APPENDIX G

DRAINAGE STUDY

DRAINAGE STUDY
for
IONE BAND OF MIWOK INDIANS
CASINO PROJECT

Prepared for:

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January, 2004

DRAINAGE STUDY
FOR
IONE BAND OF MIWOK INDIANS CASINO PROJECT

The Ione Band of Miwok Indians Casino Project encompasses approximately 216 acres, located on the east side of Highway 49, south of the City of Plymouth, in Amador County, California. The majority of the site is currently undeveloped, although there is an established commercial strip adjacent to the Highway.

The project area contributes to two distinct watersheds. Approximately 101 acres in the central portion of the site consist of mildly sloping grassland with scattered trees and brush. This area drains from south to north into Little Indian Creek. An existing on-site pond provides limited detention for a portion of the runoff. Little Indian Creek has its origin in approximately 100 acres of off-site watershed area on the west side of Highway 49. The Creek crosses the highway onto the project, thence flows northerly in a channel that roughly parallels Highway 49. Site runoff enters Little Indian Creek at several locations. The combined flow crosses Highway 49 just north of the project. The eastern and southern project perimeters are more steeply sloped, and support growths of heavy brush and/or trees. The perimeter area can be divided into seven relatively small shed areas tributary to Dry Creek. The Dry Creek channel, flowing in a southeasterly direction, is located off-site, to the south of the project.

Details of proposed site development are unknown at the time this drainage study is being completed. For purposes of the analysis, it is assumed that slope constraints preclude development within the Dry Creek sheds. It is assumed that the project area within the Little Indian Creek watershed will be fully developed, and will utilize storm drain pipes to collect and convey runoff across the project area to the existing point of discharge of Little Indian Creek near the northern project boundary. On-site storm water detention is provided for the purpose of peak flow mitigation.

The drainage study was completed in adherence to current practices utilizing the following parameters:

- Precipitation – Mean annual precipitation over the project area is estimated to be 30 inches. The 24-hour precipitation total for a 100-year event is 5.31". Based on shed elevations, the SCS Type 1 storm pattern was used.
- Runoff Curve Numbers – Curve numbers (CN's) reflect soil type and land use within shed areas. Soils underlying the study area are classified in the Exchequer series, in hydrologic soil group D, characterized by high runoff potential and low infiltration. CN's used in the study are summarized in Table 1.
- Times of Concentration / Lag Times – Times of concentration for pre-project conditions were computed using standard equations. Post-project

times of concentration were assumed to be 10 – 15 minutes. Lag times were estimated to be 0.6 x time of concentration.

- Runoff Computations – The graphical HEC-1 computer program was used to develop runoff hydrographs based on the SCS unit hydrograph method.

HEC-1 hydrograph computations represent pre- and post-project runoff due to a 100-year storm. The study area encompasses only the area draining to Little Indian Creek, which was divided into on-site sheds 8, 9, 10, 11, and 12 as shown on the Exhibit. Shed W encompasses the off-site headwater area west of Highway 49. The convergence point for these sheds, the key point in the analyses, was assumed to occur where little Indian Creek crosses the north boundary of the project area.

Project build-out is assumed to result in impervious coverage of 90% of the area within Sheds 8-12. The remaining 10% of each shed is assumed to consist of landscaped area, resulting in a composite runoff curve number (CN) of 96 representing the post-project condition in each shed. Since storm drain layouts are not yet determined, times of concentration of 10 minutes or 15 minutes were assumed.

Detailed derivations of the Hec-1 input parameters, summarized in Table 1, are included in the Technical Appendix.

Table 1 – HEC-1 Input Parameters

		PRE-PROJECT		POST-PROJECT	
SHED	**AREA (sq mi)**	**CN**	**LAG (hrs)**	**CN**	**LAG (hrs)**
W	0.1563	74	0.255	74	0.255
8	0.0419	78	0.204	96	0.15
9	0.0578	78	0.183	96	0.15
10	0.0205	78	0.159	96	0.15
11	0.0209	80	0.124	96	0.10
12	0.0169	85	0.150	96	0.15

Detention storage for the purpose of post-project peak flow reduction is provided at the existing pond location. The goal of detention design is to limit releases so that flow at the northern project boundary, where detention outflow converges with flow in Little Indian Creek, is at or below the pre-project level. Runoff from sheds 8 and 9 is routed through the detention facility. The analyses indicate that modifications to the existing pond can result in a stage-storage-discharge configuration adequate to provide mitigation of increased runoff resulting from development within sheds 8-12. These results are summarized in Table 2. The complete HEC-1 runs are included in the Technical Appendix

Table 2 – HEC-1 Output Summary

	100-YEAR RUNOFF	
Location	***Pre-Project***	***Post-Project***
Upper reach of Little Indian Creek @ Confluence of Sheds W & 11	139 cfs	146 cfs
Middle reach of Little Indian Creek @ Confluence with Shed 10	155 cfs	177 cfs
Detention Inflow 1/	42	173 cfs
Detention Outflow 2/	41	62 cfs
Little Indian Creek @ project boundary (Confluence of detention outflow & Shed 12 with flow in main channel)	***258 cfs***	***257 cfs***

1/ Shed 8 runoff
2/ Combined runoff from Sheds 8 & 9

Hydrograph routing computations, summarized in Table 2 and included in detail in the Technical Appendix, show that increased runoff resulting from development of the Ione Band of Miwok Indians Casino Project according to assumptions outlined herein can be mitigated by means of on-site detention storage.

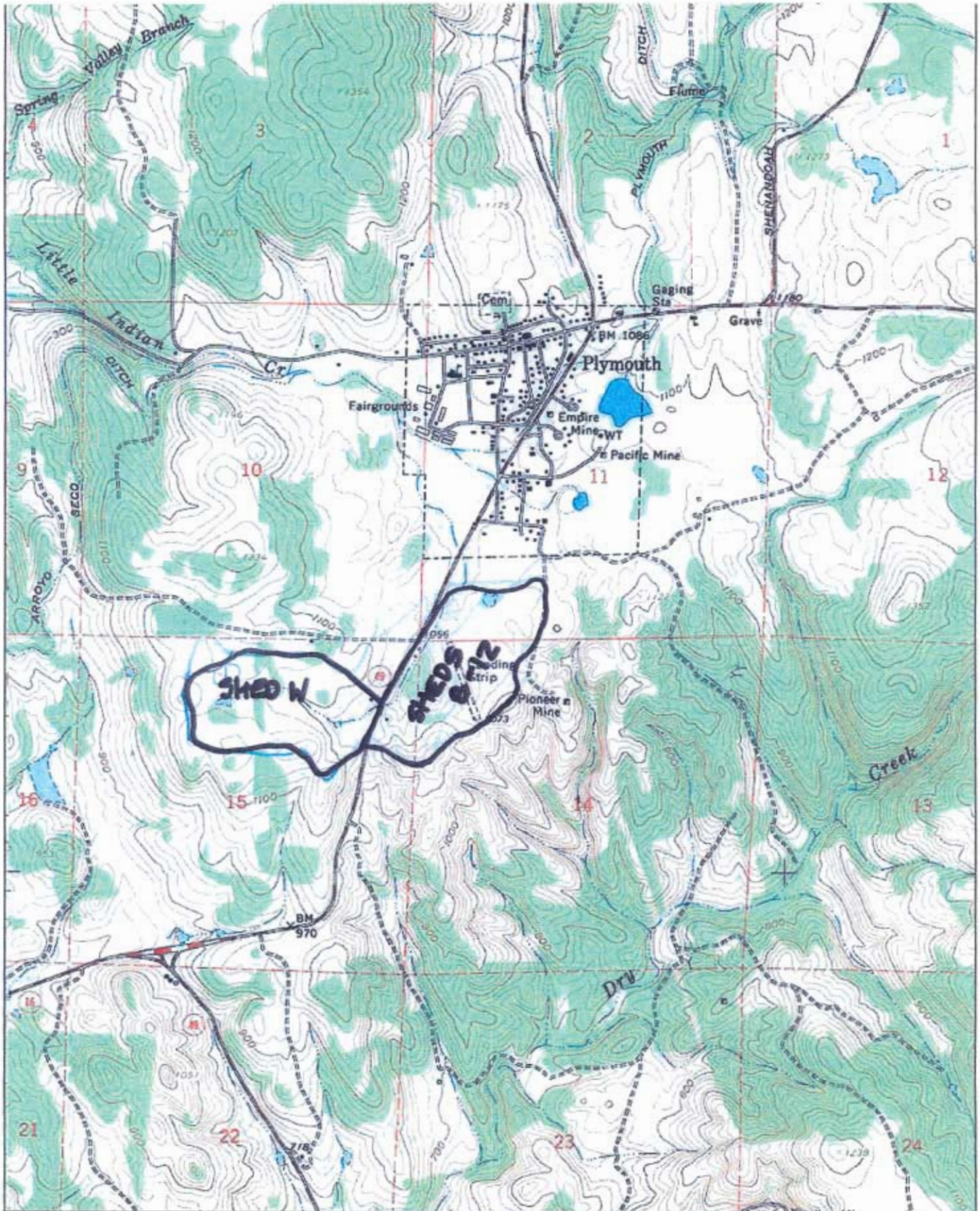
RESOURCES

Amador County Guidelines for Grading and Erosion Control, Amador County Public Works Agency, issued 11-21-03.

