	**Tc (Hrs)**	0.176	0.166	0.150	0.134	0.125	0.118
												Vel (f/s)	1.08	1.15	1.27	1.42	1.53	1.62
												R (Hrs)	0.194	0.182	0.163	0.144	0.133	0.124
DS04	0.003	0.13	166.7	166.7	HEC1 DEFAULT	0.038	0.30	0.25	6.00	0.183	15	**Tc (Hrs)**	0.170	0.160	0.144	0.129	0.120	0.113
												Vel (f/s)	1.12	1.19	1.32	1.48	1.59	1.69
												R (Hrs)	0.277	0.259	0.232	0.204	0.189	0.177
01	0.017	0.26	137.4	137.4	HEC1 DEFAULT	0.034	0.30	0.25	6.00	0.183	15	**Tc (Hrs)**	0.240	0.226	0.205	0.183	0.171	0.161
												Vel (f/s)	1.59	1.69	1.86	2.08	2.23	2.37
												R (Hrs)	0.264	0.247	0.221	0.195	0.181	0.169
02	0.002	0.08	185.2	185.2	HEC1 DEFAULT	0.039	0.30	0.25	6.00	0.183	15	**Tc (Hrs)**	0.130	0.123	0.111	0.099	0.093	0.087
												Vel (f/s)	0.90	0.95	1.06	1.19	1.26	1.35
												R (Hrs)	0.177	0.165	0.148	0.131	0.121	0.113
03	0.002	0.09	188.2	188.2	HEC1 DEFAULT	0.039	0.30	0.25	6.00	0.183	15	**Tc (Hrs)**	0.138	0.130	0.117	0.105	0.098	0.092
												Vel (f/s)	0.96	1.02	1.13	1.26	1.35	1.43
												R (Hrs)	0.206	0.193	0.173	0.152	0.141	0.132
04	0.003	0.11	181.0	181.0	HEC1 DEFAULT	0.038	0.30	0.25	6.00	0.183	15	**Tc (Hrs)**	0.152	0.143	0.130	0.116	0.108	0.102
												Vel (f/s)	1.06	1.13	1.24	1.39	1.49	1.58
												R (Hrs)	0.214	0.200	0.179	0.158	0.147	0.137
05	0.003	0.10	195.9	195.9	HEC1 DEFAULT	0.038	0.30	0.25	6.00	0.183	12	**Tc (Hrs)**	0.143	0.134	0.121	0.108	0.101	0.095
												Vel (f/s)	1.03	1.09	1.21	1.36	1.45	1.54
												R (Hrs)	0.186	0.173	0.155	0.136	0.126	0.118

* Non default value or value out of range

Area ID	Sub Basin Parameters: Area (sq mi)	Length (mi)	Slope (ft/mi)	Adj Slope	Time-Area	Kb	Rainfall Losses: IA (in)	DTHETA	PSIF (in)	XKSAT (in/hr)	RTIMP (%)		Return Period Parameters: 2 Yr	5 Yr	10 Yr	25 Yr	50 Yr	100 Yr
Major Basin ID: 01																		
06	0.003	0.15	176.5	176.5	HEC1 DEFAULT	0.038	0.30	0.25	6.00	0.183	15	**Tc (Hrs)**	0.179	0.168	0.152	0.136	0.127	0.120
												Vel (f/s)	1.23	1.31	1.45	1.62	1.73	1.83
												R (Hrs)	0.329	0.308	0.276	0.243	0.225	0.211
07	0.002	0.06	285.7	257.9	HEC1 DEFAULT	0.039	0.30	0.25	6.00	0.183	15	**Tc (Hrs)**	0.102	0.096	0.087	0.078	0.072	0.068
												Vel (f/s)	0.86	0.92	1.01	1.13	1.22	1.29
												R (Hrs)	0.107	0.100	0.089	0.079	0.073	0.068
08	0.002	0.12	156.5	156.5	HEC1 DEFAULT	0.039	0.30	0.25	6.00	0.183	10	**Tc (Hrs)**	0.172	0.161	0.145	0.129	0.120	0.113
												Vel (f/s)	1.02	1.09	1.21	1.36	1.47	1.56
												R (Hrs)	0.332	0.309	0.275	0.242	0.224	0.209
09	0.002	0.13	186.6	186.6	HEC1 DEFAULT	0.039	0.30	0.25	6.00	0.183	15	**Tc (Hrs)**	0.166	0.156	0.141	0.126	0.118	0.111
												Vel (f/s)	1.15	1.22	1.35	1.51	1.62	1.72
												R (Hrs)	0.340	0.318	0.285	0.251	0.233	0.218
010	0.001	0.03	172.4	172.4	HEC1 DEFAULT	0.041	0.30	0.25	6.00	0.183	15	**Tc (Hrs)**	0.084	0.079	0.071	0.064	0.060	0.056
												Vel (f/s)	0.52	0.56	0.62	0.69	0.73	0.79
												R (Hrs)	0.073	0.068	0.061	0.054	0.050	0.047
011	0.018	0.39	117.0	117.0	HEC1 DEFAULT	0.033	0.30	0.25	6.00	0.183	15	**Tc (Hrs)**	0.305*	0.287*	0.259*	0.232	0.216	0.204
												Vel (f/s)	1.88	1.99	2.21	2.47	2.65	2.80
												R (Hrs)	0.460	0.430	0.385	0.340	0.314	0.294
012	0.012	0.32	129.6	129.6	HEC1 DEFAULT	0.034	0.30	0.25	6.00	0.183	15	**Tc (Hrs)**	0.271*	0.255*	0.231	0.207	0.193	0.182
												Vel (f/s)	1.73	1.84	2.03	2.27	2.43	2.58
												R (Hrs)	0.435	0.407	0.364	0.321	0.298	0.279
013	0.010	0.19	139.9	139.9	HEC1 DEFAULT	0.035	0.30	0.25	6.00	0.183	15	**Tc (Hrs)**	0.207	0.195	0.177	0.158	0.147	0.139
												Vel (f/s)	1.35	1.43	1.57	1.76	1.90	2.00
												R (Hrs)	0.236	0.220	0.197	0.174	0.161	0.151
014	0.007	0.20	167.5	167.5	HEC1 DEFAULT	0.036	0.30	0.25	6.00	0.183	15	**Tc (Hrs)**	0.204	0.192	0.174	0.155	0.145	0.137
												Vel (f/s)	1.44	1.53	1.69	1.89	2.02	2.14
												R (Hrs)	0.296	0.277	0.248	0.219	0.203	0.190

* Non default value or value out of range

Flood Control District of Maricopa County
Drainage Design Management System
SUB BASINS
Project Reference: 118TH&JOMAX FU.COND.

Area ID	Sub Basin Parameters						Rainfall Losses						Return Period Parameters					
	Area (sq mi)	Length (mi)	Slope (ft/mi)	Adj Slope	Time-Area	Kb	IA (in)	DTHETA	PSIF (in)	XKSAT (in/hr)	RTIMP (%)		2 Yr	5 Yr	10 Yr	25 Yr	50 Yr	100 Yr
Major Basin ID: 01																		
015	0.002	0.05	296.3	262.0	HEC1 DEFAULT	0.039	0.30	0.25	6.00	0.183	15	**Tc (Hrs)**	0.093	0.087	0.079	0.071	0.066	0.062
												Vel (f/s)	0.79	0.84	0.93	1.03	1.11	1.18
												R (Hrs)	0.083	0.078	0.069	0.061	0.057	0.053
016	0.001	0.03	323.5	270.9	HEC1 DEFAULT	0.041	0.30	0.25	6.00	0.183	15	**Tc (Hrs)**	0.073	0.069	0.062	0.055	0.052	0.049
												Vel (f/s)	0.60	0.64	0.71	0.80	0.85	0.90
												R (Hrs)	0.063	0.059	0.053	0.046	0.043	0.040
017	0.006	0.13	223.1	220.8	HEC1 DEFAULT	0.036	0.30	0.25	6.00	0.183	15	**Tc (Hrs)**	0.151	0.142	0.129	0.115	0.107	0.101
												Vel (f/s)	1.26	1.34	1.48	1.66	1.78	1.89
												R (Hrs)	0.164	0.153	0.137	0.121	0.112	0.105
018	0.007	0.25	122.4	122.4	HEC1 DEFAULT	0.036	0.30	0.25	6.00	0.183	15	**Tc (Hrs)**	0.252*	0.237	0.214	0.192	0.179	0.168
												Vel (f/s)	1.46	1.55	1.71	1.91	2.05	2.18
												R (Hrs)	0.446	0.417	0.374	0.330	0.305	0.286
019	0.001	0.05	226.4	223.4	HEC1 DEFAULT	0.041	0.30	0.25	6.00	0.183	15	**Tc (Hrs)**	0.100	0.094	0.085	0.076	0.071	0.067
												Vel (f/s)	0.73	0.78	0.86	0.96	1.03	1.09
												R (Hrs)	0.134	0.125	0.112	0.099	0.092	0.086
020	0.003	0.12	172.1	172.1	HEC1 DEFAULT	0.038	0.30	0.25	6.00	0.183	15	**Tc (Hrs)**	0.161	0.152	0.137	0.123	0.115	0.108
												Vel (f/s)	1.09	1.16	1.28	1.43	1.53	1.63
												R (Hrs)	0.245	0.229	0.205	0.181	0.168	0.157
021	0.003	0.11	166.7	166.7	HEC1 DEFAULT	0.038	0.30	0.25	6.00	0.183	15	**Tc (Hrs)**	0.156	0.147	0.133	0.119	0.111	0.104
												Vel (f/s)	1.03	1.10	1.21	1.36	1.45	1.55
												R (Hrs)	0.221	0.206	0.185	0.163	0.151	0.141
022	0.009	0.15	142.9	142.9	HEC1 DEFAULT	0.035	0.30	0.25	6.00	0.183	15	**Tc (Hrs)**	0.183	0.172	0.156	0.139	0.130	0.123
												Vel (f/s)	1.20	1.28	1.41	1.58	1.69	1.79
												R (Hrs)	0.181	0.169	0.151	0.133	0.124	0.116
023	0.003	0.10	313.1	267.8	HEC1 DEFAULT	0.038	0.30	0.25	6.00	0.183	15	**Tc (Hrs)**	0.128	0.121	0.109	0.098	0.091	0.086
												Vel (f/s)	1.15	1.21	1.35	1.50	1.61	1.71
												R (Hrs)	0.165	0.154	0.138	0.122	0.113	0.105

* Non default value or value out of range

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1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              JUN  1998                *
*            VERSION 4.1                *
*                                       *
*  RUN DATE   29DEC16  TIME  05:58:52   *
*                                       *
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*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 756-1104              *
*                                       *
*****************************************
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X     X  XXXXXXX   XXXXX           X
X     X  X        X     X        XX
X     X  X        X              X
XXXXXXX  XXXX     X        XXXXX  X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX   XXXXX         XXX
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THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM


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LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

   1          ID        Flood Control District of Maricopa County
   2          ID        118TH&JOMAX FU.COND. - FUTURE CONDITIONS
   3          ID        2 YEAR
   4          ID        6 Hour  Storm
   5          ID        Unit Hydrograph: Clark
   6          ID        Storm: Multiple
   7          ID        12/29/2016
              *DIAGRAM
   8          IT       1  1JAN99       0    2000
   9          IO       5
  10          IN      15
              *
  11          JD   1.438  0.0001
  12          PC   0.000   0.008   0.016   0.025   0.033   0.041   0.050   0.058   0.066   0.074
  13          PC   0.087   0.099   0.118   0.138   0.216   0.377   0.834   0.911   0.931   0.950
  14          PC   0.962   0.972   0.983   0.991   1.000
  15          JD   1.429  0.5000
  16          PC   0.000   0.008   0.016   0.025   0.033   0.041   0.050   0.058   0.066   0.074
  17          PC   0.087   0.099   0.118   0.138   0.216   0.377   0.834   0.911   0.931   0.950
  18          PC   0.962   0.972   0.983   0.991   1.000
              *
  19          KK    DS01   BASIN
  20          BA   0.009
  21          LG    0.30    0.25    6.00    0.18      15
  22          UC   0.147   0.119
  23          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  24          UA     100
              *
  25          KK   RDS01   ROUTE
  26          RD     226  0.0265   0.035           TRAP   2.500   10.00
              *
  27          KK    DS02   BASIN
  28          BA   0.003
  29          LG    0.30    0.25    6.00    0.18      15
  30          UC   0.213   0.462
  31          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  32          UA     100
              *
  33          KK   CDS12 COMBINE
  34          HC       2
              *
  35          KK  RCDS12   ROUTE
  36          RD     209  0.0143   0.035           TRAP   4.000   10.00
              *
```



```
LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  37          KK    DS03   BASIN
  38          BA   0.006
  39          LG    0.30    0.25    6.00    0.18      15
  40          UC   0.176   0.194
  41          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  42          UA     100
              *
  43          KK   RDS03   ROUTE
```

```
 44          RD     467  0.0230   0.035           TRAP   3.500   10.00
             *

 45          KK    DS04   BASIN
 46          BA   0.003
 47          LG    0.30    0.25    6.00    0.18      15
 48          UC   0.170   0.277
 49          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 50          UA     100
             *

 51          KK    CDS34 COMBINE
 52          HC        2
             *

 53          KK   RCDS34   ROUTE
 54          RD     232  0.0172   0.035           TRAP   3.000   10.00
             *

 55          KK       02   BASIN
 56          BA   0.002
 57          LG    0.30    0.25    6.00    0.18      15
 58          UC   0.130   0.177
 59          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 60          UA     100
             *

 61          KK       03   BASIN
 62          BA   0.002
 63          LG    0.30    0.25    6.00    0.18      15
 64          UC   0.138   0.206
 65          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 66          UA     100
             *

 67          KK    CO23 COMBINE
 68          HC        4
             *

 69          KK   RC023   ROUTE
 70          RD     449  0.0178   0.035           TRAP   4.000   10.00
             *
```



```
LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 71          KK       01   BASIN
 72          BA   0.017
 73          LG    0.30    0.25    6.00    0.18      15
 74          UC   0.240   0.264
 75          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 76          UA     100
             *

 77          KK       04   BASIN
 78          BA   0.003
 79          LG    0.30    0.25    6.00    0.18      15
 80          UC   0.152   0.214
 81          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 82          UA     100
             *

 83          KK    CO14 COMBINE
 84          HC        3
             *

 85          KK   RC014   ROUTE
 86          RD     412  0.0194   0.035           TRAP   5.000   10.00
             *

 87          KK       05   BASIN
 88          BA   0.003
 89          LG    0.30    0.25    6.00    0.18      12
 90          UC   0.143   0.186
 91          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 92          UA     100
             *

 93          KK       06   BASIN
 94          BA   0.003
 95          LG    0.30    0.25    6.00    0.18      15
 96          UC   0.179   0.329
 97          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 98          UA     100
             *

 99          KK    CO56 COMBINE
100          HC        3
             *

101          KK   RC056   ROUTE
102          RD     195  0.0154   0.035           TRAP   5.000   10.00
             *

103          KK       07   BASIN
104          BA   0.002
105          LG    0.30    0.25    6.00    0.18      15
106          UC   0.102   0.107
107          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
108          UA     100
```

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
  109     KK     C07 COMBINE
  110     HC       2
          *
  111     KK   STOR2 STORAGE
  112     RS       1    STOR      -1
  113     SA    0.04    0.14    0.25    0.37
  114     SQ       0      15      45      81
  115     SE  2707.0 2708.00 2709.00 2710.00
  116     ST    2711      50     1.5     2.7
          *
  117     KK     011   BASIN
  118     BA   0.018
  119     LG    0.30    0.25    6.00    0.18      15
  120     UC   0.305   0.460
  121     UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  122     UA     100
          *
  123     KK     012   BASIN
  124     BA   0.012
  125     LG    0.30    0.25    6.00    0.18      15
  126     UC   0.271   0.435
  127     UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  128     UA     100
          *
  129     KK   C1112 COMBINE
  130     HC       2
          *
  131     KK  RC1112   ROUTE
  132     RD     645  0.0170   0.035            TRAP   8.000   10.00
          *
  133     KK     013   BASIN
  134     BA   0.010
  135     LG    0.30    0.25    6.00    0.18      15
  136     UC   0.207   0.236
  137     UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  138     UA     100
          *
  139     KK     014   BASIN
  140     BA   0.007
  141     LG    0.30    0.25    6.00    0.18      15
  142     UC   0.204   0.296
  143     UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  144     UA     100
          *
```



```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
  145     KK    R014   ROUTE
  146     RD     242  0.0165   0.035            TRAP   7.000   10.00
          *
  147     KK   C1314 COMBINE
  148     HC       3
          *
  149     KK   STOR1 STORAGE
  150     RS       1    STOR      -1
  151     SA    0.04    0.13    0.23    0.40
  152     SQ       0   13.00   39.00   71.00
  153     SE  2684.0 2685.00 2686.00 2687.00
  154     ST    2688      50     1.5     2.7
          *
  155     KK      08   BASIN
  156     BA   0.002
  157     LG    0.30    0.25    6.00    0.18      10
  158     UC   0.172   0.332
  159     UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  160     UA     100
          *
  161     KK      09   BASIN
  162     BA   0.002
  163     LG    0.30    0.25    6.00    0.18      15
  164     UC   0.166   0.340
  165     UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  166     UA     100
          *
  167     KK     010   BASIN
  168     BA   0.001
  169     LG    0.30    0.25    6.00    0.18      15
  170     UC   0.084   0.073
  171     UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  172     UA     100
          *
```

```
 173          KK     015   BASIN
 174          BA   0.002
 175          LG    0.30    0.25    6.00    0.18      15
 176          UC   0.093   0.083
 177          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 178          UA     100
              *

 179          KK     016   BASIN
 180          BA   0.001
 181          LG    0.30    0.25    6.00    0.18      15
 182          UC   0.073   0.063
 183          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 184          UA     100
              *
```

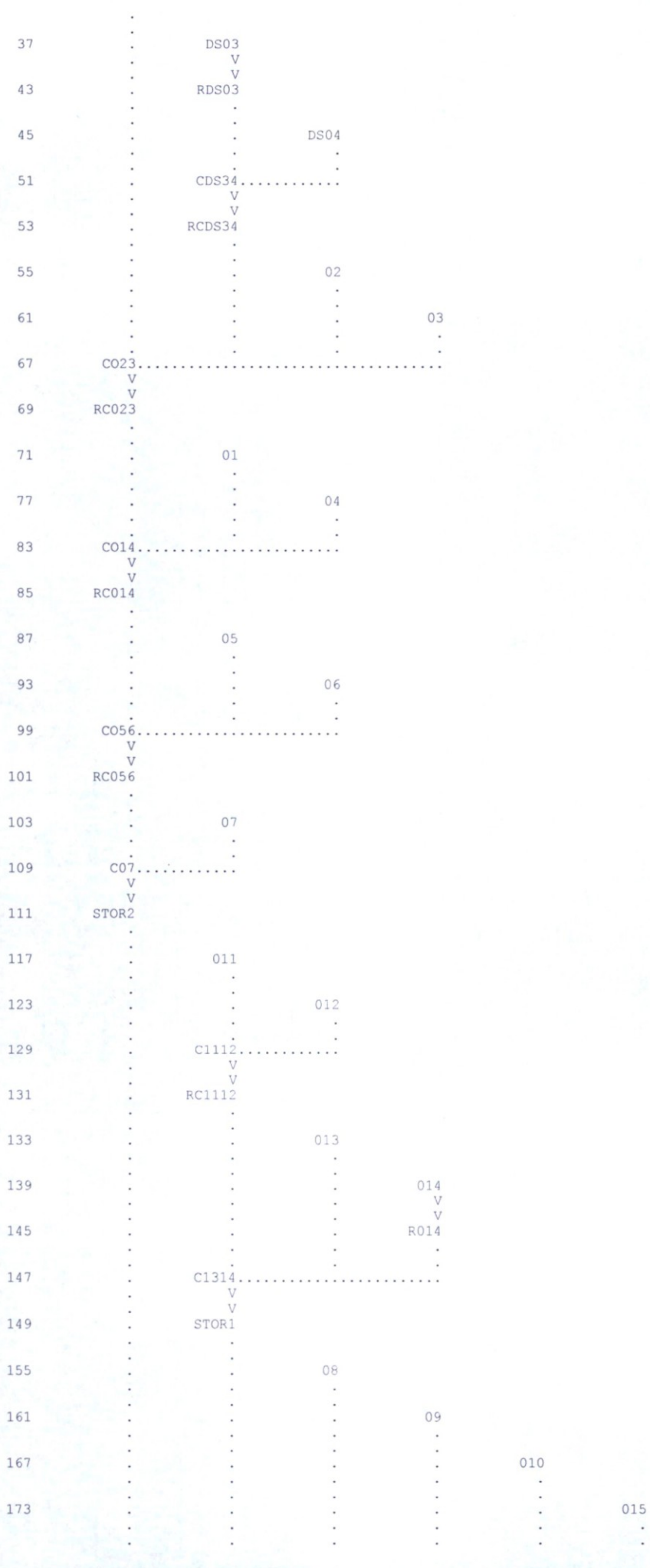


```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 185          KK     017   BASIN
 186          BA   0.006
 187          LG    0.30    0.25    6.00    0.18      15
 188          UC   0.151   0.164
 189          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 190          UA     100
              *

 191          KK     018   BASIN
 192          BA   0.007
 193          LG    0.30    0.25    6.00    0.18      15
 194          UC   0.252   0.446
 195          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 196          UA     100
              *

 197          KK     019   BASIN
 198          BA   0.001
 199          LG    0.30    0.25    6.00    0.18      15
 200          UC   0.100   0.134
 201          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 202          UA     100
              *

 203          KK     020   BASIN
 204          BA   0.003
 205          LG    0.30    0.25    6.00    0.18      15
 206          UC   0.161   0.245
 207          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 208          UA     100
              *

 209          KK     021   BASIN
 210          BA   0.003
 211          LG    0.30    0.25    6.00    0.18      15
 212          UC   0.156   0.221
 213          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 214          UA     100
              *

 215          KK     022   BASIN
 216          BA   0.009
 217          LG    0.30    0.25    6.00    0.18      15
 218          UC   0.183   0.181
 219          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 220          UA     100
              *

 221          KK     023   BASIN
 222          BA   0.003
 223          LG    0.30    0.25    6.00    0.18      15
 224          UC   0.128   0.165
 225          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 226          UA     100
              *
```



```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 227          ZZ
```

