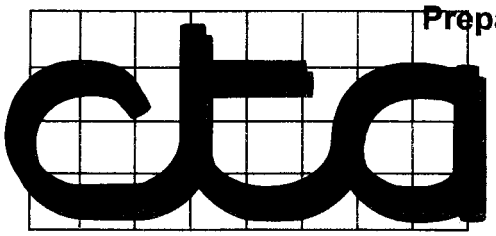
CARSON CREEK REGIONAL DRAINAGE STUDY

2005 UPDATE

DECEMBER, 2005

Prepared by:



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INTRODUCTION

The January 1996 *Carson Creek Regional Drainage Study* provided a "unified plan for stormwater management within the portion of the watershed that lies in El Dorado County." The *CCRDS* study area encompasses approximately 15 square miles, mostly located in the El Dorado Hills community of western El Dorado County, from the origins of Carson Creek north of US Highway 50 to the El Dorado / Sacramento County line. The original study offered an assessment of projected impacts due to development within areas draining to Carson Creek and its tributaries, resulting from a 100-year, 24-hour storm event.

Under natural, undeveloped conditions within the Carson Creek watershed, there is little infiltration into area soils and a high proportion of rainfall results in direct runoff to the main channel and its tributaries. The upper reaches of the stream network are characterized by relatively steep, incised channels, with minimal overbank floodplain areas. However, the stream gradient flattens between US Highway 50 and the Sacramento County line, and as a result the lower reaches of Carson Creek and its tributaries may overflow during major rainfall events. The introduction of additional impervious area and alteration of existing soil cover resulting from new development can be expected to produce increased stormwater runoff, with possible effects on the frequency and magnitude of overflowing.

Since the time the *CCRDS* was adopted by DOT, significant improvements have been constructed within the watershed area south of US Highway 50. These projects include, but are not necessarily limited to: Town Center East, Town Center West, Creekside Greens, Valley View White Rock Village, and Carson Creek Phase 1. Additional growth is projected, as plans for Valley View West Valley Village and Carson Creek Phase 2 are implemented.

PURPOSE OF STUDY UPDATE

Hydrologic and hydraulic computations included in the *CCRDS* reflect the best information available at the time of study completion. The projects noted above were then in the initial design stages, and the level of detail used in representing the rainfall-runoff process for the affected shed areas was necessarily limited. Analyses included in the *CCRDS* indicate that flow in the lower reaches of Carson Creek can be particularly sensitive to the timing of runoff hydrographs from these project locales.

The purpose of the *CCRDS* update is to incorporate revised shed parameters for the lower portion of the Carson Creek watershed into the regional model. As in the *CCRDS*, a primary concern of the updated study is consideration of flow in

Carson Creek at the El Dorado / Sacramento County line, as well as at project-specific locations within the watershed.

The methods used in updating the *CCRDS* are consistent with guidelines and procedures of *County of El Dorado Drainage Manual*, adopted March 15, 1995.

OTHER STUDIES

The 2005 update to the *CCRDS* is based, in part, on information obtained from the following reports:

- *Carson Creek Regional Drainage Study Volumes 1 and 2,* January 1996, prepared for El Dorado County Department of Transportation by Shari Bottorff
- *Drainage Study for Euer Ranch (Carson Creek Phase 1),* January 13, 2003 (Revised), Cooper, Thorne & Associates, Inc.
- *Drainage Analysis for Town Center East Development,* September 2002, Wood-Rodgers, Inc.
- *Storm Drainage Improvements Associated With West Valley Village Phases 1 & 2 (Units 1-8) Rough Grading Plans,* November 30, 2004, Cooper, Thorne & Associates, Inc.
- *An Addendum to Storm Drainage Improvements Associated With West Valley Village Phases 1 & 2 (Units 1-8) Rough Grading Plans,* March 15, 2005, Cooper, Thorne & Associates, Inc.
- *Addendum No. 2 to Storm Drainage Improvements Associated With West Valley Village Phases 1 & 2 (Units 1-8) Rough Grading Plans,* August 2005, Cooper, Thorne & Associates, Inc.
- *Drainage Report for West Valley Major Roadways,* March 7, 2005, R.E.Y. Engineers, Inc.
- *Drainage Study for West Valley Village Phase 2 Units 1A & 1B,* February 2005, Cooper, Thorne & Associates, Inc.
- *Drainage Report for West Valley Unit 2,* March 28, 2005, R.E.Y. Engineers, Inc.
- *Drainage Improvements Associated With West Valley Village – Unit 3,* June 22, 2005, Carlton Engineering, Inc.
- *Drainage Report for West Valley Unit 4,* March 7, 2005, R.E.Y. Engineers, Inc.
- *Drainage Improvements Associated With West Valley Village – Unit 5A,* February 10, 2005, Carlton Engineering, Inc.
- *Drainage Study for West Valley Village Phase 2 Unit 5B,* September 2005 (Revised), Cooper, Thorne & Associates, Inc.
- *Drainage Study for West Valley Village Phase 2 Units 6A – 6C,* September 2005 (Revised), Cooper, Thorne & Associates, Inc.
- *Drainage Report for West Valley Unit 7A,* March 7, 2005, R.E.Y. Engineers, Inc.

- *Drainage Report for West Valley Unit 7B,* March 14, 2005, R.E.Y. Engineers, Inc.
- *Drainage Improvements Associated With West Valley Village – Unit 8,* February 10, 2005, Carlton Engineering, Inc.
- *Drainage Study for West Valley Village Phase 2 Unit 18,* August 2005 (Revised), Cooper, Thorne & Associates, Inc.
- *Preliminary Drainage Study for West Valley Village Lots 6 & 7,* September 2005, Cooper, Thorne & Associates, Inc.
- *Comprehensive Drainage Report for West Valley Village,* November 2005, Cooper, Thorne & Associates, Inc.
- *El Dorado Hills Business Park Master Drainage Plan,* January 1991, Gene E. Thorne & Associates, Inc.

HYDROLOGIC ANALYSES

The rainfall-runoff process for anticipated build out of the Carson Creek watershed was replicated by means of the HEC-1 computer model, developed by the US Army Corps of Engineers Hydrologic Engineering Center. In the HEC-1 simulation, the stream basin is represented by a series of interconnected hydrologic and hydraulic components, i.e. sub basin sheds, channel routing reaches, detention sites. The model depicts the surface runoff response of the watershed to a precipitation event of specified intensity and duration, by means of streamflow hydrographs computed for specified locations throughout the network.

Shed Areas

Segmentation of the Carson Creek watershed into smaller shed areas determines the number and types of network components used in the computational process. In general, shed boundaries are based on natural topography, but may be modified to represent piped storm drain systems, or to reflect flows at key locations such as hydraulic structures or geo-political limits. It is assumed that model parameters within each shed reflect average conditions, and that precipitation and infiltration are uniform over the shed. This assumption is less accurate as shed sizes increase.

Much of the shed area north of US Highway 50 is unchanged since completion of the original *CCRDS;* input data for those sheds were adopted directly from *CCRDS* computer file FUTHEC1.DAT for use herein.

The present study focuses on the area south of Highway 50, where major growth is underway. Sheds within this portion of the Carson Creek watershed have been redefined to more realistically characterize existing and proposed improvements. Modifications to the HEC-1 input model, reflective of recent

development plans, were obtained from drainage studies completed subsequent to adoption of the *CCRDS,* notably *Drainage Study for Euer Ranch (Carson Creek Phase 1),* January 13, 2003 (Revised), Cooper, Thorne & Associates, Inc. and *Drainage Analysis for Town Center East Development,* September 2002, Wood-Rodgers, Inc.

Improvement plans for the West Valley Village segment of Valley View are currently in progress. Shed boundaries within this portion of the watershed were obtained from drainage plans for individual Units within West Valley, as cited in a preceding section of this report.

Flow in Tributary '4' originates from the ridgeline just east of West Valley Village, and is collected and conveyed through the project to several points of discharge along Latrobe Road. Project runoff thence crosses Latrobe Road via several culverts, identified as key points in the hydrologic computations, and enters the El Dorado Hills Business Park storm system.

Drainage facilities serving the Business Park consist primarily of open drainage swales and cross culverts, with minimal amounts of piped storm sewers. The Business Park shed area used in the *CCRDS* has been subdivided for the current analysis to reflect additional key locations at culverts crossings or outfall points. Shed parameters within the Business Park are consistent with the *El Dorado Hills Business Park Master Drainage Plan,* January 1991, Gene E. Thorne & Associates, Inc., as field-verified in September 2005.

Exhibit A presents redefined shed boundaries, consistent with existing and proposed improvement plans, used in the updated hydrograph computations.

Precipitation

Precipitation data applied to the study area were obtained from the *Drainage Manual.* Mean annual precipitation over the Carson Creek watershed averages approximately 26 inches; the corresponding 24-hour precipitation depth for a storm of 100-year return frequency is 5.26 inches. The average elevation within the study area is below 1640', resulting in temporal distribution of the 24-hour precipitation total characterized by the SCS Type 1 pattern. It is assumed that the specified precipitation is evenly distributed over the watershed.

Precipitation Losses

Interception and depression storage occurs as the result of surface retention of precipitation water by vegetation, local depressions, in cracks and crevices in impervious cover, or in areas where water is not free to move as overland flow. Infiltration is the movement of water to areas beneath the land surface. In the HEC-1 computations, such precipitation losses represent rainfall that does not contribute to the runoff process, and is therefore lost to the system.

Precipitation losses in the Carson Creek watershed are computed within HEC-1 by the SCS Curve Number method. A runoff curve number (CN) is assigned to each shed on the basis of ultimate land usage and the runoff potential of underlying soils. Soils within the study area are predominantly of the Auburn series, in shallow layers over nearly impermeable bedrock, characterized by high runoff potential. These soils are categorized in hydrologic soil group 'D'.

CN's assigned to shed areas redefined for the present study are summarized in Table A-1, located in Appendix A. The CN's, consistent with rational formula 'C' values used in pertinent drainage studies, are based on the following land use descriptions, or combinations thereof, found in the *Drainage Manual.*

Residential w/ 2 acre lot size – CN = 82
Residential w/ 1 acre lot size – CN = 84
Residential w/ 0.5 acre lot size – CN = 85
Residential w/ 0.25 acre lot size – CN = 87
Open space – CN = 80
Grassland – CN = 77
Impervious surfaces – CN = 98

Lag Times

HEC1 runoff computations transform precipitation excess into runoff by means of the unit hydrograph technique. For this study, the SCS dimensionless unit hydrograph method was used. The input datum for each shed consists of a single parameter, lag time, which is equal to the lag in hours between the center of mass of rainfall excess and the peak of the unit hydrograph. Lag time is expressed in simplified terms as 0.6 x Time of Concentration (Tc).

Lag times assigned to shed areas redefined for the present study are summarized in Table A-1, located in Appendix A. These values were derived from rational formula times of concentration reported in applicable drainage studies, where available, or computed in accordance with Section 2.4.2 of the *Drainage Manual.*

DETENTION STORAGE

Detention storage temporarily impounds runoff, with resultant delay in timing and reduction of the peak value of the outflow hydrograph. The same volume of water that enters detention is released, but outflow occurs over a longer period of time and at a lesser rate than inflow.

Existing detention facilities in Serrano, Rancho Dorado, Springfield Meadows, and Town Center East are represented in the updated HEC-1 runoff model,

based on stage-storage-discharge relationships developed by others and detailed in previous drainage studies.

The West Valley project contains in-channel wetlands mitigation ponds at two locations, as shown on Exhibit A. These ponds, currently in place, also provide limited volumes of detention storage during the design storm event. Pond outflow ratings for these facilities, based on field survey data, are incorporated into the updated HEC-1 model.

Additional peak flow attenuation may occur in certain reaches of the Carson Creek channel, where outflow is limited due to backwater effects at bridge or culvert constrictions. Temporary flood plain storage in the channel upstream of Golden Foothills Parkway, as simulated in the *CCRDS*, is included in the present analysis.

The tentative map for Carson Creek Phase 2 establishes wetland preserve and open space boundaries adjacent to the Carson Creek channel within the project. Potential channel storage reflecting proposed development up to these limits was evaluated by means of the US Army Corps of Engineers Hydrologic Engineering Center *Training Document No. 30* (TD 30), "River Routing With HEC1 and HEC2", for reaches between the Southern Pacific Railroad crossing and Carson Crossing Drive, and between Carson Crossing Drive and Golden Foothill Parkway. Storage-outflow relationships developed for the two reaches using TD30, as detailed in Appendix B, are included in the updated HEC-1 analysis.

Incidental detention storage that may occur due to debris blockage or backwater effects at minor crossings was not considered in the present study.

HEC-1 RESULTS

Table 1 shows a comparison of 100-year runoff computed in the updated hydrograph model at key points shown on Exhibit A, as compared to outcomes of the original *CCRDS* simulation of future conditions. Table 2 presents flows at additional key points. The HEC-1 summary output file is included in Appendix C.

TABLE 1 - CARSON CREEK REGIONAL DRAINAGE STUDY 2005 UPDATE
FLOW COMPARISONS AT KEY POINTS

KEY POINT	LOCATION / DESCRIPTION	100-YEAR RUNOFF	
		CCRDS	2005 UPDATE
1	Carson Creek @ Latrobe Road	4600 cfs	4900 cfs
1a	Carson Creek west of Latrobe Road, @ confluence w/ 'CR' Tributary	5100 cfs	5500 cfs
2	Unnamed tributary @ Latrobe Road, below Wetlands Mitigation Pond 3	500 cfs	300 cfs
3	Carson Creek @ Golden Foothill Parkway	5600 cfs	5900 cfs
4	Carson Creek @ confluence w/ Tributary '3', below Carson Crossing Drive	6500 cfs	6900 cfs
5	Tributary '4' @ Latrobe Road, below Wetlands Mitigation Ponds 1 & 2	700 cfs	600 cfs
6	Tributary '4' @ confluence w/ Tributary '5'	1000 cfs	900 cfs
7	Tributary '5' @ Latrobe Road	70 cfs	90 cfs
8	Tributary '5' @ confluence w/ Tributary '4'	400 cfs	500 cfs
9	Combined flow in Tributaries '4' and '5'	1400 cfs	1400 cfs
10	Carson Creek @ study limit	7500 cfs	7100 cfs

Flow comparisons shown in Table 1 indicate apparent flow increases of less than 10% at Key Points 1, 1a, 3, and 4 in Carson Creek, and a 10% flow decrease at Point 10. Hydrologic studies of the nature undertaken for the updated Carson Creek analysis are necessarily based on certain empirical data and other generalized assumptions. The accepted level of accuracy of such analyses is generally +/- 10%. Since the divergence of computed flow values is within this range, it is considered negligible.

Flows crossing Latrobe Road at Key Points 2 and 5 show significant decreases as compared to *CCRDS* values. However, existing wetlands mitigation ponds in West Valley Village, upstream from these key points, provide limited detention volumes for attenuation of 100-year peak runoff. The apparent flow reductions at these crossings is due to redefinition of shed boundaries in the updated study, rather than to significant peak flow reduction due to detention routing.

The updated hydrograph model was re-run to simulate additional storage volume at either of the two West Valley Village wetlands mitigation pond locations. Based on the configurations of the ponds, adjacent site grading, and the proximity of the ponds to proposed Con/Span crossings on Blackstone Parkway, it was estimated that the maximum attainable volume increase at either site is about 20%. HEC-1 analyses of this scenario produced flow reductions of less than 3% at Key Point 1, 1a, 3, or 4 in Carson Creek. Since the additional storage would have insignificant impacts on peak flows in Carson Creek, further consideration is not recommended.

TABLE 2 - CARSON CREEK REGIONAL DRAINAGE STUDY 2005 UPDATE
100-YEAR FLOW AT KEY POINTS

KEY POINT	LOCATION / DESCRIPTION	100-YEAR Q
A	Latrobe Road north of West Valley Unit 18	95 cfs
B	Latrobe Road south of West Valley entry	17 cfs
C	Latrobe Road below Shed XQ	31 cfs
D	Latrobe Road south of Investment Boulevard, below Shed XP	14 cfs
E	Latrobe Road below Shed XN	26 cfs
F	Latrobe Road below Shed XM	53 cfs
G	Tributary '4' @ Robert J Mathews Parkway	610 cfs
H	Robert J Mathews Parkway north of Investment Boulevard	60 cfs
J	Tributary '4' @ Business Park boundary	770 cfs
K	South Fork of Tributary '4' @ Business Park boundary	90 cfs
L	Tributary '5' @ Business Park boundary	440 cfs
XL'	Latrobe Road below Shed XL'	5 cfs
Z'	Latrobe Road below Shed Z' (part of Shed Z)	<1 cfs

LATROBE ROAD CROSSINGS

The County of El Dorado Department of Transportation is currently processing project plans for the construction of Latrobe Road improvements. The realignment and widening projects include bridge construction at the Carson Creek crossing location, and extensions of existing culverts at other key locations identified in Tables 1 and 2. (Refer to Department of Transportation, El Dorado County California, *Project Plans for Construction of Improvements in El Dorado County for Latrobe Road and White Rock Road Realignment, Widening, and Bridge Project Phase II,* prepared by Dokken Engineering.)