Erosion & Sediment Control Guidelines for Developing Areas of the Sierra Foothills and Mountains, High Sierra RC&D Council, October 1991.

Soil Survey Amador Area, California, United States Department of Agriculture Soil Conservation Service in cooperation with California Agricultural Experiment Station, August 1993.

TECHNICAL APPENDIX



Map created with TOPO!® ©2002 National Geographic (www.nationalgeographic.com/topo)

SHED MAP - IONE BAND OF MIWOK INDIANS COGINO PROJECT

SCS SOIL SURVEY

IONE BAND OF MIWOK INDIANS CASINO PROJECT EIS

DERIVATION OF SHED PARAMETERS USED IN HYDROLOGIC COMPUTATIONS - PRE-PROJECT CONDITONS

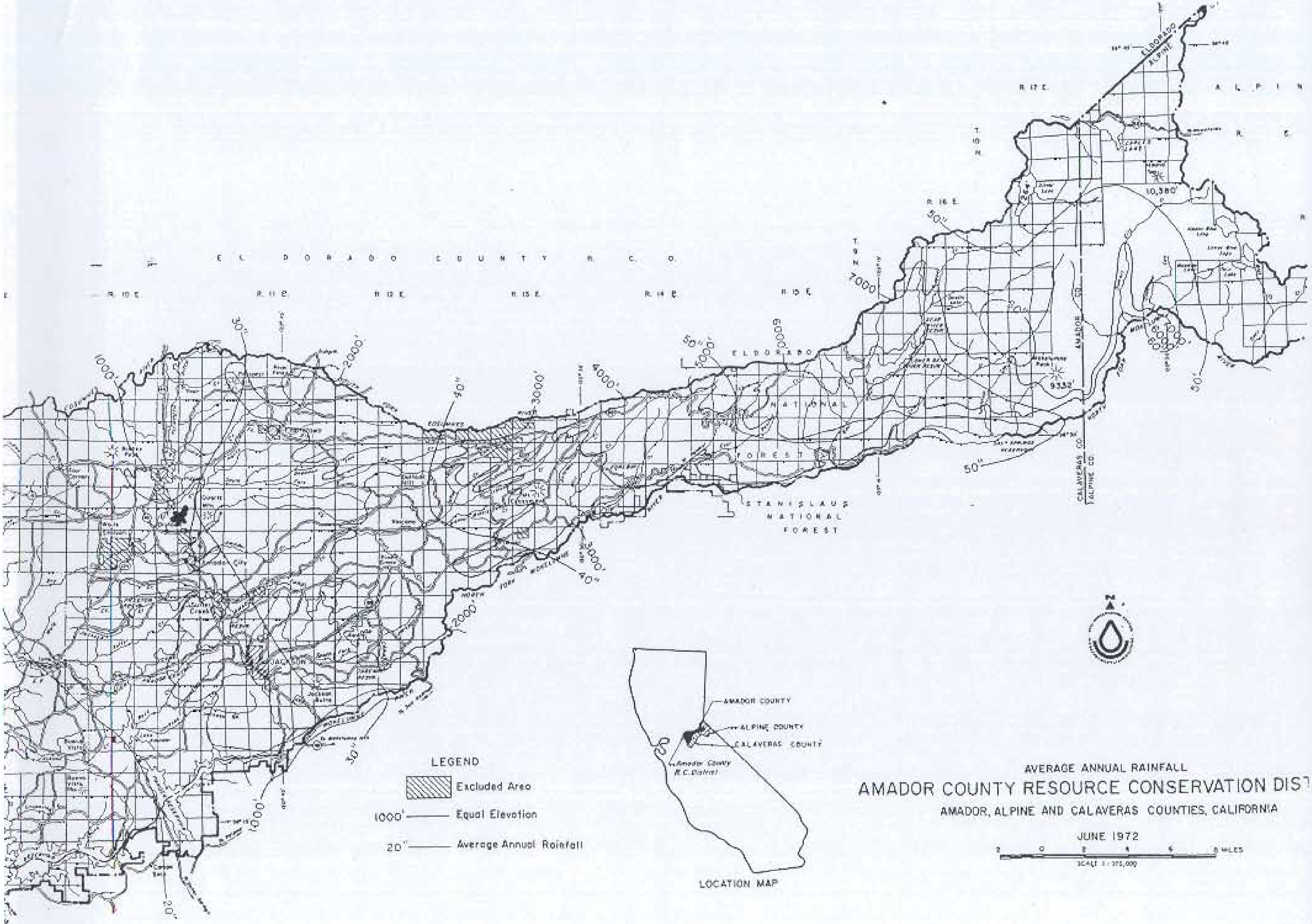
SHED #	AREA (ac)	L1 (ft)	H1up (ft)	H1dwn (ft)	S1 (ft/ft)	P (in)	n	Tt1 (hr)	L2 (ft)	H2up (ft)	H2dwn (ft)	S2 (ft/ft)	V2 (ft/sec)	Tt2 (hr)	SUM Tt (hr)	LAG (hr)	CN
W	100	300	*	*	0.067	30	0.3	0.14	3200	*	*	0.025	2.55	0.35	0.42	0.255	74
1	7.6	300	1153	1065	0.293	30	0.3	0.08	900	1065	970	0.106	5.24	0.05	0.14	0.081	78
2	6.7	300	1155	1093	0.207	30	0.3	0.09	700	1093	1002	0.130	5.82	0.03	0.13	0.076	78
3	2.7	300	1154	1100	0.180	30	0.3	0.09	400	1100	1057	0.108	5.29	0.02	0.12	0.073	78
4	15.4	300	1156	1095	0.203	30	0.35	0.10	1100	1095	885	0.191	7.05	0.04	0.15	0.093	73
5	45.4	300	1062	1015	0.157	30	0.35	0.11	2000	1015	805	0.105	5.23	0.11	0.28	0.168	73
6	21.3	300	1080	1035	0.150	30	0.6	0.17	3000	1035	790	0.082	4.61	0.18	0.36	0.213	77
7	10.4	300	1110	1085	0.083	30	0.45	0.17	1000	1085	975	0.110	5.35	0.05	0.22	0.130	77.5
8	26.8	300	1078	1065	0.043	30	0.3	0.16	1200	1065	1050	0.013	1.80	0.18	0.34	0.204	78
9	37	300	1094	1079	0.050	30	0.3	0.16	2200	1079	1045	0.015	2.01	0.30	0.30	0.183	78
10	13.1	300	1099	1073	0.087	30	0.3	0.12	1100	1073	1053	0.018	2.18	0.14	0.26	0.159	78
11	13.4	300	1143	1105	0.127	30	0.3	0.11	1000	1105	1075	0.030	2.79	0.10	0.21	0.124	80
12	10.8	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0.150	85

FORMULAS:

Tt1 = [0.007(nL)^0.8]/P^0.5S1^0.4

V2 = 16.1345S2^0.5

Tt2 = L2/V2/60



AVERAGE ANNUAL RAINFALL

AMADOR COUNTY RESOURCE CONSERVATION DIST

AMADOR, ALPINE AND CALAVERAS COUNTIES, CALIFORNIA

JUNE 1972

M7-1

PRECIPITATION DEPTH-DURATION-FREQUENCY TABLE

STATION NO. BSN ORDER SUB	STATION NAME		ELEV	SEC	TWP	RNG	LOT	BMM	LATITUDE	LONGITUDE	COUNTY CODE
B10 4886 0	LEHMAN RANCH		84	600	32	09N	09E	F	M	38.592	121.012	09

