TRAVERSE MOUNTAIN AREA PLAN
STORM DRAIN

MW BROWN ENGINEERING, INC

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TRAVERSE MOUNTAIN AREA PLAN
STORM DRAIN

12 June 2012

The Traverse Mountain development is comprised of two main drainage areas. These areas, as shown in Figure One, consist of the Fox Hollow Drainage and the SR-92 Drainage. The Fox Hollow Drainage flows westerly to an existing 60" culvert under I-15. The culvert has been extended and an energy dissipater constructed in the Jordan Narrows Regional Drainage Facility. The SR-92 Drainage flows westerly and southerly to a recently constructed 72" outfall storm drain for the Timpanogos Highway. The outfall terminal is the Jordan Narrows Facility.

Outfall Drainage

The drainage from the SR-92 basin discharges into the 72" storm drain. Traverse Mountain's by agreement between UDOT and Lehi City has the ability to connect to this storm drain and discharge at specified flow rates. Traverse Mountain participated in the project to construct the Jordan Narrows Regional Detention Facility at the end of the 72" SR-92 outfall line. By the agreement, Traverse Mountain has 8.1 acre feet of capacity in the 17.1 acre feet constructed in the first phase. This allows them to transfer the existing Pond "A" facility offsite. Traverse Mountain also has the right to construct a second pond consisting of an additional 20 acre feet at the same location. Traverse Mountain will have to disconnect the existing pond "A" detention and connect it to the 72" storm drain at the Adobe Way location. The existing 36" storm drain in Adobe Way will need to be connected to the existing Bull River Ditch crossing of I-15 which connects to the 36" storm drain in the west frontage road.

Drainage Analysis

The concept plan was modeled in WMS software using a hec-1 model to estimate drainage flow for the development. The rainfall data used is provided in the appendix. A rainfall depth of 2.52 inches for the 100 year event, 2.30 inches for the 50 year event and 1.79 inches for the 10 year event were used in the modeling.

The estimated peak flows for the development can be found on Figure 1. The analysis calculated the allowable discharge rates for the project. The discharge rates were determined to be 0.4 cfs/acre for residential and commercial for the SR-92 drainage area and the allowable discharge will be based upon a c-factor of 0.53 for a 50 year event for the Fox Hollow drainage basin, as seen in Figure 2. Onsite detention will be required for projects exceeding this discharge rate for a 100 year design event. The developer will be responsible for meeting the city's requirement for detention of 0.2 cfs/acre based upon the 100 year event. The detention will be provided in both onsite facilities and offsite facilities (Lambert and Jordan Narrows Ponds). The developer will construct the onsite detention determined from the difference on the allowable discharge rate and the city's 0.2 cfs/acre discharge. The developer will also construct the offsite detention as it is needed for the project.

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The following is an example for East Canyon A1-A4:

Required detention based upon 0.2 cfs/acre: 76,248 cubic feet.
Required detention based upon 0.4 cfs/acre: 58,176 cubic feet.
Require offsite detention (Difference between 0.2 and 0.4): 18,072 cubic feet
Offsite detention has been provided with the balance required onsite to hold to these flow rates.

An analysis of the proposed developable area was performed using the rational method to estimate the required detention volumes. Results are shown in the attached detention tables. The following c-factors were used:

			Soil Group C		Soil Group D	
Land Use	C-Factor Range	C-Factor Used	CN Range	CN Used	CN Range	CN Used
Native Open Space	.10	.10	55-59	57	61-65	63
Parks/Cut slopes/Landscaping	.20	.20	72-76	74	78-82	80
Low Density (1-4)	.34-.47	.41	79-83	81.0	84-87	85.5
Medium Density (4.1-6)	.47-.59	.53	83-88	85.5	87-90	88.5
High Density (6.1-20)	.59-.70	.64	88-91	89.5	90-93	91.5
Churches/Schools (70% imp.)	.69	.69	84-88	86	91-95	93
Commercial (85% imp.)	.80	.80	93-95	94	95	95
Roads/Impervious	.90	.90		95		95

The development will require approximately 75.49 acre-feet of detention. The following is an estimate of where it will be distributed.

	Total Req.	Constructed	Proposed
Jordan Narrows	26.50 AF	8.10 AF	18.40 AF
Lambert	10.00 AF		10.00 AF
On Site Storage	35.22 AF	5.28 AF	29.94 AF
TOTAL	**75.49 acre-feet**		

Storm Drains

The SR-92 basin will have storm drains designed for the 10 year event as per Lehi City Standards. Pipes will meet the requirement of Section 9.07 of the Lehi Design Standards. The maximum 10 year event will not exceed the agreed discharge into the 72" storm drain. Detention will be required to control the flows from developments draining to the 72" storm drain. This will be done by the discharge rates as shown on Figure 1 and as follows:

Adobe (9C):	109 CFS	Murdock Canal (11C):	62.8 CFS
Rail Road (10C):	72.7 CFS	Perry (13C):	22.6 CFS
Existing Bull River Bore	50.0 CFS		

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The master plan storm drains are shown in Figure 3. These storm drains must be installed with developments or as soon as the existing downstream capacity is exceeded. The schedule of when the storm drain lines need to be installed is shown on Figure 3. The plan requires several major pipes to be installed. The removal of pond "A" will require the installation of several storm drain lines as shown on Figure 3. A 36" line will need to be installed south of the Murdock Corridor and a 42" line (parallel in sections) will need to be installed under the canal along Cabella's Blvd. to the Adobe corridor.

Central Canyon will have the main storm drain pipe designed for the 50 year event. The existing storm drain has a capacity of approximately 200 CFS. The outfall from the Lambert basin will be limited to 325 CFS maximum flow with discharge into the Jordan Narrows facility. A parallel storm drain construction of 48" and 60" pipe will be constructed along Traverse Mtn. Blvd. to the Lambert Detention Facility. A connection from Chapple Ridge to Fox Canyon will also be required to separate the Chapple Ridge system into parts.

Mass Grading

Mass grading operations will be detained to 0.1 CFS per acre of disturbed ground or higher as determined by the City Engineer during all construction phases to control erosion and sedimentation of downstream facilities. A complete Storm Water Pollution Prevention Plan (SWPPP) will also be developed to include Best Management Practices (BMPs), for erosion and revegitation of slopes and pads.

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Outfall	Master Plan
3 C	591
4 C	85
7 C	129
8 C	11
9 C	159
10 R	40.1
11 C	72.7
12 C	25
13 C	22.3
15 R	6
16 C	51
17 R	3
18 C	57
19 R	6
20 C	93
21 C	23
22 C	30
23 R	6.2
24 C	11
25 R	26

Outfall	Master Plan
29 R	13
30 C	31
31 R	31
32 C	111
37 C	80
38 R	31
41 C	176
43 C	325

LEGEND

DRAINAGE BASIN

OUTFALLS

BASIN #
BASIN "ACRES"
* - 10 YR
* - 50 YR
* - 100 YR

* ESTIMATED DISCHARGE FROM WMS MODEL 11-30-11

SCALE (FEET)
0 600 1200 1800 2400

FOX CANYON

LAMBERT BASIN

FOX HOLLOW OUTFALL OUT OF LAMBERT BASIN

FOX HOLLOW DRAINAGE SR-92 DRAINAGE

FOX HOLLOW DRAINAGE SR-92 DRAINAGE

OFFSITE

(113) DEVELOPABLE

EXISTING

TRIUMPH

ADOBE CONNECTION
109 CFS MAX
+ 50 CFS IN EXIST. 36" STORM DRAIN

RAILROAD CONNECTION TO 72"
72.7 CFS MAX

MURDOCK CONNECTION TO 72"
62.8 CFS MAX

300 WEST CONNECTION TO 72"
22.8 CFS MAX

Timpanogos Highway (SR 92)

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Office: (801) 377-1790 Fax: (801) 377-1789
578 East 770 North , Orem UT 84097

Title:

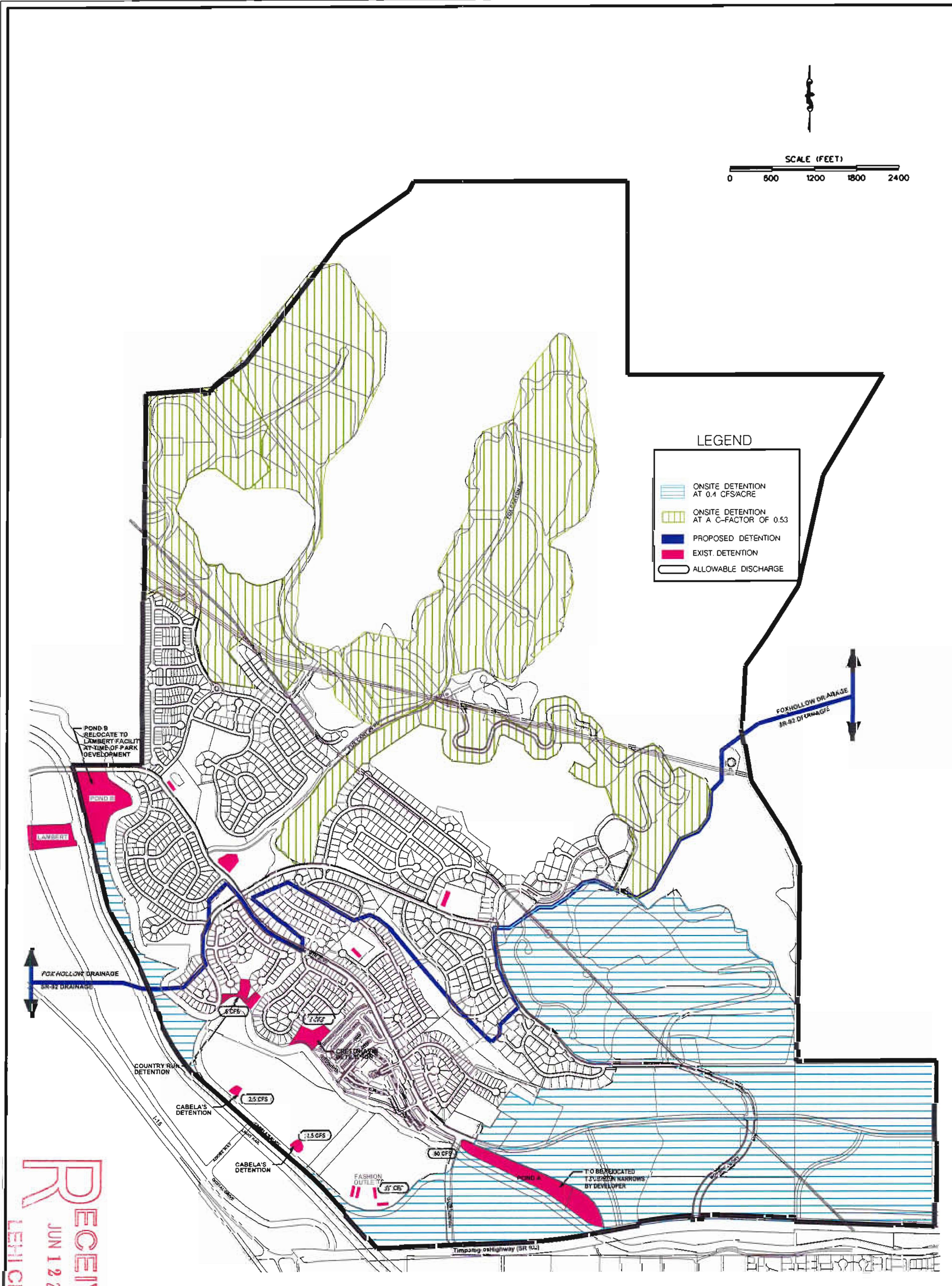
Client: TRAVERSE MOUNTAIN, LEHI UTAH

Drawing Name: DRAINAGE AREAS

PROJECT NO. 2010.037.005

FIGURE 1

DATE: 6-12-12


SCALE (FEET)
0 600 1200 1800 2400
LEGEND
ONSITE DETENTION AT 0.4 CFS/ACRE
ONSITE DETENTION AT A C-FACTOR OF 0.53
PROPOSED DETENTION
EXIST. DETENTION
ALLOWABLE DISCHARGE
FOXHOLLOW DRAINAGE
SR-92 DRAINAGE
POND B RELOCATE TO LAMBERT FACILITY AT TIME OF PARK DEVELOPMENT
POND B
LAMBERT
FOX HOLLOW DRAINAGE
SR-92 DRAINAGE
6 CFS
COUNTRY RUN DETENTION
CABELA'S DETENTION
2.5 CFS
1.5 CFS
CABELA'S DETENTION
I-15
FASHION OUTLETS
80 CFS
POND A
BY DEVELOPER
Timpanogos Highway (SR 92)

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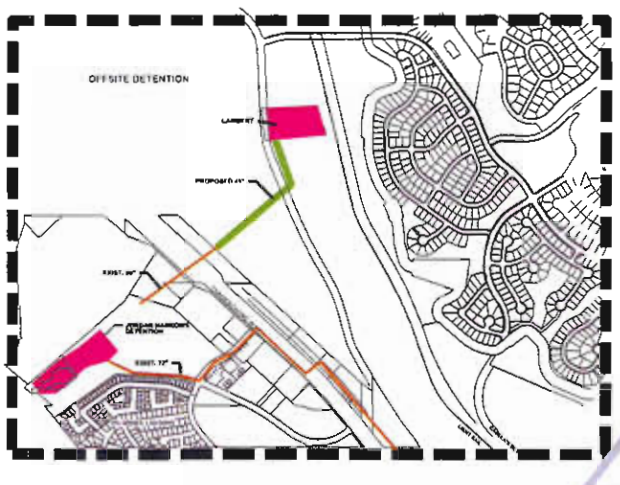
Drawing Name: ALLOWABLE RELEASE RATE

PROJECT NO. 2010.037.005

FIGURE 2

DATE: 6-12-12



SCALE (FEET)

0 600 1200 1800 2400

LEGEND

- PROPOSED MASTERPLAN PIPING TO BE PAID BY IMPACT FEES
- PROPOSED SD
- EXISTING SD
- EXIST. DETENTION

NOTE: ALL STORM DRAIN IS 18" UNLESS OTHERWISE NOTED.

* EXISTING 5 CFS DETENTION OUTFALL.

** DETENTION RELEASE OF 15 CFS FROM CABELA'S, HARVEST HOMES & COUNTRY RUN BASINS.

***DIVERT 20 CFS DOWN TRIUMPH BLVD.

(XX.X CFS) - STORM DRAIN DESIGN FLOW

NOTES:

(1) CABELA'S BLVD. PARALLEL STORM DRAIN TO BE CONSTRUCTED AS PART OF REMOVAL OF TEMP. POND "A"

(2) TRAVERSE MOUNTAIN BLVD. STORM DRAIN SHALL BE CONSTRUCTED TO PROVIDE FOR THE 50 CFS FROM MORNING GLORY. UPON INTRODUCTION OF AN ADDITIONAL 20 CFS OF FLOW IN EAST CANYON OR THE COMMERCIAL AREA BELOW TRAVERSE MTN. BLVD. & EAST OF THE MURDOCK CANAL.

(3) THE CHAPPEL RIDGE BY-PASS SHALL BE CONSTRUCTED BEFORE ANY ADDITIONAL UNITS ARE CONSTRUCTED IN VIALETTO

(4) THE PARALLEL 48" STORM DRAIN SHALL BE CONSTRUCTED UPON THE INTRODUCTION OF 40 CFS IN CENTRAL CANYON.

(5) LAMBERT POND AND OUTFALL LINE TO BE CONSTRUCTED WITH OR BEFORE CONSTRUCTION OF THE CITY PARK AT TEMPORARY POND "B"

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Title:

Client: TRAVERSE MOUNTAIN, LEHI UTAH

Drawing Name: STORM DRAIN PIPE SIZES

PROJECT NO. 2010.037.005

FIGURE 3

DATE: 6-12-12

DETENTION SUMMARY

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Proposed Plats Required Detention

Traverse Mountain Overall System

May 25, 2012

West Canyon	Acres	Required Detention		Onsite Detention		Lambert	Jordan Landing
		CF	Acre-Ft	CF	Acre-Ft	Acre-Ft	Acre-Ft
A1-A3	16.0	44,280	1.02	8,784	0.20	0.00	0.81
B1-B2	5.1	12,888	0.30	0	0.00	0.00	0.30
C1-C2	15.8	42,768	0.98	8,712	0.20	0.00	0.78
D1	5.7	18,216	0.42	3,816	0.09	0.00	0.33
E1-E2	14.0	37,044	0.85	7,704	0.18	0.00	0.67
F1-F3	15.5	27,720	0.64	0	0.00	0.00	0.64
Total	**72.1**	**182,916**	**4.20**	**29,016**	**0.67**	**0.00**	**3.53**

Central Canyon	Acres	Required Detention		Onsite Detention		Lambert	Jordan Landing
		CF	Acre-Ft	CF	Acre-Ft	Acre-Ft	Acre-Ft
A1-A2	10.3	22,824	0.52	0	0.00	0.00	0.52
B	7.0	17,676	0.41	0	0.00	0.00	0.41
C	5.7	14,400	0.33	0	0.00	0.00	0.33
D1-D2	10.4	23,076	0.53	0	0.00	0.00	0.53
E1-E2	15.0	34,200	0.79	0	0.00	0.00	0.79
F1-F3	15.2	28,116	0.65	0	0.00	0.00	0.65
G1-G2	10.4	23,076	0.53	0	0.00	0.00	0.53
H1-H2	9.9	23,184	0.53	0	0.00	0.00	0.53
I1-I2	8.4	19,152	0.44	0	0.00	0.00	0.44
J1-J2	14.4	41,616	0.96	7,920	0.18	0.00	0.77
K1-K2	9.9	26,208	0.60	5,472	0.13	0.00	0.48
L2	14.5	41,040	0.94	8,892	0.20	0.00	0.74
[illegible]	4.0	12,780	0.29	2,700	0.06	0.00	0.23
N (Public Park)	1.2	756	0.02	0	0.00	0.00	0.02
Total	**136.3**	**328,104**	**7.53**	**24,984**	**0.57**	**0.00**	**6.96**

East Canyon	Acres	Required Detention		Onsite Detention		Lambert	Jordan Landing
		CF	Acre-Ft	CF	Acre-Ft	Acre-Ft	Acre-Ft
A1-A4	25.3	76,248	1.75	58,176	1.34	0.00	0.41
B1	9.0	28,764	0.66	22,284	0.51	0.00	0.15
C1-C2	19.3	38,088	0.87	28,134	0.65	0.00	0.23
D1-D6	59.4	109,908	2.52	80,730	1.85	0.00	0.67
Total	**113.0**	**253,008**	**5.81**	**189,324**	**4.35**	**0.00**	**1.46**

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Proposed Plats Required Detention

Traverse Mountain Overall System

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Perry Properties	Acres	Required Detention		Onsite Detention		Lambert	Jordan Landing
		CF	Acre-Ft	CF	Acre-Ft	Acre-Ft	Acre-Ft
A1-A2	34.9	83,808	1.92	62,982	1.45	0.00	0.48
B1-B2	28.4	66,456	1.53	49,842	1.14	0.00	0.38
C	69.7	222,804	5.11	172,620	3.96	0.00	1.15
D	25.6	81,828	1.88	63,396	1.46	0.00	0.42
Private Park	10.4	6,552	0.15	3,915	0.09	0.00	0.06
Total	**169.0**	**461,448**	**10.59**	**352,755**	**8.10**	**0.00**	**2.50**

River Bend	Acres	Required Detention		Onsite Detention		Lambert	Jordan Landing
		CF	Acre-Ft	CF	Acre-Ft	Acre-Ft	Acre-Ft
A	9.8	24,732	0.57	0	0.00	0.57	0.00
B	14.5	46,368	1.06	9,792	0.22	0.00	0.84
C	23.8	76,068	1.75	16,020	0.37	0.00	1.38
D	5.7	18,216	0.42	3,816	0.09	0.33	0.00
E	18.9	47,700	1.10	0	0.00	0.00	1.10
F	16.0	40,392	0.93	0	0.00	0.93	0.00
Total	**88.7**	**253,476**	**5.82**	**29,628**	**0.68**	**1.83**	**3.31**

Non-Canyon	Acres	Required Detention		Onsite Detention		Lambert	Jordan Landing
		CF	Acre-Ft	CF	Acre-Ft	Acre-Ft	Acre-Ft
Church	3.4	14,184	0.33	5,616	0.13	0.00	0.20
A	8.1	25,884	0.59	5,436	0.12	0.00	0.47
	6.5	20,772	0.48	4,356	0.10	0.00	0.38
	3.3	8,316	0.19	0	0.00	0.00	0.19
D	0.6	1,512	0.03	0	0.00	0.00	0.03
Total	**21.9**	**70,668**	**1.62**	**15,408**	**0.35**	**0.00**	**1.27**