Culvert capacities based on proposed Latrobe Road improvements at key locations were estimated from hydraulic design charts. Culverts were assumed to operate under inlet control utilizing all available head under the 100-year runoff scenario, with flow values as summarized in Tables 1 and 2. The findings are summarized in Table 3. The Carson Creek crossing at Key Point 1 was identified as undersized in the original *CCRDS;* bridge hydraulics for the replacement structure are not addressed herein.

TABLE 3 – CARSON CREEK REGIONAL DRAINAGE STUDY 2005 UPDATE
LATROBE ROAD CULVERT CAPACITIES

KEY POINT	100-YR Q (CFS)	CULVERT CAPACITY *		COMMENTS
		HW/D	Q	
A	95	3.5	90	Road overtops
2	300	1.6	190	Road overtops
B	17	3.6	>30	Passes 100 yr w/ >2' f.b.
5	600	1.9	260 (total)	Road overtops
Z	< 1	1.8	>20 (total)	Passes 100 yr w/ >2' f.b.
C	31	1.9	>40	Passes 100 yr w/ >2' f.b.
D	14	3.2	16	Passes 100 yr w/ <1' f.b.
E	26	3.1	>50	Passes 100 yr w/ >2' f.b.
F	53	4.5	>100	Passes 100 yr w/ >2' f.b.
XL	5	1.9	>12	Passes 100 yr w/ >2' f.b.
* Utilizing all available head (no freeboard)				

BUSINESS PARK STORM DRAIN SYSTEM

The El Dorado Hills Business Park receives drainage from the ridge to the east of Latrobe Road, as well as from watershed area north of Highway 50. The study update focuses on runoff into tributary channels originating from the ridgeline within Valley View, which enter the Business Park drainage system via Latrobe Road culvert crossings identified in Tables 1 and 2. Storm drainage is conveyed through the Business Park in open drainage ways and cross culverts, with limited piped storm sewers.

It is recognized that sizing of existing storm drainage within the Business Park adheres to design standards pre-dating adoption of the *Drainage Manual*. The *CCRDS* update defines the level of service provided by existing facilities, when evaluated under current criteria. The *El Dorado Hills Business Park Master Drainage Plan,* prepared by Gene E. Thorne & Associates, Inc., July, 1991, was used as a basis for the evaluations, supplemented by review of a sampling of storm drain as-built plans and limited field observations. More detailed assessment is beyond the scope of the present study.

It was concluded that existing storm drainage facilities located within the Business Park south of Golden Foothills Parkway are, in general, capable of conveying 50-75% of 100-year runoff computed herein. The extent of possible flooding resulting from system deficiencies during the 100-year design storm is not addressed. However, the duration of such occurrences can be estimated by inspection of the runoff hydrographs generated in the HEC-1 computation process for selected locations within the Business Park system. These

hydrographs, representing the time distribution of runoff at selected locations in the Business Park, are included in the detailed HEC-1 output file included in Appendix C, and excerpted in Appendix D. Assuming storm drain system capacity of 50% to 75% of peak runoff, graphical interpretation of the runoff hydrographs indicates that system capacity is exceeded for a *maximum* of one hour during the 100-year, 24-hour design storm event. Because potential system overloading is of limited duration, it is felt that upgrades within the Business Park storm system are not warranted at this time.

BACKWATER COMPUTATIONS

The *CCRDS* included 100-year flood profiles for Carson Creek and its tributaries south of US Highway 50. Subsequent project-specific drainage studies have included updated flood plain delineations for selected stream segments impacted by those developments.

The present update includes re-analysis of the 100-year flood profile for the stream reaches specified below, based on revised HEC-1 results reported herein, and reflective of proposed development of the Carson Creek Phase 2 project.

- Carson Creek, from the Southern Pacific Railroad crossing to Golden Foothill Parkway.
- Tributary '3', from the confluence with Carson Creek to the Carson Creek Phase 1 / Phase 2 project boundary.
- Tributary '4', from the confluence with Carson Creek to the Carson Creek Phase 2 project limit, adjacent to the El Dorado Hills Business Park.
- Tributary '5', from the confluence with Tributary '4' to the Carson Creek Phase 2 project limit, adjacent to the El Dorado Hills Business Park.

The HEC-RAS computer program, developed by the US Army Corps of Engineers Hydrologic Engineering Center, was used to produce revised profiles resulting from 100-year runoff computed as part of the present study update. The backwater analyses were begun downstream of the railroad crossing, utilizing cross section data from the *CCRDS*. Cross sections within the Carson Creek Phase 2 project were digitized from 1-foot contour interval topography generated from April 2004 aerial photography. The cross sections represent proposed development limits coincident with field-identified wetlands boundaries.

Backwater computations are based on sub-critical flow analysis. Manning's "n" values reflect unmaintained channel and overbank areas. It is also assumed that channel flow is unrestricted by debris accumulation or other blockages within the streambeds or at culvert locations. The 100-year flow peak was assumed to be concurrent in the main Carson Creek channel as well as in its tributaries. Thus the downstream boundary condition for tributary profiles is the computed 100-year water surface elevation at the confluence with Carson Creek.

Computed 100-year base flood elevations and limits of inundation for the selected study reaches are shown on Exhiit B. HEC-RAS output data are detailed in Appendix E.

SUMMARY AND RECOMMENDATIONS

- The 2005 update to the *CCRDS* reflects the most current development scenario within the lower portion of the watershed, south of US Highway 50. Flows at key points common to the hydrograph analyses in both the original and the updated study are compared in Table 1. Computed 100-year flows at key points in Carson Creek are substantially unchanged from the original study.

- Existing culvert crossings along Latrobe Road are inadequately sized to pass computed 100-year flows. See Tables 1, 2, and 3. It is recommended that improvement plans for the realignment of Latrobe Road include analyses of culvert capacities based on flows reported herein, and that the plans be revised, as necessary, to assure the passage of 100-year runoff with a minimum of two feet of freeboard.

- It is estimated that storm drainage facilities within the El Dorado Hills Business Park are able to handle flows equivalent to at least 50% of 100-year design runoff computed herein. At this level of service, localized flooding along open channel drainage ways or at inlets to the piped system may occur for a maximum duration of 60 minutes during the 100-year, 24-hour design storm. Improvements to the existing system are not recommended based on the level of risk involved.

- The HEC-RAS computer program was used to generate new water surface profiles for stream channels within the future Carson Creek Phase 2 project. Revised flood plain delineations, shown in Exhibit B, reflect development limits established through field-identification of wetlands boundaries.

ATTACHMENTS

APPENDIX A

SHED PARAMETERS

VALLEY VIEW COMPOSITE SHED MAP																
SHED PARAMETERS*																
					SHEET FLOW TRAVEL TIME						SHALLOW CONCENTRATED					
SHED ID	Shed Area (AC)	Shed Area (MI^2)	C	CN	L1 (ft)	n	P (IN)	S1	Tt1 (HR)	Tt1 (MIN)	Unpaved Flow Length (FT)	S2	V2 (FT/SEC)	Tt2 (MIN)	SUM Tt (MIN)	LAG (HR)
A	87	0.136		84	300	0.3	2.52	0.060	0.50	29.8	3100	0.200	7.22	7.2	37.0	0.370
B	38	0.059		84	300	0.3	2.52	0.085	0.43	26.0	2400	0.145	6.14	6.5	32.5	0.325
C	2.67	0.004	0.66	98	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	12.3	0.123
D	2.13	0.003	0.53	85	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10.4	0.104
E	14.64	0.023	0.57	83	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	13.0	0.130
F	20.85	0.033	0.53	86	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	14.2	0.142
G	0.9	0.001	0.66	98	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10.3	0.103
H	0.69	0.001	0.49	98	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5.0	0.050
J	5.79	0.009	0.55	85	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	17.0	0.170
K	1.7	0.003	0.54	85	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	15.0	0.150
L	19.28	0.030	0.53	85	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	15.0	0.150
M	18.12	0.028	0.53	84	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	26.9	0.269
N	15.96	0.025	0.51	85	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	16.8	0.168
P	1.9	0.003	0.57	86	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10.2	0.102
Q	7.06	0.011	0.57	86	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	11.3	0.113
R	2.82	0.004	0.59	86	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	11.9	0.119
S	2.24	0.004	0.66	98	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	12.0	0.120
T	23.36	0.037	0.57	86	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	13.9	0.139
U	1.61	0.003	0.59	86	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	11.0	0.110
V	101	0.158	0.58	82.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	23.4	0.234
W	7.63	0.012	0.65	85	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	13.0	0.130
X	9.4	0.015	0.53	88	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	12.5	0.125
Y	0.58	0.001	0.66	98	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10.0	0.100
Z	29.51	0.046	0.57	86	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	14.2	0.142
AA	5.85	0.009	0.58	85	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	19.4	0.194
AB	57.21	0.089	0.57	86	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	22.2	0.222
AC	2.1	0.003	0.57	87	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10.8	0.108
AD	3.39	0.005	0.57	87	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10.9	0.109
AE	3.2	0.005	0.57	86	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	17.5	0.175
AF	11.43	0.018	0.57	87	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	13.0	0.130

AG	4.83	0.008	0.61	90	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	12.5	0.125
AH	11.24	0.018	0.58	86	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	25.6	0.256
AJ	1.81	0.003	0.66	98	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10.0	0.100
XA	119	0.186		82	300	0.3	2.52	0.100	0.41	24.3	3200	0.165	6.55	8.1	32.5	0.325
XB	33	0.052		80	300	0.4	2.52	0.100	0.51	30.6	1750	0.150	6.25	4.7	35.28	0.353
XC	35	0.055		80	300	0.4	2.52	0.115	0.48	28.9	2000	0.125	5.70	5.8	34.79	0.348
XD	35	0.055		80	300	0.4	2.52	0.125	0.47	28.0	2050	0.125	5.70	6.0	33.99	0.340
XE	11	0.017		80	300	0.4	2.52	0.100	0.51	30.6	1300	0.250	8.07	2.7	33.30	0.333
XF	38	0.059		80	300	0.4	2.52	0.115	0.48	28.9	1600	0.275	8.46	3.2	32.10	0.321
XG	39	0.061		81	300	0.4	2.52	0.050	0.67	40.4	3500	0.035	3.02	19.3	59.72	0.597
XH	45	0.070		81	300	0.4	2.52	0.150	0.43	26.0	2000	0.150	6.25	5.3	31.36	0.314
XJ	30	0.047		82	300	0.35	2.52	0.085	0.49	29.4	2500	0.030	2.79	14.9	44.27	0.443
XK	65	0.102		80	300	0.4	2.52	0.135	0.45	27.1	2100	0.070	4.27	8.2	35.35	0.353
XL	3	0.005		86	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	20.00	0.200
XM	26	0.041		80	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	20.00	0.200
XN	18.4	0.029		81	300	0.2	2.52	0.075	0.33	19.7	650	0.130	5.82	1.9	21.59	0.216
XP	9.4	0.015		81	250	0.2	2.52	0.125	0.23	13.9	800	0.085	4.70	2.8	16.73	0.167
XQ	16	0.025		81	300	0.2	2.52	0.100	0.29	17.6	2000	0.100	5.10	6.5	24.12	0.241
XR	8	0.013		86	300	0.11	2.52	0.030	0.29	17.6	400	0.015	1.98	3.4	21.01	0.210
XS	5.5	0.009		92	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	15.00	0.150
XT	1.6	0.003		92	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	15.00	0.150
XU	9	0.014		88	300	0.35	2.52	0.030	0.74	44.5	750	0.050	3.61	3.5	47.99	0.480
XV	30	0.047		83	300	0.2	2.52	0.250	0.20	12.2	3000	0.050	3.61	13.9	26.0	0.260
XW	70	0.109		82	300	0.25	2.52	0.235	0.25	14.9	4800	0.175	6.75	11.9	26.8	0.268
XY	80	0.125		80	300	0.25	2.52	0.165	0.29	17.2	1750	0.060	3.95	7.4	24.6	0.246
* Based on fully developed shed, both on- and off-site																

CCRDS SHED MAP																
SHED PARAMETERS*																
					SHEET FLOW TRAVEL TIME						SHALLOW CONCENTRATED					
SHED ID	Shed Area (AC)	Shed Area (MI^2)	C	CN	L1 (ft)	n	P (IN)	S1	Tt1 (HR)	Tt1 (MIN)	Unpaved Flow Length (FT)	S2	V2 (FT/SEC)	Tt2 (MIN)	SUM Tt (MIN)	LAG (HR)
CX3N	73	0.114		92	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.390
CX3S	31	0.048		92	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	30.0	0.300
CY3-1	46	0.072		92	300	0.2	2.52	0.060	0.36	21.6	2400	0.031	2.84	14.1	35.6	0.356
CY3-2A	19	0.030		92	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	30.0	0.300
CY3-2B	15	0.023		92	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	30.0	0.300
CY3-2C	23	0.036		92	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	30.0	0.300
CY3-2	69	0.108		92	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	30.0	0.300
CY3-3	41	0.064		86	300	0.2	2.52	0.050	0.39	23.2	1000	0.021	2.34	7.1	30.3	0.303
CY3-4	35	0.055		90	300	0.2	2.52	0.080	0.32	19.2	2100	0.010	1.61	21.7	40.9	0.409
CY5E	280	0.438		84	300	0.2	2.52	0.030	0.47	28.5	4700	0.020	2.28	34.3	62.8	0.628
CY5W	180	0.281		84	300	0.2	2.52	0.012	0.68	41.1	3500	0.012	1.77	33.0	74.1	0.741
CY6'	18	0.028		77	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.270
CZ1'	32	0.050		84	300	0.3	2.52	0.050	0.53	32.1	1500	0.003	0.88	28.3	60.4	0.604
CZ2'	145	0.227		83	300	0.3	2.52	0.040	0.58	35.1	4200	0.008	1.44	48.5	83.6	0.836