SCHEMATIC DIAGRAM OF STREAM NETWORK


37 DS03
43 RDS03
45 DS04
51 CDS34
53 RCDS34
55 02
61 03
67 CO23
69 RC023
71 01
77 04
83 CO14
85 RC014
87 05
93 06
99 CO56
101 RC056
103 07
109 C07
111 STOR2
117 011
123 012
129 C1112
131 RC1112
133 013
139 014
145 R014
147 C1314
149 STOR1
155 08
161 09
167 010
173 015

```
  179          .          .          .          .          .          .        016
               .          .          .          .          .          .         .
               .          .          .          .          .          .         .
  185          .          .          .          .          .          .         .        017
               .          .          .          .          .          .         .         .
               .          .          .          .          .          .         .         .
  191          .          .          .          .          .          .         .         .        018
*** HEC1 ERROR 5 *** TOO MANY HYDROGRAPHS. COMBINE MORE OFTEN.
               .          .          .          .          .          .         .         .
               .          .          .          .          .          .         .         .
  197          .          .          .          .          .          .         .         .        019
*** HEC1 ERROR 5 *** TOO MANY HYDROGRAPHS. COMBINE MORE OFTEN.
               .          .          .          .          .          .         .         .
               .          .          .          .          .          .         .         .
  203          .          .          .          .          .          .         .         .        020
*** HEC1 ERROR 5 *** TOO MANY HYDROGRAPHS. COMBINE MORE OFTEN.
               .          .          .          .          .          .         .         .
               .          .          .          .          .          .         .         .
  209          .          .          .          .          .          .         .         .        021
*** HEC1 ERROR 5 *** TOO MANY HYDROGRAPHS. COMBINE MORE OFTEN.
               .          .          .          .          .          .         .         .
               .          .          .          .          .          .         .         .
  215          .          .          .          .          .          .         .         .        022
*** HEC1 ERROR 5 *** TOO MANY HYDROGRAPHS. COMBINE MORE OFTEN.
               .          .          .          .          .          .         .         .
               .          .          .          .          .          .         .         .
  221          .          .          .          .          .          .         .         .        023

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

        5 ERRORS IN STREAM SYSTEM
1*****************************************
*                                         *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)     *
*              JUN   1998                 *
*           VERSION 4.1                   *
*                                         *
*  RUN DATE   29DEC16  TIME  05:58:52     *
*                                         *
*****************************************

*****************************************
*                                         *
*    U.S. ARMY CORPS OF ENGINEERS         *
*    HYDROLOGIC ENGINEERING CENTER        *
*          609 SECOND STREET              *
*       DAVIS, CALIFORNIA 95616           *
*           (916) 756-1104                *
*                                         *
*****************************************
```

Flood Control District of Maricopa County
118TH&JOMAX FU.COND. - FUTURE CONDITIONS
2 YEAR
6 Hour Storm
Unit Hydrograph: Clark
Storm: Multiple
12/29/2016

```
  9 IO          OUTPUT CONTROL VARIABLES
                      IPRNT           5  PRINT CONTROL
                      IPLOT           0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE

    IT          HYDROGRAPH TIME DATA
                       NMIN           1  MINUTES IN COMPUTATION INTERVAL
                      IDATE      1JAN99  STARTING DATE
                      ITIME        0000  STARTING TIME
                         NQ        2000  NUMBER OF HYDROGRAPH ORDINATES
                     NDDATE      2JAN99  ENDING DATE
                     NDTIME        0919  ENDING TIME
                     ICENT          19  CENTURY MARK

                  COMPUTATION INTERVAL     .02 HOURS
                      TOTAL TIME BASE   33.32 HOURS

        ENGLISH UNITS
             DRAINAGE AREA         SQUARE MILES
             PRECIPITATION DEPTH   INCHES
             LENGTH, ELEVATION     FEET
             FLOW                  CUBIC FEET PER SECOND
             STORAGE VOLUME        ACRE-FEET
             SURFACE AREA          ACRES
             TEMPERATURE           DEGREES FAHRENHEIT

  11 JD         INDEX STORM NO. 1
                       STRM        1.44  PRECIPITATION DEPTH
                       TRDA         .00  TRANSPOSITION DRAINAGE AREA

  12 PI           PRECIPITATION PATTERN
                   .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                   .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                   .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                   .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                   .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
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15 JD INDEX STORM NO. 2

STRM 1.43 PRECIPITATION DEPTH

TRDA .50 TRANSPOSITION DRAINAGE AREA

16 PI PRECIPITATION PATTERN

.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
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.01	.01	.01	.01	.01	.03	.03	.03	.03	.03
.03	.03	.03	.03	.03	.03	.03	.03	.03	.03
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.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

	OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
	HYDROGRAPH AT	DS01	9.	4.05	1.	0.	0.	.01		
	ROUTED TO	RDS01	9.	4.07	1.	0.	0.	.01		
+	HYDROGRAPH AT	DS02	1.	4.13	0.	0.	0.	.00		
	2 COMBINED AT	CDS12	10.	4.07	1.	0.	0.	.01		
	ROUTED TO	RCDS12	10.	4.08	1.	0.	0.	.01		
+	HYDROGRAPH AT	DS03	5.	4.07	0.	0.	0.	.01		
+	ROUTED TO	RDS03	5.	4.12	0.	0.	0.	.01		
	HYDROGRAPH AT	DS04	2.	4.08	0.	0.	0.	.00		
	2 COMBINED AT	CDS34	7.	4.10	1.	0.	0.	.01		
+	ROUTED TO	RCDS34	7.	4.13	1.	0.	0.	.01		
	HYDROGRAPH AT									

+	02	2.	4.05	0.	0.	0.	.00
HYDROGRAPH AT							
+	03	2.	4.05	0.	0.	0.	.00
4 COMBINED AT							
	CO23	19.	4.08	2.	0.	0.	.03
ROUTED TO							
	RC023	19.	4.12	2.	0.	0.	.03
HYDROGRAPH AT							
+	01	11.	4.12	1.	0.	0.	.02
HYDROGRAPH AT							
+	04	2.	4.07	0.	0.	0.	.00
3 COMBINED AT							
	CO14	33.	4.12	3.	1.	0.	.05
ROUTED TO							
	RC014	32.	4.15	3.	1.	0.	.05
HYDROGRAPH AT							
+	05	2.	4.05	0.	0.	0.	.00
HYDROGRAPH AT							
+	06	2.	4.10	0.	0.	0.	.00
3 COMBINED AT							
	CO56	36.	4.13	3.	1.	1.	.05
ROUTED TO							
	RC056	36.	4.15	3.	1.	1.	.05
HYDROGRAPH AT							
+	07	2.	4.02	0.	0.	0.	.00
2 COMBINED AT							
+	C07	37.	4.15	3.	1.	1.	.05
ROUTED TO							
	STOR2	33.	4.22	3.	1.	1.	.05
HYDROGRAPH AT							
	011	8.	4.18	1.	0.	0.	.02
HYDROGRAPH AT							
+	012	6.	4.17	1.	0.	0.	.01
2 COMBINED AT							
+	C1112	14.	4.18	2.	0.	0.	.03
ROUTED TO							
	RC1112	14.	4.23	2.	0.	0.	.03
HYDROGRAPH AT							
	013	7.	4.10	1.	0.	0.	.01
HYDROGRAPH AT							
+	014	4.	4.10	0.	0.	0.	.01
ROUTED TO							
+	R014	4.	4.13	0.	0.	0.	.01
3 COMBINED AT							
	C1314	24.	4.17	3.	1.	1.	.05
ROUTED TO							
	STOR1	22.	4.25	3.	1.	1.	.05
HYDROGRAPH AT							
+	08	1.	4.08	0.	0.	0.	.00
HYDROGRAPH AT							
	09	1.	4.08	0.	0.	0.	.00
HYDROGRAPH AT							
	010	1.	4.02	0.	0.	0.	.00
HYDROGRAPH AT							
	015	2.	4.02	0.	0.	0.	.00
HYDROGRAPH AT							
+	016	1.	4.00	0.	0.	0.	.00
HYDROGRAPH AT							
	017	5.	4.05	0.	0.	0.	.01
HYDROGRAPH AT							
	018	3.	4.15	0.	0.	0.	.01
HYDROGRAPH AT							
	019	1.	4.03	0.	0.	0.	.00
HYDROGRAPH AT							
+	020	2.	4.07	0.	0.	0.	.00
HYDROGRAPH AT							
	021	2.	4.07	0.	0.	0.	.00

HYDROGRAPH AT

022	7.	4.07	1.	0.	0.	.01

HYDROGRAPH AT

023	3.	4.05	0.	0.	0.	.00

1

SUMMARY OF KINEMATIC WAVE - MUSKINGUM-CUNGE ROUTING
(FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)

ISTAQ	ELEMENT	DT	PEAK	TIME TO PEAK	VOLUME	INTERPOLATED TO COMPUTATION INTERVAL DT	PEAK	TIME TO PEAK	VOLUME
		(MIN)	(CFS)	(MIN)	(IN)	(MIN)	(CFS)	(MIN)	(IN)
FOR STORM = 1 STORM AREA (SQ MI) =				.00					
RDS01	MANE	1.00	8.81	244.00	.57	1.00	8.81	244.00	.57

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2748E+00 EXCESS= .0000E+00 OUTFLOW= .2748E+00 BASIN STORAGE= .1065E-03 PERCENT ERROR= .0

FOR STORM = 2 STORM AREA (SQ MI) =				.50					
RDS01	MANE	1.00	8.72	244.00	.57	1.00	8.72	244.00	.57

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2719E+00 EXCESS= .0000E+00 OUTFLOW= .2719E+00 BASIN STORAGE= .1060E-03 PERCENT ERROR= .0

FOR STORM = 1 STORM AREA (SQ MI) =				.00					
RCDS12	MANE	1.00	10.13	245.00	.57	1.00	10.13	245.00	.57

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3664E+00 EXCESS= .0000E+00 OUTFLOW= .3664E+00 BASIN STORAGE= .1276E-03 PERCENT ERROR= .0

FOR STORM = 2 STORM AREA (SQ MI) =				.50					
RCDS12	MANE	1.00	10.02	245.00	.57	1.00	10.02	245.00	.57

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3625E+00 EXCESS= .0000E+00 OUTFLOW= .3625E+00 BASIN STORAGE= .1270E-03 PERCENT ERROR= .0

FOR STORM = 1 STORM AREA (SQ MI) =				.00					
RDS03	MANE	1.00	4.75	247.00	.57	1.00	4.75	247.00	.57

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1832E+00 EXCESS= .0000E+00 OUTFLOW= .1832E+00 BASIN STORAGE= .2358E-03 PERCENT ERROR= -.1

FOR STORM = 2 STORM AREA (SQ MI) =				.50					
RDS03	MANE	1.00	4.70	247.00	.57	1.00	4.70	247.00	.57

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1813E+00 EXCESS= .0000E+00 OUTFLOW= .1812E+00 BASIN STORAGE= .2347E-03 PERCENT ERROR= -.1

FOR STORM = 1 STORM AREA (SQ MI) =				.00					
RCDS34	MANE	1.00	6.70	248.00	.57	1.00	6.70	248.00	.57

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2748E+00 EXCESS= .0000E+00 OUTFLOW= .2747E+00 BASIN STORAGE= .1267E-03 PERCENT ERROR= .0

FOR STORM = 2 STORM AREA (SQ MI) =				.50					
RCDS34	MANE	1.00	6.62	248.00	.57	1.00	6.62	248.00	.57

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2719E+00 EXCESS= .0000E+00 OUTFLOW= .2718E+00 BASIN STORAGE= .1261E-03 PERCENT ERROR= .0

FOR STORM = 1 STORM AREA (SQ MI) =				.00					
RC023	MANE	1.00	19.61	247.00	.57	1.00	19.61	247.00	.57

CONTINUITY SUMMARY (AC-FT) - INFLOW= .7632E+00 EXCESS= .0000E+00 OUTFLOW= .7632E+00 BASIN STORAGE= .2445E-03 PERCENT ERROR= .0

FOR STORM = 2 STORM AREA (SQ MI) =				.50					
RC023	MANE	1.00	19.39	247.00	.57	1.00	19.39	247.00	.57

CONTINUITY SUMMARY (AC-FT) - INFLOW= .7552E+00 EXCESS= .0000E+00 OUTFLOW= .7551E+00 BASIN STORAGE= .2433E-03 PERCENT ERROR= .0

FOR STORM = 1 STORM AREA (SQ MI) =				.00					
RC014	MANE	1.00	32.71	249.00	.57	1.00	32.71	249.00	.57

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1374E+01 EXCESS= .0000E+00 OUTFLOW= .1374E+01 BASIN STORAGE= .2226E-03 PERCENT ERROR= .0

FOR STORM = 2 STORM AREA (SQ MI) =				.50					
RC014	MANE	1.00	32.35	249.00	.57	1.00	32.35	249.00	.57

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1359E+01 EXCESS= .0000E+00 OUTFLOW= .1359E+01 BASIN STORAGE= .2216E-03 PERCENT ERROR= .0

FOR STORM = 1 STORM AREA (SQ MI) =				.00					
RC056	MANE	.87	36.39	248.99	.57	1.00	36.39	249.00	.57

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1552E+01 EXCESS= .0000E+00 OUTFLOW= .1552E+01 BASIN STORAGE= .1150E-03 PERCENT ERROR= .0

FOR STORM = 2 STORM AREA (SQ MI) = .50

RC056	MANE	.87	36.00	248.85	.56	1.00	35.96	249.00	.56

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1536E+01 EXCESS= .0000E+00 OUTFLOW= .1536E+01 BASIN STORAGE= .1120E-03 PERCENT ERROR= .0

FOR STORM = 1 STORM AREA (SQ MI) = .00

RC1112	MANE	1.00	13.88	254.00	.57	1.00	13.88	254.00	.57

CONTINUITY SUMMARY (AC-FT) - INFLOW= .9158E+00 EXCESS= .0000E+00 OUTFLOW= .9157E+00 BASIN STORAGE= .3800E-03 PERCENT ERROR= .0

FOR STORM = 2 STORM AREA (SQ MI) = .50

RC1112	MANE	1.00	13.72	254.00	.57	1.00	13.72	254.00	.57

CONTINUITY SUMMARY (AC-FT) - INFLOW= .9061E+00 EXCESS= .0000E+00 OUTFLOW= .9061E+00 BASIN STORAGE= .3772E-03 PERCENT ERROR= .0

FOR STORM = 1 STORM AREA (SQ MI) = .00

R014	MANE	1.00	4.38	248.00	.57	1.00	4.38	248.00	.57

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2137E+00 EXCESS= .0000E+00 OUTFLOW= .2137E+00 BASIN STORAGE= .1443E-03 PERCENT ERROR= -.1

FOR STORM = 2 STORM AREA (SQ MI) = .50

R014	MANE	1.00	4.33	248.00	.57	1.00	4.33	248.00	.57

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2115E+00 EXCESS= .0000E+00 OUTFLOW= .2114E+00 BASIN STORAGE= .1436E-03 PERCENT ERROR= -.1

SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION STOR2
(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	2707.00	2711.00	2711.00
STORAGE	0.	1.	1.
OUTFLOW	0.	117.	117.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1.00	2708.62	.00	0.	33.	.00	4.22	.00

PLAN 2 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	2707.00	2711.00	2711.00
STORAGE	0.	1.	1.
OUTFLOW	0.	117.	117.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1.00	2708.60	.00	0.	33.	.00	4.22	.00

SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION STOR1
(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	2684.00	2688.00	2688.00
STORAGE	0.	1.	1.
OUTFLOW	0.	103.	103.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1.00	2685.34	.00	0.	22.	.00	4.25	.00

PLAN 2 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	2684.00	2688.00	2688.00
STORAGE	0.	1.	1.
OUTFLOW	0.	103.	103.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1.00	2685.33	.00	0.	22.	.00	4.25	.00

*** NORMAL END OF HEC-1 ***

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1****************************************
*                                      *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *
*              JUN  1998               *
*           VERSION 4.1                *
*                                      *
*  RUN DATE   29DEC16  TIME  05:56:51  *
*                                      *
****************************************
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****************************************
*                                      *
*    U.S. ARMY CORPS OF ENGINEERS      *
*    HYDROLOGIC ENGINEERING CENTER     *
*          609 SECOND STREET           *
*       DAVIS, CALIFORNIA 95616        *
*           (916) 756-1104             *
*                                      *
****************************************
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X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X              X
XXXXXXX  XXXX     X        XXXXX  X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX   XXXXX         XXX
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THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM


```
LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

   1          ID        Flood Control District of Maricopa County
   2          ID        118TH&JOMAX FU.COND. - FUTURE CONDITIONS
   3          ID        10 YEAR
   4          ID        6 Hour  Storm
   5          ID        Unit Hydrograph: Clark
   6          ID        Storm: Multiple
   7          ID        12/29/2016
              *DIAGRAM
   8          IT       1  1JAN99       0    2000
   9          IO       5
  10          IN      15
              *
  11          JD   2.129  0.0001
  12          PC   0.000   0.008   0.016   0.025   0.033   0.041   0.050   0.058   0.066   0.074
  13          PC   0.087   0.099   0.118   0.138   0.216   0.377   0.834   0.911   0.931   0.950
  14          PC   0.962   0.972   0.983   0.991   1.000
  15          JD   2.116  0.5000
  16          PC   0.000   0.008   0.016   0.025   0.033   0.041   0.050   0.058   0.066   0.074
  17          PC   0.087   0.099   0.118   0.138   0.216   0.377   0.834   0.911   0.931   0.950
  18          PC   0.962   0.972   0.983   0.991   1.000
              *

  19          KK    DS01   BASIN
  20          BA   0.009
  21          LG    0.30    0.25    6.00    0.18      15
  22          UC   0.125   0.099
  23          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  24          UA     100
              *

  25          KK   RDS01   ROUTE
  26          RD     226  0.0265   0.035           TRAP   2.500   10.00
              *

  27          KK    DS02   BASIN
  28          BA   0.003
  29          LG    0.30    0.25    6.00    0.18      15
  30          UC   0.181   0.386
  31          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  32          UA     100
              *

  33          KK   CDS12 COMBINE
  34          HC       2
              *

  35          KK  RCDS12   ROUTE
  36          RD     209  0.0143   0.035           TRAP   4.000   10.00
              *
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LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  37          KK    DS03   BASIN
  38          BA   0.006
  39          LG    0.30    0.25    6.00    0.18      15
  40          UC   0.150   0.163
  41          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  42          UA     100
              *