Commercial	Acres	Required Detention		Onsite Detention		Lambert	Jordan Landing
		CF	Acre-Ft	CF	Acre-Ft	Acre-Ft	Acre-Ft
Public Park	9.6	6,048	0.14	3,609	0.08	0.00	0.06
Highway Comm.	9.4	39,240	0.90	32,472	0.75	0.00	0.16
Highway Comm.	7.3	30,492	0.70	25,236	0.58	0.00	0.12
Highway Comm.	6.7	27,972	0.64	23,140	0.53	0.00	0.11
Highway Comm.	7.8	32,580	0.75	26,964	0.62	0.00	0.13
Highway Comm.	14.8	61,812	1.42	51,156	1.17	0.00	0.24
Highway Comm.	2.5	10,440	0.24	8,640	0.20	0.00	0.04
Highway Comm.	114.6	478,584	10.99	396,072	9.09	0.00	1.89
Highway Comm.	27.3	114,012	2.62	94,356	2.17	0.00	0.45
HC	1.8	7,524	0.17	6,228	0.14	0.00	0.03
HC	3.1	12,960	0.30	10,728	0.25	0.00	0.05
Total	**204.9**	**821,664**	**18.86**	**678,601**	**15.58**	**0.00**	**3.28**

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DETENTION BASIN TOTALS

Traverse Mountain Overall System

May 25, 2012

EXISTING DEVELOPMENT		DETENTION Location	REQUIRED VOLUME (cubic feet)	POND A	POND B	HH POND	CR POND	Onsite	Lambert	JORDAN NARROWS
Recorded Plats										
TM BLVD. NORTH	ROAD PLAT	POND B	6,100		6,100					
TM BLVD. SOUTH	ROAD PLAT	POND A	22,500	22,500						
MORNING GLORY ROAD	ROAD PLAT	POND A	25,265	25,265						
CHAPEL RIDGE	PHASES 1&2	POND A	20,285	20,285						
	PHASE 3	POND B	19,440		19,440					
COUNTRY RUN	ALL PHASES	CR BASIN	35,667				35,667			
HARVEST HOMES	PLAT ONE	HAR HOMES	33,000			33,000				
	PLAT TWO	DET. BASIN	0							
	PLAT THREE		0							
HEATHER MOORE	PLAT ONE	POND A	31,000	31,000						
HUNTER CHASE	PLAT ONE	POND A	15,000	15,000						
	PLAT TWO	POND A	14,000	14,000						
	PLAT THREE	POND A	2,000	2,000						
EAGLE SUMMIT	PHASES 1&2	POND B	74,558		74,558					
	PLAT THREE	POND B	870		870					
	PLAT FOUR	POND B	870		870					
	PLAT FIVE	POND B	870		870					
Eagle Summit Plat 6	Site Plan	Detained onsite	0							
SHADOW RIDGE	PLAT ONE	POND B	28,920		28,920					
	PLAT TWO	POND B	26,950		26,950					
WINTERHAVEN	PHASES 1&2	POND B	42,274		42,274					
WOODHAVEN	PHASES 1-3	POND B	68,310		68,310					
VISTA RIDGE	PHASES 1&2	POND B	43,856		43,856					
	PHASE 3 & 4	POND A	22,908	22,908						
Traverse Mount Plat D & Challenger School	Plat D	Pond A	11,909	11,909						
Vialetto Recorded Plat		Pond B	39,350		39,350					
Cresthaven Townhomes	All	Harvest Homes	23,666			23,666				
Cresthaven Apartments	All	JORDAN NARROWS/ HH	31,741			12,630				19,111
FASHION OUTLET	SITE PLAN	JORDAN NARROWS	114,138					65,959		48,179
TRAVERSE MOUNTAIN SALES CENTER			3,973	3,973						
CABELLAS ON SITE			131,237					131,237		
CHURCH (TRAVERSE MOUNTAIN BLVD)			9,230					9,230		
CHURCH (CHAPEL RIDGE)			13,464					13,464		
CHURCH (FOXTAIL DR.)			9,967					9,967		
TRANSFER FROM POND A TO JORDAN NARROWS	AGREEMENT		0	-168,840						168,840
Total Volumes Required for Existing Development (Cubic Feet)			923,318	0	352,368	69,296	35,667	229,857	0	236,130
Total Volumes Required for Existing Development (Acre Feet)			21.20	0.00	8.09	1.59	0.82	5.28	0.00	5.42

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DETENTION BASIN TOTALS

Traverse Mountain Overall System

May 25, 2012

EXISTING DETENTION BASINS		DETENTION							
Constructed Ponds	CONSTRUCTED	VOLUME (cubic feet)	POND A	POND B	HH POND	CR POND	On Site	Lambert	JORDAN NARROWS
TRAVERSE MOUNTAIN POND A	TRAV. PLAT 1	352,836	352,836						
TRAVERSE MOUNTAIN POND B*	CHAPEL BEND	196,020		196,020					
TRAVERSE MOUNTAIN POND B*	SHADOW RIDGE	60,984		60,984					
HARVEST HOMES	HARVEST HOME	33,000			33,000				
COUNTRY RUN	COUNTRY RUN	87,120				87,120			
CRESTHAVEN (constructed)	CRESTHAVEN	44,000			44,000				
JORDAN NARROWS (REPLACES POND A)	AGREEMENT	8,712	-352,836						361,548
FASHION OUTLET		65,959					65,959		
CABELLAS ON SITE		131,237					131,237		
CHURCH (TRAVERSE MOUNTAIN BLVD)		9,230					9,230		
CHURCH (CHAPEL RIDGE)		13,464					13,464		
CHURCH (FOXTAIL DR.)		9,967					9,967		
	Total Storage Provided (cubic feet)	1,012,529	0	257,004	77,000	87,120	229,857	0	361,548
	Total Storage Provided (Acre Feet)	23.24	0.00	5.90	1.77	2.00	5.28	0.00	8.30
	Percentage of storage used	91%	0	137%	90%	41%	100%	0	65%
	Percentage Available	9%	0%	-37%	10%	59%	0%	0%	35%

*Note: Expansion of Pond B to be in the Lambert Parcel with Vialetto and Fox Canyon Subdivisions. Upon final build out of project, no pond will exceed 100% of capacity.

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DETENTION BASIN TOTALS

Traverse Mountain Overall System

May 25, 2012

PROPOSED DEVELOPMENT		DETENTION VOLUME (cubic feet)	POND A	POND B	HH POND	CR POND	On Site	Lambert	JORDAN NARROWS
Proposed Plats									
TRANSFER FROM POND B TO LAMBERT	AREA PLAN	0		-352,368				352,368	0
West Canyon		182,916					29,016	0	153,900
Central Canyon		328,104					24,984	0	303,120
East Canyon		253,008					189,324	0	63,684
Perry Properties		461,448					352,755	0	108,693
Riverbend Properties		253,476					29,628	79,524	144,324
Commercial		821,664					678,601	0	143,063
Total Volumes Required for Proposed Development (Cubic Feet)		2,300,616	0	-352,368	0	0	1,304,308	431,892	916,784
Total Volumes Required for Proposed Development (Acre Feet)		52.81	0.00	-8.09	0.00	0.00	29.94	9.91	21.05

PROPOSED DETENTION BASINS		DETENTION VOLUME (cubic feet)	POND A	POND B	HH POND	CR POND	On Site	Lambert	JORDAN NARROWS
Proposed Pond Expansions									
Jordan Narrows Expansion		792,792							792,792
Lambert Pond	Area Plan W/Park	178,596		-257,004				435,600	
West Canyon		29,016					29,016		
Central Canyon		24,984					24,984		
East Canyon		189,324					189,324		
Perry Properties		352,755					352,755		
Riverbend Properties		29,628					29,628		
Commercial		678,601					678,601		
Total Volumes Required for Proposed Development (Cubic Feet)		2,275,696	0	-257,004	0	0	1,304,308	435,600	792,792
Total Volumes Required for Proposed Development (Acre Feet)		52.24	0.00	-5.90	0.00	0.00	29.94	10.00	18.20
	Percentage of storage used	101%	0	137%	0	0	100%	99%	116%
	Percentage Available	-1%	0%	-37%	0%	0%	0%	1%	-16%

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DETENTION BASIN TOTALS

Traverse Mountain Overall System

May 25, 2012

PROJECT TOTALS

Required Storage		DETENTION VOLUME	POND A	POND B	HH POND	CR POND	On Site	Lambert	JORDAN NARROWS
Storage Required For Existing Development	Cubic Feet	923,318	0	352,368	69,296	35,667	229,857	0	236,130
	Acre Feet	21.20	0.00	8.09	1.59	0.82	5.28	0.00	5.42
Storage Required For Proposed Development	Cubic Feet	2,300,616	0	-352,368	0	0	1,304,308	431,892	916,784
	Acre Feet	52.81	0.00	-8.09	0.00	0.00	29.94	9.91	21.05
Total Required Storage For Project (Cubic Feet)		3,223,934	0	0	69,296	35,667	1,534,165	431,892	1,152,914
Total Required Storage For Project (Acre Feet)		74.01	0.00	0.00	1.59	0.82	35.22	9.91	26.47

Provided Storage		DETENTION VOLUME (cubic feet)	POND A	POND B	HH POND	CR POND	On Site	Lambert	JORDAN NARROWS
Constructed Pond Total	Cubic Feet	1,012,529	0	257,004	77,000	87,120	229,857	0	361,548
	Acre Feet	23	0	6	2	2	5	0	8
Proposed Pond Expansion Total	Cubic Feet	2,275,696	0	-257,004	0	0	1,304,308	435,600	792,792
	Acre Feet	52.24	0.00	-5.90	0.00	0.00	29.94	10.00	18.20
Total Required Storage For Project (Cubic Feet)		3,288,225	0	0	77,000	87,120	1,534,165	435,600	1,154,340
Total Required Storage For Project (Acre Feet)		75.49	0.00	0.00	1.77	2.00	35.22	10.00	26.50
	Percentage of storage used	98%	0%	0%	90%	41%	100%	99%	100%
	Percentage Available	2%	0%	0%	10%	59%	0%	1%	0%

Note: Expansion of Pond B to be in the Lambert Parcel with Vialetto and Fox Canyon Subdivisions. Upon final build out of project, no pond will exceed 100% of capacity.

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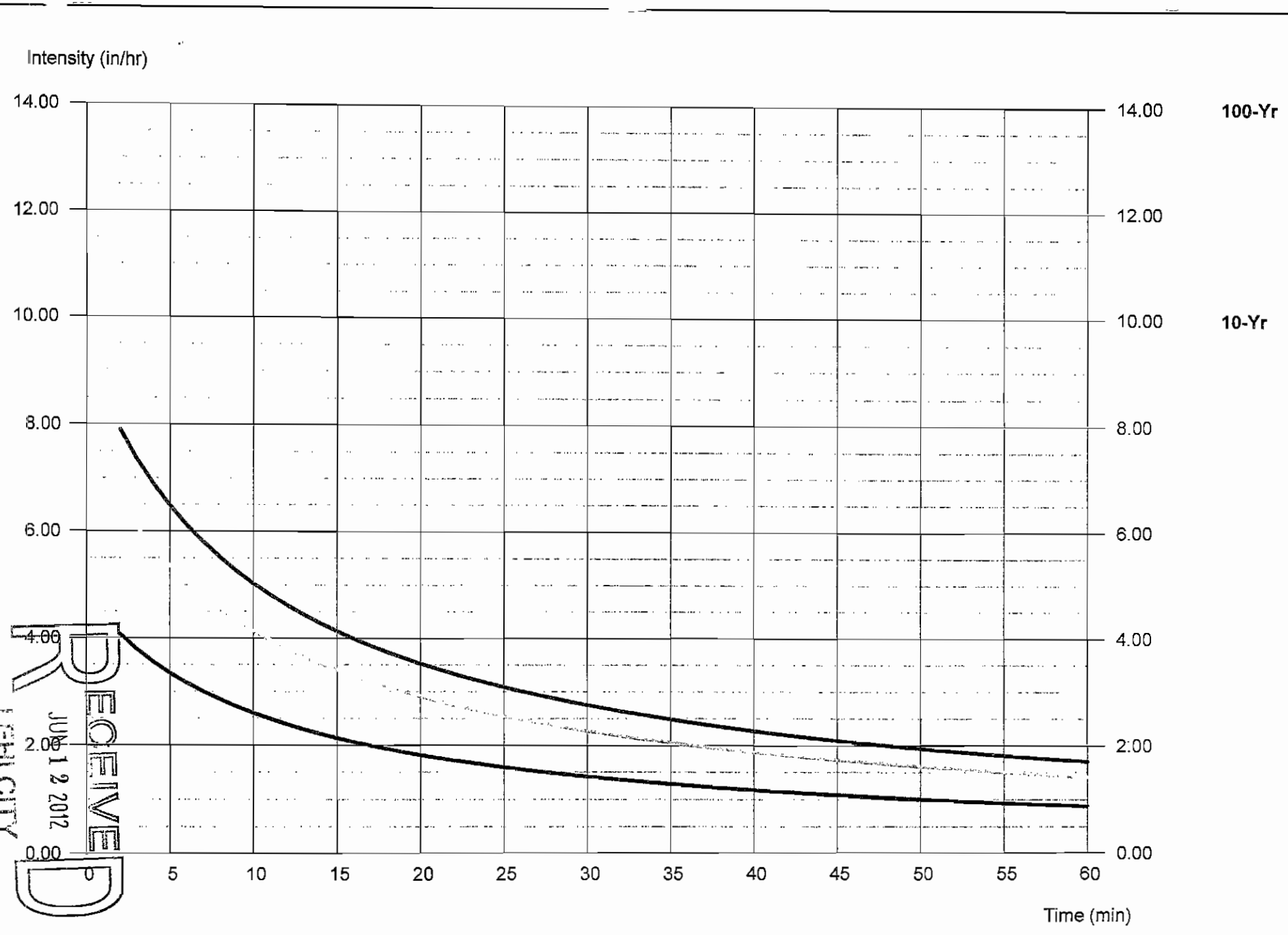
IDF fi[illegible]averse.IDF



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Hydraflow Rainfall Report

Hydraflow Hydrographs by Intelisolve v9.23 — Friday, Apr 22, 2011

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	--------
2	0.0000	0.0000	0.0000	--------
3	0.0000	0.0000	0.0000	--------
5	0.0000	0.0000	0.0000	--------
10	32.9029	9.5000	0.8549	--------
25	0.0000	0.0000	0.0000	--------
50	47.9118	8.9000	0.8330	--------
100	61.8434	9.3000	0.8479	--------

File name: lehitraverse.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	3.34	2.60	2.14	1.82	1.59	1.42	1.28	1.17	1.08	1.00	0.93	0.88
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
50	5.35	4.14	3.41	2.91	2.55	2.27	2.05	1.88	1.73	1.61	1.50	1.41
100	6.48	5.03	4.13	3.53	3.09	2.75	2.48	2.27	2.09	1.94	1.81	1.70

Tc = time in minutes. Values may exceed 60.

Precip. file name: Lehitraverse.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	1.08	1.33	0.00	1.58	1.79	2.08	2.30	2.52
SCS 6-Hr	0.76	0.94	0.00	1.14	1.32	1.58	1.82	2.07
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

NOAA Atlas 14, Volume 1, Version 5
Location name: Lehi, Utah, US*
Coordinates: 40.4373, -111.8674
Elevation: 4978ft*
* source: Google Maps

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps & aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval(years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.128 (0.112–0.148)	0.162 (0.143–0.188)	0.223 (0.195–0.259)	0.279 (0.241–0.324)	0.366 (0.308–0.429)	0.447 (0.366–0.528)	0.541 (0.430–0.647)	0.652 (0.499–0.792)	0.830 (0.602–1.03)	0.992 (0.689–1.26)
10-min	0.195 (0.171–0.226)	0.247 (0.217–0.287)	0.339 (0.297–0.394)	0.424 (0.366–0.493)	0.557 (0.469–0.652)	0.681 (0.558–0.804)	0.824 (0.655–0.984)	0.993 (0.760–1.21)	1.26 (0.917–1.57)	1.51 (1.05–1.92)
15-min	0.242 (0.212–0.280)	0.306 (0.270–0.355)	0.421 (0.368–0.488)	0.526 (0.454–0.611)	0.690 (0.581–0.809)	0.844 (0.692–0.996)	1.02 (0.812–1.22)	1.23 (0.942–1.49)	1.57 (1.14–1.95)	1.87 (1.30–2.38)
30-min	0.325 (0.285–0.377)	0.413 (0.363–0.478)	0.567 (0.495–0.657)	0.708 (0.611–0.823)	0.929 (0.783–1.09)	1.14 (0.931–1.34)	1.38 (1.09–1.64)	1.66 (1.27–2.01)	2.11 (1.53–2.62)	2.52 (1.75–3.20)
60-min	0.403 (0.353–0.466)	0.511 (0.449–0.592)	0.701 (0.613–0.813)	0.876 (0.756–1.02)	1.15 (0.969–1.35)	1.41 (1.15–1.66)	1.70 (1.35–2.03)	2.05 (1.57–2.49)	2.61 (1.90–3.25)	3.12 (2.17–3.97)
2-hr	0.503 (0.456–0.571)	0.630 (0.566–0.712)	0.823 (0.735–0.932)	1.00 (0.887–1.14)	1.29 (1.12–1.48)	1.56 (1.31–1.79)	1.87 (1.53–2.16)	2.24 (1.76–2.66)	2.83 (2.11–3.46)	3.37 (2.40–4.21)
3-hr	0.582 (0.531–0.649)	0.720 (0.658–0.801)	0.912 (0.827–1.01)	1.09 (0.979–1.21)	1.37 (1.21–1.53)	1.61 (1.39–1.82)	1.91 (1.60–2.19)	2.26 (1.84–2.69)	2.85 (2.21–3.49)	3.38 (2.52–4.26)
6-hr	0.762 (0.706–0.829)	0.936 (0.866–1.02)	1.14 (1.05–1.25)	1.32 (1.22–1.45)	1.59 (1.44–1.75)	1.82 (1.61–2.01)	2.07 (1.81–2.32)	2.38 (2.03–2.71)	2.95 (2.44–3.53)	3.44 (2.77–4.30)
12-hr	0.967 (0.893–1.05)	1.18 (1.09–1.29)	1.43 (1.32–1.56)	1.64 (1.50–1.80)	1.95 (1.76–2.14)	2.20 (1.96–2.44)	2.46 (2.16–2.76)	2.76 (2.38–3.14)	3.23 (2.71–3.76)	3.62 (2.96–4.33)
24-hr	1.08 (1.01–1.16)	1.33 (1.24–1.43)	1.58 (1.48–1.70)	1.79 (1.68–1.92)	2.08 (1.94–2.23)	2.30 (2.13–2.46)	2.52 (2.33–2.79)	2.78 (2.53–3.17)	3.26 (2.78–3.79)	3.65 (2.99–4.37)
2-day	1.28 (1.20–1.37)	1.57 (1.47–1.68)	1.87 (1.75–2.00)	2.12 (1.98–2.26)	2.45 (2.29–2.62)	2.71 (2.52–2.89)	2.97 (2.75–3.17)	3.23 (2.97–3.46)	3.57 (3.26–3.86)	3.83 (3.48–4.42)
3-day	1.40 (1.30–1.50)	1.71 (1.59–1.84)	2.04 (1.90–2.20)	2.32 (2.16–2.49)	2.70 (2.51–2.90)	2.99 (2.77–3.22)	3.29 (3.03–3.54)	3.60 (3.29–3.88)	4.00 (3.63–4.35)	4.31 (3.89–4.83)
4-day	1.51 (1.40–1.64)	1.85 (1.72–2.01)	2.22 (2.06–2.39)	2.52 (2.34–2.72)	2.95 (2.72–3.18)	3.28 (3.02–3.54)	3.62 (3.32–3.92)	3.96 (3.61–4.30)	4.43 (4.00–4.83)	4.80 (4.30–5.25)
7-day	1.79 (1.65–1.94)	2.19 (2.03–2.36)	2.61 (2.42–2.83)	2.96 (2.74–3.20)	3.43 (3.17–3.71)	3.80 (3.50–4.10)	4.16 (3.82–4.50)	4.53 (4.14–4.91)	5.02 (4.54–5.46)	5.38 (4.85–5.88)
10-day	2.01 (1.86–2.17)	2.46 (2.28–2.66)	2.92 (2.72–3.15)	3.29 (3.06–3.54)	3.78 (3.50–4.08)	4.14 (3.82–4.45)	4.49 (4.14–4.84)	4.84 (4.45–5.22)	5.28 (4.83–5.72)	5.61 (5.10–6.09)
20-day	2.65 (2.45–2.85)	3.25 (3.00–3.50)	3.83 (3.55–4.13)	4.29 (3.98–4.61)	4.87 (4.50–5.23)	5.28 (4.89–5.68)	5.68 (5.25–6.11)	6.06 (5.58–6.52)	6.52 (5.99–7.03)	6.84 (6.26–7.40)
30-day	3.19 (2.95–3.43)	3.90 (3.62–4.20)	4.59 (4.26–4.94)	5.13 (4.76–5.51)	5.82 (5.40–6.25)	6.33 (5.85–6.80)	6.81 (6.29–7.34)	7.27 (6.70–7.85)	7.85 (7.20–8.50)	8.26 (7.55–8.97)
45-day	3.96 (3.69–4.26)	4.84 (4.51–5.21)	5.68 (5.30–6.10)	6.33 (5.90–6.79)	7.16 (6.67–7.67)	7.75 (7.21–8.30)	8.31 (7.72–8.91)	8.84 (8.19–9.49)	9.47 (8.76–10.2)	9.91 (9.13–10.7)
60-day	4.69 (4.37–5.04)	5.74 (5.34–6.17)	6.72 (6.26–7.20)	7.47 (6.97–8.01)	8.42 (7.84–9.03)	9.10 (8.48–9.75)	9.73 (9.04–10.4)	10.3 (9.57–11.1)	11.0 (10.2–11.9)	11.5 (10.6–12.4)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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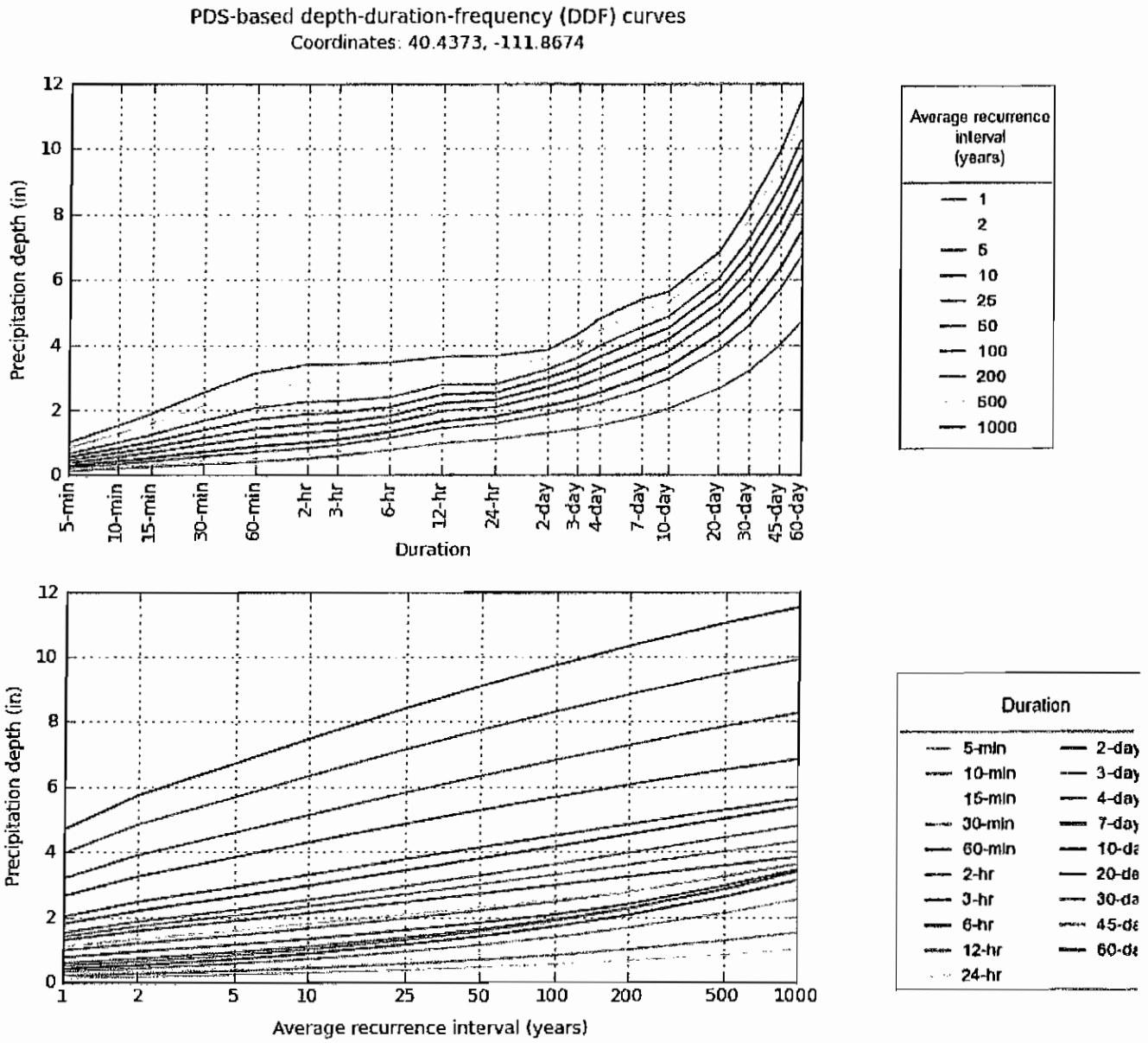
PF graphical