MAXIMUM PRECIPITATION FOR INDICATED DURATION D=DAYS H=HOURS

RETURN PERIOD IN YEARS	1D	2D	3D	4D	5D	6D	8D	10D	15D	20D	30D	60D	365D
2	2.50	3.29	3.80	4.21	4.76	5.07	5.86	6.44	7.59	8.50	10.18	14.46	27.15
5	3.34	4.53	5.30	5.85	6.56	6.96	8.05	8.79	10.33	11.67	13.83	19.52	34.37
10	3.88	5.35	6.27	6.90	7.68	8.14	9.40	10.23	12.00	13.60	16.06	22.61	38.54
20	4.38	6.11	7.16	7.86	8.70	9.21	10.64	11.52	13.51	15.34	18.08	25.40	42.19
25	4.54	6.35	7.44	8.15	9.02	9.54	11.02	11.92	13.97	15.86	18.69	26.25	43.29
40	4.61	6.84	7.58	8.76	9.66	10.22	11.80	12.73	14.91	16.97	19.95	27.99	45.52
50	5.01	7.07	8.28	9.04	9.96	10.53	12.16	13.11	15.35	17.47	20.54	28.80	46.54
100	5.46	7.77	9.10	9.90	10.86	11.48	13.26	14.24	16.66	18.99	22.29	31.23	49.57
200	5.91	8.46	9.89	10.74	11.73	12.40	14.31	15.32	17.93	20.45	23.98	33.57	52.45
1000	6.91	10.00	11.67	12.68	13.67	14.43	16.66	17.72	20.73	23.68	27.71	38.74	58.68
10000	8.28	12.14	14.12	15.15	16.31	17.20	19.86	20.96	24.50	28.04	32.75	45.71	66.87
PMP	16.28	23.64	28.41	31.31	34.53	36.34	41.93	45.45	53.02	60.99	70.80	98.39	149.29
MEAN	2.662	3.552	4.094	4.501	5.051	5.375	6.217	6.783	7.985	8.962	10.711	15.195	27.826
CLOCK HR. COR.	1.140	1.070	1.040	1.020	1.010	1.010	1.000	1.000	1.000	1.000	1.000	1.000	1.000
CALCULATED SKEW	1.660	2.340	1.622	1.591	1.309	1.200	1.007	1.069	.695	.930	1.275	1.033	.464
REGIONAL SKEW	1.100	1.200	1.100	1.000	.900	.900	.900	.800	.800	.800	.800	.800	.500
SKEW USED	1.100	1.200	1.100	1.000	.900	.900	.900	.800	.800	.800	.800	.800	.500
KURTOSIS	6.625	9.318	5.837	5.854	5.150	4.963	4.593	4.881	3.397	3.814	4.846	3.818	2.240
N	24	24	24	24	24	24	24	24	24	24	24	24	24
RECORD YEAR	1956	1956	1956	1956	1956	1956	1956	1956	1956	1956	1956	1956	1958
RECORD MAXIMUM	5.000	8.500	8.750	10.450	11.550	12.150	13.350	14.950	16.050	18.200	23.240	26.540	44.870
NORMALIZED MAX	2.489	3.155	2.672	2.878	2.888	2.871	2.873	2.954	2.516	2.568	2.887	2.473	2.025
CALC. COEF. VAR	.353	.442	.426	.459	.446	.439	.399	.408	.401	.401	.405	.355	.302
REGN. COEF. VAR	.341	.377	.396	.397	.389	.384	.383	.380	.376	.387	.374	.365	.291
USED COEF. VAR	.341	.377	.396	.397	.389	.384	.383	.380	.376	.387	.374	.365	.291
MEAN/A	.0957	.1277	.1471	.1618	.1815	.1932	.2234	.2438	.2870	.3221	.3849	.5461	1.0000
RP10/A	.1394	.1922	.2253	.2478	.2761	.2925	.3380	.3676	.4312	.4887	.5773	.8125	1.3850
RP25/A	.1631	.2281	.2675	.2929	.3241	.3429	.3961	.4284	.5020	.5705	.6719	.9434	1.5559
RP50/A	.1800	.2541	.2977	.3250	.3579	.3785	.4372	.4710	.5516	.6279	.7381	1.0350	1.6725
RP100/A	.1964	.2792	.3270	.3559	.3904	.4126	.4765	.5116	.5989	.6825	.8011	1.1223	1.7815
RP1000/A	.2482	.3594	.4194	.4527	.4914	.5187	.5989	.6370	.7449	.8512	.9960	1.3921	2.1090
RP10000/A	.2975	.4363	.5075	.5443	.5861	.6182	.7136	.7534	.8805	1.0078	1.1769	1.6426	2.4030
PMP/A	.5851	.8496	1.0211	1.1251	1.2408	1.3059	1.5069	1.6333	1.9054	2.1918	2.5443	3.5359	5.3650

PRECIPITATION DEPTH-DURATION-FREQUENCY TABLE

STATION NO. BSN ORDER SUB	STATION NAME		ELEV	SEC	TWP	RNG	LOT	BMM	LATITUDE	LONGITUDE	COUNTY CODE
B10 7000 0	PLYMOUTH		1096	11	07N	10E	C	M	38.483	120.845	03

MAXIMUM PRECIPITATION FOR INDICATED DURATION D=DAYS H=HOURS

RETURN PERIOD IN YEARS	1D	2D	3D	4D	5D	6D	8D	10D	20D	30D	60D	F YR
2	2.43	3.28	3.86	4.30	4.77	5.18	5.79	6.16	8.22	10.06	14.86	27.54
5	3.24	4.52	5.38	5.98	6.58	7.12	7.95	8.40	11.27	13.66	20.06	35.15
10	3.77	5.33	6.36	7.05	7.70	8.32	9.29	9.77	13.14	15.86	23.23	39.78
20	4.25	6.09	7.27	8.03	8.73	9.42	10.51	11.01	14.82	17.85	26.09	43.98
25	4.41	6.33	7.55	8.33	9.04	9.76	10.88	11.39	15.34	18.46	26.97	45.26
40	4.48	6.82	7.69	8.95	9.69	10.45	11.65	12.16	16.39	19.71	28.76	47.88
50	4.86	7.05	8.41	9.24	9.99	10.77	12.01	12.52	16.88	20.28	29.59	49.09
100	5.31	7.75	9.23	10.12	10.89	11.74	13.09	13.60	18.35	22.01	32.09	52.74
200	5.74	8.43	10.04	10.97	11.77	12.68	14.13	14.64	19.76	23.68	34.49	56.26
1000	6.70	9.97	11.84	12.87	13.71	14.76	16.45	16.93	22.89	27.37	39.80	64.92
10000	8.04	12.10	14.33	15.48	16.35	17.59	19.61	20.03	27.10	32.34	46.96	74.50
PMP	15.81	23.57	28.83	31.99	34.62	37.16	41.40	43.42	58.93	69.92	101.09	153.68
MEAN	2.585	3.542	4.155	4.599	5.066	5.497	6.138	6.480	8.660	10.577	15.612	28.645
CLOCK HR. COR.	1.140	1.070	1.050	1.040	1.030	1.020	1.020	1.010	1.010	1.000	1.000	1.000
CALCULATED SKEW	1.576	1.169	1.335	1.362	.982	.729	.707	.776	.758	.605	.480	.134
REGIONAL SKEW	1.100	1.200	1.100	1.000	.900	.900	.900	.800	.800	.800	.800	.800
SKEW USED	1.100	1.200	1.100	1.000	.900	.900	.900	.800	.800	.800	.800	.800
KURTOSIS	6.012	4.072	4.911	5.371	4.171	3.186	3.130	3.341	2.745	2.792	2.489	2.212
N	25	25	25	25	25	25	25	25	25	25	25	25
RECORD YEAR	1945	1951	1951	1951	1951	1951	1951	1951	1958	1956	1936	1958
RECORD MAXIMUM	4.090	6.070	7.870	9.770	10.110	10.270	10.810	11.210	15.180	18.320	25.190	40.790
NORMALIZED MAX	1.972	2.284	2.431	2.800	2.559	2.242	2.153	2.093	1.966	2.000	1.922	1.673
CALC. COEF. VAR	.295	.313	.368	.401	.389	.387	.354	.349	.383	.366	.319	.253
REGN. COEF. VAR	.341	.377	.396	.397	.389	.384	.383	.380	.387	.374	.365	.291
USED COEF. VAR	.341	.377	.396	.397	.389	.384	.383	.380	.387	.374	.365	.291
MEAN/A	.0902	.1236	.1450	.1606	.1768	.1919	.2143	.2262	.3023	.3693	.5450	1.0000
RP10/A	.1315	.1861	.2221	.2460	.2689	.2906	.3242	.3411	.4587	.5538	.8109	1.3889
RP25/A	.1538	.2210	.2908	.3157	.3407	.3800	.3976	.5355	.6445	.9415	1.5800	
RP50/A	.1698	.2461	.2935	.3226	.3487	.3760	.4193	.4371	.5893	.7080	1.0330	1.7138
RP100/A	.1852	.2704	.3223	.3532	.3803	.4099	.4570	.4748	.6406	.7685	1.1201	1.8413
RP1000/A	.2341	.3481	.4135	.4494	.4787	.5153	.5744	.5911	.7989	.9554	1.3894	2.2351
RP10000/A	.2806	.4225	.5003	.5403	.5769	.6141	.6845	.6991	.9460	1.1290	1.6394	2.6009
PMP/A	.5519	.8228	1.0066	1.1167	1.2087	1.2974	1.4454	1.5157	2.0573	2.4408	3.5290	5.3650