  43          KK   RDS03   ROUTE
```

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 44          RD     467  0.0230   0.035           TRAP   3.500   10.00
             *

 45          KK    DS04   BASIN
 46          BA   0.003
 47          LG    0.30    0.25    6.00    0.18      15
 48          UC   0.144   0.232
 49          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 50          UA     100
             *

 51          KK    CDS34 COMBINE
 52          HC        2
             *

 53          KK   RCDS34   ROUTE
 54          RD     232  0.0172   0.035           TRAP   3.000   10.00
             *

 55          KK       02   BASIN
 56          BA   0.002
 57          LG    0.30    0.25    6.00    0.18      15
 58          UC   0.111   0.148
 59          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 60          UA     100
             *

 61          KK       03   BASIN
 62          BA   0.002
 63          LG    0.30    0.25    6.00    0.18      15
 64          UC   0.117   0.173
 65          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 66          UA     100
             *

 67          KK    CO23 COMBINE
 68          HC        4
             *

 69          KK   RC023   ROUTE
 70          RD     449  0.0178   0.035           TRAP   4.000   10.00
             *
                                        HEC-1 INPUT                                          PAGE  3
LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 71          KK       01   BASIN
 72          BA   0.017
 73          LG    0.30    0.25    6.00    0.18      15
 74          UC   0.205   0.221
 75          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 76          UA     100
             *

 77          KK       04   BASIN
 78          BA   0.003
 79          LG    0.30    0.25    6.00    0.18      15
 80          UC   0.130   0.179
 81          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 82          UA     100
             *

 83          KK    CO14 COMBINE
 84          HC        3
             *

 85          KK   RC014   ROUTE
 86          RD     412  0.0194   0.035           TRAP   5.000   10.00
             *

 87          KK       05   BASIN
 88          BA   0.003
 89          LG    0.30    0.25    6.00    0.18      12
 90          UC   0.121   0.155
 91          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 92          UA     100
             *

 93          KK       06   BASIN
 94          BA   0.003
 95          LG    0.30    0.25    6.00    0.18      15
 96          UC   0.152   0.276
 97          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 98          UA     100
             *

 99          KK    CO56 COMBINE
100          HC        3
             *

101          KK   RC056   ROUTE
102          RD     195  0.0154   0.035           TRAP   5.000   10.00
             *

103          KK       07   BASIN
104          BA   0.002
105          LG    0.30    0.25    6.00    0.18      15
106          UC   0.087   0.089
107          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
108          UA     100
```

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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
  109     KK     C07 COMBINE
  110     HC       2
          *
  111     KK   STOR2 STORAGE
  112     RS       1    STOR      -1
  113     SA    0.04    0.14    0.25    0.37
  114     SQ       0      15      45      81
  115     SE  2707.0 2708.00 2709.00 2710.00
  116     ST    2711      50     1.5     2.7
          *
  117     KK     011   BASIN
  118     BA   0.018
  119     LG    0.30    0.25    6.00    0.18      15
  120     UC   0.259   0.385
  121     UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  122     UA     100
          *
  123     KK     012   BASIN
  124     BA   0.012
  125     LG    0.30    0.25    6.00    0.18      15
  126     UC   0.231   0.364
  127     UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  128     UA     100
          *
  129     KK   C1112 COMBINE
  130     HC       2
          *
  131     KK  RC1112   ROUTE
  132     RD     645  0.0170   0.035           TRAP   8.000   10.00
          *
  133     KK     013   BASIN
  134     BA   0.010
  135     LG    0.30    0.25    6.00    0.18      15
  136     UC   0.177   0.197
  137     UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  138     UA     100
          *
  139     KK     014   BASIN
  140     BA   0.007
  141     LG    0.30    0.25    6.00    0.18      15
  142     UC   0.174   0.248
  143     UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  144     UA     100
          *
```



```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
  145     KK    R014   ROUTE
  146     RD     242  0.0165   0.035           TRAP   7.000   10.00
          *
  147     KK   C1314 COMBINE
  148     HC       3
          *
  149     KK   STOR1 STORAGE
  150     RS       1    STOR      -1
  151     SA    0.04    0.13    0.23    0.40
  152     SQ       0   13.00   39.00   71.00
  153     SE  2684.0 2685.00 2686.00 2687.00
  154     ST    2688      50     1.5     2.7
          *
  155     KK      08   BASIN
  156     BA   0.002
  157     LG    0.30    0.25    6.00    0.18      10
  158     UC   0.145   0.275
  159     UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  160     UA     100
          *
  161     KK      09   BASIN
  162     BA   0.002
  163     LG    0.30    0.25    6.00    0.18      15
  164     UC   0.141   0.285
  165     UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  166     UA     100
          *
  167     KK     010   BASIN
  168     BA   0.001
  169     LG    0.30    0.25    6.00    0.18      15
  170     UC   0.071   0.061
  171     UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  172     UA     100
          *
```

```
 173          KK     015   BASIN
 174          BA   0.002
 175          LG    0.30    0.25    6.00    0.18      15
 176          UC   0.079   0.069
 177          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 178          UA     100
              *

 179          KK     016   BASIN
 180          BA   0.001
 181          LG    0.30    0.25    6.00    0.18      15
 182          UC   0.062   0.053
 183          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 184          UA     100
              *
```



```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 185          KK     017   BASIN
 186          BA   0.006
 187          LG    0.30    0.25    6.00    0.18      15
 188          UC   0.129   0.137
 189          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 190          UA     100
              *

 191          KK     018   BASIN
 192          BA   0.007
 193          LG    0.30    0.25    6.00    0.18      15
 194          UC   0.214   0.374
 195          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 196          UA     100
              *

 197          KK     019   BASIN
 198          BA   0.001
 199          LG    0.30    0.25    6.00    0.18      15
 200          UC   0.085   0.112
 201          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 202          UA     100
              *

 203          KK     020   BASIN
 204          BA   0.003
 205          LG    0.30    0.25    6.00    0.18      15
 206          UC   0.137   0.205
 207          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 208          UA     100
              *

 209          KK     021   BASIN
 210          BA   0.003
 211          LG    0.30    0.25    6.00    0.18      15
 212          UC   0.133   0.185
 213          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 214          UA     100
              *

 215          KK     022   BASIN
 216          BA   0.009
 217          LG    0.30    0.25    6.00    0.18      15
 218          UC   0.156   0.151
 219          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 220          UA     100
              *

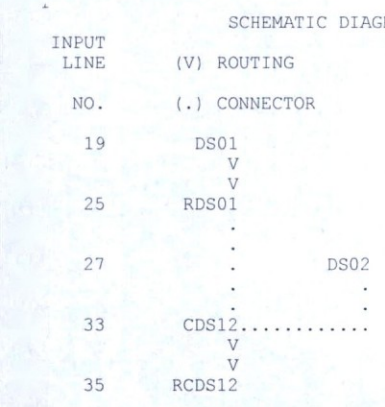
 221          KK     023   BASIN
 222          BA   0.003
 223          LG    0.30    0.25    6.00    0.18      15
 224          UC   0.109   0.138
 225          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 226          UA     100
              *
```

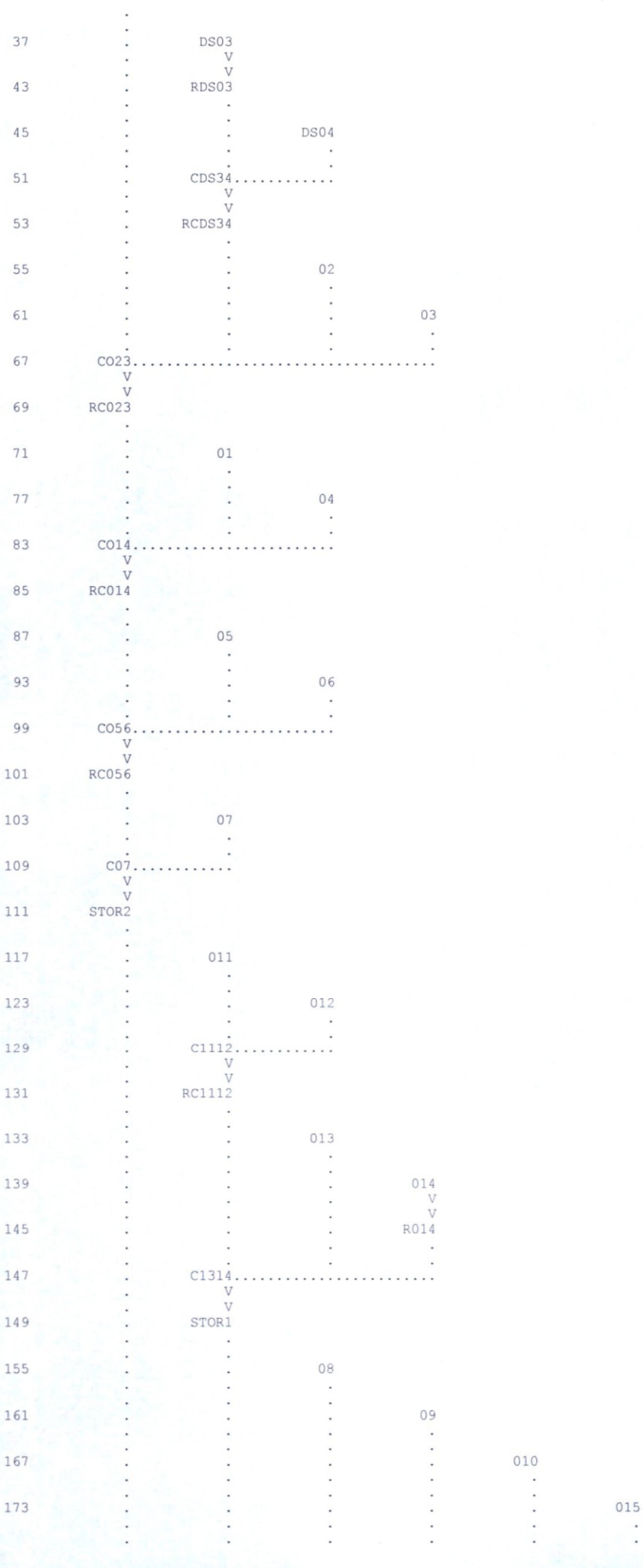


```
LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 227          ZZ
```

SCHEMATIC DIAGRAM OF STREAM NETWORK




37 DS03
43 RDS03
45 DS04
51 CDS34
53 RCDS34
55 02
61 03
67 CO23
69 RC023
71 01
77 04
83 CO14
85 RC014
87 05
93 06
99 CO56
101 RC056
103 07
109 C07
111 STOR2
117 011
123 012
129 C1112
131 RC1112
133 013
139 014
145 R014
147 C1314
149 STOR1
155 08
161 09
167 010
173 015

```
  179          .          .          .          .          .          .        016
               .          .          .          .          .          .         .
               .          .          .          .          .          .         .
  185          .          .          .          .          .          .         .        017
               .          .          .          .          .          .         .         .
               .          .          .          .          .          .         .         .
  191          .          .          .          .          .          .         .         .        018
*** HEC1 ERROR 5 *** TOO MANY HYDROGRAPHS. COMBINE MORE OFTEN.
               .          .          .          .          .          .         .         .
               .          .          .          .          .          .         .         .
  197          .          .          .          .          .          .         .         .        019
*** HEC1 ERROR 5 *** TOO MANY HYDROGRAPHS. COMBINE MORE OFTEN.
               .          .          .          .          .          .         .         .
               .          .          .          .          .          .         .         .
  203          .          .          .          .          .          .         .         .        020
*** HEC1 ERROR 5 *** TOO MANY HYDROGRAPHS. COMBINE MORE OFTEN.
               .          .          .          .          .          .         .         .
               .          .          .          .          .          .         .         .
  209          .          .          .          .          .          .         .         .        021
*** HEC1 ERROR 5 *** TOO MANY HYDROGRAPHS. COMBINE MORE OFTEN.
               .          .          .          .          .          .         .         .
               .          .          .          .          .          .         .         .
  215          .          .          .          .          .          .         .         .        022
*** HEC1 ERROR 5 *** TOO MANY HYDROGRAPHS. COMBINE MORE OFTEN.
               .          .          .          .          .          .         .         .
               .          .          .          .          .          .         .         .
  221          .          .          .          .          .          .         .         .        023

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

        5 ERRORS IN STREAM SYSTEM
1*****************************************
*                                         *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)     *
*             JUN   1998                  *
*          VERSION 4.1                    *
*                                         *
*  RUN DATE   29DEC16  TIME  05:56:51     *
*                                         *
*****************************************

*****************************************
*                                         *
*    U.S. ARMY CORPS OF ENGINEERS         *
*    HYDROLOGIC ENGINEERING CENTER        *
*          609 SECOND STREET              *
*       DAVIS, CALIFORNIA 95616           *
*           (916) 756-1104                *
*                                         *
*****************************************

                          Flood Control District of Maricopa County
                          118TH&JOMAX FU.COND. - FUTURE CONDITIONS
                          10 YEAR
                          6 Hour  Storm
                          Unit Hydrograph: Clark
                          Storm: Multiple
                          12/29/2016

    9 IO          OUTPUT CONTROL VARIABLES
                        IPRNT          5  PRINT CONTROL
                        IPLOT          0  PLOT CONTROL
                        QSCAL         0.  HYDROGRAPH PLOT SCALE

      IT          HYDROGRAPH TIME DATA
                         NMIN          1  MINUTES IN COMPUTATION INTERVAL
                        IDATE     1JAN99  STARTING DATE
                        ITIME       0000  STARTING TIME
                           NQ       2000  NUMBER OF HYDROGRAPH ORDINATES
                       NDDATE     2JAN99  ENDING DATE
                       NDTIME       0919  ENDING TIME
                       ICENT         19  CENTURY MARK

                    COMPUTATION INTERVAL      .02 HOURS
                        TOTAL TIME BASE   33.32 HOURS

            ENGLISH UNITS
                 DRAINAGE AREA         SQUARE MILES
                 PRECIPITATION DEPTH   INCHES
                 LENGTH, ELEVATION     FEET
                 FLOW                  CUBIC FEET PER SECOND
                 STORAGE VOLUME        ACRE-FEET
                 SURFACE AREA          ACRES
                 TEMPERATURE           DEGREES FAHRENHEIT

   11 JD          INDEX STORM NO. 1
                        STRM        2.13  PRECIPITATION DEPTH
                        TRDA         .00  TRANSPOSITION DRAINAGE AREA

   12 PI           PRECIPITATION PATTERN
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
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                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
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                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
                    .00       .00       .00       .00       .00       .00       .00       .00       .00       .00
```

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.00	.00	.00	.00	.00	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.03	.03	.03	.03	.03
.03	.03	.03	.03	.03	.03	.03	.03	.03	.03
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.00	.00	.00	.00	.00
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15 JD INDEX STORM NO. 2
STRM 2.12 PRECIPITATION DEPTH
TRDA .50 TRANSPOSITION DRAINAGE AREA

16 PI PRECIPITATION PATTERN

.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
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.00	.00	.00	.00	.00	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.03	.03	.03	.03	.03
.03	.03	.03	.03	.03	.03	.03	.03	.03	.03
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.00	.00	.00	.00	.00
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RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

	OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
	HYDROGRAPH AT	DS01	17.	4.02	1.	0.	0.	.01		
+	ROUTED TO	RDS01	17.	4.03	1.	0.	0.	.01		
+	HYDROGRAPH AT	DS02	3.	4.10	0.	0.	0.	.00		
	2 COMBINED AT	CDS12	20.	4.05	1.	0.	0.	.01		
	ROUTED TO	RCDS12	20.	4.07	1.	0.	0.	.01		
	HYDROGRAPH AT	DS03	9.	4.05	1.	0.	0.	.01		
+	ROUTED TO	RDS03	9.	4.08	1.	0.	0.	.01		
	HYDROGRAPH AT	DS04	4.	4.07	0.	0.	0.	.00		
	2 COMBINED AT	CDS34	13.	4.08	1.	0.	0.	.01		
+	ROUTED TO	RCDS34	13.	4.10	1.	0.	0.	.01		
	HYDROGRAPH AT									

+	02	3.	4.03	0.	0.	0.	.00
+ HYDROGRAPH AT	03	3.	4.03	0.	0.	0.	.00
4 COMBINED AT	CO23	39.	4.07	3.	1.	1.	.03
+ ROUTED TO	RC023	39.	4.08	3.	1.	1.	.03
+ HYDROGRAPH AT	01	23.	4.08	2.	0.	0.	.02
+ HYDROGRAPH AT	04	5.	4.05	0.	0.	0.	.00
3 COMBINED AT	CO14	66.	4.08	5.	1.	1.	.05
ROUTED TO	RC014	66.	4.10	5.	1.	1.	.05
+ HYDROGRAPH AT	05	5.	4.03	0.	0.	0.	.00
+ HYDROGRAPH AT	06	4.	4.07	0.	0.	0.	.00
3 COMBINED AT	CO56	73.	4.10	6.	1.	1.	.05
ROUTED TO	RC056	73.	4.12	6.	1.	1.	.05
+ HYDROGRAPH AT	07	4.	4.02	0.	0.	0.	.00
+ 2 COMBINED AT	C07	75.	4.10	6.	2.	1.	.05
ROUTED TO	STOR2	65.	4.18	6.	2.	1.	.05
HYDROGRAPH AT	011	17.	4.15	2.	1.	0.	.02
+ HYDROGRAPH AT	012	12.	4.12	1.	0.	0.	.01
+ 2 COMBINED AT	C1112	29.	4.13	3.	1.	1.	.03
ROUTED TO	RC1112	29.	4.18	3.	1.	1.	.03
HYDROGRAPH AT	013	14.	4.07	1.	0.	0.	.01
+ HYDROGRAPH AT	014	9.	4.08	1.	0.	0.	.01
+ ROUTED TO	R014	9.	4.10	1.	0.	0.	.01
3 COMBINED AT	C1314	50.	4.13	5.	1.	1.	.05
ROUTED TO	STOR1	45.	4.22	5.	1.	1.	.05
+ HYDROGRAPH AT	08	2.	4.07	0.	0.	0.	.00
+ HYDROGRAPH AT	09	2.	4.07	0.	0.	0.	.00
HYDROGRAPH AT	010	2.	4.00	0.	0.	0.	.00
HYDROGRAPH AT	015	4.	4.00	0.	0.	0.	.00
+ HYDROGRAPH AT	016	2.	4.00	0.	0.	0.	.00
+ HYDROGRAPH AT	017	10.	4.03	1.	0.	0.	.01
HYDROGRAPH AT	018	7.	4.12	1.	0.	0.	.01
HYDROGRAPH AT	019	2.	4.02	0.	0.	0.	.00
+ HYDROGRAPH AT	020	4.	4.05	0.	0.	0.	.00
+ HYDROGRAPH AT	021	5.	4.05	0.	0.	0.	.00

```
      HYDROGRAPH AT
+                          022        15.    4.05          1.          0.          0.        .01

      HYDROGRAPH AT
+                          023         5.    4.03          0.          0.          0.        .00
1
                                    SUMMARY OF KINEMATIC WAVE - MUSKINGUM-CUNGE ROUTING
                                        (FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)
                                                                                 INTERPOLATED TO
                                                                                COMPUTATION INTERVAL
        ISTAQ    ELEMENT      DT       PEAK    TIME TO      VOLUME      DT       PEAK    TIME TO      VOLUME
                                                  PEAK                                      PEAK

                                (MIN)     (CFS)     (MIN)      (IN)     (MIN)     (CFS)     (MIN)       (IN)

          FOR STORM = 1  STORM AREA (SQ MI) =        .00
            RDS01  MANE          .99     16.91    242.44      1.07      1.00     16.85    242.00       1.07

 CONTINUITY SUMMARY (AC-FT) - INFLOW= .5138E+00 EXCESS= .0000E+00 OUTFLOW= .5138E+00 BASIN STORAGE= .9933E-04 PERCENT ERROR=    .0

          FOR STORM = 2  STORM AREA (SQ MI) =        .50
            RDS01  MANE          .99     16.79    241.94      1.06      1.00     16.78    242.00       1.06

 CONTINUITY SUMMARY (AC-FT) - INFLOW= .5088E+00 EXCESS= .0000E+00 OUTFLOW= .5088E+00 BASIN STORAGE= .1027E-03 PERCENT ERROR=    .0

          FOR STORM = 1  STORM AREA (SQ MI) =        .00
            RCDS12 MANE          1.00     19.61    244.00      1.07      1.00     19.61    244.00       1.07

 CONTINUITY SUMMARY (AC-FT) - INFLOW= .6849E+00 EXCESS= .0000E+00 OUTFLOW= .6849E+00 BASIN STORAGE= .1227E-03 PERCENT ERROR=    .0

          FOR STORM = 2  STORM AREA (SQ MI) =        .50
            RCDS12 MANE          1.00     19.52    244.00      1.06      1.00     19.52    244.00       1.06