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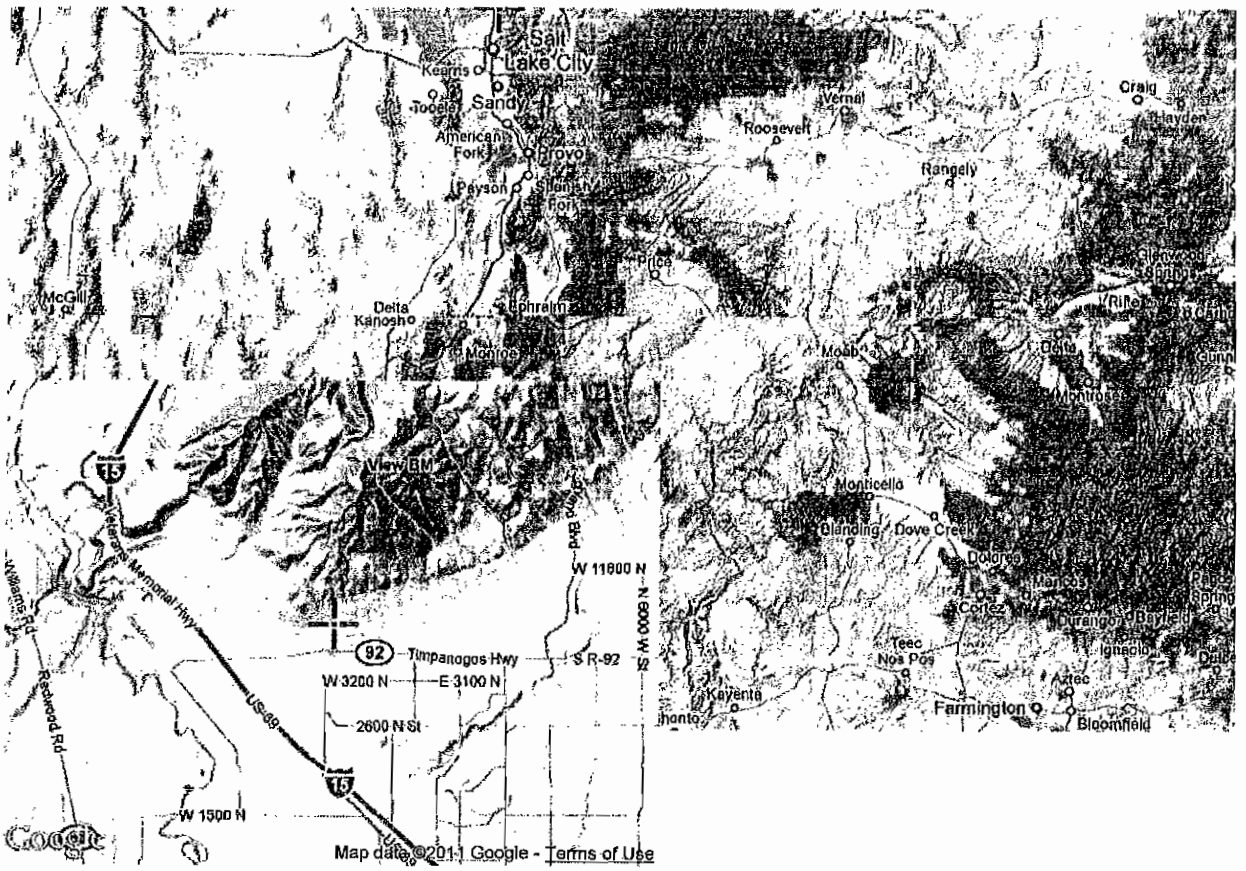
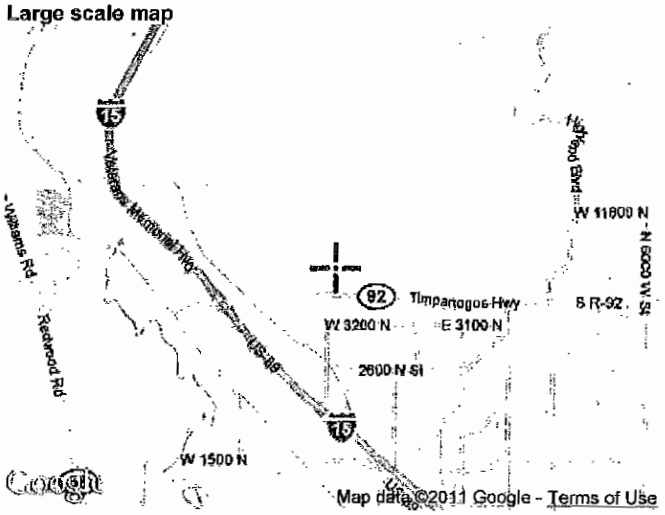
Maps & aerials

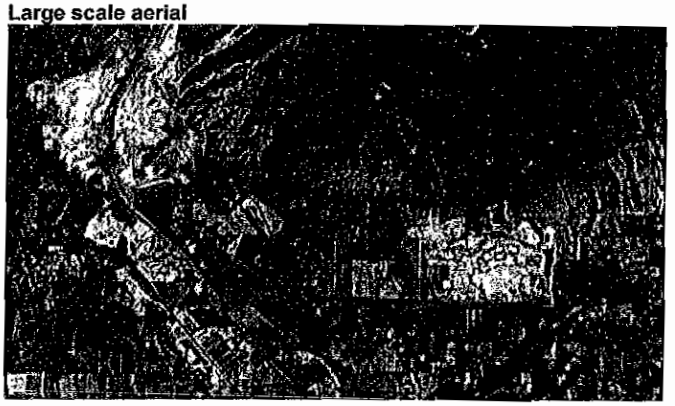
Small scale terrain



Large scale map



Large scale aerial



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NOAA Atlas 14, Volume 1, Version 5
Location name: Lehi, Utah, US*
Coordinates: 40.4373, -111.8674
Elevation: 4978ft*
* source: Google Maps

POINT PRECIPITATION FREQUENCY ESTIMATES

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NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour)[1]

Duration	Average recurrence interval(years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	1.54 (1.34-1.78)	1.94 (1.72-2.26)	2.68 (2.34-3.11)	3.35 (2.89-3.89)	4.39 (3.70-5.15)	5.36 (4.39-6.34)	6.49 (5.16-7.76)	7.82 (5.99-9.50)	9.96 (7.22-12.4)	11.9 (8.27-15.1)
10-min	1.17 (1.03-1.36)	1.48 (1.30-1.72)	2.03 (1.78-2.36)	2.54 (2.20-2.96)	3.34 (2.81-3.91)	4.09 (3.35-4.82)	4.94 (3.93-5.90)	5.96 (4.56-7.23)	7.58 (5.50-9.43)	9.06 (6.29-11.5)
15-min	0.968 (0.848-1.12)	1.22 (1.08-1.42)	1.68 (1.47-1.95)	2.10 (1.82-2.44)	2.76 (2.32-3.24)	3.38 (2.77-3.98)	4.09 (3.25-4.88)	4.92 (3.77-5.98)	6.26 (4.55-7.79)	7.49 (5.20-9.52)
30-min	0.650 (0.570-0.754)	0.826 (0.726-0.956)	1.13 (0.990-1.31)	1.42 (1.22-1.65)	1.86 (1.57-2.18)	2.27 (1.86-2.68)	2.75 (2.19-3.28)	3.32 (2.54-4.03)	4.22 (3.06-5.25)	5.04 (3.50-6.41)
60-min	0.403 (0.353-0.466)	0.511 (0.449-0.592)	0.701 (0.613-0.813)	0.876 (0.756-1.02)	1.15 (0.969-1.35)	1.41 (1.15-1.66)	1.70 (1.35-2.03)	2.05 (1.57-2.49)	2.61 (1.90-3.25)	3.12 (2.17-3.97)
2-hr	0.252 (0.228-0.286)	0.315 (0.283-0.356)	0.412 (0.368-0.466)	0.501 (0.444-0.569)	0.646 (0.558-0.738)	0.779 (0.656-0.897)	0.936 (0.762-1.09)	1.12 (0.878-1.33)	1.42 (1.05-1.73)	1.69 (1.20-2.11)
3-hr	0.194 (0.177-0.216)	0.240 (0.219-0.267)	0.304 (0.275-0.338)	0.362 (0.326-0.404)	0.455 (0.401-0.510)	0.536 (0.463-0.607)	0.636 (0.534-0.730)	0.753 (0.613-0.896)	0.947 (0.736-1.16)	1.13 (0.839-1.42)
6-hr	0.127 (0.118-0.138)	0.156 (0.145-0.171)	0.191 (0.176-0.208)	0.221 (0.203-0.241)	0.266 (0.240-0.292)	0.303 (0.270-0.335)	0.346 (0.302-0.388)	0.398 (0.340-0.452)	0.492 (0.407-0.589)	0.575 (0.463-0.718)
12-hr	0.080 (0.074-0.087)	0.098 (0.091-0.107)	0.119 (0.109-0.130)	0.136 (0.125-0.149)	0.162 (0.146-0.178)	0.182 (0.163-0.202)	0.204 (0.179-0.229)	0.229 (0.197-0.260)	0.268 (0.225-0.312)	0.300 (0.246-0.359)
24-hr	0.045 (0.042-0.048)	0.055 (0.052-0.059)	0.066 (0.062-0.071)	0.075 (0.070-0.080)	0.087 (0.081-0.093)	0.096 (0.089-0.103)	0.105 (0.097-0.116)	0.116 (0.105-0.132)	0.136 (0.116-0.158)	0.152 (0.124-0.182)
2-day	0.027 (0.025-0.029)	0.033 (0.031-0.035)	0.039 (0.036-0.042)	0.044 (0.041-0.047)	0.051 (0.048-0.055)	0.056 (0.052-0.060)	0.062 (0.057-0.066)	0.067 (0.062-0.072)	0.074 (0.068-0.080)	0.080 (0.072-0.092)
3-day	0.019 (0.018-0.021)	0.024 (0.022-0.026)	0.028 (0.026-0.031)	0.032 (0.030-0.035)	0.037 (0.035-0.040)	0.042 (0.038-0.045)	0.046 (0.042-0.049)	0.050 (0.046-0.054)	0.056 (0.050-0.060)	0.060 (0.054-0.067)
4-day	0.016 (0.015-0.017)	0.019 (0.018-0.021)	0.023 (0.021-0.025)	0.026 (0.024-0.028)	0.031 (0.028-0.033)	0.034 (0.031-0.037)	0.038 (0.035-0.041)	0.041 (0.038-0.045)	0.046 (0.042-0.050)	0.050 (0.045-0.055)
7-day	0.011 (0.010-0.012)	0.013 (0.012-0.014)	0.016 (0.014-0.017)	0.018 (0.016-0.019)	0.020 (0.019-0.022)	0.023 (0.021-0.024)	0.025 (0.023-0.027)	0.027 (0.025-0.029)	0.030 (0.027-0.032)	0.032 (0.029-0.035)
10-day	0.008 (0.008-0.009)	0.010 (0.010-0.011)	0.012 (0.011-0.013)	0.014 (0.013-0.015)	0.016 (0.015-0.017)	0.017 (0.016-0.019)	0.019 (0.017-0.020)	0.020 (0.019-0.022)	0.022 (0.020-0.024)	0.023 (0.021-0.025)
20-day	0.006 (0.005-0.006)	0.007 (0.006-0.007)	0.008 (0.007-0.009)	0.009 (0.008-0.010)	0.010 (0.009-0.011)	0.011 (0.010-0.012)	0.012 (0.011-0.013)	0.013 (0.012-0.014)	0.014 (0.012-0.015)	0.014 (0.013-0.015)
30-day	0.004 (0.004-0.005)	0.005 (0.005-0.006)	0.006 (0.006-0.007)	0.007 (0.007-0.008)	0.008 (0.007-0.009)	0.009 (0.008-0.009)	0.009 (0.009-0.010)	0.010 (0.009-0.011)	0.011 (0.010-0.012)	0.011 (0.010-0.012)
45-day	0.004 (0.003-0.004)	0.004 (0.004-0.005)	0.005 (0.005-0.006)	0.006 (0.005-0.006)	0.007 (0.006-0.007)	0.007 (0.007-0.008)	0.008 (0.007-0.008)	0.008 (0.008-0.009)	0.009 (0.008-0.009)	0.009 (0.008-0.010)
60-day	0.003 (0.003-0.003)	0.004 (0.004-0.004)	0.005 (0.004-0.005)	0.005 (0.005-0.006)	0.006 (0.005-0.006)	0.006 (0.006-0.007)	0.007 (0.006-0.007)	0.007 (0.007-0.008)	0.008 (0.007-0.008)	0.008 (0.007-0.009)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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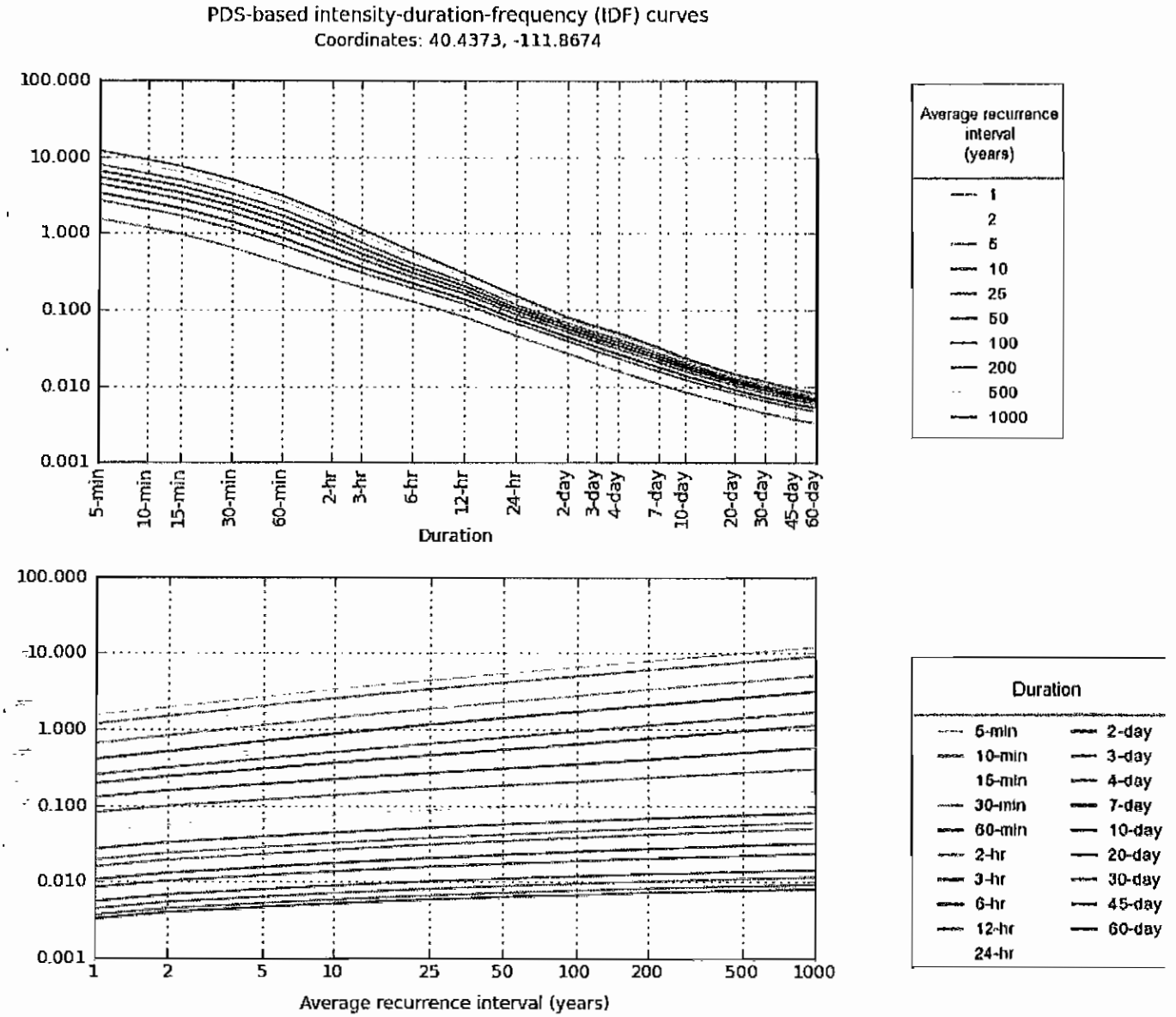
PF graphical