PEARSON TYPE III DISTRIBUTION USED
PROBABLE MAXIMUM PRECIPITATION ESTIMATE BASED ON 15 STANDARD DEVIATIONS
WHERE N IS SMALL RESULTS ARE NOT DEPENDABLE

PRE-PROJECT

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*             MAY  1991                 *
*           VERSION 4.0.1E              *
*                                       *
* RUN DATE  01/17/2004  TIME  20:18:34  *
*                                       *
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*****************************************
*                                       *
*   U.S. ARMY CORPS OF ENGINEERS        *
*   HYDROLOGIC ENGINEERING CENTER       *
*         609 SECOND STREET             *
*       DAVIS, CALIFORNIA 95616         *
*           (916) 756-1104              *
*                                       *
*****************************************
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X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X              X
XXXXXXX  XXXX     X        XXXXX  X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX   XXXXX         XXX
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:::::::::::::::::::::::::::::::::::::::::::::
:::::::::::::::::::::::::::::::::::::::::::::
:::                                       :::
:::  Full Microcomputer Implementation    :::
:::                 by                    :::
:::         Haestad Methods, Inc.         :::
:::                                       :::
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37 Brookside Road * Waterbury, Connecticut 06708 * (203) 755-1666

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  100-YEAR PRE-PROJECT RUNOFF FOR NORTH AREA
   2          IT       5                   310
   3          IO       5       0

   4          KK  SHED W
   5          KM  OFFSITE AREA, W. OF HWY 49
   6          KO                                22
   7          BA  0.1563
   8          PB    5.31
   9          IN       6
  10          PC  0.0000 0.00174 0.00348 0.00522 0.00697 0.00871 0.01046 0.01220 0.01395 0.01570
  11          PC  0.0174 0.01920 0.02095 0.02270 0.02446 0.02621 0.02797 0.02972 0.03148 0.03324
  12          PC  0.0350 0.03677 0.03858 0.04041 0.04227 0.04416 0.04608 0.04803 0.05001 0.05201
  13          PC  0.0540 0.05611 0.05821 0.06033 0.06248 0.06466 0.06687 0.06911 0.07138 0.07367
  14          PC  0.0760 0.07835 0.08070 0.08307 0.08545 0.08784 0.09024 0.09265 0.09507 0.09751
  15          PC  0.1000 0.10241 0.10487 0.10735 0.10984 0.11234 0.11485 0.11737 0.11990 0.12245
  16          PC  0.1250 0.12761 0.13034 0.13317 0.13610 0.13915 0.14230 0.14557 0.14894 0.15241
  17          PC  0.1560 0.15966 0.16334 0.16706 0.17082 0.17460 0.17842 0.18226 0.18614 0.19006
  18          PC  0.1940 0.19817 0.20275 0.20775 0.21317 0.21900 0.22523 0.23185 0.23885 0.24623
  19          PC  0.2540 0.26233 0.27139 0.28129 0.29173 0.30300 0.31942 0.34542 0.38784 0.46316
```

```
 20          PC  0.5150 0.53220 0.54760 0.56120 0.57300 0.58300 0.59188 0.60032 0.60832 0.61588
 21          PC  0.6230 0.62982 0.63648 0.64298 0.64932 0.65550 0.66152 0.66738 0.67308 0.67862
 22          PC  0.6840 0.68925 0.69440 0.69945 0.70440 0.70925 0.71400 0.71865 0.72320 0.72765
 23          PC  0.7320 0.73625 0.74040 0.74445 0.74840 0.75225 0.75600 0.75965 0.76320 0.76665
 24          PC  0.7700 0.77329 0.77656 0.77981 0.78304 0.78625 0.78944 0.79261 0.79576 0.79889
 25          PC  0.8020 0.80509 0.80816 0.81121 0.81424 0.81725 0.82024 0.82321 0.82616 0.82909
 26          PC  0.8320 0.83489 0.83776 0.84061 0.84344 0.84625 0.84904 0.85181 0.85456 0.85729
 27          PC  0.8600 0.86269 0.86536 0.86801 0.87064 0.87325 0.87584 0.87841 0.88096 0.88349
 28          PC  0.8860 0.88849 0.89096 0.89341 0.89584 0.89825 0.90064 0.90301 0.90536 0.90769
 29          PC  0.9100 0.91229 0.91456 0.91681 0.91904 0.92125 0.92344 0.92561 0.92776 0.92989
 30          PC  0.9320 0.93409 0.93616 0.93821 0.94024 0.94225 0.94424 0.94621 0.94816 0.95009
 31          PC  0.9520 0.95389 0.95576 0.95761 0.95944 0.96125 0.96304 0.96481 0.96656 0.96829
 32          PC  0.9700 0.97169 0.97336 0.97501 0.97664 0.97825 0.97984 0.98141 0.98296 0.98449
 33          PC  0.9860 0.98749 0.98896 0.99041 0.99184 0.99325 0.99464 0.99601 0.99736 0.99869
 34          PC  1.0000 1.00000 1.00000 1.00000 1.00000
 35          LS              74
 36          UD   0.255

 37          KK  SHED11
 38          KM
 39          KO                                      22
 40          BA   .0209
 41          LS              80
 42          UD   0.124

 43          KK  SUM1
 44          KM
 45          KO                                      22
 46          HC       2
                                HEC-1 INPUT                                          PAGE  2

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

 47          KK  RTE1
 48          KM  ESTIMATED SECTION
 49          KO                                      22
 50          RD    1400     .01    .035            TRAP       5       3

 51          KK  SHED10
 52          KM
 53          KO                                      22
 54          BA   .0205
 55          LS              78
 56          UD   0.159

 57          KK  SUM2
 58          KM
 59          KO                                      22
 60          HC       2

 61          KK  RTE2
 62          KM  ESTIMATED SECTION
 63          KO                                      22
 64          RD    1100     .008    .035            TRAP       5       3

 65          KK  SHED8
 66          KM
 67          KO                                      22
 68          BA   .0419
 69          LS              78
 70          UD    .204

 71          KK  POND1
 72          KM  ROUTE THROUGH EX. ON-SITE POND
 73          KO                                      22
 74          RS       1    ELEV  1047.7
 75          SA    .063    0.33    0.58
 76          SE  1047.7    1050    1051
 77          SL    1045     .01     0.6     0.5
 78          SS  1050.5     125       3     1.5

 79          KK  SHED 9
 80          KM
 81          KO                                      22
 82          BA   .0578
 83          LS              78
```