APPENDIX B

CHANNEL STORAGE USING TD 30

7/20/05
TAPE7 FOR CCRKTD30.OUT
FLOODPLAIN STORAGE COMPUTED PER 'TD30'
CARSON CREEK

CARSON CREEK ABOVE CARSON CROSS-XS 102.1E

```
KK RCH 1
KM       REACH EXTENDS FROM X-SECT.     111.600 TO X-SECT.     115.000
RS
SV      0        7        9       12       15       20       24       28       32       35
SV     39
SQ      0      800     1000     1500     2000     3000     4000     5000     6000     7000
SQ   8000
KK RCH 2
KM       REACH EXTENDS FROM X-SECT.     102.000 TO X-SECT.     111.000
RS
SV      0       44       55       78      103      155      205      256      307      356
SV    403
SQ      0      800     1000     1500     2000     3000     4000     5000     6000     7000
SQ   8000
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CARSON CREEK

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T1    CARSON CREEK FROM COUNTY LINE TO GOLDEN FOOTHILL PARKWAY
T2    MULTIPLE PROFILE RUN FOR CHANNEL STORAGE - FUTURE CONDITIONS
T3    FILENAME CCRKTD30.*; JULY 2005
J1     0       2       0       0     .006       0       0              448        0
*     BASED ON JULY 2005 HEC-RAS: CARCRKRANCH.PRJ; PLAN 11; GEOMETRY FILE .g08
J2     1       0      -1       0       0       0       0       0       0        0
J4 111.6     115     102     111
J5   -10     -10
NC  .035    .035     .04      .3      .5
QT    10     800    1000    1500    2000    3000    4000    5000    6000    7000
QT  8000
X1   100      18     200     240
GR   450     100   441.5     105   441.5     118     445     120     444     133
GR   443     144     442     165     442     182     440     195     439     200
GR   438     208     434     218     434     225     438     235     439     240
GR   440     256     441     300     442     375
NC   .04     .04    .045
X1 100.1      10     100     154     100     100     100
GR   450       0     442       5     442      27     441     100     435     105
GR 434.2     125     435     139     441     154   441.5     223     444     275
SB   1.2     1.6     2.6       0      54       2     600       0   434.2   434.2
X1 100.2                               25      25      25
X2                    1     440     442
X3    10                                                    442     442
BT    -8       0     450               5     442             100     441
BT             100   444.2             154   444.2             154     441
BT             223   441.5             275     444
X1 100.3                               50      50      50
NC                                   .1      .3
X1 100.5      21     140     165     270     270     300
X3                                           220
GR   445     100     441     140     440     147     436     150     436     153
GR   440     156     441     165     442     190   442.5     220     442     250
GR   441     263   440.2     270   440.2     273     441     280     442     295
GR   442     335   441.5     362     442     382     443     384     444     440
GR   445     466
NC  .055    .055     .06      .3      .5
X1 100.8      19     463     588     390     390     390
X3    10
GR   451       0     448      39     446      47     446     101     448     133
GR   448     165     446     363     444     375   438.2     463   438.2     588
GR   444     645     444     727     442     759     442     783     444     814
GR   446     847     446     963     448    1196     451    1197
X1 100.9                               10      10      10
SB   1.1     1.6     2.6    1197     125    10.7    1700       0   438.2   438.2
X1   101                               15      15      15
X2                    1     451     455
X3    10                                                    455     455
NH     3      10     465    .045     507     .04     575
X1   102      24     465     507      90     140     120
GR   454     100   448.5     113     449     134     450     145     451     165
GR   451     185     450     225     447     245     446     298     445     308
GR 444.3     312     445     329     446     332     446     350     445     360
GR   444     378     444     423     445     440     445     465     443     470
GR   443     490     446     507     450     560     455     575
NH     3     100     835    .045     885     .04    1065
X1   103      38     835     885     290     335     290
GR   456     100   451.5     109     451     140     451     162     451     178
GR   450     200     449     240     449     255     450     260   450.9     383
GR   451     410     451     445   453.7     490     453     520     452     577
GR   450     585     449     600     448     650     447     670     447     680
GR   447     698     446     709     445     732     445     770     446     783
GR   447     795     447     805     446     811     447     820     447     835
GR   445     840     445     863     448     885   448.5     953     449    1008
GR   450    1020     455    1058     456    1065
NH     4     100     615     .04     848    .045     902     .04     969
X1   104      26     848     902     400     405     415
GR   457     100     452     110     452     121   451.6     152     452     179
GR   452     235     453     310     453     330   452.5     340     453     378
GR 453.5     420   453.7     465   453.5     525   453.5     615     453     652
GR 452.5     672     452     715   451.4     755     451     820     450     848
GR   448     853     448     871     449     890     450     902     455     934
GR   460     969
NH     3     100     755    .045     920     .04     993
X1   105      22     920     968     190     125     165
GR   458     100     455     106     455     118     454     135   453.8     155
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GR   454    171    454    240   454.6    380    455    460    455    550
GR   454    628    455    680    455    755    454    850  454.2    885
GR   451    920    450    935    448    945    448    959    450    968
GR   455    980    460    993
NH     3    100    647   .045    710    .04    770
X1   106     21    660    710    280    290    300
GR   461    100    456    110    456    115    458    125    458    175
GR 457.7    215    458    356    457    400    455    415  454.4    508
GR   455    535    455    600    456    612    457    630    457    647
GR   455    660    450    675    450    688    455    710    460    748
GR   465    770
NH     4    100    630    .04    675   .045    710    .04    788
X1   107     18    675    710    210    230    240
GR   464    100  457.8    112  457.8    120  457.7    200    458    265
GR   458    320    458    455  458.7    560    459    610    459    630
GR   458    670    455    675    451    690    451    703    455    710
GR   458    720    460    748    465    788
NH     3    100    290   .045    360    .04    448
X1   108     11    300    360    515    510    600
GR   466    100    460    185    460    290    459    300    455    318
GR   455    338    456    356    457    360    458    380    460    405
GR   465    448
NH     4    100    313    .04    335   .045    390    .04    490
X1   109     19    335    390    175    175    175
GR   468    100    461    114    461    165    460    172    460    180
GR   461    218    461    238    458    280    458    290    460    298
GR   460    313    459    335    456    353    456    375    459    390
GR   460    395    460    410    465    455    470    490
NH     3    100    528   .045    590    .04    620
X1   110     20    535    590    220    250    260
GR   468    100    462    112    462    135    462    252    461    290
GR   458    295    458    305    459    320    461    350    460    360
GR   458    385    458    440    461    480    461    528    460    535
GR   459    555    457    562    457    575    465    590    470    620
NH     3    .04    535   .045    590    100    620
X1 110.2     25    612    660    400    420    420
GR   468    100    466    104    467    170    467    180    467    215
GR   464    234    463    254    462    262    462    275    463    390
GR   463    450    460    505    460    538    461    557    462    565
GR   463    574    463    594    464    602    464    612    460    620
GR   460    640    461    645    462    660    465    680    470    720
NC    .1    .04   .045
X1 110.4     21    600    640    400    520    520
GR   470    100    466    108    466    188    465    192    464    200
GR   463    205    463    215    464    235    464    255    464    292
GR   461    315    461    480    463    495    464    500    464    600
GR   462    610    462    625    463    640    464    675    465    790
GR   470    905
NH     4    .04    270   .045    349    .04    407    100    932
X1 110.6     24    270    349
GR   470    100    467    106    467    232    467    250    466    255
GR   465    270    464    280    463    298    463    322    464    338
GR   465    349    465    407    464    456    463    470    463    520
GR   462    523    461    529    461    537    462    540    464    558
GR   465    745    465    819    466    840    470    932
NH     3    .04    198   .045    240    100   1058
X1 110.8     33    198    240    220    220    220
GR   471    100    465    112    465    116    464    161    464    198
GR 463.3    200  463.3    238    465    240    466    241    466    258
GR   465    263    465    315  465.2    340    465    365  463.3    377
GR   465    390  465.3    425    465    452    464    462    463    480
GR   463    610    464    620    465    635    465    642    464    654
GR   463    668    463    672    464    676    465    683    466    825
GR   467    920    470    995    474   1058
NH     4    .04    173   .045    265    .04    320    100   1390
X1   111     43    173    265    520    520    520
GR   475    100    469    112 468.35    140  468.7    173    468    193
GR   466    205    465    217  464.9    228    465    238    468    240
GR 468.7    265    468    290    468    313    469    320    469    355
GR   468    368    468    380    468    390    469    415    468    439
GR   467    445    467    640    467    685    467    708    468    763
GR   469    800  469.4    842    469    847    466    860    465    870
GR   465    877    466    885    467    900  467.7    998  467.7   1072
GR   468   1112    469   1158    470   1190    471   1252    472   1286
GR   473   1315    474   1351    475   1390
NH     4    100    186   .045    232    .04    255    100    460
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X1 111.4      18     189     232     550     400     500
GR   478     100     471     101     474     107     470     123     470     140
GR   471     147     471     189   470.2     190   470.2     225     471     232
GR 471.7     255     471     275     471     290     472     330     472     360
GR 471.8     380     471     434     484     460
NC                           0.3    0.55
X1 111.5      10     176     210     145     130     140
GR   482     100     472     101   472.5     135     472     160     471     176
GR 470.5     177   470.5     209     472     210     473     260     482     261
SB  1.25       1     2.6       0     160      16     550     0.1   470.9   470.5
X1 111.6                             205     205     205
X2                     1   482.5   485.5
BT   -40      98     486   470.5   98.01     486  473.77   98.67     486  475.95
BT         99.89     486  477.36     103     486  479.02  112.23     486  481.62
BT           122   486.1   482.5  131.77   486.1  481.62     141   486.2  479.02
BT        144.11   486.2  477.36  145.33   486.2  475.95  145.99   486.2  473.77
BT           146   486.2   470.5     149   486.2   470.5  149.01   486.2  473.77
BT        149.67   486.2  475.95  150.89   486.2  477.36     154   486.3  479.02
BT        163.23  486.35  481.62     173   486.4   482.5  182.77  486.35  481.62
BT           192   486.3  479.02  195.11   486.3  477.36  196.33   486.3  475.95
BT        196.99   486.3  473.77     197   486.3   470.5     200   486.3   470.5
BT        200.01   486.3  473.77  200.67   486.3  475.95  201.89   486.3  477.36
BT           205   486.2  479.02  214.23   486.2  481.62     224   486.1   482.5
BT        233.27   486.1  481.62     243   486.1  479.02  246.11   486.1  477.36
BT        247.33   486.1  475.95  247.99   486.1  473.77     248     486   470.5
BT           261   485.5     482
NC                           .1      .3
X1 111.8      12     183     224      90      70      85
GR   483     100     475     116     474     180     473     183     472     195
GR 470.7     202   470.7     215     472     224     473     231     474     255
GR   474     292     483     310
X1   112      13     203     235     180     240     230
GR   479     100     476     106     475     140     475     185     474     203
GR   473     205     472     208     472     228     474     235     475     237
GR 475.2     280     475     304     479     311
X1   113      11     163     240     475     415     460
GR   482     100     478     108     477     163     475     175     474     184
GR   474     190     475     220     477     240     478     252     478     295
GR   482     303
NC   .04     .04     .04
X1   114      12     165     241     365     330     360
GR   484     100     480     108     480     140     479     165     478     195
GR 477.5     200   477.5     229     478     230     479     241     487     265
GR   480     302     484     310
X1   115       9     148     275     410     410     420
GR   487     100     484     106     484     148     480     165     479     185
GR   479     193     480     252     485     275     490     295
EJ
T1    PROFILE 2
J1              3                     .007
J2     2               -1
T1    PROFILE 3
J1              4                     .007
J2     3               -1
T1    PROFILE 4
J1              5                     .007
J2     4               -1
T1    PROFILE 5
J1              6                     .007
J2     5               -1
T1    PROFILE 6
J1              7                     .007
J2     6               -1
T1    PROFILE 7
J1              8                     .007
J2     7               -1
T1    PROFILE 8
J1              9                     .007
J2     8               -1
T1    PROFILE 9
J1             10                     .007
J2     9               -1
T1    PROFILE 10
J1             11                     .007
J2    15               -1
ER
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7/20/05
TAPE 7 FOR RRTD30.OUT
FLOODPLAIN STORAGE COMPUTED PER 'TD30'
TRIBUTARIES '4' AND '5' ADJACENT TO RAILROAD EMBANKMENT
CARSON CREEK PROJECT

TRIB 5' ADJ CARSON CREEK

KK	RCH 1									
KM	REACH EXTENDS FROM X-SECT.				500.000 TO X-SECT.			500.700		
RS										
SV	0	7	12	16	20	23	26	29	31	33
SQ	0	200	400	600	800	1000	1200	1400	1600	1800
KK	RCH 2									
KM	REACH EXTENDS FROM X-SECT.				41.000 TO X-SECT.			500.000		
RS										
SV	0	4	6	7	8	9	10	11	13	16
SQ	0	200	400	600	800	1000	1200	1400	1600	1800

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T1     CARSON CREEK PROJECT
T2     MULTIPLE PROFILE RUN FOR CHANNEL STORAGE ADJACENT TO RR EMBANKMENT
T3     FILENAME RRTD30.*; JULY 2005
*      FLOODPLAIN STORAGE PARALLEL TO RAILRAOD EMBANKMENT @ SOUTHERN P.L.
J1       0       2       0       0       0       0       0           444.5       0
J4     500   500.7      41     500
J5     -10     -10
NC     .04     .04    .045      .1      .3
QT       9     200     400     600     800    1000    1200    1400    1600    1800
X1      41      12     115     144
GR     453     100     415     115     443     122   442.4     131     443     139
GR     446     144     447     166     448     320     448     329     447     352
GR     447     424     450     430
NH       4     .04     460    .045     540     .04     640     100     740
X1      42      21     460     540     700     700     700
GR     457     100     456     162     454     220     453     250     452     300
GR     449     360     448     405     447     418   446.5     422     447     427
GR     448     460     448     480     446     510     449     540     449     580
GR     448     640     447     653     447     705     448     718     448     732
GR     452     740
NH       4     .04     346    .045     371     .04     429     100     519
X1     500      15     346     371     400     400     400
GR     457     100     456     131     452     215     451     248   450.5     305
GR     450     338     449     346     448     352     448     370     450     371
GR     450     405   450.8     429     450     452     450     509     455     519
NH       4     .04     252    .045     290     .04     420     100     590
X1   500.5      16     252     290     450     450     450
GR     459     100     457     131     455     176     454     205     453     233
GR     452     252     451     270     450     278     450     278     452     290
GR   452.6     420     452     509     452     528   452.5     555     453     584
GR     456     590
NH       4     100     285     .04     410    .045     443     .04     658
X1   500.6      19     410     443     600     600     600
GR     458     100     454     120     453     129  452.85     130     453     132
GR     454     140     455     153     456     285     455     410     453     420
GR     453     430     454     432     455     443     456     460     457     520
GR     459     612     460     648     460     656     461     658
NH       4     100     448     .04     512    .045     560     .04     770
X1   500.7      24     512     560     600     600     750
GR     462     100     459     106     458     150   457.4     223     458     255
GR     457     270   456.5     280     457     286     458     290     458     350
GR     457     385     457     430     458     448     458     512     456     518
GR   455.8     522     456     526     457     538     458     560     459     605
GR     460     625     461     645     463     695     464     770
EJ
T1     PROFILE 2
J1               3                       0       0       0       0     445
J2       2              -1
T1     PROFILE 3
J1               4                       0                               445.5
J2       3              -1
T1     PROFILE 4
J1               5                       0                                 446
J2       4              -1
T1     PROFILE 5
J1               6                       0                               446.3
J2       5              -1
T1     PROFILE 6
J1               7                       0                               446.8
J2       6              -1
T1     PROFILE 7
J1               8                       0                               447.3
J2       7              -1
T1     PROFILE 8
J1               9                       0                               447.6
J2       8              -1
T1     PROFILE 9
J1              10                       0                                 448
J2       9              -1
ER
```

APPENDIX C

HEC-1 OUTPUT SUMMARY

```
1****************************************
****************************************
 *                                      *                                        *
*
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                                        *    U.S. ARMY CORPS OF
ENGINEERS      *
 *              JUN   1998              *                                        *    HYDROLOGIC ENGINEERING
CENTER     *
 *           VERSION 4.1                *                                        *          609 SECOND
STREET           *
 *                                      *                                        *       DAVIS, CALIFORNIA
95616       *
 *  RUN DATE   18OCT05  TIME  10:16:12  *                                        *            (916) 756-1104
*
 *                                      *                                        *
*
 ****************************************
****************************************
```

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

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

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.

THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION

NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM


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

            1       ID     AUGUST 2005 REVISION - RUN DATE 9/20/05
            2       ID     MODIFY SHEDS CX1, CX2, CY1, CY2, CY4, CY5, CV1,CV2 PER WEST VALLEY
            3       ID     INCLUDE PROPOSED WEST VALLEY VILLAGE WETLANDS MITIGATION PONDS
            4       ID     CARSON CREEK CHANNEL STORAGE S OF BUSINESS PARK REFLECTS 2005 CARSON CREEK
            5       ID     PROJECT INFO
            6       ID     TOWN CENTER EAST HYDROLOGY PER WOOD RODGERS SEPT 2002 DRAINAGE STUDY
            7       ID     NEW FILE NAME CCFU05.DAT/OUT
            8       ID     WATERSHED ANALYSES ARE BASED ON:
            9       ID     CARSON CREEK REGIONAL DRAINAGE STUDY
           10       ID     CARSON CREEK, FROM HEADWATER TO SACRAMENTO COUNTY LINE
           11       ID     RUNOFF FOR FUTURE CONDITIONS DUE TO 100 YEAR 24-HOUR SCS TYPE I STORM
           12       ID     SCENARIO I - DETENTION @ 19 SITES AS PER EXISTING TENT. MAPS
           13       ID     FOR NON-PARTICIPANTS ASSUME FUTURE RUNOFF IS UNMITIGATED
           14       ID     (CHANNEL ROUTING BY MUSKINGIM CUNGE METHOD)
           15       ID     ANALYSIS OF UPPER BASIN FROM G E THORNE & ASSOC. MASTER DRAINAGE STUDY 8-92
           16       ID     HEC 1 FILES FUTURE.DAT/OUT - S BOTTORFF   4-22-95
           17       IT       5       0       0     300
           18       IO       5       1

           19       KK     CA1  SUBBASIN CA1
           20       KM          SUBBASIN CA1 RUNOFF FOR 100 YEAR STORM
           21       BA    .197
           22       IN      30
           23       PB   5.261
           24       PC       0    .008    .017    .026    .035    .045    .055    .065    .076    .087
           25       PC    .099    .112    .126     .14    .156    .174    .194    .219    .254    .303
           26       PC    .515    .583    .624    .655    .682    .706    .728    .748    .766    .783
           27       PC    .799    .815    .833    .844    .857     .87    .882    .893    .905    .916
           28       PC    .926    .936    .946    .956    .965    .974    .983    .992       1
           29       LS       0      83
           30       UD    .305

           31       KK    PCA1  DETENTION ROUTING - POND CA1 (EDHDC)
           32       KM          POND OUTFLOW AS PER EL DORADO HILLS SPEC PLAN MASTER DRAINAGE STUDY
           33       RS       1    ELEV     100
           34       SV       0    1.21    2.42    3.66     4.9    6.16     7.5     8.9
           35       SQ       0     5.3      15      28      42      59      78     120
           36       SE     100   100.5     101   101.5     102   102.5     103     104

           37       KK    CC-1  CHANNEL ROUTING
           38       KM          SUBBASIN CA1 ROUTED TO SUBBASIN TO CA2
           39       RD    1250    .016     .07            TRAP      10      10

           40       KK     CA2  SUBBASIN CA2
           41       KM          SUBBASIN CA2 RUNOFF FOR 100 YEAR STORM
           42       BA   .1125
           43       LS       0      84
           44       UD    .242

           45       KK   CA1+2  COMBINE HYDROGRAPHS
           46       KM          SUBBASIN CA1, ROUTED + SUBBASIN CA2
           47       HC       2
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 123          SQ       0     .25     .71    1.31       2     6.5    14.7    25.4      38
 124          SE     100  100.25   100.5  100.75     101  101.25   101.5  101.75     102

 125          KK   CC-4A  CHANNEL ROUTING
 126          KM          SUBBASIN CD1 ROUTED TO CD2
 127          RD    1900    .026    .065            TRAP      15      10

 128          KK     CD2  SUBBASIN CD2
 129          KM          SUBBASIN CD2 RUNOFF FOR 100 YEAR STORM
 130          BA    .127
 131          LS       0      83
 132          UD    .237
1                                        HEC-1 INPUT                                        PAGE  4

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


 133          KK   CD1+2  COMBINE HYDROGRAPHS
 134          KM          SUBBASINS CD1 + CD2
 135          HC       2

 136          KK    PCD2 DETENTION ROUTING - POND CD2 (EDHDC)
 137          KM         POND OUTFLOW AS PER MAY '92 GOLF COURSE GRADING REV, THORNE & ASSOC
 138          RS       1    ELEV     100
 139          SV       0      .2      .4      .6      .8       1     1.5     2.1
 140          SQ       0       8      22      42      64      90     166     254
 141          SE     100   100.2   100.4   100.6   100.8     101   101.5     102

 142          KK   CC-4B  CHANNEL ROUTING
 143          KM          SUBBASINS (CD1 + CD2) ROUTED TO CD3
 144          RD    1100    .036    .065            TRAP      15       5

 145          KK     CD3  SUBBASIN CD3
 146          KM          SUBBASIN CD3 RUNOFF FOR 100 YEAR STORM
 147          BA    .125
 148          LS       0      83
 149          UD    .178

 150          KK   CD1-3  COMBINE HYDROGRAPHS
 151          KM          SUBBASINS CD1 - CD3
 152          HC       2

 153          KK    PCD3  DETENTION ROUTING - POND CD3 (EDHDC)
 154          KM          OUTFLOW RATING AS PER EL DORADO HILLS SPEC PLAN MASTER DRAINAGE STUDY
 155          RS       1    ELEV     100
 156          SV       0     .18     .36     .55     .74     .93    1.44    1.94
 157          SQ       0       8      23      42      64      90     165     255
 158          SE     100   100.2   100.4   100.6   100.8     101   101.5     102

 159          KK   CC-4C  CHANNEL ROUTING
 160          KM          SUBBASINS CD1 - CD3 ROUTED TO CD4
 161          RD    1600    .025    .065            TRAP      15       5

 162          KK     CD4  SUBBASIN CD4
 163          KM          SUBBASIN CD4 RUNOFF FOR 100 YEAR STORM
 164          BA    .075
 165          LS       0      84
 166          UD    .219

 167          KK   CD1-4  COMBINE HYDROGRAPHS
 168          KM          SUBBASINS CD1 - CD4
 169          HC       2

 170          KK    PCD4  DETENTION ROUTING - PONDCD4 (EDHDC)
 171          KM          OUTFLOW RATING AS PER EL DORADO HILLS SPEC PLAN MASTER DRAINAGE STUDY
 172          RS       1    ELEV     950
 173          SV       0     .29     1.2    1.84     2.5    3.19     3.9     4.6
 174          SQ       0      15      45      88     127     178     233     290
 175          SE     950   950.5     951   951.5     952   952.5     953   953.5
1                                        HEC-1 INPUT                                        PAGE  5

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


 176          KK   CA-CD  COMBINE HYDROGRAPHS
 177          KM          COMBINE TRIBUTARY BASINS (CA + CB)R + CC + CD - FLOW IN MAIN CHANNEL
 178          HC       3

 179          KK    CC-5  CHANNEL ROUTING - MAIN CHANNEL
 180          KM          ROUTE CA - CD TO POINT 3
 181          RD    1300    .046    .065            TRAP      20       5

 182          KK      CE  SUBBASIN CE
 183          KM          SUBBASIN CE RUNOFF FOR 100 YEAR STORM
 184          BA    .064
 185          LS       0      83
 186          UD     .19

 187          KK      CW  SUBBASIN CW
 188          KM          SUBBASIN CW RUNOFF FOR 100 YEAR STORM
 189          BA    .052
 190          LS       0      82
 191          UD    .117

 192          KK  +CE,CW  COMBINE HYDROGRAPHS
 193          KM          COMBINE CA - CD + CE + CW
 194          HC       3

 195          KK    CC-6  CHANNEL ROUTING - MAIN CHANNEL
 196          KM          ROUTE CA - CE, CW TO POINT 4
 197          RD     800    .037    .065            TRAP      25      10
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272          KM          SUBBASIN CH1 RUNOFF FOR 100 YEAR STORM
273          BA    .086
274          LS       0      81
275          UD    .222

276          KK  TR1-1A  CHANNEL ROUTING
277          KM          SUBBASIN CH1 ROUTED TO CH2
278          RM       1   .0895      .3

279          KK     CH2  SUBBASIN CH2
280          KM          SUBBASIN CH2 RUNOFF FOR 100 YEAR STORM
281          BA   .0932
282          LS       0      82
283          UD    .217

284          KK   CH1-4  COMBINE HYDROGRAPHS
285          KM          SUBBASINS CH1 - CH4 @ SERRANO PKWY./S.V. PKWY.
286          HC       3

287          KK   TR1-2  CHANNEL ROUTING - TRIB 1
288          KM          SUBBASINS CH1 - CH4 ROUTED TO SUBBASIN CH7 OUTLET
289          RM       1    .032      .3

290          KK     CH7  SUBBASIN CH7 (N OF SERRANO PKWY)
291          KM          SUBBASIN CH7 RUNOFF FOR 100 YEAR STORM
292          BA    .223
293          LS       0      84
294          UD    .408
1                                        HEC-1 INPUT                                        PAGE  8

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

295          KK    +CH7  COMBINE HYDROGRAPHS
296          KM          SUBBASINS CH1 - CH4 & CH7 @ INTERSECTION
297          HC       2

298          KK    WMP1  DETENTION ROUTING - WETLANDS MITIGATION POND #1 (EDHDC)
299          KM          POND OUTFLOW RATING AS PER THORNE & ASSOC 10-92 ANALYSIS
300          RS       1    ELEV     770
301          SV       0    1.74    3.75    5.97    8.41
302          SQ       0      17     104     292     575
303          SE     770     771     772     773     774

304          KK   TR1-3  CHANNEL ROUTING - TRIB 1
305          KM          SUBBASINS CH1 - CH4 & CH7 ROUTED TO WETLANDS MITIGATION POND #2
306          RM       1   .0185      .3

307          KK     CH5  SUBBASIN CH5
308          KM          SUBBASIN CH5 RUNOFF FOR 100 YEAR STORM
309          BA   .0897
310          LS       0      83
311          UD    .168

312          KK     CH8  SUBBASIN CH8
313          KM          SUBBASIN CH8 RUNOFF FOR 100 YEAR STORM
314          BA   .0264
315          LS       0      83
316          UD    .118

317          KK    +CH8  COMBINE HYDROGRAPHS
318          KM          SUBBASINS CH1 - CH5 + CH7 & CH8
319          HC       3

320          KK    WMP2  DETENTION ROUTING - WETANDS MITIGATION POND #2 (EDHDC)
321          KM          POND OUTFLOW RATING AS PER THORNE & ASSOC 10-92 ANALYSIS
322          RS       1    ELEV     761
323          SV       0    .923    2.14    3.56    5.14
324          SQ       0      36     123     311     595
325          SE     761     762     763     764     765

326          KK   TR1-4  CHANNEL ROUTING - TRIB 1
327          KM          SUBBASINS CH1 - CH5 + CH7 & CH8, ROUTED TO SUBBASIN CH6
328          RM       1    .021      .3

329          KK     CH6  SUBBASIN CH6
330          KM          SUBBASIN CH6 RUNOFF FOR 100 YEAR STORM
331          BA    .074
332          LS       0      84
333          UD    .157

334          KK   CH1-8  COMBINE HYDROGRAPHS
335          KM          SUBBASINS CH1 - CH8
336          HC       2
1                                        HEC-1 INPUT                                        PAGE  9

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

337          KK   TR1-5  CHANNEL ROUTING - TRIB 1
338          KM          SUBBASINS CH1 - CH8 ROUTED TO WETLANDS MITIGATION POND #4
339          RM       1   .0486      .3

340          KK    CH9A  SUBBASIN CH9A
341          KM          SUBBASIN CH9A RUNOFF FOR 100 YEAR STORM
342          BA   .0753
343          LS       0      84
344          UD    .230

345          KK   +CH9A  COMBINE HYDROGRAPHS
346          KM          SUBBASINS CH1 - CH9A
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LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  425         KK  TR1-9A  CHANNEL ROUTING - CI TRIB
  426         KM          SUBBASIN CI1 ROUTED TO CI3
  427         RM       1    .056      .3

  428         KK     CI2  SUBBASIN CI2
  429         KM          SUBBASIN CI2 RUNOFF FOR 100 YEAR STORM
  430         BA    .031
  431         LS       0      83
  432         UD     .13

  433         KK  TR1-9B  CHANNEL ROUTING - CI TRIB
  434         KM          SUBBASIN CI2 ROUTED TO CI3
  435         RM       1    .068      .3

  436         KK     CI3  SUBBASIN CI3
  437         KM          SUBBASIN CI3 RUNOFF FOR 100 YEAR STORM
  438         BA    .067
  439         LS       0      81
  440         UD     .29

  441         KK   CI1-3  COMBINE HYDROGRAPHS
  442         KM          SUBBASINS CI1 + CI2 + CI3 @ CONFLUENCE W/TRIB 1
  443         HC       3

  444         KK   CI+CH  COMBINE HYDROGRAPHS
  445         KM          SUBBASINS CI + CH
  446         HC       2

  447         KK  TR1-10  CHANNEL ROUTING - TRIB 1
  448         KM          ROUTE TRIBUTARY BASINS CH + CI TO HWY. 50
  449         RD    1300    .035    .065            TRAP      20       10

  450         KK      CJ  SUBBASIN CJ
  451         KM          SUBBASIN CJ RUNOFF FOR 100 YEAR STORM
  452         BA    .072
  453         LS       0      80
  454         UD    .273

  455         KK      CK  SUBBASIN CK
  456         KM          SUBBASIN CK RUNOFF FOR 100 YEAR STORM
  457         BA    .033
  458         LS       0      83
  459         UD    .168

  460         KK   CH-CK  COMBINE HYDROGRAPHS
  461         KM          COMBINE SUBBASINS CH - CK @ HWY 50
  462         HC       3

  463         KK  TR1-11  CHANNEL ROUTING - TRIB 1
  464         KM          ROUTE CH - CK TO CP
  465         RD    2000     .02    .055            TRAP      20       10
1                                      HEC-1 INPUT                                        PAGE 12
LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  466         KK      CP  SUBBASIN CP
  467         KM          SUBBASIN CP RUNOFF FOR 100 YEAR STORM
  468         BA    .094
  469         LS       0      82
  470         UD    .518

  471         KK   TRIB1  COMBINE HYDROGRAPHS
  472         KM          COMBINE CP + ROUTED CH - CK (TRIBUTARY 1)
  473         HC       2

  474         KK  +TRIB1  COMBINE HYDROGRAPHS
  475         KM          ADD TRIB1 TO FLOW IN MAIN CHANNEL
  476         HC       2

  477         KK     CS1  SUBBASIN CS1
  478         KM          SUBBASIN CS1 RUNOFF FOR 100 YEAR STORM
  479         BA    .577
  480         LS       0      79
  481         UD    .879

  482         KK     CS2  SUBBASIN CS2
  483         KM          SUBBASIN CS2 RUNOFF FOR 100 YEAR STORM
  484         BA    .542
  485         LS       0    79.5
  486         UD    .489

  487         KK   CC-9A  CHANNEL ROUTING - SCREECH OWL CRK
  488         KM          ROUTE SUBBASIN CS2 TO SUBBASIN CS3
  489         RD    4500    .027    .065            TRAP      15        5

  490         KK     CS3  SUBBASIN CS3
  491         KM          SUBBASIN CS3 RUNOFF FOR 100 YEAR STORM
  492         BA    .430
  493         LS       0      78
  494         UD    .582

  495         KK   CS1+2  COMBINE HYDROGRAPHS
  496         KM          COMBINE CS2 + CS3 (SCREECH OWL CRK INFLOW)
  497         HC       2

  498         KK   CS1-3  COMBINE HYDROGRAPHS
  499         KM          COMBINE CS1-CS3
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575          KM          SUBBASINS CM1 - CM6 @ HWY. 50
576          HC       2
577          KK     CM7M  SUBBASIN CM7 MODIFIED AREA
578          KM           ANALYSES OF TOWN CENTER PER WOOD RODGERS DRAINAGE STUDY
579          BA    .0762
580          LS        0       90
581          UD    0.193
582          KK    CM1-7  COMBINE CM1 - CM7 BELOW HWY 50
583          HC       2
584          KK   REACH4  CHANNEL ROUTING - REACH HWY 50 - TOWN CENTER N. CROSSING
585          KM           COMBINED HYDROGRAPH ROUTED THROUGH WETLANDS IN TOWN CENTER EAST
586          RS        1    FLOW       -1
587          SV        0       1        2        3
588          SQ        0     200      600     1100
589          KK     CM83  INCREMENTAL PORTION OF SUBBASIN CM8 TRIB TO ROUTING REACH 3 (34 AC)
590          BA    0.053
591          LS        0       94
592          UD     0.19