NOAA/NWS/OHD/HDSC Created (GMT): Fri Apr 22 19:51:10 2011

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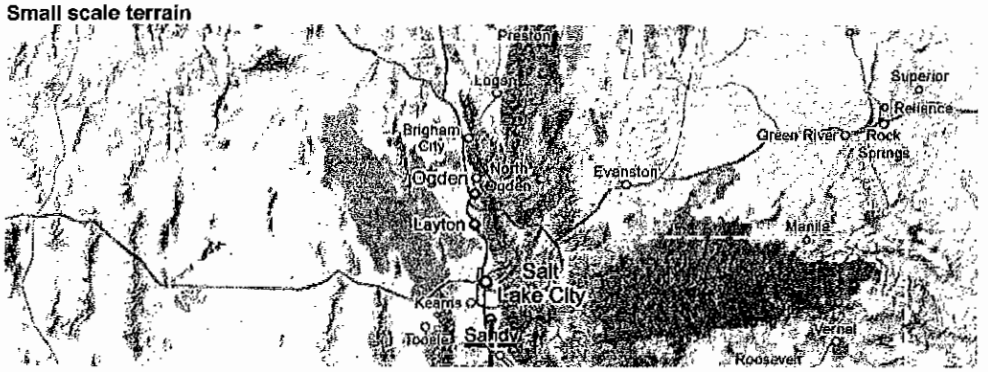
Maps & aerials

Small scale terrain



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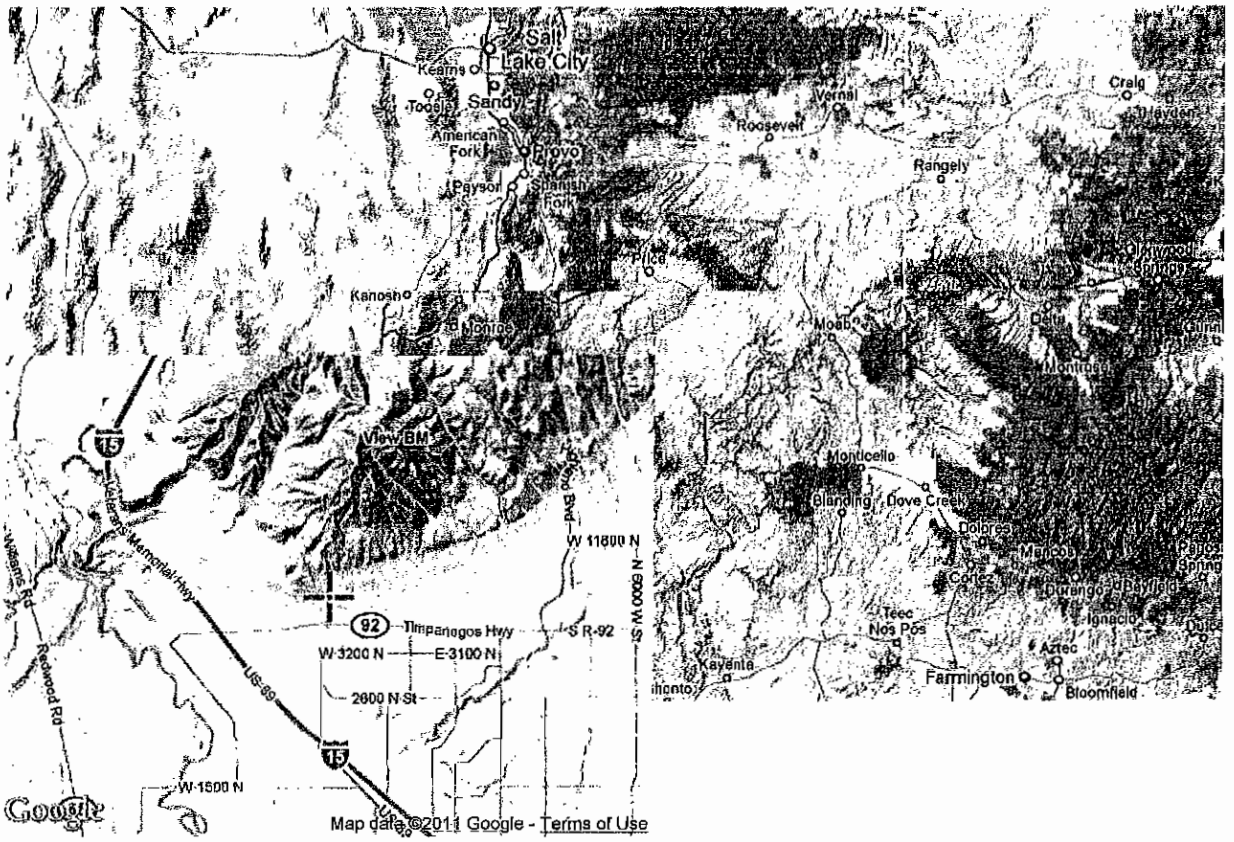
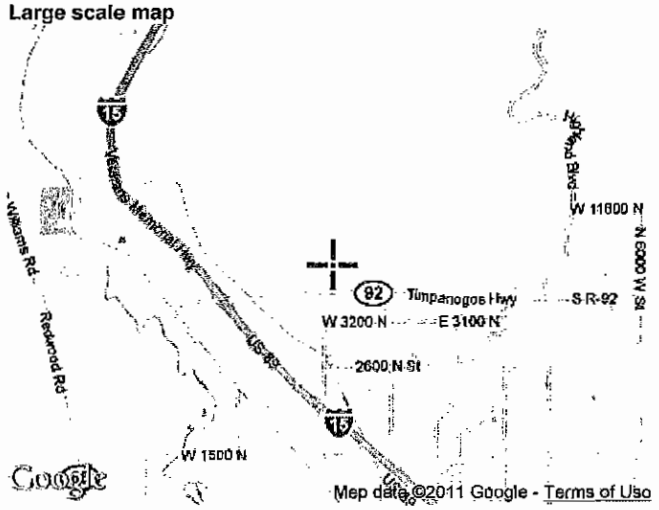


Large scale map



Large scale aerial

LEHI CITY
AGREEMENT & UDOT
EXHIBITS

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AGREEMENT

For

LEHI CITY DETENTION & STORM DRAIN FACILITIES AT PILGRIM'S LANDING

Between

LEHI CITY and PILGRIM'S LANDING, LLC and

MOUNTAIN HOME DEVELOPMENT CORPORATION

WHEREAS, Lehi City owns an existing 8.10 acre foot detention basin (the "Traverse Mountain Detention Basin") on a 9.46 acre parcel located in the Traverse Mountain Development (Parcel No.: 53:257:0001) (the "Development Property");

WHEREAS, Lehi City owns and maintains an existing detention facility (the "Pilgrim's Landing Detention Basin") along the western edge of the Pilgrim's Landing, LLC property, and has already purchased an additional 1.15 acres of adjacent property from Pilgrim's Landing, LLC;

WHEREAS, Lehi City is currently in the process of designing and constructing a 72-inch storm drain and detention basin along and in property owned by Pilgrim's Landing, LLC;

WHEREAS, Lehi City desires to acquire additional land from Pilgrim's Landing, LLC to upgrade and increase the Pilgrim's Landing Detention Basin's capacity to serve the residents of Lehi City, drainage from I-15, SR-92, and Traverse Mountain Development (including replacement of the Traverse Mountain Detention Basin), and to provide a multi-use facility; and

WHEREAS, Mountain Home Development Corporation desires to acquire from Lehi City the Development Property for commercial development purposes, and Lehi City is willing to convey such property to Mountain Home Development Corporation on the terms and conditions set forth herein.

NOW THEREFORE, in consideration of the foregoing premises and the mutual promises contained herein, the Parties hereto agree as follows:

1. Pilgrim's Landing, LLC will sign a Special Warranty Deed to Lehi City for the property needed to increase the area of the Pilgrim's Landing Detention Basin to approximately 18.75 acres. (See attached Exhibit A.) The price of the sale will be $2,890,000.00.

2. Lehi City will pay Pilgrim's Landing, LLC $200,000.00 to be applied toward the total purchase price, reducing the amount owing to $2,690,000.00. In consideration of Mountain Home Development Corporation being able to purchase the Development Property, it agrees to pay to Pilgrim's Landing, LLC the balance of the purchase price ($2,690,000.00), to be evidenced by a Promissory Note from Mountain Home Development Corporation in favor of Pilgrim's Landing, LLC, secured by a first-priority Trust Deed on the Development Property in favor of Pilgrim's Landing, LLC.

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3. Lehi City will construct a detention basin on the property purchased from Pilgrim's Landing, LLC with a capacity of 17.1 acre feet, and upon completion thereof Lehi City will decommission the detention basin on the Development Property.

4. Lehi City will sign a Special Warranty Deed to Mountain Home Development Corporation for the 9.46 acre parcel (County Parcel No.: 53:257:0001, see attached Exhibit B) per the Area Plan Note #4, page 1 on the concept plan approved by Lehi City on November 18, 2008 which shall be used for commercial purposes only as generally described in the Area Plan.

5. Mountain Home Development Corporation will execute a promissory note and a first-position trust deed on the 9.46 acre parcel in favor of Pilgrim's Landing, LLC with the following terms:

    a. The promissory note shall be in the principal amount of $2,690,000.00, plus interest at the rate of 7% per annum.
    b. Annual interest payments of $188,300.00 shall be due on each anniversary date of the Promissory Note, and all unpaid principal and accrued interest shall be due on the 3rd anniversary of the Promissory Note.
    c. The Trust Deed on the Development Property shall be in the amount of $2,690,000.00, plus accrued interest, with a 3-year maturity date.
    d. Mountain Home Development Corporation's obligations under the trust deed will be recourse only to the property encumbered by the trust deed.
    e. If Pilgrim's Landing, LLC and/or its successors and assigns forecloses on the trust deed and acquires ownership of the 9.46 acre parcel, all owners of the parcel will hold the parcel subject to the Traverse Mountain Area Plan and CC&R's, all as in effect from time to time.

6. Lehi City will own and agrees to diligently proceed to build and maintain the new storm drain and detention facility to be built on the property purchased from Pilgrim's Landing, LLC.

7. Mountain Home Development Corporation will expand at its own cost the new storm basin to 37 acre feet in the future as capacity is needed.

8. Mountain Home Development Corporation will provide the trust deed in form and substance acceptable to Pilgrim's Landing, LLC in its sole discretion.

9. Lehi City will provide all legal documents for the Special Warranty Deeds in form and substance acceptable to the grantees of such Special Warranty Deeds.

10. The grantors of the Special Warranty Deeds shall provide at their cost an ALTA standard owner's policy insuring title to the subject properties, respectively, with only such exceptions as may be approved by the grantees.

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11. Lehi City, Pilgrim's Landing, LLC, and Mountain Home Development Corporation agree to close with Affiliated First Title Company, 321 East State Road, American Fork, UT 84003, Attention: Marnae Ballantyne.

Signed:

Lehi City	Date: 7-28-10	Lehi City Mayor
Attest	Date: 7/28/10	City Recorder
Pilgrim's Landing, LLC	Date: 7/28/10	Manager
Mountain Home Development Corporation By Ted Heap, CEO	Date: 7/28/10	CEO

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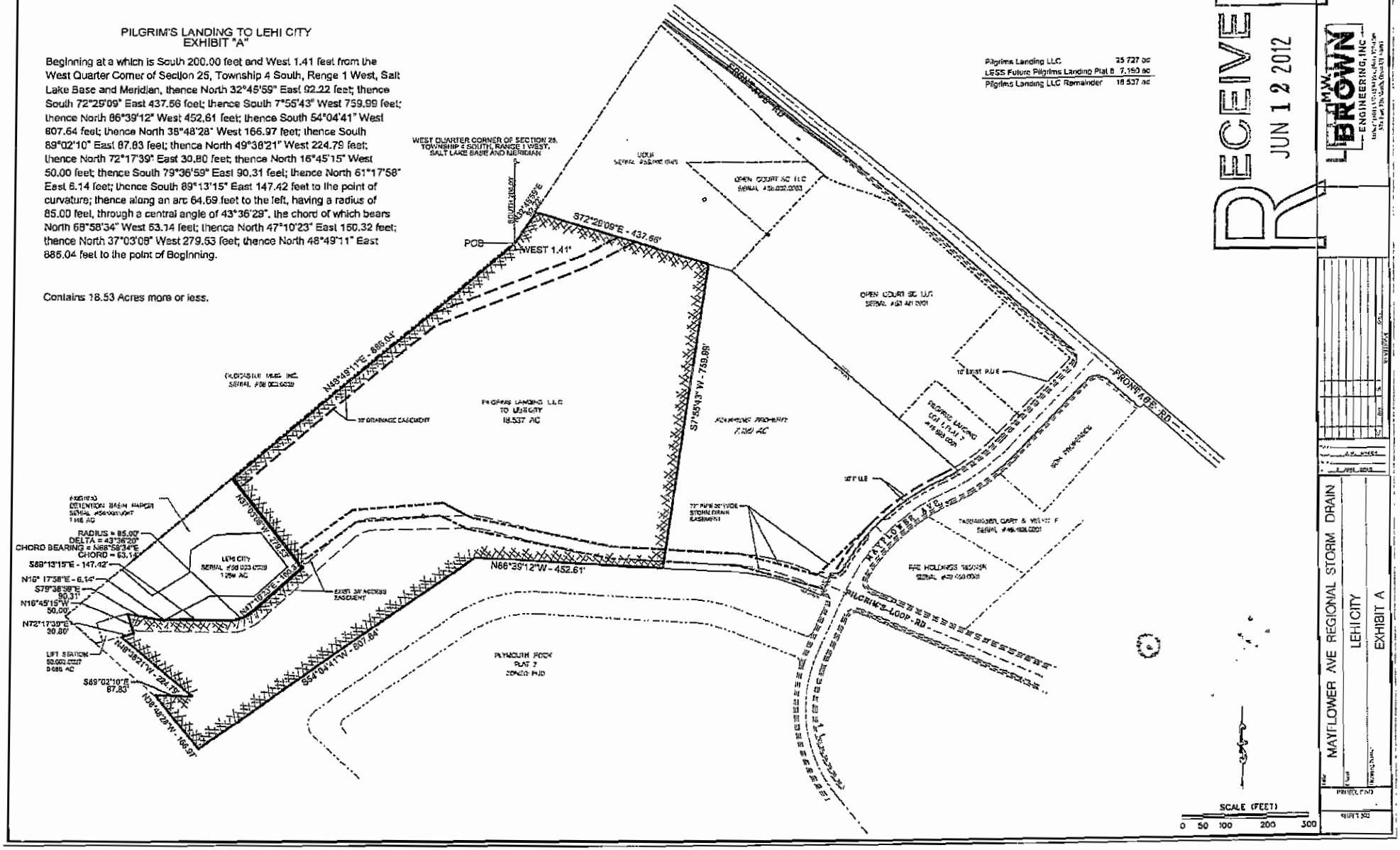
PILGRIM'S LANDING TO LEHI CITY
EXHIBIT "A"

Beginning at a which is South 200.00 feet and West 1.41 feet from the West Quarter Corner of Section 25, Township 4 South, Range 1 West, Salt Lake Base and Meridian, thence North 32°45'59" East 92.22 feet; thence South 72°29'09" East 437.66 feet; thence South 7°55'43" West 759.99 feet; thence North 86°39'12" West 452.61 feet; thence South 54°04'41" West 807.64 feet; thence North 35°48'28" West 166.97 feet; thence South 89°02'10" East 87.83 feet; thence North 49°38'21" West 224.79 feet; thence North 72°17'39" East 30.80 feet; thence North 16°45'15" West 50.00 feet; thence South 79°36'59" East 90.31 feet; thence North 61°17'58" East 6.14 feet; thence South 89°13'15" East 147.42 feet to the point of curvature; thence along an arc 64.69 feet to the left, having a radius of 85.00 feet, through a central angle of 43°36'29", the chord of which bears North 68°58'34" West 63.14 feet; thence North 47°10'23" East 160.32 feet; thence North 37°03'08" West 279.53 feet; thence North 48°49'11" East 886.04 feet to the point of Beginning.

Contains 18.53 Acres more or less.



Pilgrims Landing LLC	25.727 ac
LESS Future Pilgrims Landing Plat B	7.190 ac
Pilgrims Landing LLC Remainder	18.537 ac

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MW BROWN ENGINEERING, INC

MAYFLOWER AVE REGIONAL STORM DRAIN
LEHI CITY
EXHIBIT A

Exhibit "B"

Lehi City to Traverse Mountain

Lot 1, Plat A, Traverse Mountain Subdivision.

Area = 9.455 acres

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10 YEAR HEC-1

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1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              MAY   1991               *
*            VERSION 4.0.1E             *
*                                       *
*  RUN DATE            TIME             *
*                                       *
*****************************************
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*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 551-1748              *
*                                       *
*****************************************
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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

HEC-1 INPUT PAGE 1

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LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
    1         ID  HEC-1 Analysis using WMS
    2         ID  10 year devloped flow
    3         ID  MAY 2012
    4         IT      10 07MAY09       0     130
    5         IO       5
    6         IN       6 07MAY09       0
    7         JD    1.79    10.0
    8         * typeII-24hour
    9         PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
   10         PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
   11         PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
   12         PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
   13         PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
   14         PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
   15         PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
   16         PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
   17         PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
   18         PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
   19         PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
   20         PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
   21         PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
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21          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
22          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
23          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
24          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
25          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
26          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
27          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
28          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
29          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
30          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
31          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
32          PC     1.0

33          KK    329B
34          KO       0       0     0.0       0      22
35          BA  0.0487
36          LS     0.0    74.2     0.0
37          UD  0.1151

38          KK    403B
39          KO       0       0     0.0       0      22
40          BA  0.0216
41          LS     0.0   74.49     0.0
42          UD  0.0893