```
                 84          UD   0.183

                 85          KK  SHED12
                 86          KM
                 87          KO                                      22
                 88          BA   .0169
                 89          LS              85
                 90          UD     .15
```



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

                 91          KK  BNDY
                 92          KM  COMBINED RUNOFF @ APPROX. PROJECT BOUNDARY
                 93          KO                                      22
                 94          HC       4
                 95          ZZ
HEC1 S/N: 1343001909        HMVersion: 6.33    Data File:
        C:\WINDOWS\TEMP\~vbh0C5B.TMP

      ****************************************                ****************************************
      *                                      *                *                                      *
      *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                *   U.S. ARMY CORPS OF ENGINEERS       *
      *             MAY  1991                *                *   HYDROLOGIC ENGINEERING CENTER      *
      *          VERSION 4.0.1E              *                *        609 SECOND STREET             *
      *                                      *                *     DAVIS, CALIFORNIA 95616          *
      * RUN DATE  01/17/2004  TIME  20:18:34 *                *         (916) 756-1104               *
      *                                      *                *                                      *
      ****************************************                ****************************************

                          100-YEAR PRE-PROJECT RUNOFF FOR NORTH AREA

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

     IT           HYDROGRAPH TIME DATA
                      NMIN           5  MINUTES IN COMPUTATION INTERVAL
                      IDATE      1   0  STARTING DATE
                      ITIME        0000  STARTING TIME
                        NQ         310  NUMBER OF HYDROGRAPH ORDINATES
                     NDDATE      2   0  ENDING DATE
                     NDTIME       0145  ENDING TIME
                     ICENT         19  CENTURY MARK

                   COMPUTATION INTERVAL     0.08 HOURS
                     TOTAL TIME BASE   25.75 HOURS

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

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

               *************
               *           *
   4 KK        *   SHED W  *
               *           *
               *************

   6 KO          OUTPUT CONTROL VARIABLES
                      IPRNT          5  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
```

QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	310	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.083	TIME INTERVAL IN HOURS

*** ***

```
          **************
          *            *
 37 KK    *   SHED11   *
          *            *
          **************
```

 39 KO OUTPUT CONTROL VARIABLES

IPRNT	5	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	310	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.083	TIME INTERVAL IN HOURS

*** ***

```
          **************
          *            *
 43 KK    *   SUM1     *
          *            *
          **************
```

 45 KO OUTPUT CONTROL VARIABLES

IPRNT	5	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	310	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.083	TIME INTERVAL IN HOURS

*** ***

```
          **************
          *            *
 47 KK    *   RTE1     *
          *            *
          **************
```

 49 KO OUTPUT CONTROL VARIABLES

IPRNT	5	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	310	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.083	TIME INTERVAL IN HOURS

*** ***

```
          **************
          *            *
 51 KK    *   SHED10   *
          *            *
          **************

 53 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           5  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                      IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2         310  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT       0.083  TIME INTERVAL IN HOURS
```

*** ***

```
          **************
          *            *
 57 KK    *   SUM2     *
          *            *
          **************

 59 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           5  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                      IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2         310  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT       0.083  TIME INTERVAL IN HOURS
```

*** ***

```
          **************
          *            *
 61 KK    *   RTE2     *
          *            *
          **************

 63 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           5  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                      IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2         310  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT       0.083  TIME INTERVAL IN HOURS
```

*** ***

```
          **************
          *            *
 65 KK    *   SHED8    *
          *            *
          **************

 67 KO          OUTPUT CONTROL VARIABLES
```

IPRNT	5	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	310	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.083	TIME INTERVAL IN HOURS

*** ***

```
          **************
          *            *
71 KK     *    POND1   *
          *            *
          **************
```

73 KO OUTPUT CONTROL VARIABLES

IPRNT	5	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	310	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.083	TIME INTERVAL IN HOURS

*** ***

```
          **************
          *            *
79 KK     *    SHED 9  *
          *            *
          **************
```

81 KO OUTPUT CONTROL VARIABLES

IPRNT	5	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	310	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.083	TIME INTERVAL IN HOURS

*** ***

```
          **************
          *            *
85 KK     *    SHED12  *
          *            *
          **************
```

87 KO OUTPUT CONTROL VARIABLES

IPRNT	5	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	310	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.083	TIME INTERVAL IN HOURS

*** ***

```
          **************
          *            *
91 KK     *    BNDY    *
          *            *
          **************
```

93 KD OUTPUT CONTROL VARIABLES

IPRNT	5	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	310	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.083	TIME INTERVAL IN HOURS

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

	OPERATION	STATION	PEAK FLOW	TIME OF PEAK 6-HOUR	AVERAGE FLOW FOR MAXIMUM PERIOD 24-HOUR	72-HOUR		BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
	HYDROGRAPH AT									
	SHED W	120.	10.17	28.	11.	10.	0.16			
	HYDROGRAPH AT									
	SHED11	26.	10.00	5.	2.	2.	0.02			
	2 COMBINED AT									
	SUM1	139.	10.08	33.	13.	12.	0.18			
	ROUTED TO									
	RTE1	137.	10.17	33.	13.	12.	0.18			
	HYDROGRAPH AT									
	SHED10	22.	10.08	4.	2.	2.	0.02			
	2 COMBINED AT									
	SUM2	155.	10.17	37.	14.	13.	0.20			
	ROUTED TO									
	RTE2	150.	10.25	37.	14.	13.	0.20			
	HYDROGRAPH AT									
	SHED8	42.	10.08	9.	3.	3.	0.04			
	ROUTED TO									
	POND1	41.	10.08	8.	3.	3.	0.04			
1050.73		10.08								
	HYDROGRAPH AT									
	SHED 9	60.	10.08	12.	5.	4.	0.06			
	HYDROGRAPH AT									
	SHED12	23.	10.00	4.	2.	2.	0.02			
	4 COMBINED AT									
	BNDY	258.	10.17	61.	24.	22.				
0.31										

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

ISTAQ	ELEMENT	DT	PEAK	TIME TO PEAK	VOLUME	INTERPOLATED TO COMPUTATION INTERVAL DT	PEAK	TIME TO PEAK	VOLUME
		(MIN)	(CFS)	(MIN)	(IN)	(MIN)	(CFS)	(MIN)	(IN)
RTE1	MANE	4.02	138.35	610.45	2.68	5.00	137.43	610.00	2.68

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.2531E+02 EXCESS=0.0000E+00 OUTFLOW=0.2532E+02 BASIN STORAGE=0.8775E-03 PERCENT ERROR= 0.0

RTE2	MANE	3.32	151.57	611.07	2.71	5.00	150.27	615.00	2.71

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.2857E+02 EXCESS=0.0000E+00 OUTFLOW=0.2857E+02 BASIN STORAGE=0.9837E-03 PERCENT ERROR= 0.0

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

POST. PROJECT

C:\HAESTAD\GHEC1\SAMPLE\PLYMPST.OUT
HEC1 S/N: 1343001909 HMVersion: 6.33 Data File: C:\WINDOWS\TEMP\-vbh106P.TMP

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              MAY  1991                *
*            VERSION 4.0.1E             *
*                                       *
*  RUN DATE  01/24/2004  TIME  15:55:35 *
*                                       *
*****************************************
```

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

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