1                                        HEC-1 INPUT                                                    PAGE 15

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

593          KK     SUM3  COMBINED HYDROGRAPH; ADDED CM83
594          HC       2
595          KK   REACH3  CHANNEL ROUTING - REACH 3; N X-ING - TWN CTR BLVD
596          RS        1    FLOW       -1
597          SV        0       7        8       14
598          SQ        0     200      600     1100
599          KK     CM82  INCREMENTAL PORTION OF SUBBASIN CM8 TRIB TO ROUTING REACH 2 (25 AC)
600          BA     .039
601          LS        0       94
602          UD     .019
603          KK     SUM2  COMBINED HYDROGRAPH; ADDED CM82
604          HC       2
605          KK   REACH2  CHANNEL ROUTING - REACH 2; TWN CTR BLVD TO WEIR
606          RS        1    FLOW       -1
607          SV        0      12       13       18
608          SQ        0     200      600     1100
609          KK     CM81  INCREMENTAL PORTION OF SUBBASIN CM8 TRIB TO ROUTING REACH 1 (26 AC)
610          BA      .04
611          LS        0       94
612          UD     0.19
613          KK     SUM1  COMBINED HYDROGRAPH; ADDED CM81
614          HC       2
615          KK   WEIRDT
616          KM    WEIR CROSSING DETENTION BASIN (CM82)
617          RS        1    FLOW       -1
618          SV        0       .2      6.5      8.2
619          SE      588    588.1      592      593
620          SS      588      220        3      1.5
621          KK     CM8R  PORTION OF SUBBASIN CM8 BELOW TOWN CENTER EAST WETLANDS POND (14 AC)
622          BA     .022
623          LS        0       94
624          UD     0.19
625          KK   STHCRS  COMBINE HYDROGRAPHS - TRIB 2
626          KM           COMBINE CM1-CM8 @ SOUTH CROSSING
627          HC       2
628          KK   SSDET1
629          KM    S CROSSING DETENTION BASIN (CM8); LOW FLOW 1-103"X71"; HIGH FLOW; 1-8.03'X3.'
630          RS        1    FLOW       -1
631          SV        0      0.2      0.8     14.5     25.6     28.6
632          SE    577.2      580    582.5      588      592      593
633          SQ        0      100      200      300      400      500      600      700      800      900
634          SE    577.2    580.2    581.9    583.2    584.2    585.8    587.3      589    590.9      593
635          SQ     1100
636          SE      594

1                                        HEC-1 INPUT                                                    PAGE 16

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

637          KK      CM8  SUBBASIN CM8 (REVISED SHED AREA FOR 28.5 AC)
638          KM           SUBBASIN CM8 RUNOFF FOR 100 YEAR STORM
639          BA    .0445
640          LS        0       89
641          UD     0.15
642          KK    CM1-8  COMBINE HYDROGRAPHS - TRIB 2
643          HC       2
644          KK    TR2-4  CHANNEL ROUTING - TRIB 2
645          KM           ROUTE TO POINT CU (CONFLUENCE W/ MAIN CHANNEL)
646          RD
647          RC      .04     .045      .04     2800     .005
648          RX        0      250      500      503      518      521      771     1021
649          RY      100       90       80       77       77       80       90      100
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 721          KK     CR1  SUBBASIN CR1
 722          KM          SUBBASIN CR1 RUNOFF FOR 100 YEAR STORM
 723          BA    .303
 724          LS       0      85
 725          UD    .395

 726          KK    CR-1  CHANNEL ROUTING - IMPROVED CHANNEL THROUGH VILLAGE U
 727          KM          ROUTE CR1 TO CR2
 728          RD
 729          RC    .035    .035    .035    3000     .02
 730          RX       0      50      54      58      73      77      81     131
 731          RY     101     100      98      96      96      98     100     101

 732          KK     CR2  SUBBASIN CR2
 733          KM          SUBBASIN CR2 RUNOFF FOR 100 YEAR STORM
 734          BA    .205
 735          LS       0      94
 736          UD    .312

 737          KK   CR1+2  COMBINE HYDROGRAPHS
 738          KM          SUBBASINS CR1 + CR2 @ WHITE ROCK ROAD
 739          HC       2

 740          KK    CR-2  HYDROGRAPH ROUTING
 741          KM          ROUTE CR1 + CR2 TO CR3'
 742          RD
 743          RC     .05     .08     .05    3000     .02
 744          RX       0      50      70      75     105     110     170     470
 745          RY     105     100      98      93      93      98     100     105

 746          KK    CR3'  SUBBASIN CR3' (REVISED AREA FOR DETENTION ANALYSIS)
 747          KM          SUBBASIN CR3' RUNOFF FOR 100 YEAR STORM
 748          BA    .223
 749          LS       0      89
 750          UD    .904

 751          KK  CR1-3' COMBINE HYDROGRAPHS
 752          KM         SUBBASINS CR1 - CR3'
 753          HC       2

 754          KK    +CR'  COMBINE HYDROGRAPHS
 755          KM          ADD SUBBASIN CR' TO MAIN CHANNEL
 756          HC       2
1                                    HEC-1 INPUT                                 PAGE 19

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

 757          KK   CC-14  CHANNEL ROUTING - MAIN CHANNEL
 758          KM          ROUTE TO CX3/CX4
 759          KM          STORAGE-OUTFLOW RATING FROM CCRDS
 760          RS       1    FLOW      -1
 761          SV       0      10      11      15      19      26      33      40      48      55
 762          SV      55
 763          SQ       0     800    1000    1500    2000    3000    4000    5000    6000    7000
 764          SQ    8000

 765          KK      XB  WEST VALLEY SHED XB
 766          BA    .052
 767          LS            80
 768          UD    .353

 769          KK       K  WEST VALLEY SHED K
 770          BA    .003
 771          LS            85
 772          UD    0.15

 773          KK       L  WEST VALLEY SHED L
 774          BA     .03
 775          LS            85
 776          UD    0.15

 777          KK    SUM1  COMBINED FLOW
 778          HC       3

 779          KK     RTE  ROUTE TO CONFLUENCE BELOW W VALLEY TANK SITE
 780          RD    2000    .006    .035            TRAP       8       2       2

 781          KK       J  WEST VALLEY SHED J
 782          BA    .009
 783          LS            85
 784          UD    0.17

 785          KK       H  WEST VALLEY SHED H
 786          BA    .001
 787          LS            98
 788          UD     .05

 789          KK    SUM2  COMBINED FLOW IN MAIN CHNNEL
 790          HC       3

 791          KK     RTE  ROUTE TO CORNERSTONE DR X-ING
 792          RD    1000    .009    .035            TRAP      10       2       2

 793          KK      XA  WEST VALLEY SHED XA
 794          BA    .186
 795          LS            82
 796          UD    .325
1                                    HEC-1 INPUT                                 PAGE 20

            LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
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 872          KK   SUMCX  FLOW ENTERING CARSON CREEK
 873          HC        2
1                                        HEC-1 INPUT                                                    PAGE 22

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


 874          KK  POINT3  CARSON CREEK @ GOLDEN FOOTHILL PARKWAY - POINT 3
 875          HC        2

 876          KK  CHSTOR  CHANNEL STORAGE ROUTING BETWEEN G FOOTHILL & CARSON CROSSING
 877          KM          REACH EXTENDS FROM X-SEC 111.6 TO X-SEC 115
 878          RS        1    FLOW       -1
 879          SV        0       7        9       12       15       20       24       28       32       35
 880          SV       39
 881          SQ        0     800     1000     1500     2000     3000     4000     5000     6000     7000
 882          SQ     8000

 883          KK    CZ1'  REVISED CCRDS SHED CZ1'
 884          BA     .05
 885          LS          84
 886          UD    .604

 887          KK   +CZ1'  CARSON CREEK @ CARSON CROSSING DRIVE
 888          HC        2

 889          KK   CW1-P  SUBBASIN CW1-P (AREA TRIB TO ON-SITE POND)
 890          KM          SUBBASIN CW1-P RUNOFF FOR 100 YEAR STORM
 891          BA    .185
 892          LS        0      86
 893          UD     .34

 894          KK   RANDO  DETENTION ROUTING - RANCHO DORADO DETENTION POND
 895          KM          OUTFLOW RATING AS PER THORNE & ASSOC 6-92 ANALYSIS
 896          RS        1    ELEV     632
 897          SV        0     .01    .067     .243     .621    1.289    2.372      3.7
 898          SQ        0      18      42       54       65       87      117      143
 899          SE      632     634     636      638      640      642      644      646

 900          KK   CW1-W  SUBBASIN CW1-W (WEST AREA, NOT TRIB TO POND)
 901          KM          SUBBASIN CW1-W RUNOFF FOR 100 YEAR STORM
 902          BA    .021
 903          LS        0      83
 904          UD    .157

 905          KK   CW1-E  SUBBASIN CW1-E (EAST AREA, NOT TRIB TO POND)
 906          KM          SUBBASIN CW1-E RUNOFF FOR 100 YEAR STORM
 907          BA    .016
 908          LS        0      80
 909          UD    .081

 910          KK     CW1  COMBINE HYDROGRAPHS
 911          KM          SUBBASIN CW1
 912          HC        3

 913          KK   TR3-1  CHANNEL ROUTING
 914          KM          SUBBASIN CW1 ROUTED TO SUBBASIN CW2
 915          RM        2     .28      .3
1                                        HEC-1 INPUT                                                    PAGE 23

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


 916          KK   CW2-1  SUBBASIN CW2-1 (AREA TRIB TO POND 1)
 917          KM          SUBBASIN CW2-1 RUNOFF FOR 100 YEAR STORM
 918          BA    .078
 919          LS        0      86
 920          UD     .28

 921          KK   POND1  DETENTION ROUTING - SPRINGFIELD RANCH POND #1
 922          KM          OUTFLOW RATING AS PER SPRINGFIELD RANCH MASTER DRAINAGE STUDY
 923          RS        1    ELEV     573
 924          SV        0    .005     .01   .0257   .0977   .2482   .5012   .8656
 925          SE      573     574     575     576     577     578     579     580
 926          SQ        0     1.5     6.2    13.6      24      34      48      64       78
 927          SQ       90     106   116.5     130     138   147.8
 928          SE      573   573.5     574   574.5     575   575.5     576   576.5      577
 929          SE    577.5     578   578.5     579   579.5     580

 930          KK   CW2-2  SUBBASIN CW2-2 (AREA TRIB TO POND 2)
 931          KM          SUBBASIN CW2-2 RUNOFF FOR 100 YEAR STORM
 932          BA    .059
 933          LS        0      87
 934          UD    .183

 935          KK   POND2  DETENTION ROUTING - SPRINGFIELD RANCH POND #2
 936          KM          OUTFLOW RATING AS PER SPRINGFIELD RANCH MASTER DRAINAGE STUDY
 937          RS        1    ELEV     562
 938          SV        0    .093      .3   .5525   .8503
 939          SE      562     563     564     565     566
 940          SQ        0       1       3     7.6    13.8      20    24.5    34.5    44.5       62
 941          SE      563   563.5     564   564.5     565   565.5     566   566.5     567      568

 942          KK   CW2-3  SUBBASIN CW2-3 (AREA BELOW PONDS & N OF WHITE ROCK RD)
 943          KM          SUBBASIN CW2-3 RUNOFF FOR 100 YEAR STORM
 944          BA    .042
 945          LS        0      86
 946          UD     .25

 947          KK     CW2  COMBINE HYDROGRAPHS
 948          KM          SUBBASIN CW2
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1023          KM          SUBBASIN CW1-CW9 (TRIBUTARY 3)
1024          HC       3
1025          KK  POINT4  CARSON CREEK BELOW TRIB 3 CONFLUENCE @ POINT 4
1026          KM          COMBINE CW1-CW9 (TRIBUTARY 3) WITH FLOW IN MAIN CHANNEL
1027          HC       2
1028          KK   CC-16  CHANNEL ROUTING - MAIN CHANNEL
1029          KM          ROUTE DOWNSTREAM IN MAIN CHANNEL TO CZ2
1030          KM          CHANNEL STORAGE FOR DEVELOPED CARSON CREEK BY TD30, USING 2004 TOPO
1031          KM          COMPUTED STORAGE VALUES REDUCED 25%
1032          RS       1    FLOW       -1
1033          SV       0      33       41       60       75      116      150      190      225      260
1034          SV     300
1035          SQ       0     800     1000     1500     2000     3000     4000     5000     6000     7000
1036          SQ    8000
1                                        HEC-1 INPUT                                                  PAGE 26

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

1037          KK    CZ2'  REVISED CCRDS SHED CZ2'
1038          BA    .227
1039          LS       0       83
1040          UD    .836
1041          KK    +CZ2  COMBINE HYDROGRAPHS
1042          KM          COMBINE RUNOFF FROM CZ2 WITH FLOW IN MAIN CHANNEL
1043          HC       2
1044          KK      XF  WEST VALLEY SHED XF
1045          BA    .059
1046          LS              80
1047          UD    .321
1048          KK      AD  WEST VALLEY SHED AD
1049          BA    .005
1050          LS              87
1051          UD    .109
1052          KK    SUM1  COMBINED RUNOFF
1053          HC       2
1054          KK     RTE  ROUTED HYDROGRAPH
1055          RD    1600    .007    .035           TRAP       8       3       3
1056          KK      XE  WEST VALLEY SHED XE
1057          BA    .017
1058          LS              80
1059          UD    .333
1060          KK      XD  WEST VALLEY SHED XD
1061          BA    .055
1062          LS              80
1063          UD    .340
1064          KK      XC  WEST VALLEY SHED XC
1065          BA    .055
1066          LS              80
1067          UD    .348
1068          KK      AC  WEST VALLEY SHED AC
1069          BA    .003
1070          LS              87
1071          UD    .108
1072          KK       V  WEST VALLEY SHED V
1073          BA    .158
1074          LS         82.5
1075          UD    .234
1                                        HEC-1 INPUT                                                  PAGE 27

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

1076          KK    SUM2  COMBINED RUNOFF
1077          HC       6
1078          KK     RTE  ROUTE
1079          RD    2000    .009    .035           TRAP      10       3       3
1080          KK      AE  WEST VALLWY SHED AE
1081          BA    .095
1082          LS              86
1083          UD    .175
1084          KK     RTE  ROUTE TO ROYAL OAKS DR
1085          RD    1000    .009    .035           TRAP      10       3       3
1086          KK      XG  WEST VALLEY SHED XG
1087          BA    .061
1088          LS              81
1089          UD    .597
1090          KK     ROD  COMBINED FLOW @ ROYAL OAKS DR
1091          HC       3
1092          KK       W  WEST VALLEY SHED W
1093          BA    .012
1094          LS              85
1095          UD     .13
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1170          RD    1000     .02    .035            TRAP      10       3       3

1171          KK       S  WEST VALLEY SHED S
1172          BA    .004
1173          LS              98
1174          UD    .120

1175          KK      XS  WEST VALLEY SHED XS
1176          BA    .009
1177          LS              92
1178          UD    .150

1179          KK  POINTB  S+XS @ LATROBE RD - POINT B
1180          KO               2
1181          HC       2

1182          KK     RTE  HYDROGRAPH ROUTING TO ROBT J MATTHEWS PKWY
1183          RD    1500     .02    .035            TRAP       2       3       3

1184          KK  CY3-2C  BUSINESS PARK SHED CY3-2C
1185          BA    .036
1186          LS              92
1187          UD     .30

1188          KK  POINTG  'TRIBUTARY 4' @ ROBT J MATTHEWS PKWY - POINT G
1189          HC       3

1190          KK     RTE  ROUTE TO POINT CY3-2
1191          RD    1500    .004    .035            TRAP      12       2       2

1192          KK  CY3-2B  BUSINESS PARK SHED CY3-2B
1193          BA    .023
1194          LS              92
1195          UD     0.3
1                                        HEC-1 INPUT                                                    PAGE 30

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

1196          KK     SUM
1197          HC       2

1198          KK      AA  WEST VALLEY SHED AA
1199          BA    .009
1200          LS              85
1201          UD    .194

1202          KK     RTE  RTE AA ACROSS XQ TO LATROBE RD
1203          RD     900     .08    .035            TRAP       1       2       2

1204          KK      XQ  WEST VALLEY SHED XQ
1205          BA    .025
1206          LS              81
1207          UD    .241

1208          KK  POINTC  FLOW @ LATROBE RD - POINT C
1209          HC       2

1210          KK     RTE  RTE AA+XQ TO ROBT J MATTHEWS PKY POINT H
1211          RD    1200     .03    .035            TRAP       3       2       2

1212          KK  CY3-2A  BUSINESS PARK SHED CY3-2A
1213          BA     .03
1214          LS              92
1215          UD     0.3

1216          KK  POINTH  FLOW @ ROBT J MATTHEWS PKY - POINT H
1217          KO               2
1218          HC       2

1219          KK   CY3-2  BUSINESS PARK SHED CY3-2
1220          BA    .108
1221          LS              92
1222          UD     0.3

1223          KK  POINTJ  'TRIBUTARY 4'@ POINT J (BUSINESS PARK OUTFALL)
1224          HC       3

1225          KK     RTE  RTE TO CY3-3
1226          RD    1500    .012    .035            TRAP      14       2       2

1227          KK  XP/PTD  WEST VALLEY SHED XP - FLOW @ LATROBE RD @ POINT D
1228          KO               2
1229          BA    .015
1230          LS              81
1231          UD    .167