43          KK     37C   CNAME     37R
44          KO       0       0     0.0       0      22
45          HC       2
```

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

  46      KK     37R   CNAME     37C
  47      KO       0       0     0.0       0      22
  48      RS       1    FLOW     0.0     0.0
          * 37C Volume
  49      SV     0.00.1266630.253327 0.379990.5066530.633316 0.759980.8866431.0133061.139969
  50      SV  1.26661.3932961.5199591.6466221.7732861.8999492.0266122.1532752.2799392.406602
          * 37C Elevation
  51      SE  4742.04742.4214742.8424743.2634743.6844744.1054744.5264744.9474745.3684745.789
  52      SE  4746.24746.6314747.0524747.4734747.8944748.3154748.7364749.1574749.578  4750.0
          * 37C Discharge
  53      SQ     0.02.197453 8.3679616.4140423.1448215.9029218.6881421.1090223.2794925.26417
  54      SQ  27.10328.8264930.4517731.9946033.4663734.8761036.2310137.5370538.7991540.02147
          * 37C Elevation
  55      SE  4742.04742.4214742.8424743.2634743.6844744.1054744.5264744.9474745.3684745.789
  56      SE  4746.24746.6314747.0524747.4734747.8944748.3154748.7364749.1574749.578  4750.0

  57      KK     11B
  58      KO       0       0     0.0       0      22
  59      BA  0.1161
  60      LS     0.0    57.0     0.0
  61      UD  0.0767

  62      KK      6R   CNAME      6C
  63      KO       0       0     0.0       0      22
  64      RN      6R

  65      KK     10B
  66      KO       0       0     0.0       0      22
  67      BA  0.1616
  68      LS     0.0   71.74     0.0
  69      UD  0.1283

  70      KK     13C   CNAME     13R
  71      KO       0       0     0.0       0      22
  72      HC       2

  73      KK     13R   CNAME     13C
  74      KO       0       0     0.0       0      22
  75      RS       1    FLOW     0.0     0.0
          * 13C Volume
  76      SV     0.00.9742581.9639382.969202 3.990215.0271236.0801017.1493058.2348969.337034
  77      SV  10.45511.5915912.7443313.9142715.1015516.3063517.5288218.7691220.0274121.30386
          * 13C Elevation
  78      SE  4800.04800.5264801.0524801.5784802.1054802.6314803.1574803.6844804.2104804.736
  79      SE  4805.24805.7894806.3154806.8424807.3684807.8944808.4214808.9474809.473  4810.0
          * 13C Discharge
  80      SQ     0.03.42952912.3279421.8209515.9029219.3218222.2207724.7829127.1039229.24128
  81      SQ  31.23233.1045734.8761036.5618938.1733239.7194241.2075542.6437844.0331945.38008
          * 13C Elevation
  82      SE  4800.04800.5264801.0524801.5784802.1054802.6314803.1574803.6844804.2104804.736
  83      SE  4805.24805.7894806.3154806.8424807.3684807.8944808.4214808.9474809.473  4810.0
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LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

   84         KK     98B
   85         KO       0       0     0.0       0      22
   86         BA  0.1097
   87         LS     0.0   64.48     0.0
   88         UD  0.0812

   89         KK     29R   CNAME     29C
   90         KO       0       0     0.0       0      22
   91         RN     29R

   92         KK    408B
   93         KO       0       0     0.0       0      22
   94         BA  0.0830
   95         LS     0.0   66.25     0.0
   96         UD  0.1008

   97         KK     99B
   98         KO       0       0     0.0       0      22
   99         BA  0.0594
  100         LS     0.0   78.61     0.0
  101         UD  0.0694

  102         KK     30C   CNAME     30R
  103         KO       0       0     0.0       0      22
  104         HC       3

  105         KK    103B
  106         KO       0       0     0.0       0      22
  107         BA  0.0102
  108         LS     0.0    84.1     0.0
  109         UD  0.1933

  110         KK    401B
  111         KO       0       0     0.0       0      22
  112         BA  0.1360
  113         LS     0.0   74.82     0.0
  114         UD  0.1917

  115         KK     32C   CNAME     32R
  116         KO       0       0     0.0       0      22
  117         HC       3

  118         KK    101B
  119         KO       0       0     0.0       0      22
  120         BA  0.1138
  121         LS     0.0   64.94     0.0
  122         UD  0.1459

  123         KK     31R   CNAME     31C
  124         KO       0       0     0.0       0      22
  125         RN     31R
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LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  126         KK     83B
  127         KO       0       0     0.0       0      22
  128         BA  0.5686
  129         LS     0.0   58.07     0.0
  130         UD  0.0556

  131         KK     19R   CNAME     19C
  132         KO       0       0     0.0       0      22
  133         RN     19R

  134         KK     86B
  135         KO       0       0     0.0       0      22
  136         BA  0.0259
  137         LS     0.0   73.61     0.0
  138         UD  0.0556

  139         KK     21C   CNAME     21R
  140         KO       0       0     0.0       0      22
  141         HC       2

  142         KK     85B
  143         KO       0       0     0.0       0      22
  144         BA  0.1593
  145         LS     0.0   63.35     0.0
  146         UD  0.0556

  147         KK     16C   CNAME     16R
  148         KO       0       0     0.0       0      22
  149         HC       2

  150         KK     81B
  151         KO       0       0     0.0       0      22
  152         BA  0.1869
  153         LS     0.0   58.02     0.0
  154         UD  0.0556

  155         KK     17R   CNAME     17C
  156         KO       0       0     0.0       0      22
  157         RN     17R

  158         KK     84B
  159         KO       0       0     0.0       0      22
  160         BA  0.1198
  161         LS     0.0   67.12     0.0
  162         UD  0.0556

  163         KK     20C   CNAME     20R
  164         KO       0       0     0.0       0      22
  165         HC       3
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LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 166          KK     79B
 167          KO       0       0     0.0       0      22
 168          BA  0.0165
 169          LS     0.0   68.61     0.0
 170          UD  0.0556

 171          KK     15R   CNAME     15C
 172          KO       0       0     0.0       0      22
 173          RN     15R

 174          KK     78B
 175          KO       0       0     0.0       0      22
 176          BA  0.0764
 177          LS     0.0   61.01     0.0
 178          UD  0.0556

 179          KK      8C   CNAME      8R
 180          KO       0       0     0.0       0      22
 181          HC       2

 182          KK     87B
 183          KO       0       0     0.0       0      22
 184          BA  0.0637
 185          LS     0.0   66.31     0.0
 186          UD  0.0556

 187          KK     22C   CNAME     22R
 188          KO       0       0     0.0       0      22
 189          HC       2

 190          KK     77B
 191          KO       0       0     0.0       0      22
 192          BA  0.0564
 193          LS     0.0   62.17     0.0
 194          UD  0.0556

 195          KK      7C   CNAME      7R
 196          KO       0       0     0.0       0      22
 197          HC       3

 198          KK    177B
 199          KO       0       0     0.0       0      22
 200          BA  0.0215
 201          LS     0.0    64.7     0.0
 202          UD  0.0320

 203          KK    248B
 204          KO       0       0     0.0       0      22
 205          BA  0.0832
 206          LS     0.0   66.07     0.0
 207          UD  0.0813
```

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

  208         KK    176B
  209         KO       0       0     0.0       0      22
  210         BA  0.0174
  211         LS     0.0   75.39     0.0
  212         UD  0.1412

  213         KK     41C   CNAME     41R
  214         KO       0       0     0.0       0      22
  215         HC       5

  216         KK    286B
  217         KO       0       0     0.0       1      22
  218         BA  0.4184
  219         LS     0.0   70.78     0.0
  220         UD  0.0268

  221         KK    181B
  222         KO       0       0     0.0       1      22
  223         BA  0.0313
  224         LS     0.0   77.05     0.0
  225         UD  0.0991

  226         KK     43C   CNAME     43R
  227         KO       0       0     0.0       0      22
  228         HC       3

  229         KK      2B
  230         KO       0       0     0.0       1      22
  231         BA  0.0817
  232         LS     0.0   81.16     0.0
  233         UD  0.3103

  234         KK     38R   CNAME     38C
  235         KO       0       0     0.0       0      22
  236         RN     38R

  237         KK    405B
  238         KO       0       0     0.0       1      22
  239         BA  0.0092
  240         LS     0.0   80.21     0.0
  241         UD  0.0730

  242         KK    288B
  243         KO       0       0     0.0       1      22
  244         BA  0.0149
  245         LS     0.0   78.34     0.0
  246         UD  0.0664

  247         KK     44C   CNAME     44R
  248         KO       0       0     0.0       0      22
  249         HC       4
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LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 250          KK    415B
 251          KO       0       0     0.0       1      22
 252          BA  0.0771
 253          LS     0.0   80.26     0.0
 254          UD  0.0921

 255          KK    459B
 256          KO       0       0     0.0       1      22
 257          BA  0.1803
 258          LS     0.0   79.85     0.0
 259          UD  0.1662

 260          KK      3C   CNAME      3R
 261          KO       0       0     0.0       0      22
 262          HC       4

 263          KK    163B
 264          KO       0       0     0.0       1      22
 265          BA  0.0618
 266          LS     0.0   80.62     0.0
 267          UD  0.1138

 268          KK      7B
 269          KO       0       0     0.0       1      22
 270          BA  0.0408
 271          LS     0.0   67.23     0.0
 272          UD  0.0556

 273          KK    411B
 274          KO       0       0     0.0       1      22
 275          BA  0.0331
 276          LS     0.0   79.74     0.0
 277          UD  0.0892

 278          KK     12C   CNAME     12R
 279          KO       0       0     0.0       0      22
 280          HC       4

 281          KK     12R   CNAME     12C
 282          KO       0       0     0.0       0      22
 283          RN     12R

 284          KK    141B
 285          KO       0       0     0.0       1      22
 286          BA  0.1600
 287          LS     0.0   69.57     0.0
 288          UD  0.1866

 289          KK     25R   CNAME     25C
 290          KO       0       0     0.0       0      22
 291          RD  1297.6 0.07153   0.013            CIRC     2.0      0.0
```

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

  292         KK    139B
  293         KO       0       0     0.0       0      22
  294         BA  0.0660
  295         LS     0.0   61.27     0.0
  296         UD  0.0702

  297         KK     23R   CNAME     23C
  298         KO       0       0     0.0       0      22
  299         RD  1357.8 0.04276   0.013            CIRC     2.0     0.0

  300         KK    140B
  301         KO       0       0     0.0       0      22
  302         BA  0.0475
  303         LS     0.0   67.54     0.0
  304         UD  0.0616

  305         KK     24C   CNAME     24R
  306         KO       0       0     0.0       0      22
  307         HC       2

  308         KK     24R   CNAME     24C
  309         KO       0       0     0.0       0      22
  310         RD  3765.7 0.06856   0.013            CIRC     2.0     0.0

  311         KK    138B
  312         KO       0       0     0.0       0      22
  313         BA  0.1174
  314         LS     0.0   71.23     0.0
  315         UD  0.2069

  316         KK     18C   CNAME     18R
  317         KO       0       0     0.0       0      22
  318         HC       3

  319         KK     18R   CNAME     18C
  320         KO       0       0     0.0       0      22
  321         RD  3528.0 0.04879   0.013            TRAP     2.0     0.0

  322         KK    155B
  323         KO       0       0     0.0       0      22
  324         BA  0.0758
  325         LS     0.0   75.21     0.0
  326         UD  0.1458

  327         KK    149B
  328         KO       0       0     0.0       0      22
  329         BA  0.2020
  330         LS     0.0   80.17     0.0
  331         UD  0.2477
```

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

 332          KK      4C   CNAME      4R
 333          KO       0       0     0.0       0      22
 334          HC       2

 335          KK      4R   CNAME      4C
 336          KO       0       0     0.0       0      22
 337          RS       1    FLOW     0.0     0.0
              * 4C Volume
 338          SV     0.00.2728530.5501420.8319091.118195 1.409041.7044872.0045762.3093492.618846
 339          SV  2.93313.2521783.5760963.9049024.2386384.5773464.921066 5.269845.6237085.982713
              * 4C Elevation
 340          SE  4811.04811.2104811.4214811.6314811.8424812.0524812.2634812.4734812.6844812.894
 341          SE  4813.14813.3154813.5264813.7364813.9474814.1574814.3684814.5784814.789  4815.0
              * 4C Discharge
 342          SQ  12.76313.3469013.9061714.4438114.9621415.4631015.9483316.4192316.8770017.32267
 343          SQ  17.75718.1812818.7378822.8393729.3622537.5566847.1173257.86315 69.670582.44792
              * 4C Elevation
 344          SE  4811.04811.2104811.4214811.6314811.8424812.0524812.2634812.4734812.6844812.894
 345          SE  4813.14813.3154813.5264813.7364813.9474814.1574814.3684814.5784814.789  4815.0

 346          KK     30B
 347          KO       0       0     0.0       0      22
 348          BA  0.1491
 349          LS     0.0   74.12     0.0
 350          UD  0.2306

 351          KK     66B
 352          KO       0       0     0.0       0      22
 353          BA  0.0522
 354          LS     0.0    72.0     0.0
 355          UD  0.0556

 356          KK     11C   CNAME     11R
 357          KO       0       0     0.0       0      22
 358          HC       4

 359          KK     11R   CNAME     11C
 360          KO       0       0     0.0       0      22
 361          RN     11R

 362          KK    241B
 363          KO       0       0     0.0       0      22
 364          BA  0.0949
 365          LS     0.0   73.24     0.0
 366          UD  0.1459

 367          KK     10R   CNAME     10C
 368          KO       0       0     0.0       0      22
 369          RN     10R
```

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

  370         KK    151B
  371         KO       0       0     0.0       0      22
  372         BA  0.0132
  373         LS     0.0   72.23     0.0
  374         UD  0.0337

  375         KK    150B
  376         KO       0       0     0.0       0      22
  377         BA  0.0461
  378         LS     0.0   79.46     0.0
  379         UD  0.0407

  380         KK     35C   CNAME     35R
  381         KO       0       0     0.0       0      22
  382         HC       2

  383         KK     35R   CNAME     35C
  384         KO       0       0     0.0       0      22
  385         RS       1    FLOW     0.0     0.0
              * 35C Volume
  386         SV     1.0     2.0     3.0     4.0     5.0     6.0     7.0     8.0     9.0    10.0
              * 35C Elevation
  387         SE  4815.0  4816.0  4817.0  4818.0  4819.0  4820.0  4821.0  4822.0  4823.0  4824.0
              * 35C Discharge
  388         SQ     5.0     5.0     5.0     5.0     5.0     5.0     5.0     5.0     5.0     5.0
              * 35C Elevation
  389         SE  4815.0  4816.0  4817.0  4818.0  4819.0  4820.0  4821.0  4822.0  4823.0  4824.0

  390         KK    143B
  391         KO       0       0     0.0       0      22
  392         BA  0.0414
  393         LS     0.0    74.0     0.0
  394         UD  0.0120

  395         KK    402B
  396         KO       0       0     0.0       0      22
  397         BA  0.0153
  398         LS     0.0    74.0     0.0
  399         UD  0.0514

  400         KK     33C   CNAME     33R
  401         KO       0       0     0.0       0      22
  402         HC       2

  403         KK     33R   CNAME     33C
  404         KO       0       0     0.0       0      22
  405         RS       1    FLOW     0.0     0.0
              * 33C Volume
  406         SV     0.0     1.0     2.0     3.0     4.0     5.0     6.0     7.0     8.0     9.0
              * 33C Elevation
  407         SE  4810.0  4811.0  4812.0  4813.0  4814.0  4815.0  4816.0  4817.0  4818.0  4819.0
              * 33C Discharge
  408         SQ     5.0     5.0     5.0     5.0     5.0     5.0     5.0     5.0     5.0     5.0
              * 33C Elevation
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LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 409          SE  4810.0  4811.0  4812.0  4813.0  4814.0  4815.0  4816.0  4817.0  4818.0  4819.0

 410          KK    407B
 411          KO       0       0     0.0       0      22
 412          BA  0.0182
 413          LS     0.0    74.0     0.0
 414          UD  0.0532

 415          KK    406B
 416          KO       0       0     0.0       0      22
 417          BA  0.0256
 418          LS     0.0   68.46     0.0
 419          UD  0.0717

 420          KK    358B
 421          KO       0       0     0.0       0      22
 422          BA  0.0053
 423          LS     0.0    72.0     0.0
 424          UD  0.0822

 425          KK     54C   CNAME     54R
 426          KO       0       0     0.0       0      22
 427          HC       5

 428          KK    344B
 429          KO       0       0     0.0       0      22
 430          BA  0.0449
 431          LS     0.0   73.99     0.0
 432          UD  0.0895

 433          KK    363B
 434          KO       0       0     0.0       0      22
 435          BA  0.0208
 436          LS     0.0   75.76     0.0
 437          UD  0.1262

 438          KK      9C   CNAME      9R
 439          KO       0       0     0.0       0      22
 440          HC       3

 441          KK      9R   CNAME      9C
 442          KO       0       0     0.0       0      22
 443          RN      9R
 444          ZZ
```

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	329B	7.	12.00	1.	0.	0.	0.05		
+	HYDROGRAPH AT	403B	4.	12.00	1.	0.	0.	0.02		
+	2 COMBINED AT	37C	11.	12.00	2.	1.	1.	0.07		
+	ROUTED TO	37R	5.	12.33	2.	1.	1.	0.07		
+									4742.62	12.33
+	HYDROGRAPH AT	11B	0.	18.33	0.	0.	0.	0.12		
+	ROUTED TO	6R	0.	18.33	0.	0.	0.	0.12		
+	HYDROGRAPH AT	10B	14.	12.00	3.	1.	1.	0.16		
+	2 COMBINED AT	13C	14.	12.00	3.	1.	1.	0.28		
+	ROUTED TO	13R	2.	14.00	2.	1.	1.	0.28		
+									4800.34	14.00
+	HYDROGRAPH AT	98B	1.	12.33	1.	0.	0.	0.11		
+	ROUTED TO	29R	1.	12.33	1.	0.	0.	0.11		
+	HYDROGRAPH AT	408B	2.	12.00	1.	0.	0.	0.08		
+	HYDROGRAPH AT	99B	19.	12.00	2.	1.	1.	0.06		
+	3 COMBINED AT	30C	21.	12.00	3.	1.	1.	0.25		
+	HYDROGRAPH AT	103B	4.	12.17	1.	0.	0.	0.01		
+	HYDROGRAPH AT	401B	18.	12.17	3.	1.	1.	0.14		

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3 COMBINED AT							
+	32C	37.	12.00	7.	3.	3.	0.40
HYDROGRAPH AT							
+	101B	1.	12.33	1.	0.	0.	0.11
ROUTED TO							
+	31R	1.	12.33	1.	0.	0.	0.11
HYDROGRAPH AT							
+	83B	1.	17.83	1.	0.	0.	0.57
ROUTED TO							
+	19R	1.	17.83	1.	0.	0.	0.57
HYDROGRAPH AT							
+	86B	4.	12.00	1.	0.	0.	0.03
2 COMBINED AT							
+	21C	4.	12.00	1.	0.	0.	0.59
HYDROGRAPH AT							
+	85B	1.	12.50	1.	0.	0.	0.16
2 COMBINED AT							
+	16C	5.	12.00	2.	1.	1.	0.75
HYDROGRAPH AT							
+	81B	0.	17.83	0.	0.	0.	0.19
ROUTED TO							
+	17R	0.	17.83	0.	0.	0.	0.19
HYDROGRAPH AT							
+	84B	4.	12.00	1.	0.	0.	0.12
3 COMBINED AT							
+	20C	9.	12.00	3.	1.	1.	1.06
HYDROGRAPH AT							
+	79B	1.	12.00	0.	0.	0.	0.02
ROUTED TO							
+	15R	1.	12.00	0.	0.	0.	0.02
HYDROGRAPH AT							
+	78B	0.	13.50	0.	0.	0.	0.08
2 COMBINED AT							
+	8C	1.	12.00	0.	0.	0.	0.09
HYDROGRAPH AT							
+	87B	1.	12.00	1.	0.	0.	0.06
2 COMBINED AT							
+	22C	2.	12.00	1.	0.	0.	0.16
HYDROGRAPH AT							
+	77B	0.	12.83	0.	0.	0.	0.06

+	3 COMBINED AT 7C	11.	12.00	4.	2.	2.	1.27
+	HYDROGRAPH AT 177B	0.	12.33	0.	0.	0.	0.02
+	HYDROGRAPH AT 248B	2.	12.00	1.	0.	0.	0.08
+	HYDROGRAPH AT 176B	3.	12.00	0.	0.	0.	0.02
+	5 COMBINED AT 41C	16.	12.00	6.	2.	2.	1.51
+	HYDROGRAPH AT 286B	41.	12.00	7.	2.	2.	0.42
+	HYDROGRAPH AT 181B	8.	12.00	1.	0.	0.	0.03
+	3 COMBINED AT 43C	65.	12.00	14.	5.	5.	1.96
+	HYDROGRAPH AT 2B	18.	12.17	4.	1.	1.	0.08
+	ROUTED TO 38R	18.	12.17	4.	1.	1.	0.08
+	HYDROGRAPH AT 405B	3.	12.00	0.	0.	0.	0.01
+	HYDROGRAPH AT 288B	5.	12.00	1.	0.	0.	0.01
+	4 COMBINED AT 44C	83.	12.00	18.	6.	6.	2.06
+	HYDROGRAPH AT 415B	27.	12.00	3.	1.	1.	0.08
+	HYDROGRAPH AT 459B	42.	12.00	7.	2.	2.	0.18
+	4 COMBINED AT 3C	190.	12.00	36.	12.	12.	2.72
+	HYDROGRAPH AT 163B	21.	12.00	3.	1.	1.	0.06
+	HYDROGRAPH AT 7B	1.	12.00	0.	0.	0.	0.04
+	HYDROGRAPH AT 411B	11.	12.00	1.	0.	0.	0.03
	4 COMBINED AT						

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+		12C	224.	12.00	40.	14.	14.	2.86	
	ROUTED TO								
+		12R	224.	12.00	40.	14.	14.	2.86	
	HYDROGRAPH AT								
+		141B	8.	12.17	2.	1.	1.	0.16	
	ROUTED TO								
+		25R	8.	12.17	2.	1.	1.	0.16	
	HYDROGRAPH AT								
+		139B	0.	13.33	0.	0.	0.	0.07	
	ROUTED TO								
+		23R	0.	13.33	0.	0.	0.	0.07	
	HYDROGRAPH AT								
+		140B	2.	12.00	0.	0.	0.	0.05	
	2 COMBINED AT								
+		24C	2.	12.00	1.	0.	0.	0.11	
	ROUTED TO								
+		24R	2.	12.17	1.	0.	0.	0.11	
	HYDROGRAPH AT								
+		138B	8.	12.17	2.	1.	1.	0.12	
	3 COMBINED AT								
+		18C	18.	12.17	5.	2.	2.	0.39	
	ROUTED TO								
+		18R	16.	12.17	5.	2.	2.	0.39	
	HYDROGRAPH AT								
+		155B	11.	12.00	2.	1.	1.	0.08	
	HYDROGRAPH AT								
+		149B	46.	12.17	8.	3.	3.	0.20	
	2 COMBINED AT								
+		4C	57.	12.17	10.	3.	3.	0.28	
	ROUTED TO								
+		4R	16.	12.83	14.	13.	13.	0.28	
+									4812.09 12.83
	HYDROGRAPH AT								
+		30B	17.	12.17	3.	1.	1.	0.15	
	HYDROGRAPH AT								
+		66B	7.	12.00	1.	0.	0.	0.05	
	4 COMBINED AT								
+		11C	50.	12.17	23.	16.	16.	0.87	
	ROUTED TO								
+		11R	50.	12.17	23.	16.	16.	0.87	