```
:::::::::::::::::::::::::::::::::::::::::::::
:::::::::::::::::::::::::::::::::::::::::::::
:::                                       :::
:::  Full Microcomputer Implementation    :::
:::                by                     :::
:::        Haestad Methods, Inc.          :::
:::                                       :::
:::::::::::::::::::::::::::::::::::::::::::::
:::::::::::::::::::::::::::::::::::::::::::::
```

37 Brookside Road * Waterbury, Connecticut 06708 * (203) 755-1666

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  100-YEAR POST-PROJECT RUNOFF (NORTH AREA)
   2          IT       5                  310
   3          IO       5       0

   4          KK  SHED W
   5          KM  OFFSITE AREA, W. OF HWY 49
   6          KO                                  22
   7          BA  0.1563
   8          PB    5.31
   9          IN       6
  10          PC  0.0000 0.00174 0.00348 0.00522 0.00697 0.00871 0.01046 0.01220 0.01395 0.01570
  11          PC  0.0174 0.01920 0.02095 0.02270 0.02446 0.02621 0.02797 0.02972 0.03148 0.03324
  12          PC  0.0350 0.03677 0.03858 0.04041 0.04227 0.04416 0.04608 0.04803 0.05001 0.05201
  13          PC  0.0540 0.05611 0.05821 0.06033 0.06248 0.06466 0.06687 0.06911 0.07138 0.07367
  14          PC  0.0760 0.07835 0.08070 0.08307 0.08545 0.08784 0.09024 0.09265 0.09507 0.09751
  15          PC  0.1000 0.10241 0.10487 0.10735 0.10984 0.11234 0.11485 0.11737 0.11990 0.12245
  16          PC  0.1250 0.12761 0.13034 0.13317 0.13610 0.13915 0.14230 0.14557 0.14894 0.15241
  17          PC  0.1560 0.15966 0.16334 0.16706 0.17082 0.17460 0.17842 0.18226 0.18614 0.19006
  18          PC  0.1940 0.19817 0.20275 0.20775 0.21317 0.21900 0.22523 0.23185 0.23885 0.24623
  19          PC  0.2540 0.26233 0.27139 0.28119 0.29173 0.30300 0.31942 0.34542 0.38784 0.46316
```

```
 20          PC  0.5150 0.53220 0.54760 0.56120 0.57300 0.58300 0.59188 0.60033 0.60832 0.61588
 21          PC  0.6230 0.62982 0.63648 0.64298 0.64932 0.65550 0.66152 0.66738 0.67308 0.67862
 22          PC  0.6840 0.68925 0.69440 0.69945 0.70440 0.70925 0.71400 0.71865 0.72320 0.72765
 23          PC  0.7320 0.73625 0.74040 0.74445 0.74840 0.75225 0.75600 0.75965 0.76320 0.76665
 24          PC  0.7700 0.77329 0.77656 0.77981 0.78304 0.78625 0.78944 0.79261 0.79576 0.79889
 25          PC  0.8020 0.80509 0.80816 0.81121 0.81424 0.81725 0.82024 0.82321 0.82616 0.82909
 26          PC  0.8320 0.83489 0.83776 0.84061 0.84344 0.84625 0.84904 0.85181 0.85456 0.85729
 27          PC  0.8600 0.86269 0.86536 0.86801 0.87064 0.87325 0.87584 0.87841 0.88096 0.88349
 28          PC  0.8860 0.88849 0.89096 0.89341 0.89584 0.89825 0.90064 0.90301 0.90536 0.90769
 29          PC  0.9100 0.91229 0.91456 0.91681 0.91904 0.92125 0.92344 0.92561 0.92776 0.92989
 30          PC  0.9320 0.93409 0.93616 0.93821 0.94024 0.94225 0.94424 0.94621 0.94816 0.95009
 31          PC  0.9520 0.95389 0.95576 0.95761 0.95944 0.96125 0.96304 0.96481 0.96656 0.96829
 32          PC  0.9700 0.97169 0.97336 0.97501 0.97664 0.97825 0.97984 0.98141 0.98296 0.98449
 33          PC  0.9860 0.98749 0.98896 0.99041 0.99184 0.99325 0.99464 0.99601 0.99736 0.99869
 34          PC  1.0000 1.00000 1.00000 1.00000 1.00000
 35          LS              74
 36          UD   0.255

 37          KK  SHED11
 38          KM  POST-PROJECT; ASSUME 90% IMPERVIOUS; 10 MIN. TIME OF CONCENTRATION
 39          KO                                      22
 40          BA   .0209
 41          LS              96
 42          UD    0.1

 43          KK  SUM1
 44          KM
 45          KO                                      22
 46          HC       2
                              HEC-1 INPUT                                                    PAGE  2

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

 47          KK  RTE1
 48          KM  ESTIMATED SECTION
 49          KO                                      22
 50          RD    1400     .01    .035            TRAP       5       3

 51          KK  SHED10
 52          KM  POST-PTOJECT; ASSUME 90% IMPERVIOUS; 10 MIN. TIME OF CONCENTRATION
 53          KO                                      22
 54          BA   .0205
 55          LS              96
 56          UD    0.1

 57          KK  SUM2
 58          KM
 59          KO                                      22
 60          HC       2

 61          KK  RTE2
 62          KM  ESTIMATED SECTION
 63          KO                                      22
 64          RD    1100    .008    .035            TRAP       5       3

 65          KK  SHED8
 66          KM  POST-PROJECT; ASSUME 90% IMPERVIOUS; 15 MIN. TIME OF CONCENTRATION
 67          KO                                      22
 68          BA   .0419
 69          LS              96
 70          UD    .15

 71          KK  SHED 9
 72          KM  POST- PROJECT; ASSUME 90% IMPERVIOUS; 15 MIN. TIME OF CONCENTRATION
 73          KO                                      22
 74          BA   .0578
 75          LS              96
 76          UD    0.15

 77          KK  SHED12
 78          KM  POST-PROJECT; ASSUME 90% IMPERVIOUS; 15 MIN. TIME OF CONCENTRATION
 79          KO                                      22
 80          BA   .0169
 81          LS              96
 82          UD    .15
```

```
                83          KK  BNDY
                84          KM  COMBINED RUNOFF @ APPROX. PROJECT BOUNDARY
                85          KO                                        22
                86          HC       4
                87          ZZ
..EC1 S/N: 1343001909       HMVersion: 6.33    Data File:
        C:\WINDOWS\TEMP\-vbh106F.TMP
```

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*              MAY  1991                *
*            VERSION 4.0.1E             *
*                                       *
*  RUN DATE  01/24/2004  TIME  15:55:35 *
*                                       *
*****************************************
```

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

100-YEAR POST-PROJECT RUNOFF (NORTH AREA)

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

    IT          HYDROGRAPH TIME DATA
                     NMIN           5  MINUTES IN COMPUTATION INTERVAL
                     IDATE      1   0  STARTING DATE
                     ITIME        0000  STARTING TIME
                       NQ         310  NUMBER OF HYDROGRAPH ORDINATES
                    NDDATE      2   0  ENDING DATE
                    NDTIME        0145  ENDING TIME
                    ICENT           19  CENTURY MARK

                  COMPUTATION INTERVAL    0.08 HOURS
                      TOTAL TIME BASE   25.75 HOURS

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

*** ***

```
            **************
            *            *
  4 KK      *   SHED W   *
            *            *
            **************

  6 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          5  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                      IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2        310  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT      0.083  TIME INTERVAL IN HOURS
```

*** ***

```
          **************
          *            *
 37 KK    *   SHED11   *
          *            *
          **************

 39 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           5  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                      IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2         310  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT       0.083  TIME INTERVAL IN HOURS


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

          **************
          *            *
 43 KK    *   SUM1     *
          *            *
          **************

 45 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           5  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                      IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2         310  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT       0.083  TIME INTERVAL IN HOURS


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

          **************
          *            *
 47 KK    *   RTE1     *
          *            *
          **************

 49 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           5  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH           0  PUNCH COMPUTED HYDROGRAPH
                      IOUT          22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1           1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2         310  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT       0.083  TIME INTERVAL IN HOURS


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

          **************
          *            *
 51 KK    *   SHED10   *
          *            *
          **************

 53 KO          OUTPUT CONTROL VARIABLES
                     IPRNT           5  PRINT CONTROL
                     IPLOT           0  PLOT CONTROL
```

QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	310	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.083	TIME INTERVAL IN HOURS

*** ***

```
          **************
          *            *
57 KK     *    SUM2    *
          *            *
          **************
```

59 KO OUTPUT CONTROL VARIABLES

IPRNT	5	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	310	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.083	TIME INTERVAL IN HOURS

*** ***

```
          **************
          *            *
61 KK     *    RTE2    *
          *            *
          **************
```

63 KO OUTPUT CONTROL VARIABLES

IPRNT	5	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	310	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.083	TIME INTERVAL IN HOURS

*** ***

```
          **************
          *            *
65 KK     *    SHED8   *
          *            *
          **************
```

67 KO OUTPUT CONTROL VARIABLES

IPRNT	5	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	310	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.083	TIME INTERVAL IN HOURS

```
*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

          **************
          *            *
71 KK     *    SHED 9  *
          *            *
          **************

73 KO          OUTPUT CONTROL VARIABLES
                    IPRNT          5  PRINT CONTROL
                    IPLOT          0  PLOT CONTROL
                    QSCAL          0.  HYDROGRAPH PLOT SCALE
                    IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                     IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                    ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                    ISAV2        310  LAST ORDINATE PUNCHED OR SAVED
                   TIMINT      0.083  TIME INTERVAL IN HOURS