 CONTINUITY SUMMARY (AC-FT) - INFLOW= .6785E+00 EXCESS= .0000E+00 OUTFLOW= .6784E+00 BASIN STORAGE= .1221E-03 PERCENT ERROR=    .0

          FOR STORM = 1  STORM AREA (SQ MI) =        .00
            RDS03  MANE          1.00      9.52    245.00      1.07      1.00      9.52    245.00       1.07

 CONTINUITY SUMMARY (AC-FT) - INFLOW= .3425E+00 EXCESS= .0000E+00 OUTFLOW= .3425E+00 BASIN STORAGE= .2385E-03 PERCENT ERROR=   -.1

          FOR STORM = 2  STORM AREA (SQ MI) =        .50
            RDS03  MANE          1.00      9.44    245.00      1.06      1.00      9.44    245.00       1.06

 CONTINUITY SUMMARY (AC-FT) - INFLOW= .3390E+00 EXCESS= .0000E+00 OUTFLOW= .3390E+00 BASIN STORAGE= .2375E-03 PERCENT ERROR=   -.1

          FOR STORM = 1  STORM AREA (SQ MI) =        .00
            RCDS34 MANE          1.00     13.54    246.00      1.07      1.00     13.54    246.00       1.07

 CONTINUITY SUMMARY (AC-FT) - INFLOW= .5137E+00 EXCESS= .0000E+00 OUTFLOW= .5137E+00 BASIN STORAGE= .1223E-03 PERCENT ERROR=    .0

          FOR STORM = 2  STORM AREA (SQ MI) =        .50
            RCDS34 MANE          1.00     13.42    246.00      1.06      1.00     13.42    246.00       1.06

 CONTINUITY SUMMARY (AC-FT) - INFLOW= .5085E+00 EXCESS= .0000E+00 OUTFLOW= .5085E+00 BASIN STORAGE= .1218E-03 PERCENT ERROR=    .0

          FOR STORM = 1  STORM AREA (SQ MI) =        .00
            RC023  MANE          1.00     38.96    245.00      1.07      1.00     38.96    245.00       1.07

 CONTINUITY SUMMARY (AC-FT) - INFLOW= .1427E+01 EXCESS= .0000E+00 OUTFLOW= .1427E+01 BASIN STORAGE= .2405E-03 PERCENT ERROR=    .0

          FOR STORM = 2  STORM AREA (SQ MI) =        .50
            RC023  MANE          1.00     38.71    245.00      1.06      1.00     38.71    245.00       1.06

 CONTINUITY SUMMARY (AC-FT) - INFLOW= .1413E+01 EXCESS= .0000E+00 OUTFLOW= .1413E+01 BASIN STORAGE= .2378E-03 PERCENT ERROR=    .0

          FOR STORM = 1  STORM AREA (SQ MI) =        .00
            RC014  MANE          1.00     66.06    246.00      1.07      1.00     66.06    246.00       1.07

 CONTINUITY SUMMARY (AC-FT) - INFLOW= .2568E+01 EXCESS= .0000E+00 OUTFLOW= .2568E+01 BASIN STORAGE= .2219E-03 PERCENT ERROR=    .0

          FOR STORM = 2  STORM AREA (SQ MI) =        .50
            RC014  MANE          1.00     65.56    246.00      1.06      1.00     65.56    246.00       1.06

 CONTINUITY SUMMARY (AC-FT) - INFLOW= .2543E+01 EXCESS= .0000E+00 OUTFLOW= .2543E+01 BASIN STORAGE= .2197E-03 PERCENT ERROR=    .0

          FOR STORM = 1  STORM AREA (SQ MI) =        .00
            RC056  MANE          .73     73.71    246.44      1.07      1.00     73.53    247.00       1.07
```

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2905E+01 EXCESS= .0000E+00 OUTFLOW= .2905E+01 BASIN STORAGE= .1110E-03 PERCENT ERROR= .0

FOR STORM = 2 STORM AREA (SQ MI) = .50

RC056	MANE	.73	73.10	246.92	1.06	1.00	73.04	247.00	1.06

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2876E+01 EXCESS= .0000E+00 OUTFLOW= .2876E+01 BASIN STORAGE= .1159E-03 PERCENT ERROR= .0

FOR STORM = 1 STORM AREA (SQ MI) = .00

RC1112	MANE	1.00	29.49	251.00	1.07	1.00	29.49	251.00	1.07

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1712E+01 EXCESS= .0000E+00 OUTFLOW= .1712E+01 BASIN STORAGE= .3905E-03 PERCENT ERROR= .0

FOR STORM = 2 STORM AREA (SQ MI) = .50

RC1112	MANE	1.00	29.22	251.00	1.06	1.00	29.22	251.00	1.06

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1695E+01 EXCESS= .0000E+00 OUTFLOW= .1695E+01 BASIN STORAGE= .3888E-03 PERCENT ERROR= .0

FOR STORM = 1 STORM AREA (SQ MI) = .00

R014	MANE	1.00	9.06	246.00	1.07	1.00	9.06	246.00	1.07

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3996E+00 EXCESS= .0000E+00 OUTFLOW= .3996E+00 BASIN STORAGE= .1462E-03 PERCENT ERROR= .0

FOR STORM = 2 STORM AREA (SQ MI) = .50

R014	MANE	1.00	8.98	246.00	1.06	1.00	8.98	246.00	1.06

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3955E+00 EXCESS= .0000E+00 OUTFLOW= .3955E+00 BASIN STORAGE= .1456E-03 PERCENT ERROR= .0

SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION STOR2
(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	2707.00	2711.00	2711.00
STORAGE	0.	1.	1.
OUTFLOW	0.	117.	117.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1.00	2709.57	.00	0.	66.	.00	4.18	.00

PLAN 2 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	2707.00	2711.00	2711.00
STORAGE	0.	1.	1.
OUTFLOW	0.	117.	117.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1.00	2709.56	.00	0.	65.	.00	4.18	.00

SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION STOR1
(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	2684.00	2688.00	2688.00
STORAGE	0.	1.	1.
OUTFLOW	0.	103.	103.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1.00	2686.18	.00	0.	45.	.00	4.22	.00

PLAN 2 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	2684.00	2688.00	2688.00
STORAGE	0.	1.	1.
OUTFLOW	0.	103.	103.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1.00	2686.17	.00	0.	44.	.00	4.22	.00

*** NORMAL END OF HEC-1 ***

```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             JUN  1998                 *
*           VERSION 4.1                 *
*                                       *
*  RUN DATE   29DEC16  TIME  05:53:44   *
*                                       *
*****************************************
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*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*         609 SECOND STREET             *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 756-1104              *
*                                       *
*****************************************
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X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X              X
XXXXXXX  XXXX     X        XXXXX  X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX   XXXXX         XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM


```
LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

   1          ID        Flood Control District of Maricopa County
   2          ID        118TH&JOMAX FU.COND. - FUTURE CONDITIONS
   3          ID        100 YEAR
   4          ID        6 Hour  Storm
   5          ID        Unit Hydrograph: Clark
   6          ID        Storm: Multiple
   7          ID        12/29/2016
              *DIAGRAM
   8          IT       1  1JAN99       0    2000
   9          IO       5
  10          IN      15
              *
  11          JD   3.218  0.0001
  12          PC   0.000   0.008   0.016   0.025   0.033   0.041   0.050   0.058   0.066   0.074
  13          PC   0.087   0.099   0.118   0.138   0.216   0.377   0.834   0.911   0.931   0.950
  14          PC   0.962   0.972   0.983   0.991   1.000
  15          JD   3.199  0.5000
  16          PC   0.000   0.008   0.016   0.025   0.033   0.041   0.050   0.058   0.066   0.074
  17          PC   0.087   0.099   0.118   0.138   0.216   0.377   0.834   0.911   0.931   0.950
  18          PC   0.962   0.972   0.983   0.991   1.000
              *
  19          KK    DS01   BASIN
  20          BA   0.009
  21          LG    0.30    0.25    6.00    0.18      15
  22          UC   0.098   0.076
  23          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  24          UA     100
              *
  25          KK   RDS01   ROUTE
  26          RD     226  0.0265   0.035           TRAP   2.500   10.00
              *
  27          KK    DS02   BASIN
  28          BA   0.003
  29          LG    0.30    0.25    6.00    0.18      15
  30          UC   0.142   0.296
  31          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  32          UA     100
              *
  33          KK   CDS12 COMBINE
  34          HC       2
              *
  35          KK  RCDS12   ROUTE
  36          RD     209  0.0143   0.035           TRAP   4.000   10.00
              *
```



```
LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  37          KK    DS03   BASIN
  38          BA   0.006
  39          LG    0.30    0.25    6.00    0.18      15
  40          UC   0.118   0.124
  41          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  42          UA     100
              *
  43          KK   RDS03   ROUTE
```

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 44          RD     467  0.0230   0.035           TRAP   3.500   10.00
             *

 45          KK    DS04   BASIN
 46          BA   0.003
 47          LG    0.30    0.25    6.00    0.18      15
 48          UC   0.113   0.177
 49          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 50          UA     100
             *

 51          KK    CDS34 COMBINE
 52          HC        2
             *

 53          KK   RCDS34   ROUTE
 54          RD     232  0.0172   0.035           TRAP   3.000   10.00
             *

 55          KK      02   BASIN
 56          BA   0.002
 57          LG    0.30    0.25    6.00    0.18      15
 58          UC   0.087   0.113
 59          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 60          UA     100
             *

 61          KK      03   BASIN
 62          BA   0.002
 63          LG    0.30    0.25    6.00    0.18      15
 64          UC   0.092   0.132
 65          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 66          UA     100
             *

 67          KK    CO23 COMBINE
 68          HC        4
             *

 69          KK   RC023   ROUTE
 70          RD     449  0.0178   0.035           TRAP   4.000   10.00
             *
                                        HEC-1 INPUT                                          PAGE  3
LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 71          KK      01   BASIN
 72          BA   0.017
 73          LG    0.30    0.25    6.00    0.18      15
 74          UC   0.161   0.169
 75          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 76          UA     100
             *

 77          KK      04   BASIN
 78          BA   0.003
 79          LG    0.30    0.25    6.00    0.18      15
 80          UC   0.102   0.137
 81          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 82          UA     100
             *

 83          KK    CO14 COMBINE
 84          HC        3
             *

 85          KK   RC014   ROUTE
 86          RD     412  0.0194   0.035           TRAP   5.000   10.00
             *

 87          KK      05   BASIN
 88          BA   0.003
 89          LG    0.30    0.25    6.00    0.18      12
 90          UC   0.095   0.118
 91          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 92          UA     100
             *

 93          KK      06   BASIN
 94          BA   0.003
 95          LG    0.30    0.25    6.00    0.18      15
 96          UC   0.120   0.211
 97          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 98          UA     100
             *

 99          KK    CO56 COMBINE
100          HC        3
             *

101          KK   RC056   ROUTE
102          RD     195  0.0154   0.035           TRAP   5.000   10.00
             *

103          KK      07   BASIN
104          BA   0.002
105          LG    0.30    0.25    6.00    0.18      15
106          UC   0.068   0.068
107          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
108          UA     100
```

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  109     KK     C07 COMBINE
  110     HC       2
          *

  111     KK   STOR2 STORAGE
  112     RS       1    STOR      -1
  113     SA    0.04    0.14    0.25    0.37
  114     SQ       0      15      45      81
  115     SE  2707.0 2708.00 2709.00 2710.00
  116     ST    2711      50     1.5     2.7
          *

  117     KK     011   BASIN
  118     BA   0.018
  119     LG    0.30    0.25    6.00    0.18      15
  120     UC   0.204   0.294
  121     UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  122     UA     100
          *

  123     KK     012   BASIN
  124     BA   0.012
  125     LG    0.30    0.25    6.00    0.18      15
  126     UC   0.182   0.279
  127     UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  128     UA     100
          *

  129     KK   C1112 COMBINE
  130     HC       2
          *

  131     KK  RC1112   ROUTE
  132     RD     645  0.0170   0.035           TRAP   8.000   10.00
          *

  133     KK     013   BASIN
  134     BA   0.010
  135     LG    0.30    0.25    6.00    0.18      15
  136     UC   0.139   0.151
  137     UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  138     UA     100
          *

  139     KK     014   BASIN
  140     BA   0.007
  141     LG    0.30    0.25    6.00    0.18      15
  142     UC   0.137   0.190
  143     UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  144     UA     100
          *
```



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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  145     KK    R014   ROUTE
  146     RD     242  0.0165   0.035           TRAP   7.000   10.00
          *

  147     KK   C1314 COMBINE
  148     HC       3
          *

  149     KK   STOR1 STORAGE
  150     RS       1    STOR      -1
  151     SA    0.04    0.13    0.23    0.40
  152     SQ       0   13.00   39.00   71.00
  153     SE  2684.0 2685.00 2686.00 2687.00
  154     ST    2688      50     1.5     2.7
          *

  155     KK      08   BASIN
  156     BA   0.002
  157     LG    0.30    0.25    6.00    0.18      10
  158     UC   0.113   0.209
  159     UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  160     UA     100
          *

  161     KK      09   BASIN
  162     BA   0.002
  163     LG    0.30    0.25    6.00    0.18      15
  164     UC   0.111   0.218
  165     UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  166     UA     100
          *

  167     KK     010   BASIN
  168     BA   0.001
  169     LG    0.30    0.25    6.00    0.18      15
  170     UC   0.056   0.047
  171     UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
  172     UA     100
          *
```

```
 173          KK     015   BASIN
 174          BA   0.002
 175          LG    0.30    0.25    6.00    0.18      15
 176          UC   0.062   0.053
 177          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 178          UA     100
              *

 179          KK     016   BASIN
 180          BA   0.001
 181          LG    0.30    0.25    6.00    0.18      15
 182          UC   0.049   0.040
 183          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 184          UA     100
              *
```



```
LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 185          KK     017   BASIN
 186          BA   0.006
 187          LG    0.30    0.25    6.00    0.18      15
 188          UC   0.101   0.105
 189          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 190          UA     100
              *

 191          KK     018   BASIN
 192          BA   0.007
 193          LG    0.30    0.25    6.00    0.18      15
 194          UC   0.168   0.286
 195          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 196          UA     100
              *

 197          KK     019   BASIN
 198          BA   0.001
 199          LG    0.30    0.25    6.00    0.18      15
 200          UC   0.067   0.086
 201          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 202          UA     100
              *

 203          KK     020   BASIN
 204          BA   0.003
 205          LG    0.30    0.25    6.00    0.18      15
 206          UC   0.108   0.157
 207          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 208          UA     100
              *

 209          KK     021   BASIN
 210          BA   0.003
 211          LG    0.30    0.25    6.00    0.18      15
 212          UC   0.104   0.141
 213          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 214          UA     100
              *

 215          KK     022   BASIN
 216          BA   0.009
 217          LG    0.30    0.25    6.00    0.18      15
 218          UC   0.123   0.116
 219          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 220          UA     100
              *

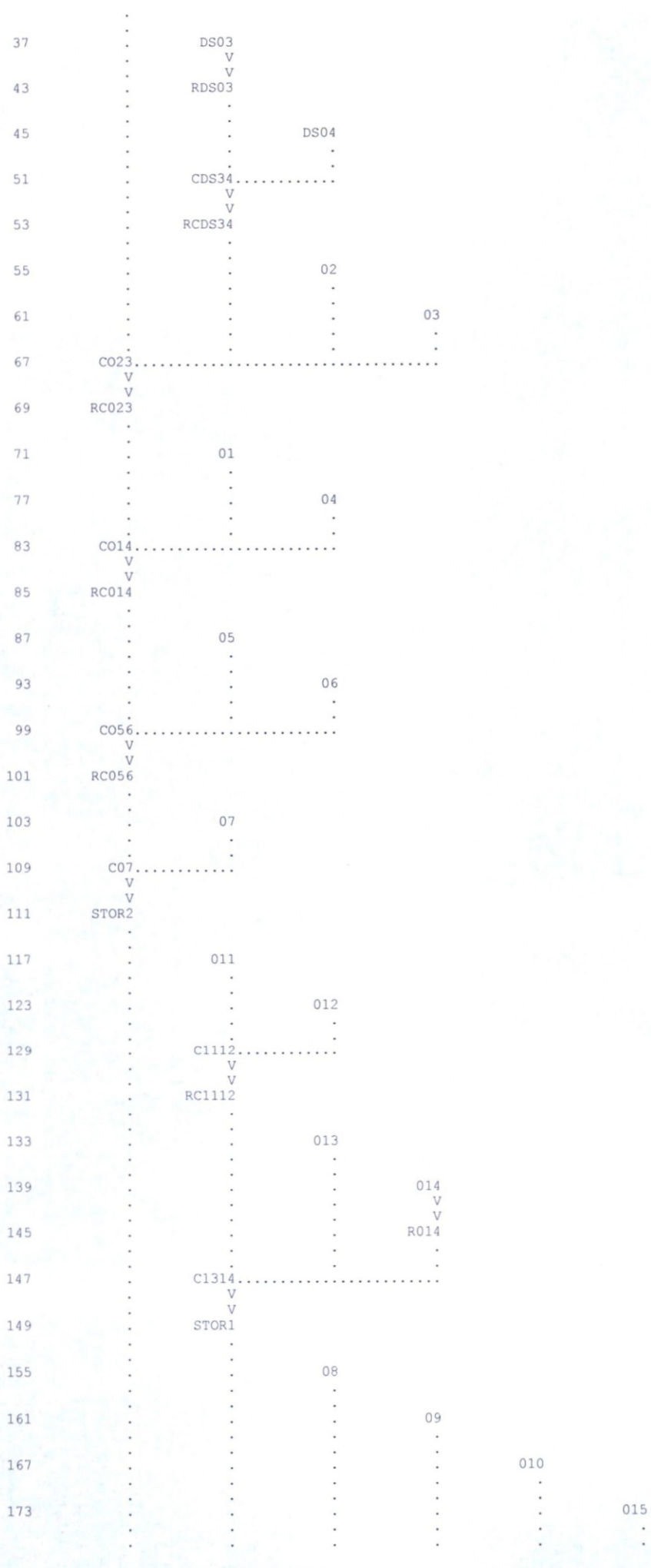
 221          KK     023   BASIN
 222          BA   0.003
 223          LG    0.30    0.25    6.00    0.18      15
 224          UC   0.086   0.105
 225          UA       0     4.5    12.6    23.2    35.8    50.0    64.2    76.8    87.4    95.5
 226          UA     100
              *
```



```
LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 227          ZZ
```

SCHEMATIC DIAGRAM OF STREAM NETWORK


37 DS03
43 RDS03
45 DS04
51 CDS34
53 RCDS34
55 02
61 03
67 CO23
69 RC023
71 01
77 04
83 CO14
85 RC014
87 05
93 06
99 CO56
101 RC056
103 07
109 CO7
111 STOR2
117 011
123 012
129 C1112
131 RC1112
133 013
139 014
145 R014
147 C1314
149 STOR1
155 08
161 09
167 010
173 015

```
  179           .           .           .           .           .           .         016
                .           .           .           .           .           .           .
                .           .           .           .           .           .           .
  185           .           .           .           .           .           .           .         017
                .           .           .           .           .           .           .           .
                .           .           .           .           .           .           .           .
  191           .           .           .           .           .           .           .           .         018
*** HEC1 ERROR 5 *** TOO MANY HYDROGRAPHS. COMBINE MORE OFTEN.
                .           .           .           .           .           .           .           .
                .           .           .           .           .           .           .           .
  197           .           .           .           .           .           .           .           .         019
*** HEC1 ERROR 5 *** TOO MANY HYDROGRAPHS. COMBINE MORE OFTEN.
                .           .           .           .           .           .           .           .
                .           .           .           .           .           .           .           .
  203           .           .           .           .           .           .           .           .         020
*** HEC1 ERROR 5 *** TOO MANY HYDROGRAPHS. COMBINE MORE OFTEN.
                .           .           .           .           .           .           .           .
                .           .           .           .           .           .           .           .
  209           .           .           .           .           .           .           .           .         021
*** HEC1 ERROR 5 *** TOO MANY HYDROGRAPHS. COMBINE MORE OFTEN.
                .           .           .           .           .           .           .           .
                .           .           .           .           .           .           .           .
  215           .           .           .           .           .           .           .           .         022
*** HEC1 ERROR 5 *** TOO MANY HYDROGRAPHS. COMBINE MORE OFTEN.
                .           .           .           .           .           .           .           .
                .           .           .           .           .           .           .           .
  221           .           .           .           .           .           .           .           .         023