1232          KK     RTE  RTE XP THROUGH CY3-1 TO PL
1233          RD    2300    .033    .035            TRAP       4       3       3
1                                        HEC-1 INPUT                                                    PAGE 31

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

1234          KK   CY3-1  BUSINESS PARK SHED CY3-1
1235          BA    .072
1236          LS              92
1237          UD    .356

1238          KK  POINTK  S FORK 'TRIB 4' @ PL - POINT K
1239          HC       2
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          LINE           ID.......1.......2.......3.......4.......5.......6.......7.......8.......9.....10

          1312           KK  POINT8  FLOW IN 'TRIBUTARY 5' - POINT 8
          1313           HC       2
          1314           KK  POINT9  COMBINED FLOW IN 'TRIBUTARIES 4 & 5' - POINT 9
          1315           HC       2
          1316           KK     RTE  CHANNEL STORAGE ROUTING
          1317           KM          REACH EXTENDS FROM X-SEC 41 TO X-SEC 500
          1318           RS       1    FLOW       -1
          1319           SV       0       4       6       7       8       9      10      11      13      16
          1320           SQ       0     200     400     600     800    1000    1200    1400    1600    1800
          1321           KK    CY6'  REVISED CCRDS SHED CY6
          1322           BA    .028
          1323           LS              77
          1324           UD     .27
          1325           KK    PT10  FLOW IN CARSON CREEK @ LIMIT OF STUDY - POINT 10
          1326           KO              2
          1327           HC       3
          1328           ZZ
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 *                                       *                                                *
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                          AUGUST 2005 REVISION - RUN DATE 9/20/05
                          MODIFY SHEDS CX1, CX2, CY1, CY2, CY4, CY5, CV1,CV2 PER WEST VALLEY
                          INCLUDE PROPOSED WEST VALLEY VILLAGE WETLANDS MITIGATION PONDS
                          CARSON CREEK CHANNEL STORAGE S OF BUSINESS PARK REFLECTS 2005 CARSON CREEK
                          PROJECT INFO
                          TOWN CENTER EAST HYDROLOGY PER WOOD RODGERS SEPT 2002 DRAINAGE STUDY
                          NEW FILE NAME CCFU05.DAT/OUT
                          WATERSHED ANALYSES ARE BASED ON:
                          CARSON CREEK REGIONAL DRAINAGE STUDY
                          CARSON CREEK, FROM HEADWATER TO SACRAMENTO COUNTY LINE
                          RUNOFF FOR FUTURE CONDITIONS DUE TO 100 YEAR 24-HOUR SCS TYPE I STORM
                          SCENARIO I - DETENTION @ 19 SITES AS PER EXISTING TENT. MAPS
                          FOR NON-PARTICIPANTS ASSUME FUTURE RUNOFF IS UNMITIGATED
                          (CHANNEL ROUTING BY MUSKINGIM CUNGE METHOD)
                          ANALYSIS OF UPPER BASIN FROM G E THORNE & ASSOC. MASTER DRAINAGE STUDY 8-92
                          HEC 1 FILES FUTURE.DAT/OUT - S BOTTORFF   4-22-95

  18 IO          OUTPUT CONTROL VARIABLES
                      IPRNT          5  PRINT CONTROL
                      IPLOT          1  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         300  NUMBER OF HYDROGRAPH ORDINATES
                     NDDATE      2   0  ENDING DATE
                     NDTIME        0055  ENDING TIME
                     ICENT          19  CENTURY MARK

                  COMPUTATION INTERVAL     .08 HOURS
                     TOTAL TIME BASE   24.92 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

 WARNING --- ROUTED OUTFLOW (     38.) IS GREATER THAN MAXIMUM OUTFLOW (     38.) IN STORAGE-OUTFLOW TABLE
 ***** WARNING *****  POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH   TR1-1.
       ADJUST NSTPS AND/OR COMPUTATION INTERVAL TO MEET CRITERIA IN USER MANUAL).
 ***** WARNING *****  POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH   TR1-2.
       ADJUST NSTPS AND/OR COMPUTATION INTERVAL TO MEET CRITERIA IN USER MANUAL).
 ***** WARNING *****  POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH   TR1-3.
       ADJUST NSTPS AND/OR COMPUTATION INTERVAL TO MEET CRITERIA IN USER MANUAL).
 ***** WARNING *****  POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH   TR1-4.
       ADJUST NSTPS AND/OR COMPUTATION INTERVAL TO MEET CRITERIA IN USER MANUAL).
 ***** WARNING *****  POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH   TR1-5.
       ADJUST NSTPS AND/OR COMPUTATION INTERVAL TO MEET CRITERIA IN USER MANUAL).
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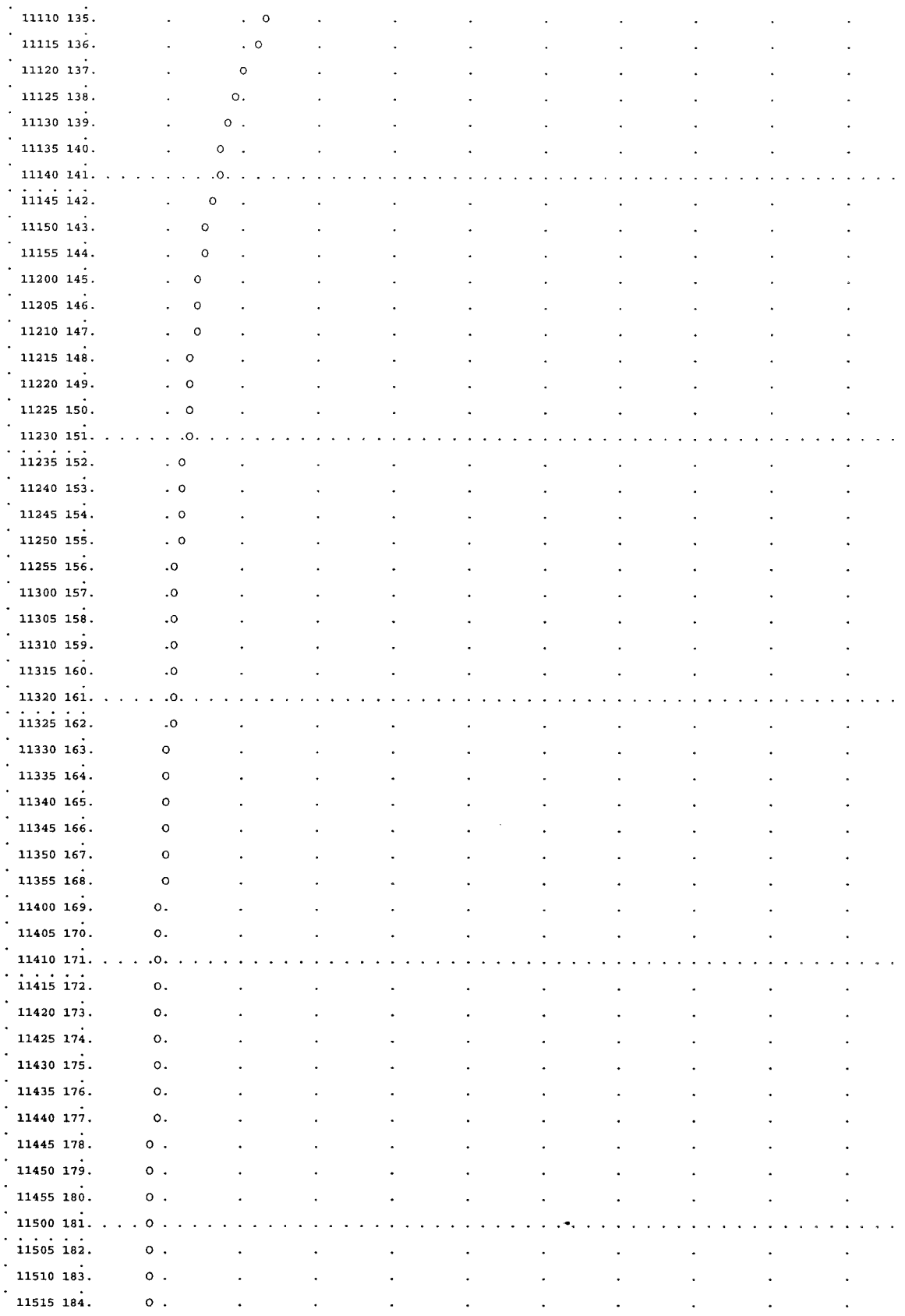
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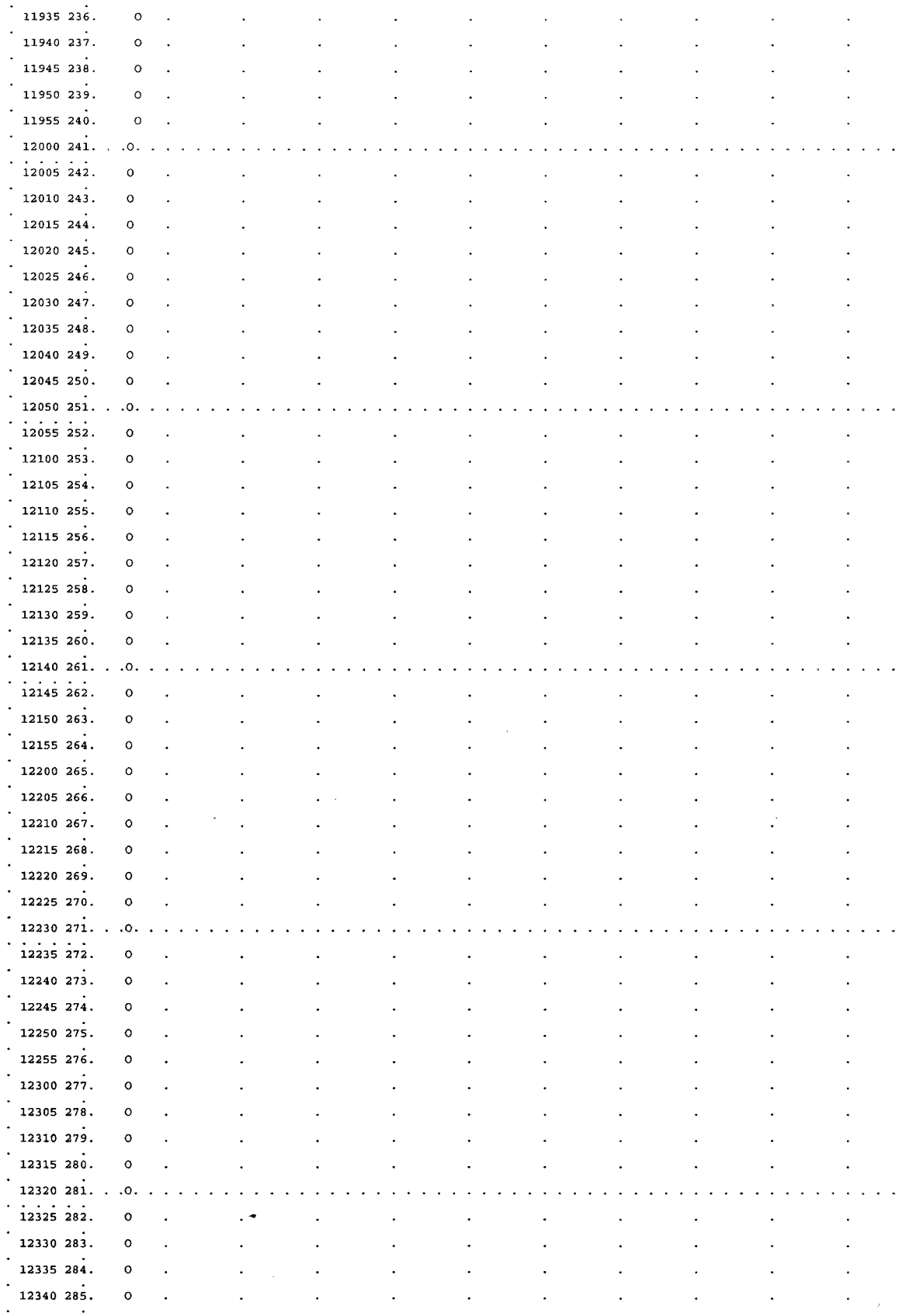
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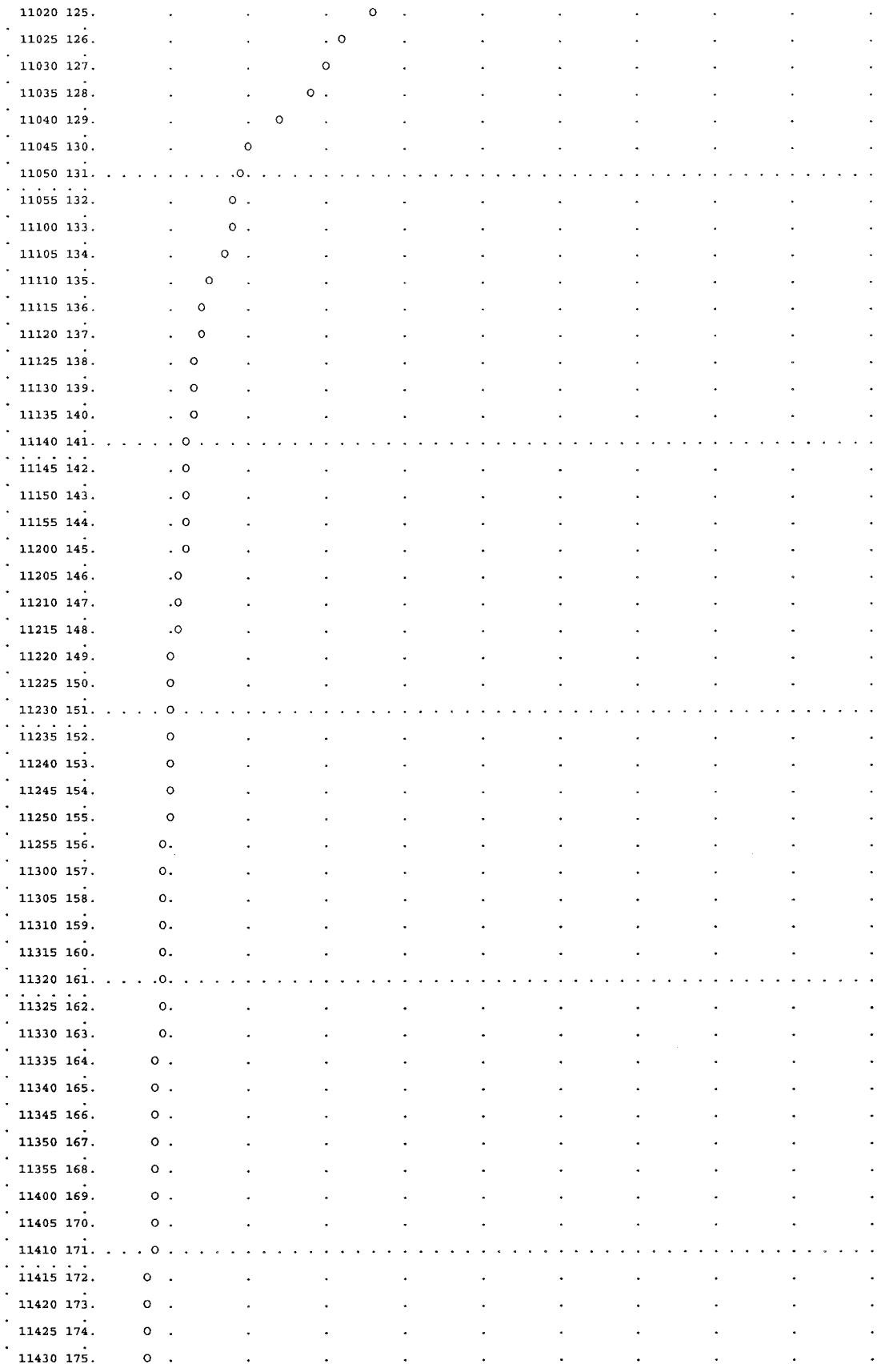