+	HYDROGRAPH AT	241B	10.	12.17	2.	1.	1.	0.09	
+	ROUTED TO	10R	10.	12.17	2.	1.	1.	0.09	
+	HYDROGRAPH AT	151B	2.	12.00	0.	0.	0.	0.01	
+	HYDROGRAPH AT	150B	16.	12.00	2.	1.	1.	0.05	
+	2 COMBINED AT	35C	17.	12.00	2.	1.	1.	0.06	
+	ROUTED TO	35R	5.	0.17	5.	5.	5.	0.06	
+									4815.00 0.00
+	HYDROGRAPH AT	143B	7.	12.00	1.	0.	0.	0.04	
+	HYDROGRAPH AT	402B	3.	12.00	0.	0.	0.	0.02	
+	2 COMBINED AT	33C	10.	12.00	1.	0.	0.	0.06	
+	ROUTED TO	33R	5.	0.17	5.	5.	5.	0.06	
+									4810.01 12.17
+	HYDROGRAPH AT	407B	3.	12.00	0.	0.	0.	0.02	
+	HYDROGRAPH AT	406B	1.	12.00	0.	0.	0.	0.03	
+	HYDROGRAPH AT	358B	1.	12.00	0.	0.	0.	0.01	
+	5 COMBINED AT	54C	15.	12.00	11.	10.	10.	0.17	
+	HYDROGRAPH AT	344B	8.	12.00	1.	0.	0.	0.04	
+	HYDROGRAPH AT	363B	4.	12.00	1.	0.	0.	0.02	
+	3 COMBINED AT	9C	26.	12.00	12.	11.	11.	0.23	
+	ROUTED TO	9R	26.	12.00	12.	11.	11.	0.23	

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

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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) =				10.00					
25R	MANE	1.26	8.21	731.71	0.16	10.00	7.92	730.00	0.16

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1336E+01 EXCESS=0.0000E+00 OUTFLOW=0.1334E+01 BASIN STORAGE=0.2259E-02 PERCENT ERROR= 0.0

FOR STORM = 1 STORM AREA (SQ MI) =				10.00					
23R	MANE	3.29	0.24	806.43	0.04	10.00	0.24	810.00	0.04

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1403E+00 EXCESS=0.0000E+00 OUTFLOW=0.1395E+00 BASIN STORAGE=0.7757E-03 PERCENT ERROR= 0.0

FOR STORM = 1 STORM AREA (SQ MI) =				10.00					
24R	MANE	0.50	1.83	725.50	0.07	10.00	1.56	730.00	0.07

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.4467E+00 EXCESS=0.0000E+00 OUTFLOW=0.4434E+00 BASIN STORAGE=0.3500E-02 PERCENT ERROR= 0.0

FOR STORM = 1 STORM AREA (SQ MI) =				10.00					
18R	MANE	2.00	17.70	734.00	0.14	10.00	16.22	730.00	0.14

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.2969E+01 EXCESS=0.0000E+00 OUTFLOW=0.2956E+01 BASIN STORAGE=0.2097E-01 PERCENT ERROR= -0.2

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

50 YEAR HEC-1

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```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*               MAY   1991              *
*            VERSION 4.0.1E             *
*                                       *
*  RUN DATE            TIME             *
*                                       *
*****************************************
```

```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*         609 SECOND STREET             *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 551-1748              *
*                                       *
*****************************************
```

```
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

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HEC-1 INPUT PAGE 1

```
LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
    1         ID  HEC-1 Analysis using WMS
    2         ID  50 year devloped flow
    3         ID  MAY 2012
    4         IT      10 07MAY09       0     130
    5         IO       5
    6         IN       6 07MAY09       0
    7         JD     2.3    10.0
              * typeII-24hour
    8         PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
    9         PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
   10         PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
   11         PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
```

```
12          PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
13          PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
14          PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
15          PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
16          PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
17          PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
18          PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
19          PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
20          PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
21          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
22          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
23          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
24          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
25          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
26          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
27          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
28          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
29          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
30          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
31          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
32          PC     1.0

33          KK    329B
34          KO       0       0     0.0       0      22
35          BA  0.0487
36          LS     0.0    74.2     0.0
37          UD  0.1151

38          KK    403B
39          KO       0       0     0.0       0      22
40          BA  0.0216
41          LS     0.0   74.49     0.0
42          UD  0.0893

43          KK     37C   CNAME     37R
44          KO       0       0     0.0       0      22
45          HC       2
```

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

  46      KK     37R   CNAME     37C
  47      KO       0       0     0.0       0      22
  48      RS       1    FLOW     0.0     0.0
          * 37C Volume
  49      SV     0.00.1266630.253327 0.379990.5066530.633316 0.759980.8866431.0133061.139969
  50      SV  1.26661.3932961.5199591.6466221.7732861.8999492.0266122.1532752.2799392.406602
          * 37C Elevation
  51      SE  4742.04742.4214742.8424743.2634743.6844744.1054744.5264744.9474745.3684745.789
  52      SE  4746.24746.6314747.0524747.4734747.8944748.3154748.7364749.1574749.578  4750.0
          * 37C Discharge
  53      SQ     0.02.197453 8.3679616.4140423.1448215.9029218.6881421.1090223.2794925.26417
  54      SQ  27.10328.8264930.4517731.9946033.4663734.8761036.2310137.5370538.7991540.02147
          * 37C Elevation
  55      SE  4742.04742.4214742.8424743.2634743.6844744.1054744.5264744.9474745.3684745.789
  56      SE  4746.24746.6314747.0524747.4734747.8944748.3154748.7364749.1574749.578  4750.0

  57      KK     11B
  58      KO       0       0     0.0       0      22
  59      BA  0.1161
  60      LS     0.0    57.0     0.0
  61      UD  0.0767

  62      KK      6R   CNAME      6C
  63      KO       0       0     0.0       0      22
  64      RN      6R

  65      KK     10B
  66      KO       0       0     0.0       0      22
  67      BA  0.1616
  68      LS     0.0   71.74     0.0
  69      UD  0.1283

  70      KK     13C   CNAME     13R
  71      KO       0       0     0.0       0      22
  72      HC       2

  73      KK     13R   CNAME     13C
  74      KO       0       0     0.0       0      22
  75      RS       1    FLOW     0.0     0.0
          * 13C Volume
  76      SV     0.00.9742581.9639382.969202 3.990215.0271236.0801017.1493058.2348969.337034
  77      SV  10.45511.5915912.7443313.9142715.1015516.3063517.5288218.7691220.0274121.30386
          * 13C Elevation
  78      SE  4800.04800.5264801.0524801.5784802.1054802.6314803.1574803.6844804.2104804.736
  79      SE  4805.24805.7894806.3154806.8424807.3684807.8944808.4214808.9474809.473  4810.0
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           * 13C Discharge
80         SQ     0.03.42952912.3279421.8209515.9029219.3218222.2207724.7829127.1039229.24128
81         SQ  31.23233.1045734.8761036.5618938.1733239.7194241.2075542.6437844.0331945.38008
           * 13C Elevation
82         SE  4800.04800.5264801.0524801.5784802.1054802.6314803.1574803.6844804.2104804.736
83         SE  4805.24805.7894806.3154806.8424807.3684807.8944808.4214808.9474809.473  4810.0
```

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

  84          KK     98B
  85          KO       0       0     0.0       0      22
  86          BA  0.1097
  87          LS     0.0   64.48     0.0
  88          UD  0.0812

  89          KK     29R   CNAME     29C
  90          KO       0       0     0.0       0      22
  91          RN     29R

  92          KK    408B
  93          KO       0       0     0.0       0      22
  94          BA  0.0830
  95          LS     0.0   66.25     0.0
  96          UD  0.1008

  97          KK     99B
  98          KO       0       0     0.0       0      22
  99          BA  0.0594
 100          LS     0.0   78.61     0.0
 101          UD  0.0694

 102          KK     30C   CNAME     30R
 103          KO       0       0     0.0       0      22
 104          HC       3

 105          KK    103B
 106          KO       0       0     0.0       0      22
 107          BA  0.0102
 108          LS     0.0    84.1     0.0
 109          UD  0.1933

 110          KK    401B
 111          KO       0       0     0.0       0      22
 112          BA  0.1360
 113          LS     0.0   74.82     0.0
 114          UD  0.1917

 115          KK     32C   CNAME     32R
 116          KO       0       0     0.0       0      22
 117          HC       3

 118          KK    101B
 119          KO       0       0     0.0       0      22
 120          BA  0.1138
```

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```
121          LS      0.0    64.94      0.0
122          UD   0.1459

123          KK      31R    CNAME      31C
124          KO        0        0      0.0         0       22
125          RN      31R
```

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

  126         KK     83B
  127         KO       0       0     0.0       0      22
  128         BA  0.5686
  129         LS     0.0   58.07     0.0
  130         UD  0.0556

  131         KK     19R   CNAME     19C
  132         KO       0       0     0.0       0      22
  133         RN     19R

  134         KK     86B
  135         KO       0       0     0.0       0      22
  136         BA  0.0259
  137         LS     0.0   73.61     0.0
  138         UD  0.0556

  139         KK     21C   CNAME     21R
  140         KO       0       0     0.0       0      22
  141         HC       2

  142         KK     85B
  143         KO       0       0     0.0       0      22
  144         BA  0.1593
  145         LS     0.0   63.35     0.0
  146         UD  0.0556

  147         KK     16C   CNAME     16R
  148         KO       0       0     0.0       0      22
  149         HC       2

  150         KK     81B
  151         KO       0       0     0.0       0      22
  152         BA  0.1869
  153         LS     0.0   58.02     0.0
  154         UD  0.0556

  155         KK     17R   CNAME     17C
  156         KO       0       0     0.0       0      22
  157         RN     17R

  158         KK     84B
  159         KO       0       0     0.0       0      22
  160         BA  0.1198
  161         LS     0.0   67.12     0.0
  162         UD  0.0556
```

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```
163             KK      20C   CNAME     20R
164             KO        0       0     0.0         0       22
165             HC        3
```

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

  166         KK     79B
  167         KO       0       0     0.0       0      22
  168         BA  0.0165
  169         LS     0.0   68.61     0.0
  170         UD  0.0556

  171         KK     15R   CNAME     15C
  172         KO       0       0     0.0       0      22
  173         RN     15R

  174         KK     78B
  175         KO       0       0     0.0       0      22
  176         BA  0.0764
  177         LS     0.0   61.01     0.0
  178         UD  0.0556

  179         KK      8C   CNAME      8R
  180         KO       0       0     0.0       0      22
  181         HC       2

  182         KK     87B
  183         KO       0       0     0.0       0      22
  184         BA  0.0637
  185         LS     0.0   66.31     0.0
  186         UD  0.0556

  187         KK     22C   CNAME     22R
  188         KO       0       0     0.0       0      22
  189         HC       2

  190         KK     77B
  191         KO       0       0     0.0       0      22
  192         BA  0.0564
  193         LS     0.0   62.17     0.0
  194         UD  0.0556

  195         KK      7C   CNAME      7R
  196         KO       0       0     0.0       0      22
  197         HC       3

  198         KK    177B
  199         KO       0       0     0.0       0      22
  200         BA  0.0215
  201         LS     0.0    64.7     0.0
  202         UD  0.0320
```

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```
203          KK    248B
204          KO       0        0     0.0        0       22
205          BA  0.0832
206          LS     0.0    66.07     0.0
207          UD  0.0813
```

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

  208         KK    176B
  209         KO       0       0     0.0       0      22
  210         BA  0.0174
  211         LS     0.0   75.39     0.0
  212         UD  0.1412

  213         KK     41C   CNAME     41R
  214         KO       0       0     0.0       0      22
  215         HC       5

  216         KK    286B
  217         KO       0       0     0.0       1      22
  218         BA  0.4184
  219         LS     0.0   70.78     0.0
  220         UD  0.0268

  221         KK    181B
  222         KO       0       0     0.0       1      22
  223         BA  0.0313
  224         LS     0.0   77.05     0.0
  225         UD  0.0991

  226         KK     43C   CNAME     43R
  227         KO       0       0     0.0       0      22
  228         HC       3

  229         KK      2B
  230         KO       0       0     0.0       1      22
  231         BA  0.0817
  232         LS     0.0   81.16     0.0
  233         UD  0.3103

  234         KK     38R   CNAME     38C
  235         KO       0       0     0.0       0      22
  236         RN     38R

  237         KK    405B
  238         KO       0       0     0.0       1      22
  239         BA  0.0092
  240         LS     0.0   80.21     0.0
  241         UD  0.0730

  242         KK    288B
  243         KO       0       0     0.0       1      22
  244         BA  0.0149
```

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```
245          LS      0.0   78.34      0.0
246          UD   0.0664

247          KK      44C   CNAME      44R
248          KO        0       0      0.0        0       22
249          HC        4
```

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

  250         KK    415B
  251         KO       0       0     0.0       1      22
  252         BA  0.0771
  253         LS     0.0   80.26     0.0
  254         UD  0.0921

  255         KK    459B
  256         KO       0       0     0.0       1      22
  257         BA  0.1803
  258         LS     0.0   79.85     0.0
  259         UD  0.1662

  260         KK      3C   CNAME      3R
  261         KO       0       0     0.0       0      22
  262         HC       4

  263         KK    163B
  264         KO       0       0     0.0       1      22
  265         BA  0.0618
  266         LS     0.0   80.62     0.0
  267         UD  0.1138

  268         KK      7B
  269         KO       0       0     0.0       1      22
  270         BA  0.0408
  271         LS     0.0   67.23     0.0
  272         UD  0.0556

  273         KK    411B
  274         KO       0       0     0.0       1      22
  275         BA  0.0331
  276         LS     0.0   79.74     0.0
  277         UD  0.0892

  278         KK     12C   CNAME     12R
  279         KO       0       0     0.0       0      22
  280         HC       4

  281         KK     12R   CNAME     12C
  282         KO       0       0     0.0       0      22
  283         RN     12R

  284         KK    141B
  285         KO       0       0     0.0       1      22
  286         BA  0.1600
```

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```
287          LS      0.0    69.57      0.0
288          UD   0.1866
289          KK      25R    CNAME      25C
290          KO        0        0      0.0        0       22
291          RD   1297.6  0.07153    0.013             CIRC      2.0      0.0
```

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

  292         KK    139B
  293         KO       0       0     0.0       0      22
  294         BA  0.0660
  295         LS     0.0   61.27     0.0
  296         UD  0.0702

  297         KK     23R   CNAME     23C
  298         KO       0       0     0.0       0      22
  299         RD  1357.8 0.04276   0.013            CIRC     2.0      0.0

  300         KK    140B
  301         KO       0       0     0.0       0      22
  302         BA  0.0475
  303         LS     0.0   67.54     0.0
  304         UD  0.0616

  305         KK     24C   CNAME     24R
  306         KO       0       0     0.0       0      22
  307         HC       2

  308         KK     24R   CNAME     24C
  309         KO       0       0     0.0       0      22
  310         RD  3765.7 0.06856   0.013            CIRC     2.0      0.0

  311         KK    138B
  312         KO       0       0     0.0       0      22
  313         BA  0.1174
  314         LS     0.0   71.23     0.0
  315         UD  0.2069

  316         KK     18C   CNAME     18R
  317         KO       0       0     0.0       0      22
  318         HC       3

  319         KK     18R   CNAME     18C
  320         KO       0       0     0.0       0      22
  321         RD  3528.0 0.04879   0.013            TRAP     2.0      0.0

  322         KK    155B
  323         KO       0       0     0.0       0      22
  324         BA  0.0758
  325         LS     0.0   75.21     0.0
  326         UD  0.1458

  327         KK    149B
```

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328	KO	0	0	0.0	0	22
329	BA	0.2020				
330	LS	0.0	80.17	0.0		
331	UD	0.2477				

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

  332     KK      4C   CNAME      4R
  333     KO       0       0     0.0       0      22
  334     HC       2

  335     KK      4R   CNAME      4C
  336     KO       0       0     0.0       0      22
  337     RS       1    FLOW     0.0     0.0
          * 4C Volume
  338     SV     0.00.2728530.5501420.8319091.118195 1.409041.7044872.0045762.3093492.618846
  339     SV  2.93313.2521783.5760963.9049024.2386384.5773464.921066 5.269845.6237085.982713
          * 4C Elevation
  340     SE  4811.04811.2104811.4214811.6314811.8424812.0524812.2634812.4734812.6844812.894
  341     SE  4813.14813.3154813.5264813.7364813.9474814.1574814.3684814.5784814.789  4815.0
          * 4C Discharge
  342     SQ  12.76313.3469013.9061714.4438114.9621415.4631015.9483316.4192316.8770017.32267
  343     SQ  17.75718.1812818.7378822.8393729.3622537.5566847.1173257.86315 69.670582.44792
          * 4C Elevation
  344     SE  4811.04811.2104811.4214811.6314811.8424812.0524812.2634812.4734812.6844812.894
  345     SE  4813.14813.3154813.5264813.7364813.9474814.1574814.3684814.5784814.789  4815.0

  346     KK     30B
  347     KO       0       0     0.0       0      22
  348     BA  0.1491
  349     LS     0.0   74.12     0.0
  350     UD  0.2306

  351     KK     66B
  352     KO       0       0     0.0       0      22
  353     BA  0.0522
  354     LS     0.0    72.0     0.0
  355     UD  0.0556

  356     KK     11C   CNAME     11R
  357     KO       0       0     0.0       0      22
  358     HC       4

  359     KK     11R   CNAME     11C
  360     KO       0       0     0.0       0      22
  361     RN     11R

  362     KK    241B
  363     KO       0       0     0.0       0      22
  364     BA  0.0949
  365     LS     0.0   73.24     0.0
  366     UD  0.1459
```

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367	KK	10R	CNAME	10C		
368	KO	0	0	0.0	0	22
369	RN	10R				

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

  370         KK    151B
  371         KO       0       0     0.0       0      22
  372         BA  0.0132
  373         LS     0.0   72.23     0.0
  374         UD  0.0337

  375         KK    150B
  376         KO       0       0     0.0       0      22
  377         BA  0.0461
  378         LS     0.0   79.46     0.0
  379         UD  0.0407

  380         KK     35C   CNAME     35R
  381         KO       0       0     0.0       0      22
  382         HC       2

  383         KK     35R   CNAME     35C
  384         KO       0       0     0.0       0      22
  385         RS       1    FLOW     0.0     0.0
              * 35C Volume
  386         SV     1.0     2.0     3.0     4.0     5.0     6.0     7.0     8.0     9.0    10.0
              * 35C Elevation
  387         SE  4815.0  4816.0  4817.0  4818.0  4819.0  4820.0  4821.0  4822.0  4823.0  4824.0
              * 35C Discharge
  388         SQ     5.0     5.0     5.0     5.0     5.0     5.0     5.0     5.0     5.0     5.0
              * 35C Elevation
  389         SE  4815.0  4816.0  4817.0  4818.0  4819.0  4820.0  4821.0  4822.0  4823.0  4824.0

  390         KK    143B
  391         KO       0       0     0.0       0      22
  392         BA  0.0414
  393         LS     0.0    74.0     0.0
  394         UD  0.0120

  395         KK    402B
  396         KO       0       0     0.0       0      22
  397         BA  0.0153
  398         LS     0.0    74.0     0.0
  399         UD  0.0514

  400         KK     33C   CNAME     33R
  401         KO       0       0     0.0       0      22
  402         HC       2

  403         KK     33R   CNAME     33C
```

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```
404          KO        0        0      0.0        0       22
405          RS        1     FLOW      0.0      0.0
             * 33C Volume
406          SV      0.0      1.0      2.0      3.0      4.0      5.0      6.0      7.0      8.0      9.0
             * 33C Elevation
407          SE   4810.0   4811.0   4812.0   4813.0   4814.0   4815.0   4816.0   4817.0   4818.0   4819.0
             * 33C Discharge
408          SQ      5.0      5.0      5.0      5.0      5.0      5.0      5.0      5.0      5.0      5.0
             * 33C Elevation
```

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

  409         SE  4810.0  4811.0  4812.0  4813.0  4814.0  4815.0  4816.0  4817.0  4818.0  4819.0

  410         KK    407B
  411         KO       0       0     0.0       0      22
  412         BA  0.0182
  413         LS     0.0    74.0     0.0
  414         UD  0.0532

  415         KK    406B
  416         KO       0       0     0.0       0      22
  417         BA  0.0256
  418         LS     0.0   68.46     0.0
  419         UD  0.0717

  420         KK    358B
  421         KO       0       0     0.0       0      22
  422         BA  0.0053
  423         LS     0.0    72.0     0.0
  424         UD  0.0822

  425         KK     54C   CNAME     54R
  426         KO       0       0     0.0       0      22
  427         HC       5

  428         KK    344B
  429         KO       0       0     0.0       0      22
  430         BA  0.0449
  431         LS     0.0   73.99     0.0
  432         UD  0.0895

  433         KK    363B
  434         KO       0       0     0.0       0      22
  435         BA  0.0208
  436         LS     0.0   75.76     0.0
  437         UD  0.1262

  438         KK      9C   CNAME      9R
  439         KO       0       0     0.0       0      22
  440         HC       3

  441         KK      9R   CNAME      9C
  442         KO       0       0     0.0       0      22
  443         RN      9R
  444         ZZ
```