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

        5 ERRORS IN STREAM SYSTEM
1*****************************************                                                ***************************************
*                                       *                                                *                                     *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *                                                *  U.S. ARMY CORPS OF ENGINEERS       *
*              JUN   1998               *                                                *  HYDROLOGIC ENGINEERING CENTER      *
*            VERSION 4.1                *                                                *        609 SECOND STREET            *
*                                       *                                                *     DAVIS, CALIFORNIA 95616         *
*  RUN DATE   29DEC16  TIME  05:53:44   *                                                *          (916) 756-1104             *
*                                       *                                                *                                     *
*****************************************                                                ***************************************




                                    Flood Control District of Maricopa County
                                    118TH&JOMAX FU.COND. - FUTURE CONDITIONS
                                    100 YEAR
                                    6 Hour  Storm
                                    Unit Hydrograph: Clark
                                    Storm: Multiple
                                    12/29/2016

    9 IO           OUTPUT CONTROL VARIABLES
                         IPRNT            5  PRINT CONTROL
                         IPLOT            0  PLOT CONTROL
                         QSCAL           0.  HYDROGRAPH PLOT SCALE

      IT           HYDROGRAPH TIME DATA
                          NMIN            1  MINUTES IN COMPUTATION INTERVAL
                         IDATE       1JAN99  STARTING DATE
                         ITIME         0000  STARTING TIME
                            NQ         2000  NUMBER OF HYDROGRAPH ORDINATES
                        NDDATE       2JAN99  ENDING DATE
                        NDTIME         0919  ENDING TIME
                         ICENT           19  CENTURY MARK

                     COMPUTATION INTERVAL      .02 HOURS
                          TOTAL TIME BASE    33.32 HOURS

            ENGLISH UNITS
                 DRAINAGE AREA          SQUARE MILES
                 PRECIPITATION DEPTH    INCHES
                 LENGTH, ELEVATION      FEET
                 FLOW                   CUBIC FEET PER SECOND
                 STORAGE VOLUME         ACRE-FEET
                 SURFACE AREA           ACRES
                 TEMPERATURE            DEGREES FAHRENHEIT

   11 JD           INDEX STORM NO. 1
                          STRM         3.22  PRECIPITATION DEPTH
                          TRDA          .00  TRANSPOSITION DRAINAGE AREA

   12 PI             PRECIPITATION PATTERN
                         .00        .00        .00        .00        .00        .00        .00        .00        .00        .00
                         .00        .00        .00        .00        .00        .00        .00        .00        .00        .00
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.01	.01	.01	.01	.01	.03	.03	.03	.03	.03
.03	.03	.03	.03	.03	.03	.03	.03	.03	.03
.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
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15 JD INDEX STORM NO. 2

STRM 3.20 PRECIPITATION DEPTH

TRDA .50 TRANSPOSITION DRAINAGE AREA

16 PI PRECIPITATION PATTERN

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.01	.01	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.03	.03	.03	.03	.03
.03	.03	.03	.03	.03	.03	.03	.03	.03	.03
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RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

	OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
	HYDROGRAPH AT	DS01	30.	4.02	2.	0.	0.	.01		
+	ROUTED TO	RDS01	29.	4.02	2.	0.	0.	.01		
+	HYDROGRAPH AT	DS02	6.	4.07	1.	0.	0.	.00		
	2 COMBINED AT	CDS12	35.	4.03	3.	1.	0.	.01		
	ROUTED TO	RCDS12	35.	4.03	3.	1.	0.	.01		
	HYDROGRAPH AT	DS03	18.	4.03	1.	0.	0.	.01		
+	ROUTED TO	RDS03	18.	4.05	1.	0.	0.	.01		
	HYDROGRAPH AT	DS04	8.	4.03	1.	0.	0.	.00		
	2 COMBINED AT	CDS34	26.	4.05	2.	0.	0.	.01		
+	ROUTED TO	RCDS34	25.	4.07	2.	0.	0.	.01		
	HYDROGRAPH AT									

+		02	6.	4.02	0.	0.	0.	.00
	HYDROGRAPH AT							
		03	6.	4.02	0.	0.	0.	.00
	4 COMBINED AT							
		CO23	72.	4.03	5.	1.	1.	.03
	ROUTED TO							
		RC023	72.	4.07	5.	1.	1.	.03
	HYDROGRAPH AT							
+		01	44.	4.05	4.	1.	1.	.02
	HYDROGRAPH AT							
		04	9.	4.03	1.	0.	0.	.00
	3 COMBINED AT							
		CO14	124.	4.05	10.	2.	2.	.05
	ROUTED TO							
		RC014	124.	4.07	10.	2.	2.	.05
	HYDROGRAPH AT							
+		05	9.	4.02	1.	0.	0.	.00
	HYDROGRAPH AT							
		06	7.	4.05	1.	0.	0.	.00
	3 COMBINED AT							
		CO56	139.	4.07	11.	3.	2.	.05
	ROUTED TO							
		RC056	139.	4.07	11.	3.	2.	.05
	HYDROGRAPH AT							
+		07	7.	4.00	0.	0.	0.	.00
	2 COMBINED AT							
		C07	143.	4.07	11.	3.	2.	.05
	ROUTED TO							
		STOR2	116.	4.15	11.	3.	2.	.05
	HYDROGRAPH AT							
		011	36.	4.10	4.	1.	1.	.02
	HYDROGRAPH AT							
+		012	25.	4.08	3.	1.	0.	.01
	2 COMBINED AT							
		C1112	61.	4.08	6.	2.	1.	.03
	ROUTED TO							
		RC1112	61.	4.13	6.	2.	1.	.03
	HYDROGRAPH AT							
		013	27.	4.03	2.	1.	0.	.01
	HYDROGRAPH AT							
+		014	18.	4.05	1.	0.	0.	.01
	ROUTED TO							
		R014	18.	4.07	1.	0.	0.	.01
	3 COMBINED AT							
		C1314	102.	4.08	10.	2.	2.	.05
	ROUTED TO							
		STOR1	84.	4.20	10.	2.	2.	.05
	HYDROGRAPH AT							
+		08	5.	4.03	0.	0.	0.	.00
	HYDROGRAPH AT							
		09	5.	4.05	0.	0.	0.	.00
	HYDROGRAPH AT							
		010	3.	4.00	0.	0.	0.	.00
	HYDROGRAPH AT							
		015	7.	4.00	0.	0.	0.	.00
	HYDROGRAPH AT							
+		016	3.	4.00	0.	0.	0.	.00
	HYDROGRAPH AT							
		017	19.	4.02	1.	0.	0.	.01
	HYDROGRAPH AT							
		018	15.	4.08	1.	0.	0.	.01
	HYDROGRAPH AT							
		019	3.	4.00	0.	0.	0.	.00
	HYDROGRAPH AT							
+		020	8.	4.03	1.	0.	0.	.00
	HYDROGRAPH AT							
		021	9.	4.03	1.	0.	0.	.00

HYDROGRAPH AT
022 27. 4.03 2. 0. 0. .01

HYDROGRAPH AT
023 9. 4.02 1. 0. 0. .00

1

SUMMARY OF KINEMATIC WAVE - MUSKINGUM-CUNGE ROUTING
(FLOW IS DIRECT RUNOFF WITHOUT BASE FLOW)

ISTAQ	ELEMENT	DT	PEAK	TIME TO PEAK	VOLUME	INTERPOLATED TO COMPUTATION INTERVAL DT	PEAK	TIME TO PEAK	VOLUME
		(MIN)	(CFS)	(MIN)	(IN)	(MIN)	(CFS)	(MIN)	(IN)
FOR STORM = 1 STORM AREA (SQ MI) = .00									
RDS01	MANE	.86	29.55	241.41	1.98	1.00	29.49	241.00	1.98
CONTINUITY SUMMARY (AC-FT) - INFLOW= .9525E+00 EXCESS= .0000E+00 OUTFLOW= .9525E+00 BASIN STORAGE= .1122E-03 PERCENT ERROR= .0									
FOR STORM = 2 STORM AREA (SQ MI) = .50									
RDS01	MANE	.86	29.36	240.97	1.97	1.00	29.36	241.00	1.97
CONTINUITY SUMMARY (AC-FT) - INFLOW= .9448E+00 EXCESS= .0000E+00 OUTFLOW= .9448E+00 BASIN STORAGE= .9931E-04 PERCENT ERROR= .0									
FOR STORM = 1 STORM AREA (SQ MI) = .00									
RCDS12	MANE	.96	35.34	242.15	1.98	1.00	35.28	242.00	1.98
CONTINUITY SUMMARY (AC-FT) - INFLOW= .1270E+01 EXCESS= .0000E+00 OUTFLOW= .1270E+01 BASIN STORAGE= .1237E-03 PERCENT ERROR= .0									
FOR STORM = 2 STORM AREA (SQ MI) = .50									
RCDS12	MANE	.96	35.13	242.43	1.97	1.00	35.04	242.00	1.97
CONTINUITY SUMMARY (AC-FT) - INFLOW= .1259E+01 EXCESS= .0000E+00 OUTFLOW= .1259E+01 BASIN STORAGE= .1195E-03 PERCENT ERROR= .0									
FOR STORM = 1 STORM AREA (SQ MI) = .00									
RDS03	MANE	1.00	17.70	243.00	1.98	1.00	17.70	243.00	1.98
CONTINUITY SUMMARY (AC-FT) - INFLOW= .6349E+00 EXCESS= .0000E+00 OUTFLOW= .6348E+00 BASIN STORAGE= .2349E-03 PERCENT ERROR= .0									
FOR STORM = 2 STORM AREA (SQ MI) = .50									
RDS03	MANE	1.00	17.58	243.00	1.97	1.00	17.58	243.00	1.97
CONTINUITY SUMMARY (AC-FT) - INFLOW= .6298E+00 EXCESS= .0000E+00 OUTFLOW= .6297E+00 BASIN STORAGE= .2324E-03 PERCENT ERROR= .0									
FOR STORM = 1 STORM AREA (SQ MI) = .00									
RCDS34	MANE	1.00	25.58	244.00	1.98	1.00	25.58	244.00	1.98
CONTINUITY SUMMARY (AC-FT) - INFLOW= .9521E+00 EXCESS= .0000E+00 OUTFLOW= .9521E+00 BASIN STORAGE= .1217E-03 PERCENT ERROR= .0									
FOR STORM = 2 STORM AREA (SQ MI) = .50									
RCDS34	MANE	1.00	25.40	244.00	1.97	1.00	25.40	244.00	1.97
CONTINUITY SUMMARY (AC-FT) - INFLOW= .9445E+00 EXCESS= .0000E+00 OUTFLOW= .9444E+00 BASIN STORAGE= .1209E-03 PERCENT ERROR= .0									
FOR STORM = 1 STORM AREA (SQ MI) = .00									
RC023	MANE	1.00	72.02	244.00	1.98	1.00	72.02	244.00	1.98
CONTINUITY SUMMARY (AC-FT) - INFLOW= .2645E+01 EXCESS= .0000E+00 OUTFLOW= .2645E+01 BASIN STORAGE= .2508E-03 PERCENT ERROR= .0									
FOR STORM = 2 STORM AREA (SQ MI) = .50									
RC023	MANE	1.00	71.48	244.00	1.97	1.00	71.48	244.00	1.97
CONTINUITY SUMMARY (AC-FT) - INFLOW= .2622E+01 EXCESS= .0000E+00 OUTFLOW= .2622E+01 BASIN STORAGE= .2497E-03 PERCENT ERROR= .0									
FOR STORM = 1 STORM AREA (SQ MI) = .00									
RC014	MANE	1.00	124.62	244.00	1.98	1.00	124.62	244.00	1.98
CONTINUITY SUMMARY (AC-FT) - INFLOW= .4761E+01 EXCESS= .0000E+00 OUTFLOW= .4761E+01 BASIN STORAGE= .2220E-03 PERCENT ERROR= .0									
FOR STORM = 2 STORM AREA (SQ MI) = .50									
RC014	MANE	1.00	123.74	244.00	1.97	1.00	123.74	244.00	1.97
CONTINUITY SUMMARY (AC-FT) - INFLOW= .4721E+01 EXCESS= .0000E+00 OUTFLOW= .4721E+01 BASIN STORAGE= .2211E-03 PERCENT ERROR= .0									
FOR STORM = 1 STORM AREA (SQ MI) = .00									
RC056	MANE	.62	139.76	244.53	1.98	1.00	139.42	244.00	1.98

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5388E+01 EXCESS= .0000E+00 OUTFLOW= .5388E+01 BASIN STORAGE= .1105E-03 PERCENT ERROR= .0

FOR STORM = 2 STORM AREA (SQ MI) = .50

RC056	MANE	.62	138.72	244.35	1.96	1.00	138.40	244.00	1.96

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5343E+01 EXCESS= .0000E+00 OUTFLOW= .5343E+01 BASIN STORAGE= .1164E-03 PERCENT ERROR= .0

FOR STORM = 1 STORM AREA (SQ MI) = .00

RC1112	MANE	1.00	61.18	248.00	1.98	1.00	61.18	248.00	1.98

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3173E+01 EXCESS= .0000E+00 OUTFLOW= .3173E+01 BASIN STORAGE= .3769E-03 PERCENT ERROR= .0

FOR STORM = 2 STORM AREA (SQ MI) = .50

RC1112	MANE	1.00	60.74	248.00	1.97	1.00	60.74	248.00	1.97

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3147E+01 EXCESS= .0000E+00 OUTFLOW= .3147E+01 BASIN STORAGE= .3753E-03 PERCENT ERROR= .0

FOR STORM = 1 STORM AREA (SQ MI) = .00

R014	MANE	1.00	17.80	244.00	1.98	1.00	17.80	244.00	1.98

CONTINUITY SUMMARY (AC-FT) - INFLOW= .7404E+00 EXCESS= .0000E+00 OUTFLOW= .7404E+00 BASIN STORAGE= .1450E-03 PERCENT ERROR= .0

FOR STORM = 2 STORM AREA (SQ MI) = .50

R014	MANE	1.00	17.67	244.00	1.97	1.00	17.67	244.00	1.97

CONTINUITY SUMMARY (AC-FT) - INFLOW= .7344E+00 EXCESS= .0000E+00 OUTFLOW= .7344E+00 BASIN STORAGE= .1444E-03 PERCENT ERROR= .0

SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION STOR2
(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	2707.00	2711.00	2711.00
STORAGE	0.	1.	1.
OUTFLOW	0.	117.	117.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1.00	2710.98	.00	1.	116.	.00	4.15	.00

PLAN 2 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	2707.00	2711.00	2711.00
STORAGE	0.	1.	1.
OUTFLOW	0.	117.	117.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1.00	2710.96	.00	1.	116.	.00	4.15	.00

SUMMARY OF DAM OVERTOPPING/BREACH ANALYSIS FOR STATION STOR1
(PEAKS SHOWN ARE FOR INTERNAL TIME STEP USED DURING BREACH FORMATION)

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	2684.00	2688.00	2688.00
STORAGE	0.	1.	1.
OUTFLOW	0.	103.	103.

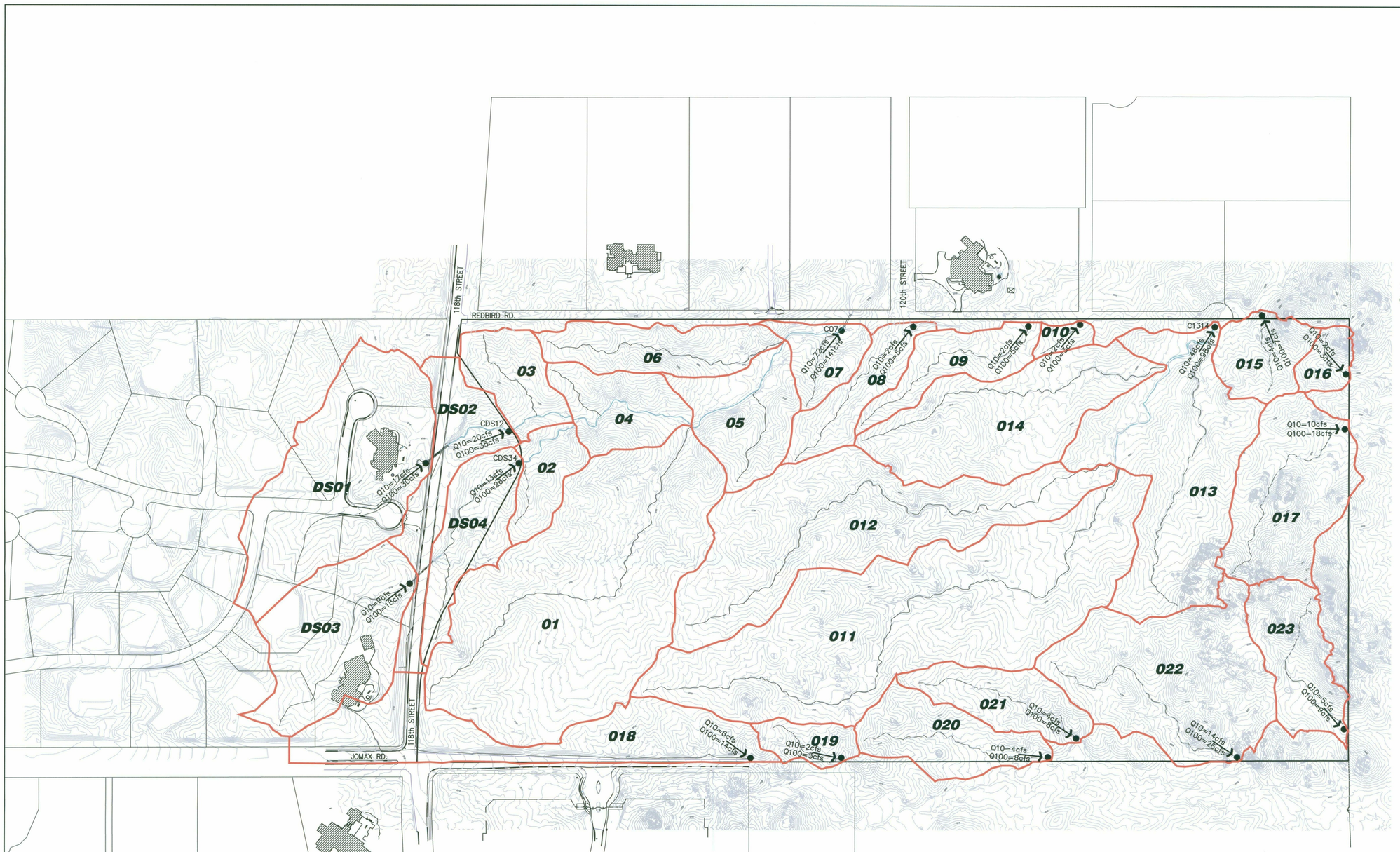
RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1.00	2687.41	.00	1.	84.	.00	4.20	.00

PLAN 2 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	2684.00	2688.00	2688.00
STORAGE	0.	1.	1.
OUTFLOW	0.	103.	103.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1.00	2687.40	.00	1.	84.	.00	4.20	.00

*** NORMAL END OF HEC-1 ***



LEGEND

- EXISTING CONTOUR
- DRAINAGE AREA BOUNDARY
- DRAINAGE AREA FLOW PATH
- FLOW ROUTING REACH
- CDS12 ● FLOW CONCENTRATION POINT AND IDENTIFICATION
- **DS02** DRAINAGE AREA IDENTIFICATION
- Q10=20cfs, Q100=35cfs → ESTIMATED 10-YR AND 100-YR PEAK FLOW

SCALE: 1" = 150'

0' 150' 300' 450'