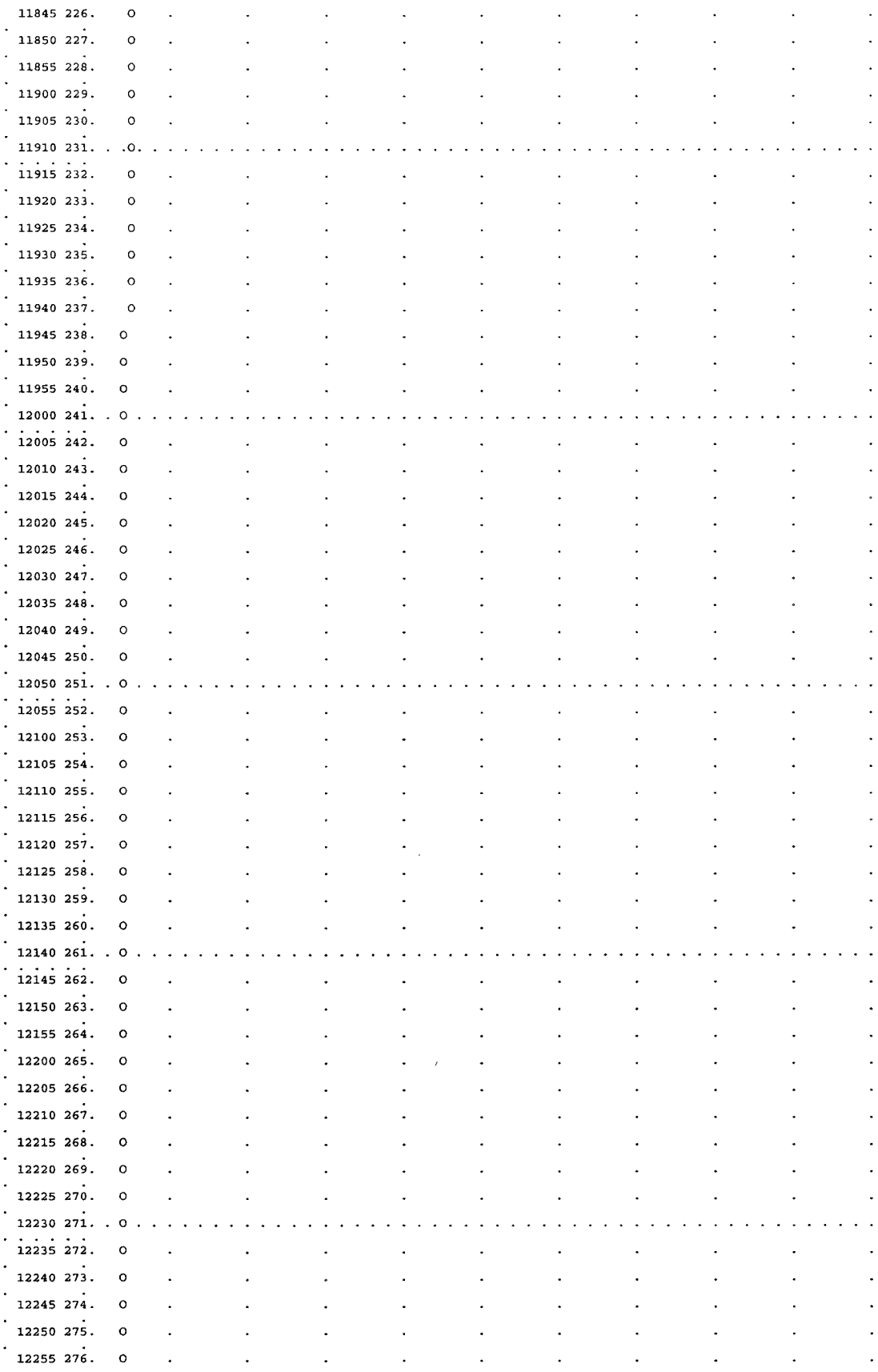
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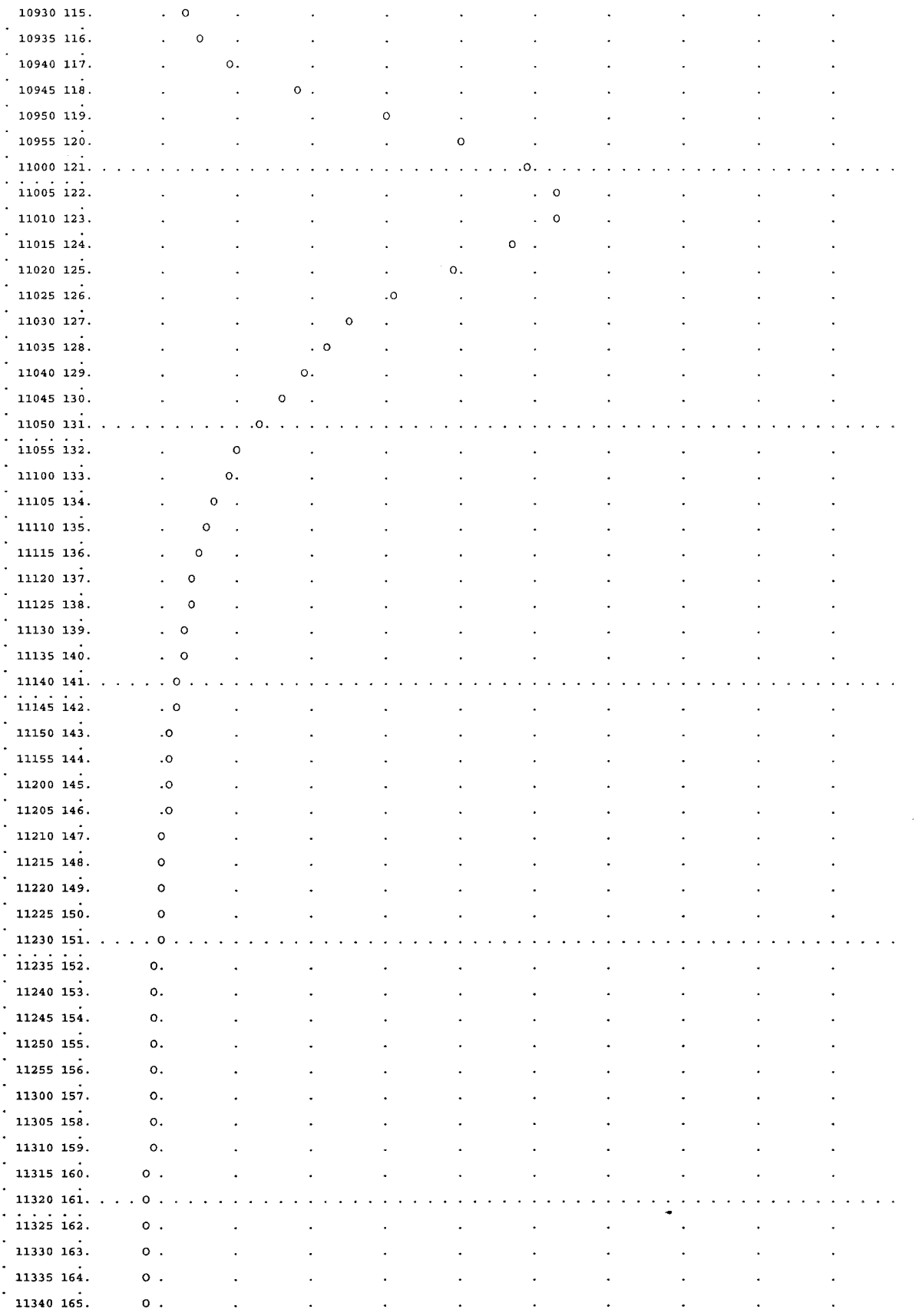
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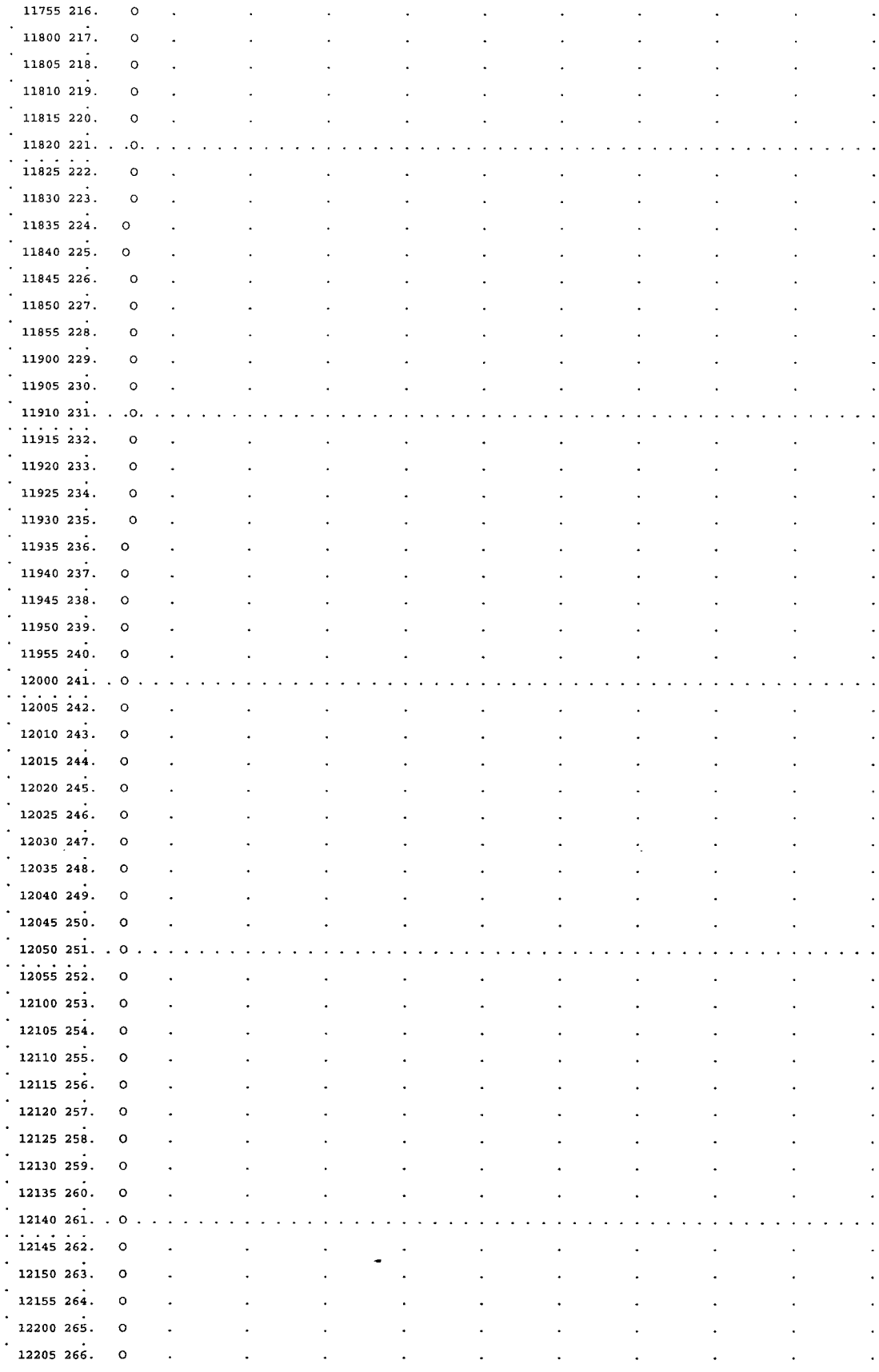
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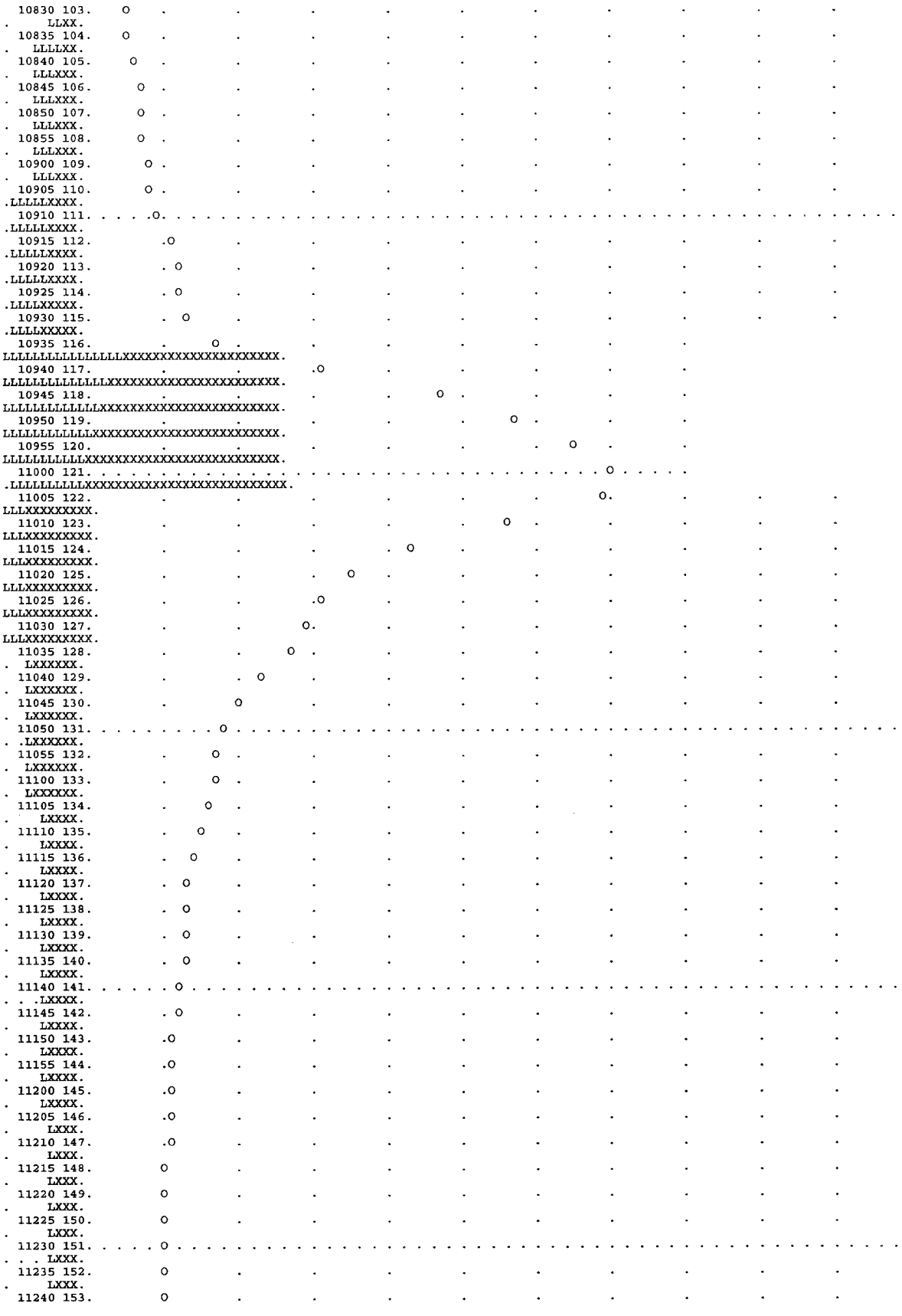
POINT D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  12105 254.   O    .        .        .        .        .        .        .        .        .        .
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            *            *
 1325 KK    *      PT10  *      FLOW IN CARSON CREEK @ LIMIT OF STUDY - POINT 10
            *            *
            **************

 1326 KO          OUTPUT CONTROL VARIABLES
                       IPRNT          5  PRINT CONTROL
                       IPLOT          2  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE
1                                                    STATION     PT10