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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	329B	17.	12.00	2.	1.	1.	0.05		
+	HYDROGRAPH AT	403B	9.	12.00	1.	0.	0.	0.02		
+	2 COMBINED AT	37C	26.	12.00	3.	1.	1.	0.07		
+	ROUTED TO	37R	15.	12.17	3.	1.	1.	0.07		
+									4743.20	12.17
+	HYDROGRAPH AT	11B	1.	12.50	1.	0.	0.	0.12		
+	ROUTED TO	6R	1.	12.50	1.	0.	0.	0.12		
+	HYDROGRAPH AT	10B	40.	12.00	6.	2.	2.	0.16		
+	2 COMBINED AT	13C	40.	12.00	7.	2.	2.	0.28		
+	ROUTED TO	13R	7.	13.00	5.	2.	2.	0.28		
+									4800.75	13.00
+	HYDROGRAPH AT	98B	12.	12.00	2.	1.	1.	0.11		
+	ROUTED TO	29R	12.	12.00	2.	1.	1.	0.11		
+	HYDROGRAPH AT	408B	11.	12.00	2.	1.	1.	0.08		
+	HYDROGRAPH AT	99B	34.	12.00	4.	1.	1.	0.06		
	3 COMBINED AT									

+		30C	57.	12.00	8.	3.	3.	0.25
+	HYDROGRAPH AT	103B	6.	12.17	1.	0.	0.	0.01
+	HYDROGRAPH AT	401B	39.	12.17	7.	2.	2.	0.14
+	3 COMBINED AT	32C	96.	12.00	15.	5.	5.	0.40
+	HYDROGRAPH AT	101B	9.	12.17	2.	1.	1.	0.11
+	ROUTED TO	31R	9.	12.17	2.	1.	1.	0.11
+	HYDROGRAPH AT	83B	7.	12.33	4.	2.	2.	0.57
+	ROUTED TO	19R	7.	12.33	4.	2.	2.	0.57
+	HYDROGRAPH AT	86B	10.	12.00	1.	0.	0.	0.03
+	2 COMBINED AT	21C	13.	12.00	5.	2.	2.	0.59
+	HYDROGRAPH AT	85B	13.	12.00	3.	1.	1.	0.16
+	2 COMBINED AT	16C	26.	12.00	8.	3.	3.	0.75
+	HYDROGRAPH AT	81B	2.	12.33	1.	1.	1.	0.19
+	ROUTED TO	17R	2.	12.33	1.	1.	1.	0.19
+	HYDROGRAPH AT	84B	21.	12.00	3.	1.	1.	0.12
+	3 COMBINED AT	20C	48.	12.00	12.	4.	4.	1.06
+	HYDROGRAPH AT	79B	4.	12.00	0.	0.	0.	0.02

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	ROUTED TO						
+		15R	4.	12.00	0.	0.	0.	0.02
	HYDROGRAPH AT						
+		78B	3.	12.00	1.	0.	0.	0.08
	2 COMBINED AT						
+		8C	6.	12.00	1.	0.	0.	0.09
	HYDROGRAPH AT						
+		87B	10.	12.00	1.	0.	0.	0.06
	2 COMBINED AT						
+		22C	16.	12.00	3.	1.	1.	0.16
	HYDROGRAPH AT						
+		77B	3.	12.00	1.	0.	0.	0.06
	3 COMBINED AT						
+		7C	67.	12.00	16.	6.	6.	1.27
	HYDROGRAPH AT						
+		177B	2.	12.00	0.	0.	0.	0.02
	HYDROGRAPH AT						
+		248B	12.	12.00	2.	1.	1.	0.08
	HYDROGRAPH AT						
+		176B	6.	12.00	1.	0.	0.	0.02
	5 COMBINED AT						
+		41C	96.	12.00	21.	7.	7.	1.51
	HYDROGRAPH AT						
+		286B	119.	12.00	15.	5.	5.	0.42
	HYDROGRAPH AT						
+		181B	15.	12.00	2.	1.	1.	0.03
	3 COMBINED AT						
+		43C	230.	12.00	37.	13.	13.	1.96
	HYDROGRAPH AT						
+		2B	32.	12.17	6.	2.	2.	0.08
	ROUTED TO						
+		38R	32.	12.17	6.	2.	2.	0.08
	HYDROGRAPH AT						
+		405B	6.	12.00	1.	0.	0.	0.01

+	HYDROGRAPH AT	288B	8.	12.00	1.	0.	0.	0.01
+	4 COMBINED AT	44C	265.	12.00	45.	15.	15.	2.06
+	HYDROGRAPH AT	415B	49.	12.00	5.	2.	2.	0.08
+	HYDROGRAPH AT	459B	80.	12.00	12.	4.	4.	0.18
+	4 COMBINED AT	3C	489.	12.00	78.	26.	26.	2.72
+	HYDROGRAPH AT	163B	37.	12.00	4.	1.	1.	0.06
+	HYDROGRAPH AT	7B	7.	12.00	1.	0.	0.	0.04
+	HYDROGRAPH AT	411B	20.	12.00	2.	1.	1.	0.03
+	4 COMBINED AT	12C	553.	12.00	86.	29.	29.	2.86
+	ROUTED TO	12R	553.	12.00	86.	29.	29.	2.86
+	HYDROGRAPH AT	141B	26.	12.17	5.	2.	2.	0.16
+	ROUTED TO	25R	26.	12.17	5.	2.	2.	0.16
+	HYDROGRAPH AT	139B	3.	12.00	1.	0.	0.	0.07
	ROUTED TO	23R	2.	12.17	1.	0.	0.	0.07
	HYDROGRAPH AT	140B	9.	12.00	1.	0.	0.	0.05
	2 COMBINED AT	24C	11.	12.00	2.	1.	1.	0.11
	ROUTED TO							

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+		24R	8.	12.17	2.	1.	1.	0.11		
+	HYDROGRAPH AT	138B	23.	12.17	4.	1.	1.	0.12		
+	3 COMBINED AT	18C	57.	12.17	11.	4.	4.	0.39		
+	ROUTED TO	18R	55.	12.17	11.	4.	4.	0.39		
+	HYDROGRAPH AT	155B	25.	12.00	4.	1.	1.	0.08		
+	HYDROGRAPH AT	149B	85.	12.17	14.	5.	5.	0.20		
+	2 COMBINED AT	4C	106.	12.17	18.	6.	6.	0.28		
+	ROUTED TO	4R	21.	13.00	17.	14.	14.	0.28		
+									4813.64	13.00
+	HYDROGRAPH AT	30B	38.	12.17	7.	2.	2.	0.15		
+	HYDROGRAPH AT	66B	17.	12.00	2.	1.	1.	0.05		
+	4 COMBINED AT	11C	117.	12.17	37.	21.	21.	0.87		
+	ROUTED TO	11R	117.	12.17	37.	21.	21.	0.87		
+	HYDROGRAPH AT	241B	25.	12.00	4.	1.	1.	0.09		
+	ROUTED TO	10R	25.	12.00	4.	1.	1.	0.09		
+	HYDROGRAPH AT	151B	4.	12.00	1.	0.	0.	0.01		
+	HYDROGRAPH AT	150B	28.	12.00	3.	1.	1.	0.05		
+	2 COMBINED AT	35C	33.	12.00	4.	1.	1.	0.06		

+	ROUTED TO	35R	5.	0.17	5.	5.	5.	0.06	4815.00	0.00
+	HYDROGRAPH AT	143B	16.	12.00	2.	1.	1.	0.04		
+	HYDROGRAPH AT	402B	6.	12.00	1.	0.	0.	0.02		
+	2 COMBINED AT	33C	23.	12.00	3.	1.	1.	0.06		
+	ROUTED TO	33R	5.	0.17	5.	5.	5.	0.06	4810.30	12.50
+	HYDROGRAPH AT	407B	7.	12.00	1.	0.	0.	0.02		
+	HYDROGRAPH AT	406B	5.	12.00	1.	0.	0.	0.03		
+	HYDROGRAPH AT	358B	2.	12.00	0.	0.	0.	0.01		
+	5 COMBINED AT	54C	24.	12.00	12.	11.	11.	0.17		
+	HYDROGRAPH AT	344B	17.	12.00	2.	1.	1.	0.04		
+	HYDROGRAPH AT	363B	8.	12.00	1.	0.	0.	0.02		
+	3 COMBINED AT	9C	50.	12.00	15.	12.	12.	0.23		
+	ROUTED TO	9R	50.	12.00	15.	12.	12.	0.23		

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

STAQ	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) =      10.00
               25R  MANE         1.00     25.99    730.49      0.35     10.00     25.72    730.00        0.35

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.2960E+01 EXCESS=0.0000E+00 OUTFLOW=0.2957E+01 BASIN STORAGE=0.3543E-02 PERCENT ERROR=   0.0

          FOR STORM = 1  STORM AREA (SQ MI) =      10.00
               23R  MANE         0.50      2.68    722.00      0.14     10.00      2.21    730.00        0.14

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.5098E+00 EXCESS=0.0000E+00 OUTFLOW=0.5084E+00 BASIN STORAGE=0.1490E-02 PERCENT ERROR=   0.0

          FOR STORM = 1  STORM AREA (SQ MI) =      10.00
               24R  MANE         1.00     10.99    724.00      0.20     10.00      8.20    730.00        0.21

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1245E+01 EXCESS=0.0000E+00 OUTFLOW=0.1240E+01 BASIN STORAGE=0.6146E-02 PERCENT ERROR=   0.0

          FOR STORM = 1  STORM AREA (SQ MI) =      10.00
               18R  MANE         1.50     56.03    732.00      0.32     10.00     54.90    730.00        0.32

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.6707E+01 EXCESS=0.0000E+00 OUTFLOW=0.6693E+01 BASIN STORAGE=0.2973E-01 PERCENT ERROR=  -0.2


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

100 YEAR HEC-1

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```
1*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              MAY   1991               *
*            VERSION 4.0.1E             *
*                                       *
*  RUN DATE            TIME             *
*                                       *
*****************************************
```

```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 551-1748              *
*                                       *
*****************************************
```

```
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

HEC-1 INPUT PAGE 1

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
    1     ID  HEC-1 Analysis using WMS
    2     ID  100 year devloped flow
    3     ID  MAY 2012
    4     IT      10 07MAY09       0     130
    5     IO       5
    6     IN       6 07MAY09       0
    7     JD    2.52    10.0
    8     * typeII-24hour
    9     PC     0.0   0.001   0.002  0.0031  0.0041  0.0051  0.0062  0.0073  0.0083  0.0094
   10     PC  0.0105  0.0116  0.0127  0.0138   0.015  0.0161  0.0173  0.0185  0.0196  0.0208
   11     PC   0.022  0.0232  0.0244  0.0256  0.0269  0.0281  0.0294  0.0307  0.0319  0.0332
   12     PC  0.0345  0.0358  0.0371  0.0384  0.0398  0.0411  0.0425  0.0439  0.0452  0.0466
   13     PC   0.048  0.0494  0.0508  0.0523  0.0538  0.0553  0.0568  0.0583  0.0598  0.0614
   14     PC   0.063  0.0646  0.0662  0.0679  0.0696  0.0712   0.073  0.0747  0.0764  0.0782
   15     PC    0.08  0.0818  0.0836  0.0855  0.0874  0.0892  0.0912  0.0931   0.095   0.097
   16     PC   0.099   0.101   0.103  0.1051  0.1072  0.1093  0.1114  0.1135  0.1156  0.1178
   17     PC    0.12  0.1223  0.1246  0.1271  0.1296  0.1323   0.135  0.1379  0.1408  0.1439
   18     PC   0.147  0.1502  0.1534  0.1566  0.1598   0.163  0.1663  0.1697  0.1733  0.1771
   19     PC   0.181  0.1851  0.1895  0.1941  0.1989   0.204  0.2094  0.2152  0.2214   0.228
   20     PC   0.235  0.2427  0.2513  0.2609  0.2715   0.283  0.3068  0.3544  0.4308  0.5679
   21     PC   0.663   0.682  0.6986   0.713  0.7252   0.735  0.7434  0.7514  0.7588  0.7656
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21          PC   0.772   0.778  0.7836   0.789  0.7942   0.799  0.8036   0.808  0.8122  0.8162
22          PC    0.82  0.8237  0.8273  0.8308  0.8342  0.8376  0.8409  0.8442  0.8474  0.8505
23          PC  0.8535  0.8565  0.8594  0.8622  0.8649  0.8676  0.8702  0.8728  0.8753  0.8777
24          PC    0.88  0.8823  0.8845  0.8868   0.889  0.8912  0.8933  0.8955  0.8976  0.8997
25          PC  0.9018  0.9038  0.9058  0.9078  0.9097  0.9117  0.9136  0.9155  0.9174  0.9192
26          PC   0.921  0.9228  0.9245  0.9263   0.928  0.9297  0.9314   0.933  0.9346  0.9362
27          PC  0.9377  0.9393  0.9408  0.9423  0.9437  0.9452  0.9466   0.948  0.9494  0.9507
28          PC   0.952  0.9533  0.9546  0.9559  0.9572  0.9584  0.9597   0.961  0.9622  0.9635
29          PC  0.9648   0.966  0.9672  0.9685  0.9697  0.9709  0.9722  0.9734  0.9746  0.9758
30          PC   0.977  0.9782  0.9794  0.9806  0.9818  0.9829  0.9841  0.9853  0.9864  0.9876
31          PC  0.9888  0.9899   0.991  0.9922  0.9933  0.9944  0.9956  0.9967  0.9978  0.9989
32          PC     1.0

33          KK    329B
34          KO       0       0     0.0       0      22
35          BA  0.0487
36          LS     0.0    74.2     0.0
37          UD  0.1151

38          KK    403B
39          KO       0       0     0.0       0      22
40          BA  0.0216
41          LS     0.0   74.49     0.0
42          UD  0.0893

43          KK     37C   CNAME     37R
44          KO       0       0     0.0       0      22
45          HC       2
```

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

  46      KK     37R   CNAME     37C
  47      KO       0       0     0.0       0      22
  48      RS       1    FLOW     0.0     0.0
          * 37C Volume
  49      SV     0.00.1266630.253327 0.379990.5066530.633316 0.759980.8866431.0133061.139969
  50      SV  1.26661.3932961.5199591.6466221.7732861.8999492.0266122.1532752.2799392.406602
          * 37C Elevation
  51      SE  4742.04742.4214742.8424743.2634743.6844744.1054744.5264744.9474745.3684745.789
  52      SE  4746.24746.6314747.0524747.4734747.8944748.3154748.7364749.1574749.578  4750.0
          * 37C Discharge
  53      SQ     0.02.197453 8.3679616.4140423.1448215.9029218.6881421.1090223.2794925.26417
  54      SQ  27.10328.8264930.4517731.9946033.4663734.8761036.2310137.5370538.7991540.02147
          * 37C Elevation
  55      SE  4742.04742.4214742.8424743.2634743.6844744.1054744.5264744.9474745.3684745.789
  56      SE  4746.24746.6314747.0524747.4734747.8944748.3154748.7364749.1574749.578  4750.0

  57      KK     11B
  58      KO       0       0     0.0       0      22
  59      BA  0.1161
  60      LS     0.0    57.0     0.0
  61      UD  0.0767

  62      KK      6R   CNAME      6C
  63      KO       0       0     0.0       0      22
  64      RN      6R

  65      KK     10B
  66      KO       0       0     0.0       0      22
  67      BA  0.1616
  68      LS     0.0   71.74     0.0
  69      UD  0.1283

  70      KK     13C   CNAME     13R
  71      KO       0       0     0.0       0      22
  72      HC       2

  73      KK     13R   CNAME     13C
  74      KO       0       0     0.0       0      22
  75      RS       1    FLOW     0.0     0.0
          * 13C Volume
          SV     0.00.9742581.9639382.969202 3.990215.0271236.0801017.1493058.2348969.337034
          SV  10.45511.5915912.7443313.9142715.1015516.3063517.5288218.7691220.0274121.30386
          * 13C Elevation
          SE  4800.04800.5264801.0524801.5784802.1054802.6314803.1574803.6844804.2104804.736
          SE  4805.24805.7894806.3154806.8424807.3684807.8944808.4214808.9474809.473  4810.0
          * 13C Discharge
          SQ     0.03.42952912.3279421.8209515.9029219.3218222.2207724.7829127.1039229.24128
          SQ  31.23233.1045734.8761036.5618938.1733239.7194241.2075542.6437844.0331945.38008
          * 13C Elevation
          SE  4800.04800.5264801.0524801.5784802.1054802.6314803.1574803.6844804.2104804.736
          SE  4805.24805.7894806.3154806.8424807.3684807.8944808.4214808.9474809.473  4810.0
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LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  84          KK     98B
  85          KO       0       0     0.0       0      22
  86          BA  0.1097
  87          LS     0.0   64.48     0.0
  88          UD  0.0812

  89          KK     29R   CNAME     29C
  90          KO       0       0     0.0       0      22
  91          RN     29R

  92          KK    408B
  93          KO       0       0     0.0       0      22
  94          BA  0.0830
  95          LS     0.0   66.25     0.0
  96          UD  0.1008

  97          KK     99B
  98          KO       0       0     0.0       0      22
  99          BA  0.0594
 100          LS     0.0   78.61     0.0
 101          UD  0.0694

 102          KK     30C   CNAME     30R
 103          KO       0       0     0.0       0      22
 104          HC       3

 105          KK    103B
 106          KO       0       0     0.0       0      22
 107          BA  0.0102
 108          LS     0.0    84.1     0.0
 109          UD  0.1933

 110          KK    401B
 111          KO       0       0     0.0       0      22
 112          BA  0.1360
 113          LS     0.0   74.82     0.0
 114          UD  0.1917

 115          KK     32C   CNAME     32R
 116          KO       0       0     0.0       0      22
 117          HC       3

 118          KK    101B
 119          KO       0       0     0.0       0      22
 120          BA  0.1138
 121          LS     0.0   64.94     0.0
 122          UD  0.1459

 123          KK     31R   CNAME     31C
 124          KO       0       0     0.0       0      22
 125          RN     31R
```

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

 126           KK     83B
 127           KO       0       0     0.0       0      22
 128           BA  0.5686
 129           LS     0.0   58.07     0.0
 130           UD  0.0556

 131           KK     19R   CNAME     19C
 132           KO       0       0     0.0       0      22
 133           RN     19R

 134           KK     86B
 135           KO       0       0     0.0       0      22
 136           BA  0.0259
 137           LS     0.0   73.61     0.0
 138           UD  0.0556

 139           KK     21C   CNAME     21R
 140           KO       0       0     0.0       0      22
 141           HC       2

 142           KK     85B
 143           KO       0       0     0.0       0      22
 144           BA  0.1593
 145           LS     0.0   63.35     0.0
 146           UD  0.0556

 147           KK     16C   CNAME     16R
 148           KO       0       0     0.0       0      22
 149           HC       2

 150           KK     81B
 151           KO       0       0     0.0       0      22
 152           BA  0.1869
 153           LS     0.0   58.02     0.0
 154           UD  0.0556

 155           KK     17R   CNAME     17C
 156           KO       0       0     0.0       0      22
 157           RN     17R

 158           KK     84B
 159           KO       0       0     0.0       0      22
 160           BA  0.1198
 161           LS     0.0   67.12     0.0
 162           UD  0.0556

 163           KK     20C   CNAME     20R
 164           KO       0       0     0.0       0      22
 165           HC       3
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LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  166         KK     79B
  167         KO       0       0     0.0       0      22
  168         BA  0.0165
  169         LS     0.0   68.61     0.0
  170         UD  0.0556

  171         KK     15R   CNAME     15C
  172         KO       0       0     0.0       0      22
  173         RN     15R

  174         KK     78B
  175         KO       0       0     0.0       0      22
  176         BA  0.0764
  177         LS     0.0   61.01     0.0
  178         UD  0.0556

  179         KK      8C   CNAME      8R
  180         KO       0       0     0.0       0      22
  181         HC       2

  182         KK     87B
  183         KO       0       0     0.0       0      22
  184         BA  0.0637
  185         LS     0.0   66.31     0.0
  186         UD  0.0556