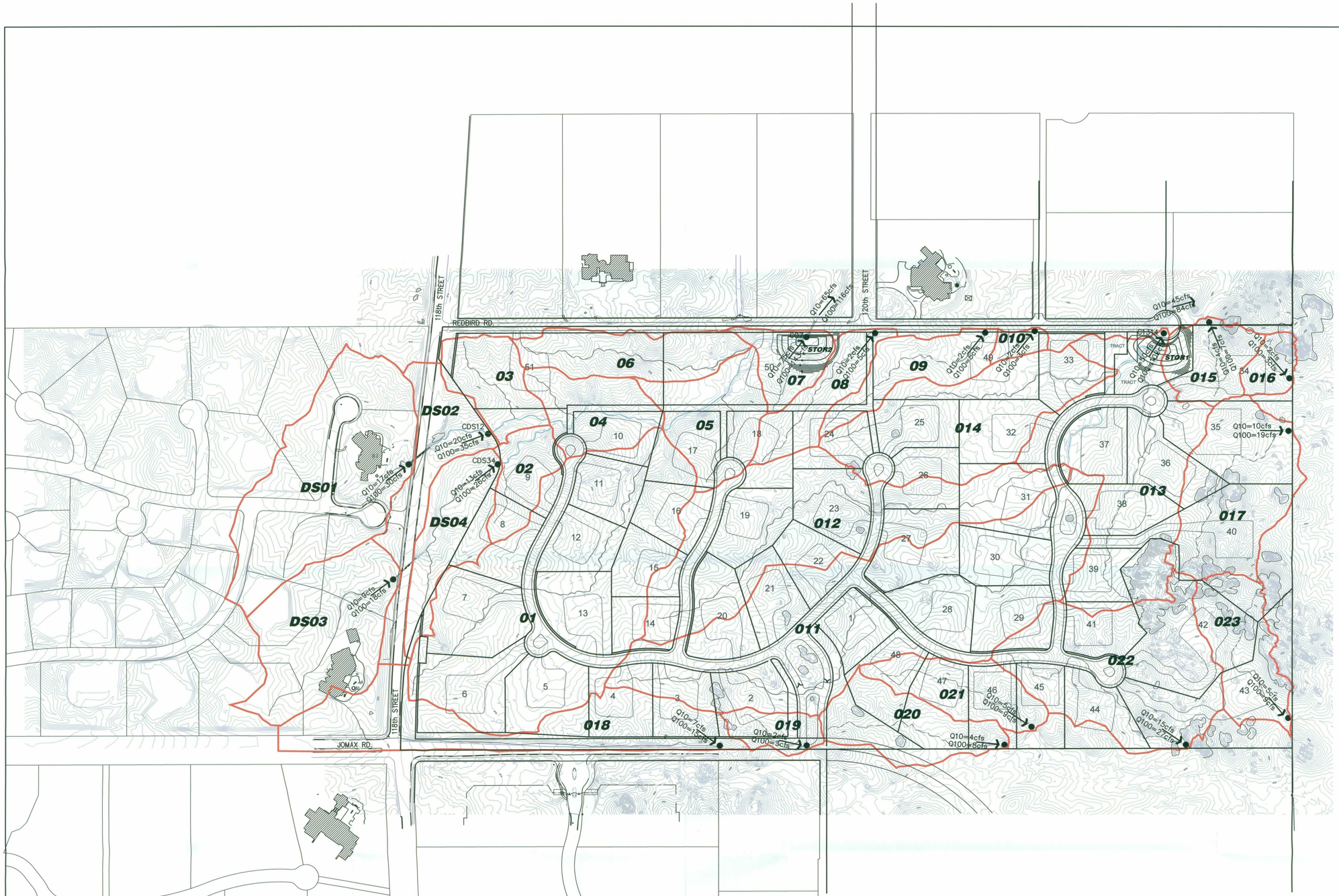
FILE NAME:
DATE PLOTTED:

ARGUS CONSULTING
A CIVIL ENGINEERING COMPANY, P.C.
10115 E. Bell Road, Suite 107 - #104
Scottsdale, Arizona 85260 480-596-1131

PLATE A

EXISTING CONDITIONS HYDROLOGY
118TH & JOMAX
SCOTTSDALE

Date 2/1/17	Job No. 365-16	Sheet 1 of 1



LEGEND

- EXISTING CONTOUR
- DRAINAGE AREA BOUNDARY
- DRAINAGE AREA FLOW PATH
- FLOW ROUTING REACH
- CDS12 ● FLOW CONCENTRATION POINT AND IDENTIFICATION
- **DS02** DRAINAGE AREA IDENTIFICATION
- Q10=20cfs Q100=35cfs ❯ ESTIMATED 10-YR AND 100-YR PEAK FLOW
- PRELIMINARY GRADING PROPOSED STORMWATER DETENTION BASIN

N

SCALE: 1" = 150'

0' 150' 300' 450'

ARGUS CONSULTING
A CIVIL ENGINEERING COMPANY, P.C.
10115 E. Bell Road, Suite 107 - #104
Scottsdale, Arizona 85260 480-596-1131

PLATE B

FUTURE CONDITIONS HYDROLOGY
118TH & JOMAX
SCOTTSDALE

Date 2/3/17 | Job No. 365-16 | Sheet 1 of 1

FILE NAME:
DATE PLOTTED

LEGEND

- EXISTING CONTOUR
- DRAINAGE AREA BOUNDARY
- DRAINAGE AREA FLOW PATH
- FLOW ROUTING REACH
- 50 CFS WASH
- CDS12 ● — FLOW CONCENTRATION POINT AND IDENTIFICATION
- **DS02** — DRAINAGE AREA IDENTIFICATION
- Q10=20cfs Q100=35cfs → — ESTIMATED 10-YR AND 100-YR PEAK FLOW (PROP.CONDITIONS)
- PRELIMINARY GRADING PROPOSED STORMWATER DETENTION BASIN

REDBIRD RD.
118th STREET
120th STREET
JOMAX RD.
WASH A
WASH B
DS01
DS02
DS03
DS04
CDS12
CDS34
RETORT
TRACT

SCALE: 1" = 150'
0' 150' 300' 450'

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PLATE C

WASHES OF 50 CFS CAPACITY OR MORE
118TH & JOMAX
SCOTTSDALE

Date 10/18/16 | Job No. 365-16 | Sheet 1 of 1

FILE NAME:
DATE PLOTTED:

Water Basis of Design Report

118th & Jomax

(504-PA-16)

EXPIRES 12/31/18

Accepted For:
City of Scottsdale
Water Resources Department
9379 E. San Salvador
Scottsdale, Arizona
By:
Date: 2/16/17

prepared for:

Toll Brothers Inc.
8767 E. Via de Ventura, Suite 390
Scottsdale, Arizona 85258
480 951 0782

prepared by:

ARGUS CONSULTING
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480 596 1131

~~July 2014~~
Feb. 2017

25-ZN-2016
02/10/17

TABLE OF CONTENTS

LIST OF EXHIBITS

1.0 Introduction

This Water Basis of Design Report has been prepared for the 118th & Jomax (80 acre) single family residential development, which is being developed by Toll Brothers, an Arizona Corporation.

1.1 Project Location

The project is located in a portion of the Southeast 1/4 of Section 34 and the Southwest 1/4 of Section 35, Township 5 North, Range 5 East of the Gila and Salt River Baseline and Meridian, Maricopa County, Arizona. It is bound on south by Jomax Road Alignment, west by 118th Street Alignment and residential dwellings, north by Red Bird Road and rural residential dwellings and east by McDowell Sonoran Preserve.
See Figure 1, Vicinity Map.

1.2 Property Description

The project is located within the City of Scottsdale, Arizona. The project is approximately 80 acres with a total of 51 dwelling units. The project is currently zoned as R1-130 and R1-190 and is currently vacant desert land. The project is proposing to be rezoned to be consistent with the City of Scottsdale standards for R1-35, R1-43, R1-70 (ESL), R1-130 and R1-190 zoning districts. The project Land use is 0.64 Dwelling units per acre. The property is located on rolling terrain. The northern and western portions of the property slope to the north and to the east. The southeast portion of the property slope to the east and to the south. The site is within the elevation range from 2750 to 2680.

1.3 Purpose

This Report has been prepared to satisfy the City of Scottsdale requirements for the Rezoning of the property. This report provides preliminary design calculations to determine the amount of water this project is expected to use both during normal demand peak demand and during a fire flow demand. The city of Scottsdale Water Resources Department approved a Water Basis of Design Report for the east 40 acres of this property. The report was approved January 30th. 2009 and was prepared by Wood Patel and Associates, Inc. This property is located within Quarter Section map 49-57 as C.O.S. project number 12 PP 2008. This report was used as a reference for the proposed 118th & Jomax (80) acre development. This report

was prepared in accordance with the City of Scottsdale Design Standards & Policies Manual, January 2010 (Reference 1).

2.0 Description of Existing Conditions

2.1 On-Site Current Conditions

The site is currently undeveloped desert land and is being rezoned as single family residential dwelling units. The development is to be supplied from existing City water system adjacent to the property. Based on Figure 6.1-3, Pressure Zone Map of the City of Scottsdale Design Standards and Policies Manual the project is located in Zone 13 and Zone 12. The majority of the property is within Zone 13 with the remaining within Zone 12. Zone 12 is located at the eastern portion of the property with only 10 lots are within this zone. The remaining 41 lots are within Zone 13. A Zone 13 16-inch transmission line is located within Jomax Road. There is an existing 6-inch Zone 13 water line within East Redbird Road. Located at the intersection of East Redbird Road and North 120th Street is an existing water vault without a PRV. This PRV vault was intended to connect Zone 13 existing 12-inch pipe with the Zone 12 existing 12-inch pipe within East Redbird Road. *See Figure 3- Water Distribution Plan.*

3.0 Proposed Water Distribution Plan

3.1 Design Criteria

As per the City of Scottsdale this Rezoning Basis of Water Design Report was prepared according Design Standards & Policies Manual, dated January 2010. The following is a summary of the design criteria upon which this study is based.

Basis of Water Design

- The project is located in Zones 12 and 13 according to figure 6.1-3 pressure zone map
- The total number of dwelling units = 51
- Average day water demand calculations were analyzing using Figure 6.1-2 Average Day Water Demands in Gallons Per Day.
- Residual pressure between 50psi and 120psi at the highest finished floor level.
- Minimum of 30psi under design fire flow requirements.

3.2 Proposed Condition

The development will consist of custom single family residential dwellings. The proposed

distribution system will be 8-inch water pipes that will provide service to each lot within the development. Within Zone 13 the 8-inch distribution water pipe will connect to a proposed 12-inch water main that will be constructed within the 120th Street alignment and connect the existing 16-inch water line within Jomax Road and loop the system with a connection to the existing 6-inch water pipe within East Redbird Road. All lots will be served from the zone 13 distribution system.

Fire protection for the development shall follow the Design Standards & Policies Manual, dated January 2010 under section 6-1.500. Fire hydrants are to be used within the subdivision for fire protection. Fire sprinklers will be required for all dwelling units.

Domestic flow was calculated as follows:

Total units = 51 x 485.6 gallon/unit = 24,765.6 gallons per day
Total average day Flow = 17.2 gpm
Peak hour Flow = 3.5 * 17.2 = 60.2 gpm
Maximum day Demand = 2.0 * 17.2 = 34.4 gpm

Note: These calculations are for the rezoning phase of the project and are preliminary. Additional detailed reports will be prepared as the project continues with the final design of the development. See Figure 3, *Water Distribution Exhibit* for the proposed water pipe layout for the development.

3.3 Reimbursement Agreements

The proposed 12-inch line within the proposed 120th Street alignment is eligible for over sizing reimbursement of difference in cost between an eight-inch line needed for subdivision and size required by the city to complete looping in 118th Street and 120th Street alignment. Any 16-inch line extension within the Jomax Road is eligible for over sizing reimbursement or credit eligible for water development fee reimbursement of the difference in cost between an 8-inch line needed for subdivision and the 16-inch required by the City of Scottsdale.

4.0 Fire Flow Test

A fire flow test was not performed at this stage of the development process. Fire Flow Test will be performed during the Preliminary Plat and Final Design phases for the development. Existing fire hydrants are located at the intersection of 118th Street and East Redbird Road.

Also an existing fire hydrant is located 977 feet east along the East Redbird Road alignment. Also an existing fire hydrant is located at the northwest corner of the intersection of Jomax Road and 118th Street.

5.0 Water Model

A proposed water system model was not prepared for this stage of the entitlement process for the development. Although a complete water distribution model will be prepared with the Preliminary Plat submittal for the development. With the Preliminary Plat phase of the development, the system will be modeled using the "EPANET" software and meet the design criteria noted above in section 3.1.

6.0 Conclusions

- The water system is to be designed, operation and pressures will be in accordance with the City of Scottsdale Design Standards and Policies.
- All dwelling units are to use fire sprinkler systems.

7.0 References

1. City of Scottsdale Design Standards & Policies Manual, *January 2010.*

Figure 1: Vicinity Map

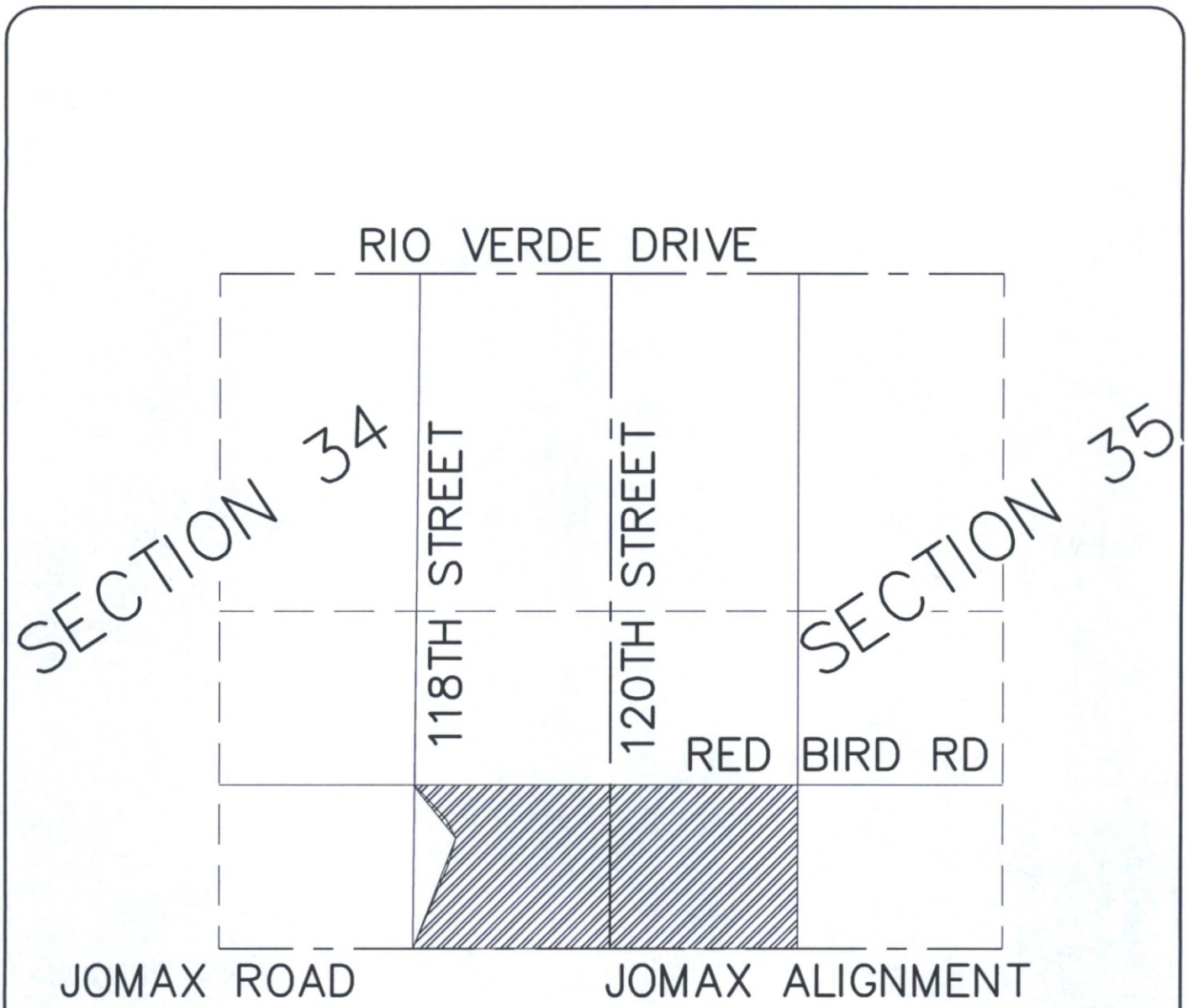


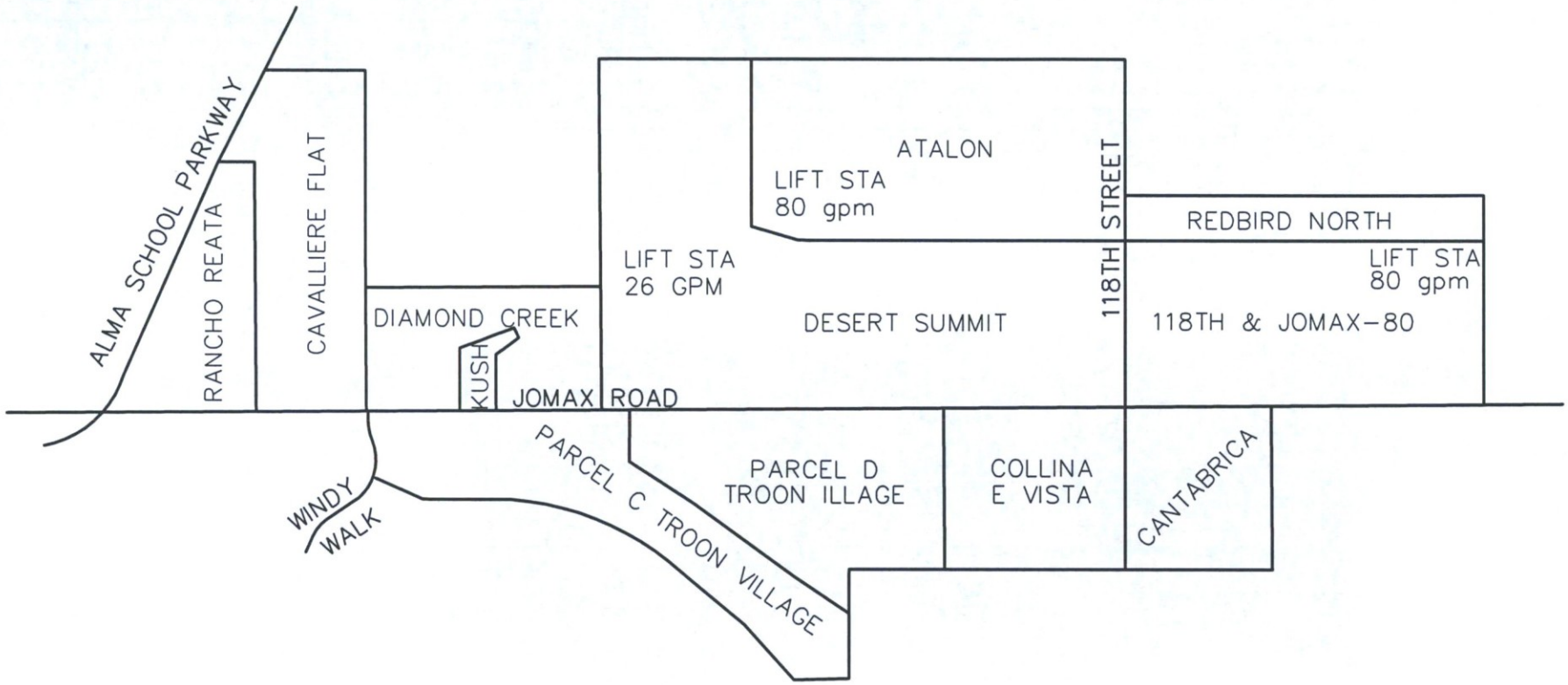
FIGURE 1
Vicinity Map

118th & Jomax–80

Scottsdale – Arizona

FILE NAME:
MACHINE NUMBER:
DATE PLOTTED:

Figure 2: Adjoining Area Map



DATE PLOTTED:

FIGURE 2

SITE PLAN

118TH & JOMAX-80

SCOTTSDALE - ARIZONA

Figure 3: Water Distribution Map

SCALE 1"=100'

EAST REDBIRD ROAD

EAST FOUR PEAKS ROAD

JOMAX ROAD

118TH STREET

120TH STREET

121ST STREET

EXIST FH

EXIST 6" DIP WATER

EXIST VAULT

FUTURE PRV

EXIST 12" DIP WATER

BLOW OFF

8" DIP WATER

ZONE 13
2700

ZONE 12

20' TRACT

TRACT

FH

12" DIP WATER

6" DIP WATER

EXIST 8" DIP WATER

EXIST 12" DIP WATER

EXIST 16" DIP WATER

8"X12" TEE

8"X12" REDUCER

EXIST ARV

16" DIP WATER

FUTURE PRV LOCATION TBD

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51

Total units = 51 x 485.6 gallon/unit = 24,765.6 gpd
Total average day Flow = 17.20 gpm
Peak hour Flow = 3.5 * 17.20 = 60.19 gpm
Maximum day Demand = 2.0 * 17.20 = 34.40 gpm

ALL LOTS TO BE SERVED WITHIN ZONE 13
WATER QS 49-56, QS 49-57

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Scottsdale, Arizona 85260 480-596-1131

118th & JOMAX (80 ACRES)

FIGURE 3

WATER DISTRIBUTION EXHIBIT

Designed by	Drawn by	
Date 2-3-2017	Job No.	Sheet 1 of 1

Preliminary

Sewer Basis of Design Report

118th & Jomax (80 Acres)

Registered Professional Engineer (Civil)
CERTIFICATE NO.
28638
JORGE R.
GARRE
Date Signed 10/6/16
ARIZONA, U.S.A.