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

          **************
          *            *
77 KK     *    SHED12  *
          *            *
          **************

79 KO          OUTPUT CONTROL VARIABLES
                    IPRNT          5  PRINT CONTROL
                    IPLOT          0  PLOT CONTROL
                    QSCAL          0.  HYDROGRAPH PLOT SCALE
                    IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                     IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                    ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                    ISAV2        310  LAST ORDINATE PUNCHED OR SAVED
                   TIMINT      0.083  TIME INTERVAL IN HOURS


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

          **************
          *            *
83 KK     *    BNDY    *
          *            *
          **************

85 KO          OUTPUT CONTROL VARIABLES
                    IPRNT          5  PRINT CONTROL
                    IPLOT          0  PLOT CONTROL
                    QSCAL          0.  HYDROGRAPH PLOT SCALE
                    IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                     IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                    ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                    ISAV2        310  LAST ORDINATE PUNCHED OR SAVED
                   TIMINT      0.083  TIME INTERVAL IN HOURS
```

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

	OPERATION	STATION	PEAK FLOW	TIME OF PEAK 6-HOUR	AVERAGE FLOW FOR MAXIMUM PERIOD			BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
24-HOUR	72-HOUR									
	HYDROGRAPH AT									
	SHED W	120.	10.17	28.	11.	10.	0.16			
	HYDROGRAPH AT									
	SHED11	40.	10.00	7.	3.	3.	0.02			
	2 COMBINED AT									
	SUM1	146.	10.08	35.	14.	13.	0.18			

ROUTED TO RTE1	145.	10.17	35.	14.	13.	0.18
HYDROGRAPH AT SHED10	40.	10.00	7.	3.	2.	0.02
2 COMBINED AT SUM2	167.	10.08	41.	16.	15.	0.20
ROUTED TO RTE2	165.	10.17	41.	16.	15.	0.20
HYDROGRAPH AT SHED8	73.	10.00	13.	5.	5.	0.04
HYDROGRAPH AT SHED 9	100.	10.00	18.	8.	7.	0.06
HYDROGRAPH AT SHED12	29.	10.00	5.	2.	2.	0.02
4 COMBINED AT BNDY	351.	10.08	78.	32.	29.	

0.31

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

ISTAQ	ELEMENT	DT	PEAK	TIME TO PEAK	VOLUME	INTERPOLATED TO COMPUTATION INTERVAL DT	PEAK	TIME TO PEAK	VOLUME
		(MIN)	(CFS)	(MIN)	(IN)	(MIN)	(CFS)	(MIN)	(IN)
RTE1	MANE	3.96	145.63	609.47	2.88	5.00	144.82	610.00	2.88

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.2718E+02 EXCESS=0.0000E+00 OUTFLOW=0.2718E+02 BASIN STORAGE=0.1137E-02 PERCENT ERROR= 0.0

RTE2	MANE	3.26	165.80	608.78	3.08	5.00	165.33	610.00	3.08

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.3248E+02 EXCESS=0.0000E+00 OUTFLOW=0.3248E+02 BASIN STORAGE=0.7374E-03 PERCENT ERROR= 0.0

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

POST-PROJECT W/ DETENTION

C:\HAESTAD\GHEC1\SAMPLE\FLYMD1.OUT
HEC1 S/N: 1343001909 HMVersion: 6.33 Data File: C:\WINDOWS\TEMP\~vbh3C65.TMP

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             MAY  1991                 *
*          VERSION 4.0.1E               *
*                                       *
*  RUN DATE  01/24/2004  TIME  15:45:05 *
*                                       *
*****************************************
```

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

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

```
::::::::::::::::::::::::::::::::::::::::::::
::::::::::::::::::::::::::::::::::::::::::::
:::                                      :::
:::  Full Microcomputer Implementation   :::
:::              by                      :::
:::        Haestad Methods, Inc.         :::
:::                                      :::
::::::::::::::::::::::::::::::::::::::::::::
::::::::::::::::::::::::::::::::::::::::::::
```

37 Brookside Road * Waterbury, Connecticut 06708 * (203) 755-1666

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  100-YEAR POST-PROJECT RUNOFF FOR NORTH AREA  W/ DET
   2          IT       5                    310
   3          IO       5       0

   4          KK  SHED W
   5          KM  OFFSITE AREA, W. OF HWY 49
   6          KO                                22
   7          BA  0.1563
   8          PB    5.31
   9          IN       6
  10          PC  0.0000 0.00174 0.00348 0.00522 0.00697 0.00871 0.01046 0.01220 0.01395 0.01570
  11          PC  0.0174 0.01920 0.02095 0.02270 0.02446 0.02621 0.02797 0.02972 0.03148 0.03324
  12          PC  0.0350 0.03677 0.03858 0.04041 0.04227 0.04416 0.04608 0.04803 0.05001 0.05201
  13          PC  0.0540 0.05611 0.05821 0.06033 0.06248 0.06466 0.06687 0.06911 0.07138 0.07367
  14          PC  0.0760 0.07835 0.08070 0.08307 0.08545 0.08784 0.09024 0.09265 0.09507 0.09751
  15          PC  0.1000 0.10241 0.10487 0.10735 0.10984 0.11234 0.11485 0.11737 0.11990 0.12245
  16          PC  0.1250 0.12761 0.13034 0.13317 0.13610 0.13915 0.14230 0.14557 0.14894 0.15241
  17          PC  0.1560 0.15966 0.16334 0.16706 0.17082 0.17460 0.17842 0.18226 0.18614 0.19006
  18          PC  0.1940 0.19817 0.20275 0.20775 0.21317 0.21900 0.22523 0.23185 0.23885 0.24623
  19          PC  0.2540 0.26233 0.27139 0.28119 0.29173 0.30300 0.31942 0.34542 0.38784 0.46316
```

```
 20          PC  0.5150 0.53220 0.54760 0.56120 0.57300 0.58300 0.59188 0.60032 0.60832 0.61588
 21          PC  0.6230 0.62982 0.63648 0.64298 0.64932 0.65550 0.66152 0.66738 0.67308 0.67862
 22          PC  0.6840 0.68925 0.69440 0.69945 0.70440 0.70925 0.71400 0.71865 0.72320 0.72765
 23          PC  0.7320 0.73625 0.74040 0.74445 0.74840 0.75225 0.75600 0.75965 0.76320 0.76665
 24          PC  0.7700 0.77329 0.77656 0.77981 0.78304 0.78625 0.78944 0.79261 0.79576 0.79889
 25          PC  0.8020 0.80509 0.80816 0.81121 0.81424 0.81725 0.82024 0.82321 0.82616 0.82909
 26          PC  0.8320 0.83489 0.83776 0.84061 0.84344 0.84625 0.84904 0.85181 0.85456 0.85729
 27          PC  0.8600 0.86269 0.86536 0.86801 0.87064 0.87325 0.87584 0.87841 0.88096 0.88349
 28          PC  0.8860 0.88849 0.89096 0.89341 0.89584 0.89825 0.90064 0.90301 0.90536 0.90769
 29          PC  0.9100 0.91229 0.91456 0.91681 0.91904 0.92125 0.92344 0.92561 0.92776 0.92989
 30          PC  0.9320 0.93409 0.93616 0.93821 0.94024 0.94225 0.94424 0.94621 0.94816 0.95009
 31          PC  0.9520 0.95389 0.95576 0.95761 0.95944 0.96125 0.96304 0.96481 0.96656 0.96829
 32          PC  0.9700 0.97169 0.97336 0.97501 0.97664 0.97825 0.97984 0.98141 0.98296 0.98449
 33          PC  0.9860 0.98749 0.98896 0.99041 0.99184 0.99325 0.99464 0.99601 0.99736 0.99869
 34          PC  1.0000 1.00000 1.00000 1.00000 1.00000
 35          LS              74
 36          UD   0.255

 37          KK  SHED11
 38          KM
 39          KO                                      22
 40          BA   .0209
 41          LS              96
 42          UD    0.1