  187         KK     22C   CNAME     22R
  188         KO       0       0     0.0       0      22
  189         HC       2

  190         KK     77B
  191         KO       0       0     0.0       0      22
  192         BA  0.0564
  193         LS     0.0   62.17     0.0
  194         UD  0.0556

  195         KK      7C   CNAME      7R
  196         KO       0       0     0.0       0      22
  197         HC       3

  198         KK    177B
  199         KO       0       0     0.0       0      22
  200         BA  0.0215
  201         LS     0.0    64.7     0.0
  202         UD  0.0320

  203         KK    248B
  204         KO       0       0     0.0       0      22
  205         BA  0.0832
  206         LS     0.0   66.07     0.0
  207         UD  0.0813
```

LINE	ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10					
208	KK	176B				
209	KO	0	0	0.0	0	22
210	BA	0.0174				
211	LS	0.0	75.39	0.0		
212	UD	0.1412				
213	KK	41C	CNAME	41R		
214	KO	0	0	0.0	0	22
215	HC	5				
216	KK	286B				
217	KO	0	0	0.0	1	22
218	BA	0.4184				
219	LS	0.0	70.78	0.0		
220	UD	0.0268				
221	KK	181B				
222	KO	0	0	0.0	1	22
223	BA	0.0313				
224	LS	0.0	77.05	0.0		
225	UD	0.0991				
226	KK	43C	CNAME	43R		
227	KO	0	0	0.0	0	22
228	HC	3				
229	KK	2B				
230	KO	0	0	0.0	1	22
231	BA	0.0817				
232	LS	0.0	81.16	0.0		
233	UD	0.3103				
234	KK	38R	CNAME	38C		
235	KO	0	0	0.0	0	22
236	RN	38R				
237	KK	405B				
238	KO	0	0	0.0	1	22
239	BA	0.0092				
240	LS	0.0	80.21	0.0		
241	UD	0.0730				
242	KK	288B				
243	KO	0	0	0.0	1	22
244	BA	0.0149				
245	LS	0.0	78.34	0.0		
246	UD	0.0664				
247	KK	44C	CNAME	44R		
248	KO	0	0	0.0	0	22
249	HC	4				

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

 250          KK    415B
 251          KO       0       0     0.0       1      22
 252          BA  0.0771
 253          LS     0.0   80.26     0.0
 254          UD  0.0921

 255          KK    459B
 256          KO       0       0     0.0       1      22
 257          BA  0.1803
 258          LS     0.0   79.85     0.0
 259          UD  0.1662

 260          KK      3C   CNAME      3R
 261          KO       0       0     0.0       0      22
 262          HC       4

 263          KK    163B
 264          KO       0       0     0.0       1      22
 265          BA  0.0618
 266          LS     0.0   80.62     0.0
 267          UD  0.1138

 268          KK      7B
 269          KO       0       0     0.0       1      22
 270          BA  0.0408
 271          LS     0.0   67.23     0.0
 272          UD  0.0556

 273          KK    411B
 274          KO       0       0     0.0       1      22
 275          BA  0.0331
 276          LS     0.0   79.74     0.0
 277          UD  0.0892

 278          KK     12C   CNAME     12R
 279          KO       0       0     0.0       0      22
 280          HC       4

 281          KK     12R   CNAME     12C
 282          KO       0       0     0.0       0      22
 283          RN     12R

 284          KK    141B
 285          KO       0       0     0.0       1      22
 286          BA  0.1600
 287          LS     0.0   69.57     0.0
 288          UD  0.1866

 289          KK     25R   CNAME     25C
 290          KO       0       0     0.0       0      22
 291          RD  1297.6 0.07153   0.013            CIRC     2.0     0.0
```

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

  292         KK    139B
  293         KO       0       0     0.0       0      22
  294         BA  0.0660
  295         LS     0.0   61.27     0.0
  296         UD  0.0702

  297         KK     23R   CNAME     23C
  298         KO       0       0     0.0       0      22
  299         RD  1357.8 0.04276   0.013             CIRC     2.0     0.0

  300         KK    140B
  301         KO       0       0     0.0       0      22
  302         BA  0.0475
  303         LS     0.0   67.54     0.0
  304         UD  0.0616

  305         KK     24C   CNAME     24R
  306         KO       0       0     0.0       0      22
  307         HC       2

  308         KK     24R   CNAME     24C
  309         KO       0       0     0.0       0      22
  310         RD  3765.7 0.06856   0.013             CIRC     2.0     0.0

  311         KK    138B
  312         KO       0       0     0.0       0      22
  313         BA  0.1174
  314         LS     0.0   71.23     0.0
  315         UD  0.2069

  316         KK     18C   CNAME     18R
  317         KO       0       0     0.0       0      22
  318         HC       3

  319         KK     18R   CNAME     18C
  320         KO       0       0     0.0       0      22
  321         RD  3528.0 0.04879   0.013             TRAP     2.0     0.0

  322         KK    155B
  323         KO       0       0     0.0       0      22
  324         BA  0.0758
  325         LS     0.0   75.21     0.0
  326         UD  0.1458

  327         KK    149B
  328         KO       0       0     0.0       0      22
  329         BA  0.2020
  330         LS     0.0   80.17     0.0
  331         UD  0.2477
```

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

  332     KK      4C   CNAME      4R
  333     KO       0       0     0.0       0      22
  334     HC       2

  335     KK      4R   CNAME      4C
  336     KO       0       0     0.0       0      22
  337     RS       1    FLOW     0.0     0.0
          * 4C Volume
  338     SV     0.00.2728530.5501420.8319091.118195 1.409041.7044872.0045762.3093492.618846
  339     SV  2.93313.2521783.5760963.9049024.2386384.5773464.921066 5.269845.6237085.982713
          * 4C Elevation
  340     SE  4811.04811.2104811.4214811.6314811.8424812.0524812.2634812.4734812.6844812.894
  341     SE  4813.14813.3154813.5264813.7364813.9474814.1574814.3684814.5784814.789  4815.0
          * 4C Discharge
  342     SQ  12.76313.3469013.9061714.4438114.9621415.4631015.9483316.4192316.8770017.32267
  343     SQ  17.75718.1812818.7378822.8393729.3622537.5566847.1173257.86315 69.670582.44792
          * 4C Elevation
  344     SE  4811.04811.2104811.4214811.6314811.8424812.0524812.2634812.4734812.6844812.894
  345     SE  4813.14813.3154813.5264813.7364813.9474814.1574814.3684814.5784814.789  4815.0

  346     KK     30B
  347     KO       0       0     0.0       0      22
  348     BA  0.1491
  349     LS     0.0   74.12     0.0
  350     UD  0.2306

  351     KK     66B
  352     KO       0       0     0.0       0      22
  353     BA  0.0522
  354     LS     0.0    72.0     0.0
  355     UD  0.0556

  356     KK     11C   CNAME     11R
  357     KO       0       0     0.0       0      22
  358     HC       4

  359     KK     11R   CNAME     11C
  360     KO       0       0     0.0       0      22
  361     RN     11R

  362     KK    241B
  363     KO       0       0     0.0       0      22
  364     BA  0.0949
  365     LS     0.0   73.24     0.0
  366     UD  0.1459

  367     KK     10R   CNAME     10C
  368     KO       0       0     0.0       0      22
  369     RN     10R
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  370     KK    151B
  371     KO       0       0     0.0       0      22
  372     BA  0.0132
  373     LS     0.0   72.23     0.0
  374     UD  0.0337

  375     KK    150B
  376     KO       0       0     0.0       0      22
  377     BA  0.0461
  378     LS     0.0   79.46     0.0
  379     UD  0.0407

  380     KK     35C   CNAME     35R
  381     KO       0       0     0.0       0      22
  382     HC       2

  383     KK     35R   CNAME     35C
  384     KO       0       0     0.0       0      22
  385     RS       1    FLOW     0.0     0.0
          * 35C Volume
  386     SV     1.0     2.0     3.0     4.0     5.0     6.0     7.0     8.0     9.0    10.0
          * 35C Elevation
  387     SE  4815.0  4816.0  4817.0  4818.0  4819.0  4820.0  4821.0  4822.0  4823.0  4824.0
          * 35C Discharge
  388     SQ     5.0     5.0     5.0     5.0     5.0     5.0     5.0     5.0     5.0     5.0
          * 35C Elevation
  389     SE  4815.0  4816.0  4817.0  4818.0  4819.0  4820.0  4821.0  4822.0  4823.0  4824.0

  390     KK    143B
  391     KO       0       0     0.0       0      22
  392     BA  0.0414
  393     LS     0.0    74.0     0.0
  394     UD  0.0120

  395     KK    402B
  396     KO       0       0     0.0       0      22
  397     BA  0.0153
  398     LS     0.0    74.0     0.0
  399     UD  0.0514

  400     KK     33C   CNAME     33R
  401     KO       0       0     0.0       0      22
  402     HC       2

  403     KK     33R   CNAME     33C
  404     KO       0       0     0.0       0      22
  405     RS       1    FLOW     0.0     0.0
          * 33C Volume
  406     SV     0.0     1.0     2.0     3.0     4.0     5.0     6.0     7.0     8.0     9.0
          * 33C Elevation
  407     SE  4810.0  4811.0  4812.0  4813.0  4814.0  4815.0  4816.0  4817.0  4818.0  4819.0
          * 33C Discharge
  408     SQ     5.0     5.0     5.0     5.0     5.0     5.0     5.0     5.0     5.0     5.0
          * 33C Elevation
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LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  409         SE  4810.0  4811.0  4812.0  4813.0  4814.0  4815.0  4816.0  4817.0  4818.0  4819.0

  410         KK    407B
  411         KO       0       0     0.0       0      22
  412         BA  0.0182
  413         LS     0.0    74.0     0.0
  414         UD  0.0532

  415         KK    406B
  416         KO       0       0     0.0       0      22
  417         BA  0.0256
  418         LS     0.0   68.46     0.0
  419         UD  0.0717

  420         KK    358B
  421         KO       0       0     0.0       0      22
  422         BA  0.0053
  423         LS     0.0    72.0     0.0
  424         UD  0.0822

  425         KK     54C   CNAME     54R
  426         KO       0       0     0.0       0      22
  427         HC       5

  428         KK    344B
  429         KO       0       0     0.0       0      22
  430         BA  0.0449
  431         LS     0.0   73.99     0.0
  432         UD  0.0895

  433         KK    363B
  434         KO       0       0     0.0       0      22
  435         BA  0.0208
  436         LS     0.0   75.76     0.0
  437         UD  0.1262

  438         KK      9C   CNAME      9R
  439         KO       0       0     0.0       0      22
  440         HC       3

  441         KK      9R   CNAME      9C
  442         KO       0       0     0.0       0      22
  443         RN      9R
  444         ZZ
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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	329B	22.	12.00	3.	1.	1.	0.05		
+	HYDROGRAPH AT	403B	11.	12.00	1.	0.	0.	0.02		
+	2 COMBINED AT	37C	33.	12.00	4.	1.	1.	0.07		
+	ROUTED TO	37R	20.	12.17	4.	1.	1.	0.07		
+									4743.48	12.17
+	HYDROGRAPH AT	11B	2.	12.33	1.	0.	0.	0.12		
+	ROUTED TO	6R	2.	12.33	1.	0.	0.	0.12		
+	HYDROGRAPH AT	10B	54.	12.00	8.	3.	3.	0.16		
+	2 COMBINED AT	13C	56.	12.00	9.	3.	3.	0.28		
+	ROUTED TO	13R	11.	12.83	7.	3.	3.	0.28		
+									4800.96	12.83
+	HYDROGRAPH AT	98B	19.	12.00	3.	1.	1.	0.11		
+	ROUTED TO	29R	19.	12.00	3.	1.	1.	0.11		
+	HYDROGRAPH AT	408B	17.	12.00	3.	1.	1.	0.08		
+	HYDROGRAPH AT	99B	42.	12.00	5.	1.	1.	0.06		
+	3 COMBINED AT	30C	78.	12.00	10.	3.	3.	0.25		
+	HYDROGRAPH AT	103B	7.	12.17	1.	0.	0.	0.01		
+	HYDROGRAPH AT	401B	49.	12.17	8.	3.	3.	0.14		
	3 COMBINED AT									

+	32C	128.	12.00	19.	6.	6.	0.40
+ HYDROGRAPH AT	101B	14.	12.17	3.	1.	1.	0.11
+ ROUTED TO	31R	14.	12.17	3.	1.	1.	0.11
+ HYDROGRAPH AT	83B	17.	12.00	7.	2.	2.	0.57
+ ROUTED TO	19R	17.	12.00	7.	2.	2.	0.57
+ HYDROGRAPH AT	86B	13.	12.00	1.	0.	0.	0.03
+ 2 COMBINED AT	21C	29.	12.00	8.	3.	3.	0.59
+ HYDROGRAPH AT	85B	23.	12.00	4.	1.	1.	0.16
+ 2 COMBINED AT	16C	52.	12.00	12.	4.	4.	0.75
+ HYDROGRAPH AT	81B	5.	12.00	2.	1.	1.	0.19
+ ROUTED TO	17R	5.	12.00	2.	1.	1.	0.19
+ HYDROGRAPH AT	84B	30.	12.00	4.	1.	1.	0.12
+ 3 COMBINED AT	20C	88.	12.00	18.	6.	6.	1.06
+ HYDROGRAPH AT	79B	5.	12.00	1.	0.	0.	0.02
+ ROUTED TO	15R	5.	12.00	1.	0.	0.	0.02
+ HYDROGRAPH AT	78B	6.	12.00	1.	0.	0.	0.08
+ COMBINED AT	8C	11.	12.00	2.	1.	1.	0.09
+ HYDROGRAPH AT	87B	15.	12.00	2.	1.	1.	0.06
+ 2 COMBINED AT	22C	26.	12.00	4.	1.	1.	0.16
+ HYDROGRAPH AT	77B	6.	12.00	1.	0.	0.	0.06

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	3 COMBINED AT						
+	7C	120.	12.00	23.	8.	8.	1.27
	HYDROGRAPH AT						
+	177B	4.	12.00	1.	0.	0.	0.02
	HYDROGRAPH AT						
+	248B	18.	12.00	2.	1.	1.	0.08
	HYDROGRAPH AT						
+	176B	8.	12.00	1.	0.	0.	0.02
	5 COMBINED AT						
+	41C	163.	12.00	30.	10.	10.	1.51
	HYDROGRAPH AT						
+	286B	160.	12.00	19.	6.	6.	0.42
	HYDROGRAPH AT						
+	181B	19.	12.00	2.	1.	1.	0.03
	3 COMBINED AT						
+	43C	341.	12.00	51.	17.	17.	1.96
	HYDROGRAPH AT						
+	2B	39.	12.17	7.	2.	2.	0.08
	ROUTED TO						
+	38R	39.	12.17	7.	2.	2.	0.08
	HYDROGRAPH AT						
+	405B	7.	12.00	1.	0.	0.	0.01
	HYDROGRAPH AT						
+	288B	10.	12.00	1.	0.	0.	0.01
	4 COMBINED AT						
+	44C	384.	12.00	60.	20.	20.	2.06
	HYDROGRAPH AT						
+	415B	59.	12.00	7.	2.	2.	0.08
	HYDROGRAPH AT						
+	459B	98.	12.00	15.	5.	5.	0.18
	4 COMBINED AT						
+	3C	668.	12.00	100.	33.	33.	2.72
	HYDROGRAPH AT						
+	163B	44.	12.00	5.	2.	2.	0.06
	HYDROGRAPH AT						
+	7B	10.	12.00	1.	0.	0.	0.04
	HYDROGRAPH AT						
+	411B	25.	12.00	3.	1.	1.	0.03
	4 COMBINED AT						
+	12C	747.	12.00	110.	36.	36.	2.86

+	ROUTED TO	12R	747.	12.00	110.	36.	36.	2.86	
+	HYDROGRAPH AT	141B	36.	12.17	6.	2.	2.	0.16	
+	ROUTED TO	25R	35.	12.17	6.	2.	2.	0.16	
+	HYDROGRAPH AT	139B	6.	12.00	1.	0.	0.	0.07	
+	ROUTED TO	23R	5.	12.00	1.	0.	0.	0.07	
+	HYDROGRAPH AT	140B	13.	12.00	2.	1.	1.	0.05	
+	2 COMBINED AT	24C	18.	12.00	3.	1.	1.	0.11	
+	ROUTED TO	24R	13.	12.00	3.	1.	1.	0.11	
+	HYDROGRAPH AT	138B	31.	12.17	5.	2.	2.	0.12	
+	3 COMBINED AT	18C	79.	12.17	15.	5.	5.	0.39	
+	ROUTED TO	18R	77.	12.17	15.	5.	5.	0.39	
+	HYDROGRAPH AT	155B	32.	12.00	5.	2.	2.	0.08	
+	HYDROGRAPH AT	149B	103.	12.17	17.	5.	5.	0.20	
+	2 COMBINED AT	4C	129.	12.17	22.	7.	7.	0.28	
+	ROUTED TO	4R	35.	12.67	20.	15.	15.	0.28	
+									4814.08 12.67
+	HYDROGRAPH AT	30B	49.	12.17	9.	3.	3.	0.15	
+	HYDROGRAPH AT	66B	22.	12.00	3.	1.	1.	0.05	
+	2 COMBINED AT	11C	154.	12.17	45.	23.	23.	0.87	
+	ROUTED TO	11R	154.	12.17	45.	23.	23.	0.87	

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	HYDROGRAPH AT								
+		241B	33.	12.00	5.	2.	2.	0.09	
	ROUTED TO								
+		10R	33.	12.00	5.	2.	2.	0.09	
	HYDROGRAPH AT								
+		151B	6.	12.00	1.	0.	0.	0.01	
	HYDROGRAPH AT								
+		150B	34.	12.00	4.	1.	1.	0.05	
	2 COMBINED AT								
+		35C	40.	12.00	4.	1.	1.	0.06	
	ROUTED TO								
+		35R	5.	0.17	5.	5.	5.	0.06	
+								4815.00	0.00
	HYDROGRAPH AT								
+		143B	21.	12.00	2.	1.	1.	0.04	
	HYDROGRAPH AT								
+		402B	8.	12.00	1.	0.	0.	0.02	
	2 COMBINED AT								
+		33C	29.	12.00	3.	1.	1.	0.06	
	ROUTED TO								
+		33R	5.	0.17	5.	5.	5.	0.06	
+								4810.49	12.50
	HYDROGRAPH AT								
+		407B	9.	12.00	1.	0.	0.	0.02	
	HYDROGRAPH AT								
+		406B	8.	12.00	1.	0.	0.	0.03	
	HYDROGRAPH AT								
+		358B	2.	12.00	0.	0.	0.	0.01	
	5 COMBINED AT								
+		54C	29.	12.00	12.	11.	11.	0.17	
	HYDROGRAPH AT								
+		344B	22.	12.00	3.	1.	1.	0.04	
	HYDROGRAPH AT								
+		363B	10.	12.00	1.	0.	0.	0.02	
	3 COMBINED AT								
+		9C	61.	12.00	16.	12.	12.	0.23	
	ROUTED TO								
+		9R	61.	12.00	16.	12.	12.	0.23	

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

INTERPOLATED TO

ISTAQ	ELEMENT	DT	PEAK	TIME TO PEAK	VOLUME	COMPUTATION INTERVAL DT	PEAK	TIME TO PEAK	VOLUME
		(MIN)	(CFS)	(MIN)	(IN)	(MIN)	(CFS)	(MIN)	(IN)
FOR STORM = 1 STORM AREA (SQ MI) =					10.00				
25R	MANE	0.94	35.56	730.30	0.45	10.00	35.38	730.00	0.45

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.3804E+01 EXCESS=0.0000E+00 OUTFLOW=0.3801E+01 BASIN STORAGE=0.4098E-02 PERCENT ERROR= 0.0

FOR STORM = 1 STORM AREA (SQ MI) =					10.00				
23R	MANE	0.50	5.82	722.00	0.21	10.00	4.93	720.00	0.21

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.7282E+00 EXCESS=0.0000E+00 OUTFLOW=0.7265E+00 BASIN STORAGE=0.1807E-02 PERCENT ERROR= 0.0

FOR STORM = 1 STORM AREA (SQ MI) =					10.00				
24R	MANE	1.00	17.38	723.00	0.28	10.00	12.90	720.00	0.28

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.1692E+01 EXCESS=0.0000E+00 OUTFLOW=0.1686E+01 BASIN STORAGE=0.7309E-02 PERCENT ERROR= 0.0

FOR STORM = 1 STORM AREA (SQ MI) =					10.00				
18R	MANE	1.54	77.93	731.22	0.41	10.00	76.86	730.00	0.42

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.8656E+01 EXCESS=0.0000E+00 OUTFLOW=0.8640E+01 BASIN STORAGE=0.3327E-01 PERCENT ERROR= -0.2

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