EXPIRES 12/31/18

Accepted For:
City of Scottsdale
Water Resources Department
9379 E. San Salvador
Scottsdale, Arizona

By: _____
Date: 11/8/16

WITH Comments

prepared for:

Toll Brothers Inc.
8767 E. Via de Ventura, Suite 390
Scottsdale, Arizona 85258
480 951 0782

prepared by:

ARGUS CONSULTING
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October 2016

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TABLE OF FIGURES

1.0 INTRODUCTION

1.1 General Description

This Rezoning Sewer Basis of Design Report has been prepared to describe how sanitary sewer services will be provided to the proposed subdivision of 118th & Jomax (80 acres), for Toll Brothers' Arizona Construction Company. The project is located within the City of Scottsdale, Arizona. The project is approximately 80 acres with a total of 52 dwelling units. The project is currently zoned as R1-130 and R1-190. The project is proposing to be rezoned to be consistent with the City of Scottsdale standards for R1-43, R1-70 (ESL), R1-130 and R1-190 zoning districts. The property is located on rolling terrain. Northern and western portions of the property slope to the north and to the east. The southeast portion of the property slope to the east and to the south. The site is within the elevation range from 2750 to 2680.

This analysis will present the design requirements for the collection system for the entire project.

1.2 Location

The project is located in a portion of the Southeast 1/4 of Section 34 and the Southwest 1/4 of Section 35, Township 5 North, Range 5 East of the Gila and Salt River Baseline and Meridian, Maricopa County, Arizona. It is bound on south by Jomax Road Alignment, west by 118th Street Alignment and residential dwellings, north by Red Bird Road and rural residential dwellings and east by McDowell Sonoran Preserve. *See Figure 1: Vicinity Map.*

1.3 Purpose

This report has been prepared to analyze the construction of the sanitary sewer system that will serve this project. The report shall provide technical information for the sanitary sewer distribution system for the entire project. Final design reports will be completed as the Development Review Process progresses.

2.0 COLLECTION SYSTEM DESCRIPTION

2.1 Existing Collection System

An Off-Site Wastewater Capacity Report for the project was approved by the City of Scottsdale Water Resources Administration on February 26, 2016. This report depicts the existing off-site collection system layout and capacities as well as the proposed off-site collection system for the project. See Appendix A for the approved Off-Site Wastewater Capacity Report. The east 40 acres of the property has been planned within the Master Wastewater Plan for the Sereno Canyon Development proposed by Crown Development. The property is to be removed from this master plan. The project will convey the demand flows to an existing gravity line in East Four Peaks Road within the Desert Summit subdivision. The Catabrica Subdivision and Goldie Brown Parcel 8, both located south of Jomax Road constructed a dry 8-inch sewer pipe line within the Jomax Road alignment. The 118th & Jomax (80 acre) development will connect to the existing dry sewer pipe and convey the existing flows from the Catabrica Subdivision and Goldie Brown Parcel 8 thru the project to the proposed lift station. *See Figure 2: Adjoining Area Map.*

WILL REQUIRE HOA PERMISSION

2.2 Proposed Collection System

The proposed collection system will convey the wastewater demand flows within a gravity pipe system that is routed to a proposed lift station to be constructed between lots 33 and 34 near the northeast property corner of the 80 acres. In addition, the proposed and existing properties that front East Redbird Road will be served by an 8-inch sewer pipe to be constructed with this development. The lift station will discharge the demand flows from the lift station to the existing gravity line in East Four Peaks Road within the Desert Summit subdivision. All pipes within the project are to be gravity 8-inch diameter sewer pipe lines. *See Figure 3: Sewer Distribution Map.*

WITH HOA APPROVAL

3.0 BASIS OF DESIGN

3.1 Design Flow Rates

As per the City of Scottsdale this Basis of Sewer Design Report was prepared according Design Standards & Policies Manual, dated January 2010. The following is a summary of the design criteria upon which this study is based.

Basis of Sewer Design

- The total number of units = 52 + 7 (East Redbird Rd) + 10 Catabrica Subdivision and Goldie Brown Parcel 8) = 69 units ✓
- Per the City of Scottsdale design standards section 7-1.403 residential design flow will be 100 gallons per capita day with 2.5 persons per dwelling unit. ✓
- A peaking factor of 4 will be used. ✓

Sewer flow was calculated as follows:

Total units = 69

Total average day Flow = 100 gpcd x 2.5 persons x 69 units = 17,250 gpd ✓

Average Daily Flow = 11.98 gpm = 0.027 cfs ✓

Peak Day Flow = 11.98 gpm x 4 = 47.92 gpm = 0.107 cfs ✓

Peak Hour Flow = 0.107 cfs x 1.7 = 0.182 cfs ✓

The collection system design criterion is based on the City of Scottsdale DSPM. The following represents the design criteria for the collection system:

- Mean full flow velocity = 2.5 feet per second
- Peak Flow velocity = 10.0 feet per second maximum.
- The Manning's roughness coefficient, n=0.013 for all pipe materials.
- Maximum sewer capacity: d/D=65% at peak flow conditions.

- Manhole spacing shall not exceed 500 feet for sewer lines less than 18 inches in diameter
- The minimum drop in elevation from the invert to the outlet of a manhole shall be 0.1 feet.
- The minimum manhole diameter shall be 48 inches for manholes less than 10 feet deep or the pipe is 15 inches in diameter or larger.
- MAG Standard 601 and 615 and any subsequent MAG specification and details, shall be followed for trench bedding.
- Minimum slopes: Use the minimum slope calculated from Manning's Formula using a sewage velocity of 2.5 feet per second when flowing full, or the slopes in the following table, whichever is greater:
- Force Main shall be designed per the DSPM under section 7-1.303.

3.2 Sewer Capacity

The 118th & Jomax (80 acres) project will accumulate 13,000 gallons per day average day flow at buildout. At Peak Day Flows the development will accumulate 52,000 gallons per day at buildout of the development.

4.0 On-site Improvements

The collection system for the community is to be a gravity sewer system. The pipes shall be constructed within the proposed streets and dedicated sewer easements. The onsite gravity sewer collection system will collect and convey sewer flows to a proposed Lift Station that will be constructed between future lots #33 and #34 within a dedicated easement. This lift station is to discharge the sewer flows within a 3-inch diameter force main. The force main will be constructed within the proposed street section for the project. The force main will connect to a proposed odor control discharge divergence structure located within an easement along the east right of way line of 118th Street. From this structure the flows will be discharge to a proposed gravity sewer pipe within 118th Street. Flows within this proposed off-site system are conveyed to the north along the 118th Street alignment to a manhole proposed to the east of the existing East Four Peaks Drive. From this proposed manhole an 8- inch gravity pipe will be constructed within the East Four Peaks Drive alignment to an existing manhole. See City of Scottsdale Sewer QS Map 49-56 at station 0+70 for the location of the existing sewer manhole within the East Four Peaks Drive roadway. See *Figure 3: Sewer Distribution* Map.

The proposed Lift Station will be designed per the minimum requirements of the Arizona Administration Code, Title 18, Chapter 9 "Water Pollution Control" and the City of Scottsdale Water Resources Department design standards. Per the approved Off-Site Wastewater Capacity Report, February 26, 2016 the maximum discharge from the proposed Lift Station shall not exceed 80 gpm. The total peak day flows for the project are calculated to be 36.12 gpm. Final design calculations for the Lift Station will be completed with the final design phase of the project. The elevation difference from the order control structure and the proposed Lift Station is 62 feet. The flow velocities in the force main must be between 4 and 6 feet per second. From preliminary design calculation, the Xylem, D3080 Vortex, centrifugal pump would be specified.

Figure 1: Vicinity Map

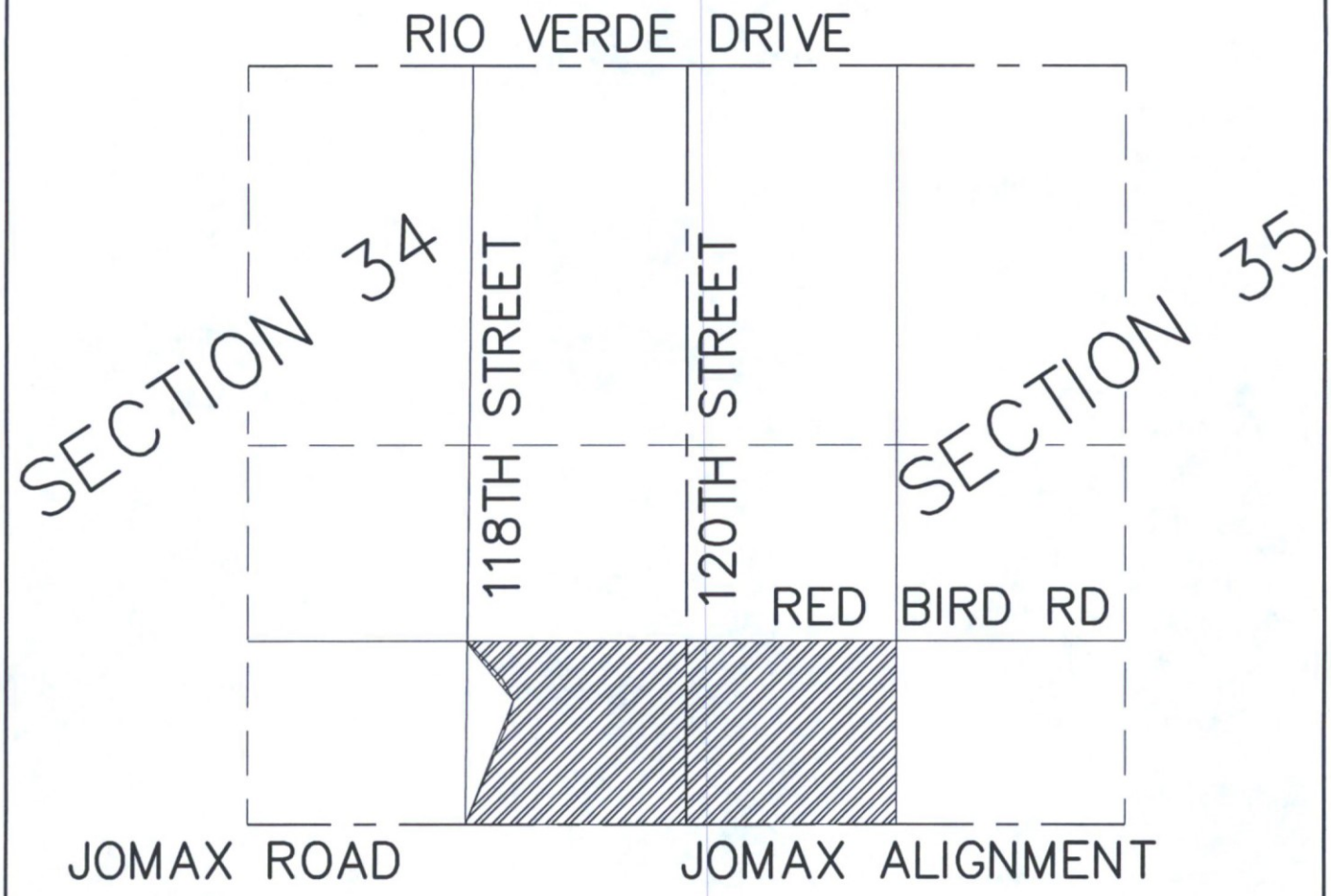


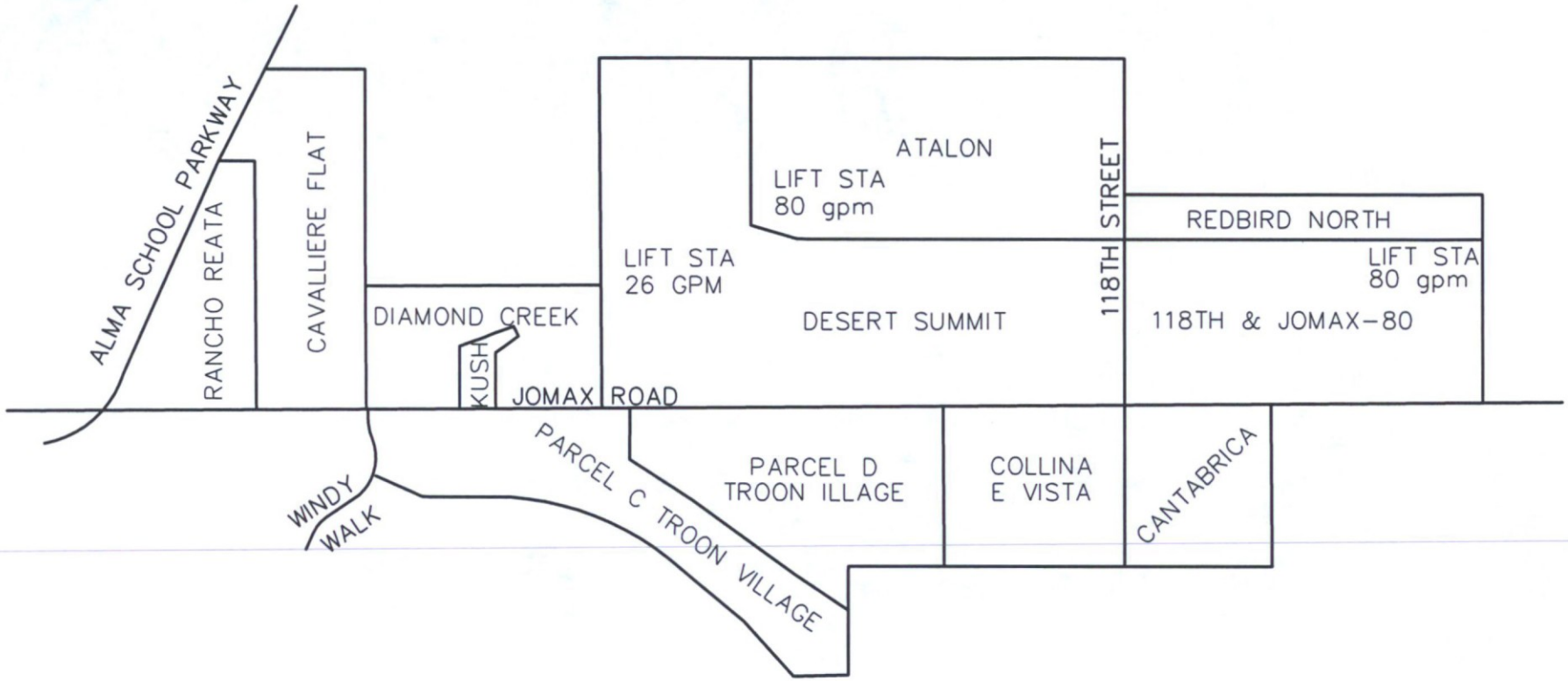
FIGURE 1
Vicinity Map

118th & Jomax–80

Scottsdale – Arizona

FILE NAME:
MACHINE NUMBER:
DATE PLOTTED:

Figure 2: Adjoining Area Map



DATE PLOTTED:

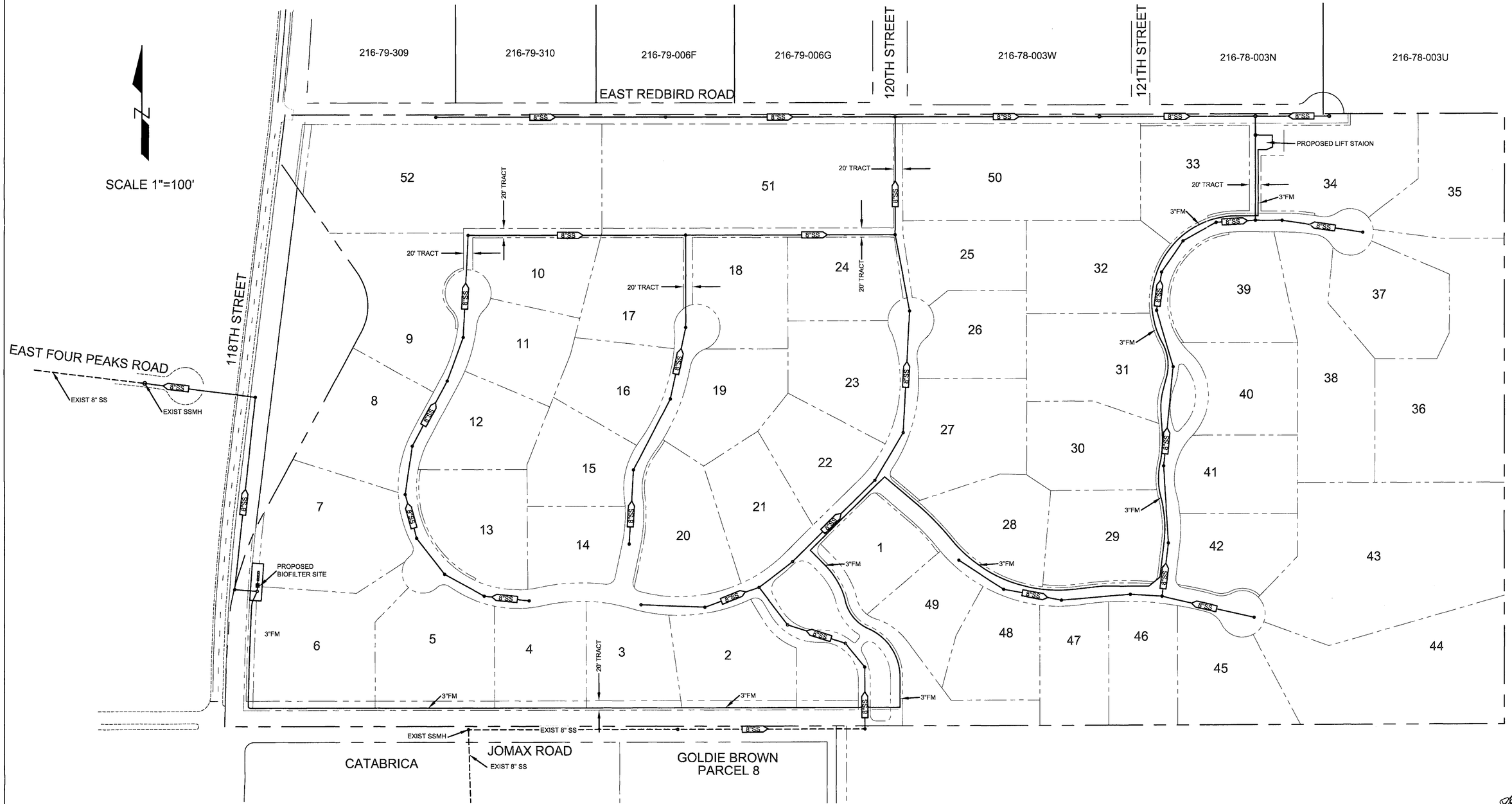
FIGURE 2

SITE PLAN

118TH & JOMAX-80

SCOTTSDALE - ARIZONA

Figure 3: Sewer Distribution Map



Total units = 69
Total average day Flow = 100 gpcd x 2.5 persons x 69 units = 17,250 gpd
Average Daily Flow = 11.98 gpm = 0.027 cfs
Peak Day Flow = 11.98 gpm x 4 = 47.92 gpm = 0.107 cfs
Peak Hour Flow = 0.107 cfs x 1.7 = 0.182 cfs

CERTIFICATE NO. 28638 JORGE R. GARRE Date Signed 10/18/16 ARIZONA, U.S.A.
EXPIRES 12/31/18

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118th & JOMAX (80 ACRES)

FIGURE 3
SEWER DISTRIBUTION MAP

Designed by	Drawn by	
Date 10-2016	Job No.	Sheet 1 of 1

Appendix: Off-site Wastewater Capacity Report

Off-Site Wastewater

Capacity Report

118th & Jomax (80 acres)

EXPIRES 12/31/18

Prepared for:

Accepted As Noted

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8767 E. Via de Ventura, Ste. 390
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City of Scottsdale
Water Resources Administration
9379 E. San Salvador
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prepared by:

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Scottsdale, Arizona 85260
480 596 1131

February 2016

INTRODUCTION

LIST OF FIGURES

INTRODUCTION

This report has been prepared for the subject property consisting of approximately 80 acres of land situated at the northeast corner of 118th Street and Jomax Road, Scottsdale Arizona. This design report present an analysis of the existing sewer line in Jomax Road for disposal of wastewater from the proposed project.