 43          KK  SUM1
 44          KM
 45          KO                                      22
 46          HC       2
```



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

 47          KK  RTE1
 48          KM  ESTIMATED SECTION - USE 36" HDPE
 49          KO                                      22
 50          RD    1400     .01    .013            CIRC       3

 51          KK  SHED10
 52          KM
 53          KO                                      22
 54          BA   .0205
 55          LS              96
 56          UD    0.15

 57          KK  SUM2
 58          KM
 59          KO                                      22
 60          HC       2

 61          KK  RTE2
 62          KM  ESTIMATED SECTION - USE 36" HDPE
 63          KO                                      22
 64          RD    1100    .008    .013            CIRC       3

 65          KK  SHED8
 66          KM
 67          KO                                      22
 68          BA   .0419
 69          LS              96
 70          UD     .15

 71          KK  SHED 9
 72          KM
 73          KO                                      22
 74          BA   .0578
 75          LS              96
 76          UD    0.15

 77          KK  Node15
 78          KM
 79          KO                                      22
 80          HC       2

 81          KK  DET1
 82          KM  DETENTION ROUTING; MODIFY EX. POND; F.L. OUT 1045; C.L. OUT 1046.5; 6 SQ. FT.
```

```
                 83          KO                                    22
                 84          RS       1    STOR       0
                 85          SA      .1     1.3     1.5    1.85
                 86          SE    1045    1050    1051  1051.5
                 87          SL  1046.5       6      .6      .5
                 88          SS  1051.3      20       3     1.5
                                          HEC-1 INPUT                                                    PAGE  3

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

                 89          KK  SHED12
                 90          KM
                 91          KO                                    22
                 92          BA   .0169
                 93          LS                 96
                 94          UD     .15

                 95          KK  BNDY
                 96          KM  COMBINED RUNOFF @ APPROX. PROJECT BOUNDARY
                 97          KO                                    22
                 98          HC       3
                 99          ZZ
EC1 S/N: 1343001909        HMVersion: 6.33    Data File:
        C:\WINDOWS\TEMP\-vbh3C65.TMP
```

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             MAY  1991                 *
*          VERSION 4.0.1E               *
*                                       *
*  RUN DATE  01/24/2004  TIME  15:45:05 *
*                                       *
*****************************************
```

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

100-YEAR POST-PROJECT RUNOFF FOR NORTH AREA W/ DET

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

    IT          HYDROGRAPH TIME DATA
                     NMIN           5  MINUTES IN COMPUTATION INTERVAL
                     IDATE      1   0  STARTING DATE
                     ITIME       0000  STARTING TIME
                       NQ         310  NUMBER OF HYDROGRAPH ORDINATES
                    NDDATE      2   0  ENDING DATE
                    NDTIME       0145  ENDING TIME
                    ICENT          19  CENTURY MARK

                  COMPUTATION INTERVAL    0.08 HOURS
                      TOTAL TIME BASE   25.75 HOURS

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

*** ***

```
              **************
              *            *
  4 KK        *   SHED W   *
              *            *
```

```
          **************
 6 KO           OUTPUT CONTROL VARIABLES
                     IPRNT          5  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                      IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2        310  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT      0.083  TIME INTERVAL IN HOURS


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

          **************
          *            *
 37 KK    *   SHED11   *
          *            *
          **************

 39 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          5  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                      IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2        310  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT      0.083  TIME INTERVAL IN HOURS


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

          **************
          *            *
 43 KK    *   SUM1     *
          *            *
          **************

 45 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          5  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                      IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2        310  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT      0.083  TIME INTERVAL IN HOURS


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

          **************
          *            *
 47 KK    *   RTE1     *
          *            *
          **************

 49 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          5  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                      IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2        310  LAST ORDINATE PUNCHED OR SAVED
```

TIMINT 0.083 TIME INTERVAL IN HOURS

*** ***

```
          **************
          *            *
 51 KK    *   SHED10   *
          *            *
          **************

 53 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          5  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                      IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2        310  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT      0.083  TIME INTERVAL IN HOURS
```

*** ***

```
          **************
          *            *
 57 KK    *   SUM2     *
          *            *
          **************

 59 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          5  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                      IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2        310  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT      0.083  TIME INTERVAL IN HOURS
```

*** ***

```
          **************
          *            *
 61 KK    *   RTE2     *
          *            *
          **************

 63 KO          OUTPUT CONTROL VARIABLES
                     IPRNT          5  PRINT CONTROL
                     IPLOT          0  PLOT CONTROL
                     QSCAL          0.  HYDROGRAPH PLOT SCALE
                     IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                      IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                     ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                     ISAV2        310  LAST ORDINATE PUNCHED OR SAVED
                    TIMINT      0.083  TIME INTERVAL IN HOURS
```

*** ***

```
          **************
          *            *
```

```
 65 KK      *    SHED8   *
            *            *
            **************

 67 KO           OUTPUT CONTROL VARIABLES
                      IPRNT          5  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                       IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2        310  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT      0.083  TIME INTERVAL IN HOURS


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

            **************
            *            *
 71 KK      *    SHED 9  *
            *            *
            **************

 73 KO           OUTPUT CONTROL VARIABLES
                      IPRNT          5  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                       IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2        310  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT      0.083  TIME INTERVAL IN HOURS


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

            **************
            *            *
 77 KK      *    Node15  *
            *            *
            **************

 79 KO           OUTPUT CONTROL VARIABLES
                      IPRNT          5  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                       IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2        310  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT      0.083  TIME INTERVAL IN HOURS


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

            **************
            *            *
 81 KK      *    DET1    *
            *            *
            **************

 83 KO           OUTPUT CONTROL VARIABLES
                      IPRNT          5  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL          0.  HYDROGRAPH PLOT SCALE
                      IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                       IOUT         22  SAVE HYDROGRAPH ON THIS UNIT
```

	ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
	ISAV2	310	LAST ORDINATE PUNCHED OR SAVED
	TIMINT	0.083	TIME INTERVAL IN HOURS

*** ***

```
          **************
          *            *
89 KK     *   SHED12   *
          *            *
          **************
```

91 KO OUTPUT CONTROL VARIABLES

IPRNT	5	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	310	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.083	TIME INTERVAL IN HOURS

*** ***

```
          **************
          *            *
95 KK     *    BNDY    *
          *            *
          **************
```

97 KO OUTPUT CONTROL VARIABLES

IPRNT	5	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE
IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	22	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	310	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.083	TIME INTERVAL IN HOURS

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			BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
			6-HOUR						
24-HOUR	72-HOUR								
HYDROGRAPH AT SHED W	120.	10.17	28.	11.	10.	0.16			
HYDROGRAPH AT SHED11	40.	10.00	7.	3.	3.	0.02			
2 COMBINED AT SUM1	146.	10.08	35.	14.	13.	0.18			
ROUTED TO RTE1	142.	10.08	35.	14.	13.	0.18			
HYDROGRAPH AT SHED10	36.	10.00	7.	3.	2.	0.02			
2 COMBINED AT SUM2	177.	10.08	41.	16.	15.	0.20			
ROUTED TO RTE2	172.	10.08	41.	16.	15.	0.20			
HYDROGRAPH AT SHED8	73.	10.00	13.	5.	5.	0.04			
HYDROGRAPH AT SHED 9	100.	10.00	18.	8.	7.	0.06			
2 COMBINED AT Node15	173.	10.00	32.	13.	12.	0.10			

ROUTED TO DET1	62.	10.42	32.	13.	12.	0.10	
1051.06	10.42						
HYDROGRAPH AT SHED12	29.	10.00	5.	2.	2.	0.02	
3 COMBINED AT BNDY	257.	10.08	78.	31.	29.		
0.31							

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

ISTAQ	ELEMENT	DT	PEAK	TIME TO PEAK	VOLUME	INTERPOLATED TO COMPUTATION INTERVAL DT	PEAK	TIME TO PEAK	VOLUME
		(MIN)	(CFS)	(MIN)	(IN)	(MIN)	(CFS)	(MIN)	(IN)
RTE1	MANE	1.59	145.18	607.48	2.88	5.00	142.17	605.00	2.88

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.2718E+02 EXCESS=0.0000E+00 OUTFLOW=0.2718E+02 BASIN STORAGE=0.1929E-03 PERCENT ERROR= 0.0

RTE2	MANE	1.32	174.96	606.69	3.08	5.00	171.90	605.00	3.08

CONTINUITY SUMMARY (AC-FT) - INFLOW=0.3248E+02 EXCESS=0.0000E+00 OUTFLOW=0.3248E+02 BASIN STORAGE=0.1512E-03 PERCENT ERROR= 0.0

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