The project is located within the City of Scottsdale in the Southeast quarter of the southeast quarter of Section 34 and the Southwest quarter of the Southwest quarter of Section 35, Township 5 North, Range 5 East of the Gila and Salt River Base and Meridian, Maricopa County, Arizona. Figure 1 show a Vicinity Map.

The project will be developed consistent with City of Scottsdale standards for R1-35, R1-43, and R1-70 (ESL) zoning districts. The project proposes approximately 63 Lots on 80 acres.

The property is currently included in the master wastewater plan for the Sereno Canyon Development proposed by Crown Development. Under the current Master Plan there is no timetable for extension of service to the property. This report proposes removing the property from the Sereno Canyon Development Master Plan. The project will collect wastewater in a gravity system and route it to a lift station within the project. The lift station would discharge to an existing gravity line in East Four Peaks Road within the Desert Summit Subdivision. In addition to the subject property the existing dry sewer line in Jomax Road would be connected to the system. This line serves the Cantabrica Subdivision.

Previous developments in the area have identified potential capacity issues with lines downstream of this discharge point in Windy Walk Drive. City staff has requested capacity of lines be reviewed considering discharges from lift stations in Desert Summit, Atalon (Talon Ranch) and the herein proposed property impacting the lines simultaneously.

SITE DESCRIPTION

The subject property is located on rolling terrain. Northern and western portion slope to the north and east. Portion of the property to the southeast slope to the east and south. Site elevations range from 2750 to 2680.

WASTE WATER GENERATION

The residential flow rate is based upon information provided by the City of Scottsdale. Flows utilized for this report were taken from Table 2.4 of the City Wastewater Master Plan. Flows were calculated based on area and zoning classification. Copies of the tables are included in Appendix III.

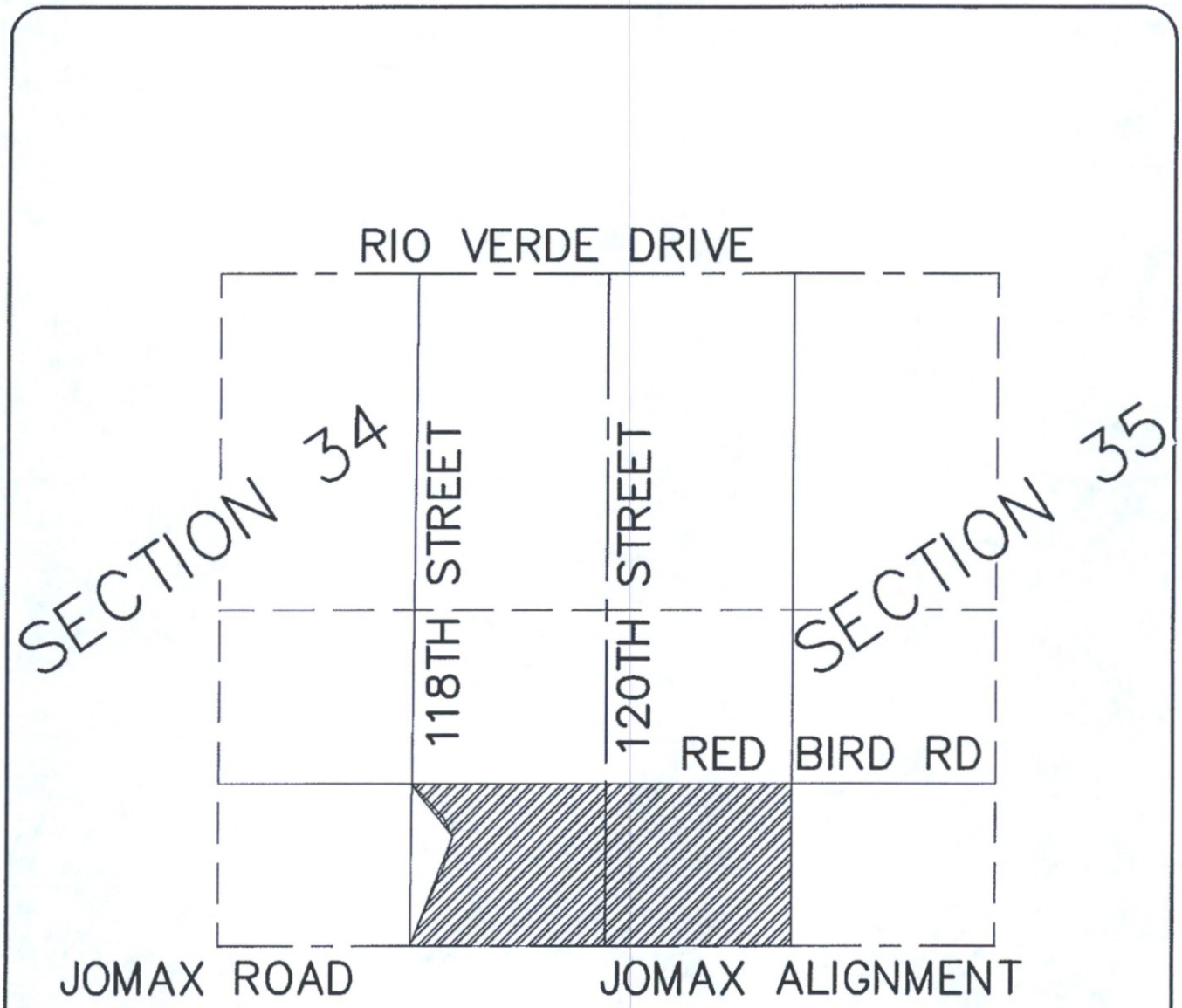

FIGURE 1
Vicinity Map

118th & Jomax–80

Scottsdale – Arizona

FILE NAME:
MACHINE NUMBER:
DATE PLOTTED:

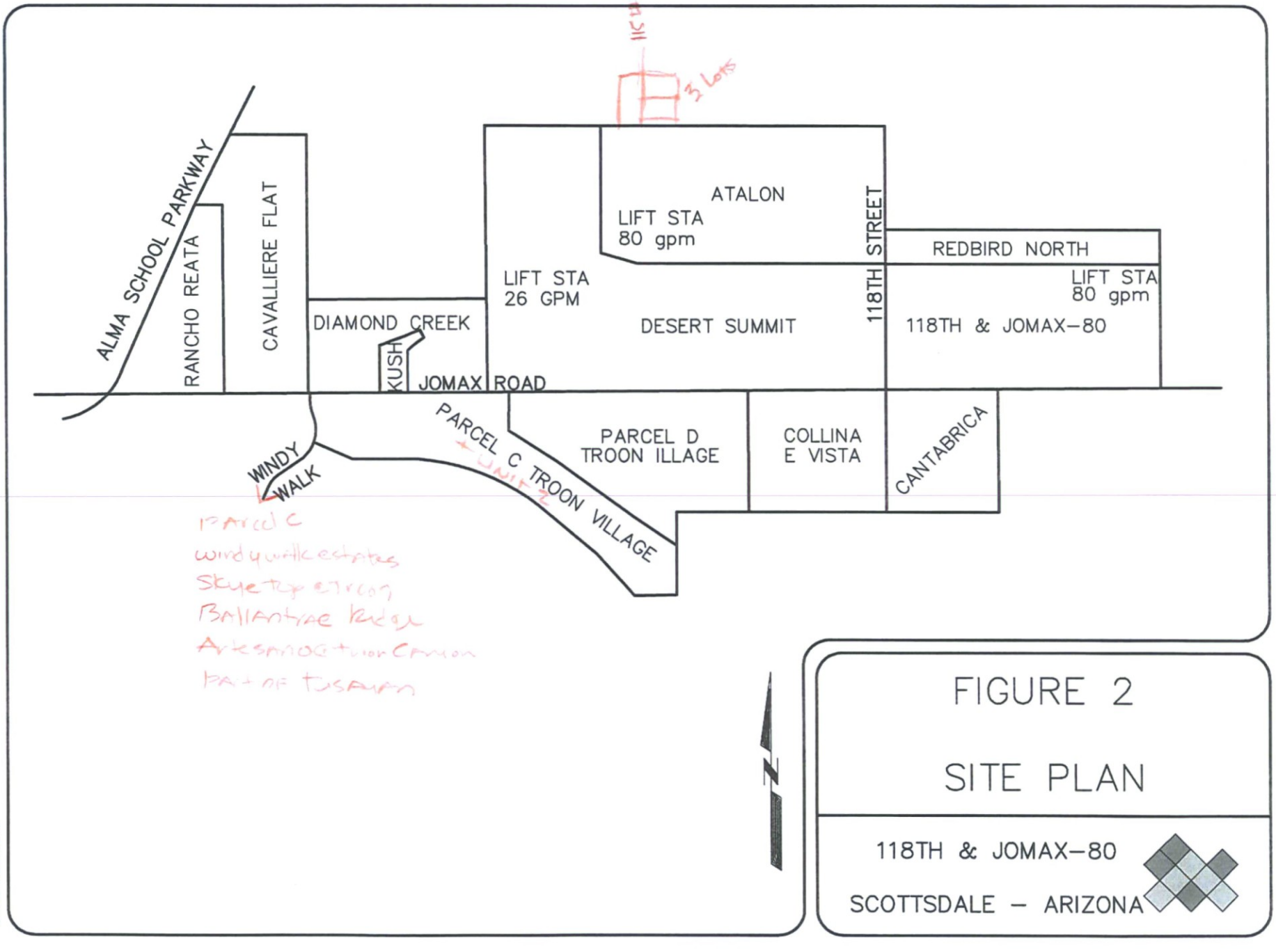

FIGURE 2

SITE PLAN

118TH & JOMAX-80

SCOTTSDALE - ARIZONA

DATE PLOTTED:

EXISTING SYSTEM

Sewer lines in Desert Summit, Desert Summit lift station, Atalon lift station, Parcels C and D of Troon Village at Windy Walk and Colina E Vista are collected in an existing 8" line in Jomax Road. The line turn south at 110th Street into Parcel D at Troon Village to Desert Troon Lane and Windy Walk Drive The portion of the line in Windy Walk Drive was identified in The Water and Wastewater Report for Colina E Vista by Kimley Horn & Associates as the section with most critical capacity issue. Results of calculations indicate the system cannot accept additional flow in this section from the subject property. Summary of existing flows to this point are provided in Table 1 below. See Calculations in Appendix I for existing flows in line to this point.

TABLE 1

Windy Walk Sewer						
Property	Zoning	Area Acre	High gpad	Flow gpad	GPM	CFS
Parcel C @Troon Village	Suburban	41.4	1215	50301	34.93	
Parcel D @Troon Village	Suburban	21.3	1215	25879.5	17.97	
Desert Summit	Rural	130.4	268	34947.2	24.27	
Desert Summit Lift Station	Rural		268		26.00	
Atalon Lift Station	Rural		268		80.00	
Collina E Vista	Rural	40	268	10720	7.44	
					190.62	0.42
118th & Jomax-80 Lift Station					80.00	0.18
Total Flow					270.62	0.60

PROPOSED SYSTEM

After consultation with City of Scottsdale staff it has been proposed a new line be constructed in Jomax Road connecting at 110th Street and extended westerly in Jomax to the recently completed line for the Cavalliere Flat project. This would direct flows from Desert Summit, Desert Summit Lift Station, Atalon Lift Station, Parcel C of Troon Village at Windy Walk, Colina E Vista and the subject property away from Windy Walk Drive and to Jomax Road Line and Alma School Parkway. Calculations were made to confirm this will not create capacity issues in the Jomax Line to Alma School Parkway. Calculations indicate the line does have sufficient capacity for estimated flows. Summary of existing flows to this point are provided in Table 2 below. See Calculations in Appendix II for existing flows in line to this point.

So 110TH + windywalk going South will be capped!

TABLE 2

Jomax Sewer						
Property	Zoning	Area Acre	High gpad	Flow gpad	GPM	CFS
Desert Summit	Rural	130.4	268	34947.20	24.27	
Desert Summit Lift Station	Rural		268		26.00	
Atalon Lift Station	Rural		268		80.00	
Collina E Vista	Rural	40	268	10720.00	7.44	
Rancho Reata	Urban	25.15	2060	51809.00	35.98	
Cavalliere Flat	Suburban	22.8	1215	27702.00	19.24	
Cavalliere Flat	Urban	24.1	2060	49646.00	34.48	
Diamond Creek	Rural	41.34	268	11079.12	7.69	
Kush	Suburban	4.46	1215	5418.90	3.76	
Parcel D @Troon Village	Suburban	21.3	1215	25879.5	17.97	
					256.83	0.572
Lift Station					80.00	0.178
Total Flow					336.83	0.750

Final LS Design Limit to 80gpm.

CONCLUSIONS

The Sewer Systems can be designed in accordance with the City of Scottsdale and Arizona Department of Health services standards.

Land use and wastewater flows are consistent with City of Scottsdale Master Plan for this area.

APPENDIX I

Windy Walk Drive Pipe Flows

Hydraulic Analysis Report

Project Data

Project Title: 118th & Jomax-80

Designer: Argus

Project Date: Monday, February 20, 2016

Project Units: U.S. Customary Units

Notes: 8" Sewer in Windy Walk Drive Slope 0.0024ft/ft

Input Parameters

Channel Type: Circular

Pipe Diameter: 0.6700 ft

Longitudinal Slope: 0.0024 ft/ft

Manning's n: 0.0130

Flow: 0.4200 cfs

Result Parameters

Depth: 0.4131 ft

Area of Flow: 0.2281 ft^2

Wetted Perimeter: 1.2101 ft

Hydraulic Radius: 0.1885 ft

Average Velocity: 1.8411 ft/s

Top Width: 0.6515 ft

Froude Number: 0.5483

Critical Depth: 0.3016 ft

Critical Velocity: 2.7279 ft/s

Critical Slope: 0.0068 ft/ft

Critical Top Width: 0.67 ft

Calculated Max Shear Stress: 0.0619 lb/ft^2

Calculated Avg Shear Stress: 0.0282 lb/ft^2

D/d 0.4131/0.67=0.6166 Okay

Hydraulic Analysis Report

Project Data

Project Title: 118th & Jomax-80

Designer: Argus

Project Date: Monday, February 20, 2016

Project Units: U.S. Customary Units

Notes: 8" sewer Windy Walk Drive Slope 0.0024ft/ft

Input Parameters

Channel Type: Circular

Pipe Diameter: 0.6700 ft

Longitudinal Slope: 0.0024 ft/ft

Manning's n: 0.0130

Flow: 0.6000 cfs

Result Parameters

Depth: 0.5492 ft

Area of Flow: 0.3093 ft^2

Wetted Perimeter: 1.5173 ft

Hydraulic Radius: 0.2039 ft

Average Velocity: 1.9397 ft/s

Top Width: 0.5151 ft

Froude Number: 0.4411

Critical Depth: 0.3638 ft

Critical Velocity: 3.0683 ft/s

Critical Slope: 0.0073 ft/ft

Critical Top Width: 0.67 ft

Calculated Max Shear Stress: 0.0823 lb/ft^2

Calculated Avg Shear Stress: 0.0305 lb/ft^2

D/d 0.5492/0.67 = 0.8197 Not Acceptable

APPENDIX II
Jomax Road Pipe Flows

Hydraulic Analysis Pipe Report

Project Data

Project Title: 118th & Jomax-80

Designer: Argus

Project Date: Monday, February 20, 2016

Project Units: U.S. Customary Units

Notes: 8" Sewer in Jomax Road west of Alma School Parkway Slope = 0.0052ft/ft

Input Parameters

Channel Type: Circular

Pipe Diameter: 0.6700 ft

Longitudinal Slope: 0.0052 ft/ft ✓

Manning's n: 0.0130

Flow: 0.7500 cfs ✓

Result Parameters

Depth: 0.4742 ft

Area of Flow: 0.2668 ft^2

Wetted Perimeter: 1.3395 ft

Hydraulic Radius: 0.1992 ft

Average Velocity: 2.8112 ft/s

Top Width: 0.6094 ft

Froude Number: 0.7488

Critical Depth: 0.4086 ft

Critical Velocity: 3.3304 ft/s

Critical Slope: 0.0079 ft/ft

Critical Top Width: 0.65 ft

Calculated Max Shear Stress: 0.1539 lb/ft^2

Calculated Avg Shear Stress: 0.0646 lb/ft^2

D/d: ✓ 0.4742/0.67 = 0.7078 Acceptable ✓

APPENDIX III

Scottsdale Wastewater Unit Load Tables

Table 2-4 Scottsdale Wastewater Unit Loads

WASTEWATER UNIT LOADS PER LAND USE CATEGORY									
2008 Categories			2011 Categories						
Land Use Type	Sub-Category	Previous Zoning Category	Land Use Type	Zoning Category	Unit Load Estimate gpad	Weighted Average gpad	Average gpad	High gpad	Low gpad
Single Family Residential	1/5 - 1/3 du/ac	R1-190, R1-130	Rural Neighborhoods	R1-190	92	162	144	268	92
				R1-130	92				
	1/3 - 1/2 du/ac	R1-43, R1-70		R1-70	134				
				R1-43	134				
	1/2 - 1 du/ac	R1-35		R1-35	268				
	1 - 2 du/ac	R1-10, R1-18	Suburban Neighborhoods	R1-18	488	557	689	1,215	488
				R1-10	488				
	2 - 4 du/ac	R1-7, R1-5		R1-7	627				
				R1-5	627				
Patio Home and Townhouse Residential	4 - 6 du/ac	R2		R-2	1,215				
Townhouse Residential	6 - 8 du/ac	R-3, M-H	Urban Neighborhoods	M-H	1,328	1,754	1,541	2,060	1,328
				R-3	1,328				
Multi-Family Residential	8 - 12 du/ac	R-4, S-R, RCO-2		R-4	1,448				
	12 - 23 du/ac	R-5, RHD		R-5	2,060				

Table 2-4 Scottsdale Wastewater Unit Loads (Cont'd.)

WASTEWATER UNIT LOADS PER LAND USE CATEGORY									
2008 Categories			2011 Categories						
Land Use Type	Sub-Category	Previous Zoning Category	Land Use Type	Zoning Category	Unit Load Estimate gpad	Weighted Average gpad	Average gpad	High gpad	Low gpad
Mixed Use	Mixed Use	PRC, PNC, PCP, PCD, PCC, P.Co.C, P-1, P-2	Mixed-Use Neighborhoods	PNC	1,447	1,447	1,447	2098 1,447	1,447
				PRC	1,447				
				P.Co.C.	1,447				
			Mixed-Use High Rise	Mixed-Use High Rise	3,000	3,000	3,000	3,000	3,000
Destination Resort	10 - 25 rm/ac		Resorts/Tourism		861	3,982	1,941	3,985	861
Hotel / Resort	3 - 10 rm/ac	RH, RH-2			977				
	10 - 43 rm/ac	R-4R, M		R-4R	3985				
Churches	Churches		Cultural/ Institutional or Public		277	378	307	382	192
Community Service Facilities	Community Service Facilities	C-S, S-C, SC		S-C	192				
Institutional Facilities	Institutional Facilities	CC, C-O		C-O	378				
Schools	Schools				382				
Industrial	Major Industrial	I-1	Employment	I-1	752	926	953	1,574	561
	Minor Industrial	I-G		I-G	561				
Office	Major Office	O-S		C-2	1,001				
	Minor Office			C-1	878				
Utilities	Utilities			C-4	1,574				

Table 2-4 Scottsdale Wastewater Unit Loads (Cont'd.)

WASTEWATER UNIT LOADS PER LAND USE CATEGORY									
2008 Categories			2011 Categories						
Land Use Type	Sub-Category	Previous Zoning Category	Land Use Type	Zoning Category	Unit Load Estimate gpad	Weighted Average gpad	Average gpad	High gpad	Low gpad
Retail	Community	C-1, OR	Commercial	S-R	656	553	822	1,173	502
	General	C-2, C-2/P-3, C-2/P-4, S-S		S-S	1,173				
	Neighborhood	OC		C-3	502				
	Regional	RCO		C-S	680				
	Specialty/Tourism	RS		RS	1,100				
Improved Open Spaces	Golf Courses	Water	Developed Open Space	O-S	0	-	-	-	-
				P-2	0				
				P-1	0				
	Private Open and Recreation Areas	HC		O-S	0				
	Public Parks, etc.	W-P		O-S	0				
			Roads	O-S	0				
			Natural Open Space	O-S	0				

Note:
gpad = gallons/acre/day, du/ac = dwelling units per acre, rm/ac = rooms per acre