                        (O) OUTFLOW
          0.     1000.     2000.     3000.     4000.     5000.     6000.     7000.     8000.        0.        0.
0.        0.
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  10015   4O         .         .         .         .         .         .         .         .         .         .
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  10020   5O         .         .         .         .         .         .         .         .         .         .
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  10025   6O         .         .         .         .         .         .         .         .         .         .
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  10030   7O         .         .         .         .         .         .         .         .         .         .
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  10035   8.O        .         .         .         .         .         .         .         .         .         .
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  10040   9. O       .         .         .         .         .         .         .         .         .         .
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  10045  10.  O      .         .         .         .         .         .         .         .         .         .
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  10050  11. .O. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
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  10100  13.    O    .         .         .         .         .         .         .         .         .         .
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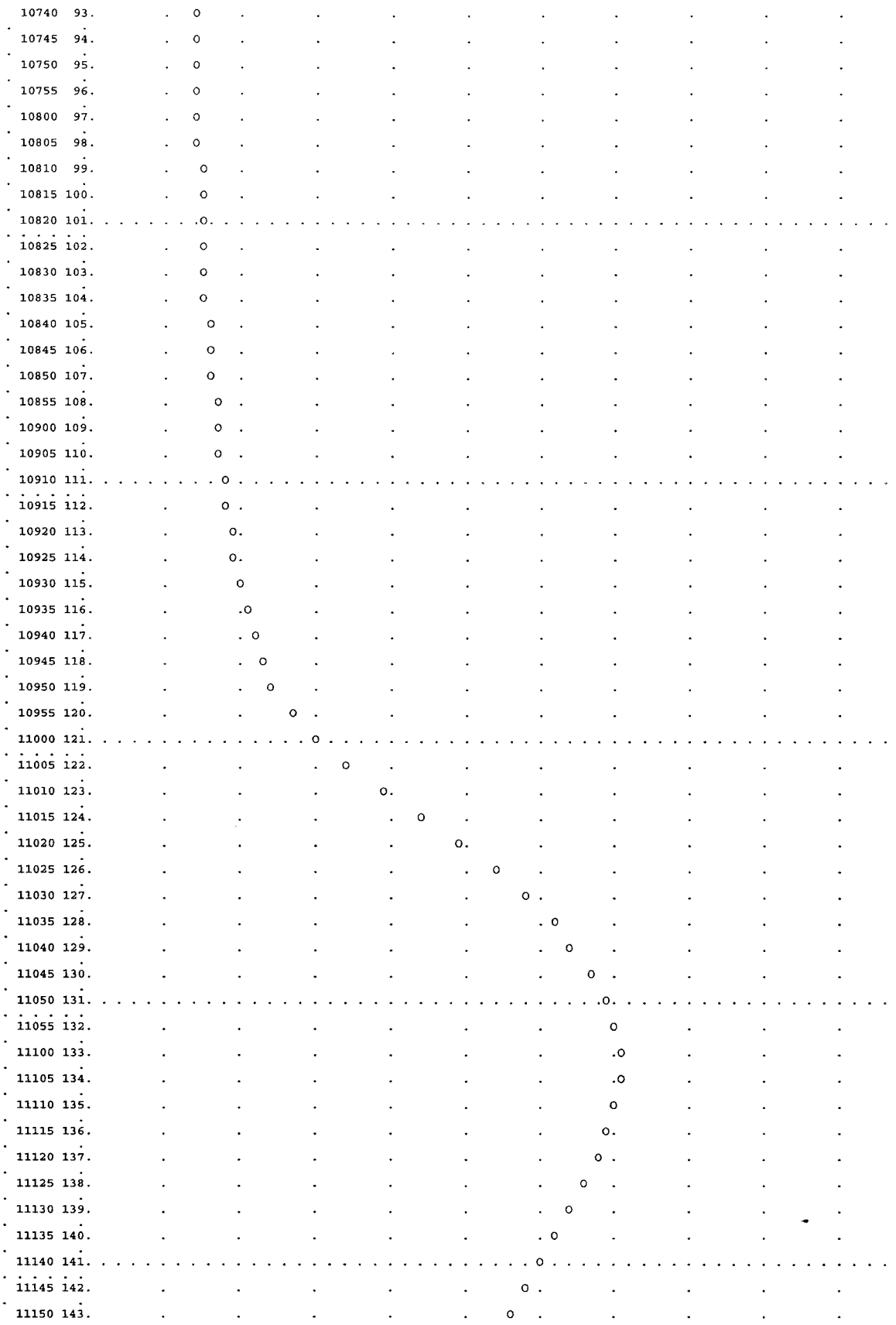
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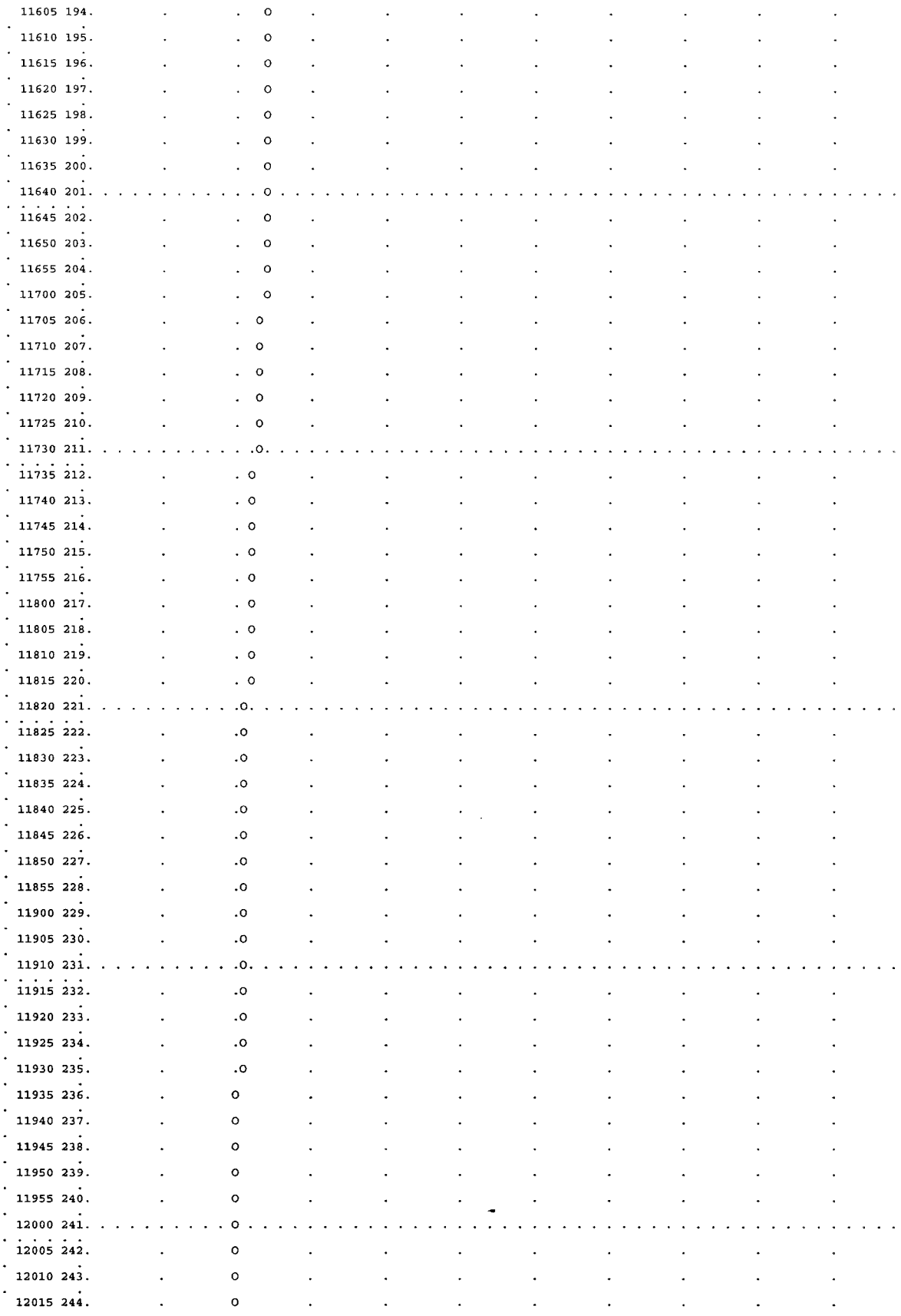
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RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

	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	CA1	170.	10.17	46.	18.	17.	.20		
+	ROUTED TO	PCA1	92.	10.58	44.	17.	17.	.20	103.33	
10.58										
+	ROUTED TO	CC-1	92.	10.67	44.	17.	17.	.20		
+	HYDROGRAPH AT	CA2	108.	10.08	27.	11.	10.	.11		
+	2 COMBINED AT	CA1+2	145.	10.17	70.	28.	27.	.31		
+	ROUTED TO	PCA2	108.	11.08	67.	27.	26.	.31	103.29	
11.08										
+	ROUTED TO	CC-2	108.	11.17	67.	27.	26.	.31		
+	HYDROGRAPH AT	CA3	73.	10.08	20.	8.	7.	.08		
+	HYDROGRAPH AT	CA4	242.	10.25	74.	29.	28.	.31		
+	3 COMBINED AT	CA1-4	363.	10.25	158.	63.	61.	.70		
+	ROUTED TO	CC-3	364.	10.33	158.	63.	60.	.70		
+	HYDROGRAPH AT	CA5	88.	10.08	24.	9.	9.	.10		
+	2 COMBINED AT	CA1-5	432.	10.33	181.	72.	69.	.80		
+	HYDROGRAPH AT	CB1	100.	10.00	24.	9.	9.	.10		
+	ROUTED TO	PCB1	86.	10.17	24.	9.	9.	.10	69.27	
10.17										
+	ROUTED TO	CC-3A	86.	10.25	24.	9.	9.	.10		
+	HYDROGRAPH AT	CB2	77.	10.17	21.	8.	8.	.09		
+	2 COMBINED AT	CB1+2	159.	10.25	45.	18.	17.	.20		
+	2 COMBINED AT	CA+CB	590.	10.25	226.	90.	86.	1.00		
+	ROUTED TO	CC-4	587.	10.33	226.	89.	86.	1.00		
+	HYDROGRAPH AT	CC	260.	10.42	95.	37.	36.	.44		
+	HYDROGRAPH AT	CD1	67.	10.08	16.	6.	6.	.07		
+	ROUTED TO	PCD1	38.	10.33	15.	6.	5.	.07	102.01	
10.33										

+	ROUTED TO	CC-9	1851.	10.58	730.	285.	275.	3.29	
+	HYDROGRAPH AT	CH3	89.	10.00	22.	8.	8.	.09	
+	HYDROGRAPH AT	CH4	12.	10.00	3.	1.	1.	.01	
+	2 COMBINED AT	CH3+4	102.	10.00	24.	10.	9.	.10	
+	ROUTED TO	TR1-1	102.	10.08	24.	10.	9.	.10	
+	HYDROGRAPH AT	CH1	76.	10.08	19.	7.	7.	.09	
+	ROUTED TO	TR1-1A	74.	10.17	19.	7.	7.	.09	
+	HYDROGRAPH AT	CH2	86.	10.08	21.	8.	8.	.09	
+	3 COMBINED AT	CH1-4	260.	10.08	65.	25.	24.	.28	
+	ROUTED TO	TR1-2	256.	10.08	65.	25.	24.	.28	
+	HYDROGRAPH AT	CH7	179.	10.25	54.	21.	20.	.22	
+	2 COMBINED AT	+CH7	430.	10.17	119.	46.	45.	.50	
+	ROUTED TO	WMP1	403.	10.25	118.	46.	44.	.50	
+ 10.25									773.39
+	ROUTED TO	TR1-3	402.	10.25	118.	46.	44.	.50	
+	HYDROGRAPH AT	CH5	89.	10.00	21.	8.	8.	.09	
+	HYDROGRAPH AT	CH8	28.	10.00	6.	2.	2.	.03	
+	3 COMBINED AT	+CH8	469.	10.25	146.	56.	54.	.62	
+	ROUTED TO	WMP2	459.	10.33	145.	56.	54.	.62	
+ 10.33									764.52
+	ROUTED TO	TR1-4	461.	10.33	145.	56.	54.	.62	
+	HYDROGRAPH AT	CH6	77.	10.00	18.	7.	7.	.07	
+	2 COMBINED AT	CH1-8	497.	10.33	163.	63.	61.	.69	
+	ROUTED TO	TR1-5	498.	10.33	163.	63.	61.	.69	
+	HYDROGRAPH AT	CH9A	73.	10.08	18.	7.	7.	.08	
+	2 COMBINED AT	+CH9A	545.	10.33	181.	70.	67.	.77	
+	ROUTED TO	WMP4	546.	10.33	181.	70.	67.	.77	
+ 10.33									735.40
+	ROUTED TO	TR1-6	546.	10.33	181.	70.	67.	.77	
+	HYDROGRAPH AT	CH9B	13.	10.00	3.	1.	1.	.01	
+	2 COMBINED AT	+CH9B	551.	10.33	184.	71.	68.	.78	
+	ROUTED TO	WMP5	550.	10.33	184.	71.	68.	.78	
+ 10.33									728.40
+	ROUTED TO	TR1-7	548.	10.33	184.	71.	68.	.78	
+	HYDROGRAPH AT	CH10	17.	10.00	4.	1.	1.	.02	

+		CQ	36.	10.00	9.	3.	3.	.03	
+	2 COMBINED AT	+CQ	3435.	10.58	1338.	522.	502.	6.08	
+	HYDROGRAPH AT	CT1	128.	10.17	35.	14.	13.	.15	
+	2 COMBINED AT	+CT1	3507.	10.58	1373.	535.	516.	6.23	
+	ROUTED TO	CC-11	3487.	10.58	1373.	534.	514.	6.23	
+	HYDROGRAPH AT	CM6	100.	10.92	47.	18.	18.	.22	
+	HYDROGRAPH AT	CM2	32.	10.08	8.	3.	3.	.04	
+	2 COMBINED AT	CM2+6	111.	10.83	55.	21.	21.	.26	
+	ROUTED TO	TR2-1	111.	11.00	55.	21.	21.	.26	
+	HYDROGRAPH AT	CM1	438.	10.33	143.	56.	54.	.56	
+	HYDROGRAPH AT	CM3	97.	10.08	25.	10.	9.	.12	
+	HYDROGRAPH AT	CM5	39.	10.25	12.	5.	4.	.05	
+	4 COMBINED AT	CM	625.	10.33	234.	92.	88.	.99	
+	ROUTED TO	TR2-2	625.	10.33	233.	92.	88.	.99	
+	HYDROGRAPH AT	CM4	134.	10.08	35.	14.	13.	.15	
+	2 COMBINED AT	CM1-6	725.	10.33	269.	105.	101.	1.14	
+	HYDROGRAPH AT	CM7M	89.	10.00	21.	8.	8.	.08	
+	2 COMBINED AT	CM1-7	780.	10.25	290.	114.	110.	1.22	
+	ROUTED TO	REACH4	776.	10.33	290.	114.	110.	1.22	
+	HYDROGRAPH AT	CM83	68.	10.00	16.	7.	6.	.05	
+	2 COMBINED AT	SUM3	820.	10.25	305.	120.	116.	1.27	
+	ROUTED TO	REACH3	786.	10.42	304.	119.	115.	1.27	
+	HYDROGRAPH AT	CM82	54.	10.00	12.	5.	5.	.04	
+	2 COMBINED AT	SUM2	804.	10.42	314.	124.	120.	1.31	
+	ROUTED TO	REACH2	786.	10.50	309.	122.	118.	1.31	
+	HYDROGRAPH AT	CM81	51.	10.00	12.	5.	5.	.04	
+	2 COMBINED AT	SUM1	806.	10.50	320.	127.	123.	1.35	
+	ROUTED TO	WEIRDT	805.	10.50	320.	127.	122.	1.35	
+									589.14
10.50									
+	HYDROGRAPH AT	CM8R	28.	10.00	7.	3.	3.	.02	
+	2 COMBINED AT	STHCRS	816.	10.50	326.	130.	125.	1.37	
+	ROUTED TO	SSDET1	1100.	.08	1100.	1100.	1098.	1.37	
+									577.20
.00									
+	HYDROGRAPH AT	CM8	53.	10.00	12.	5.	5.	.04	
+	2 COMBINED AT	CM1-8	1153.	10.00	1112.	1105.	1103.	1.42	

+		L	32.	10.00	7.	3.	3.	.03
+	3 COMBINED AT	SUM1	70.	10.08	19.	8.	7.	.09
+	ROUTED TO	RTE	69.	10.17	19.	8.	7.	.09
+	HYDROGRAPH AT	J	9.	10.00	2.	1.	1.	.01
+	HYDROGRAPH AT	H	1.	10.00	0.	0.	0.	.00
+	3 COMBINED AT	SUM2	77.	10.17	22.	9.	8.	.09
+	ROUTED TO	RTE	76.	10.25	22.	9.	8.	.09
+	HYDROGRAPH AT	XA	152.	10.17	42.	17.	16.	.19
+	HYDROGRAPH AT	G	1.	10.00	0.	0.	0.	.00
+	3 COMBINED AT	SUM3	228.	10.17	65.	25.	24.	.28
+	ROUTED TO	RTE	223.	10.25	65.	25.	24.	.28
+	HYDROGRAPH AT	N	26.	10.00	6.	2.	2.	.03
+	HYDROGRAPH AT	E	24.	10.00	5.	2.	2.	.02
+	HYDROGRAPH AT	P	3.	10.00	1.	0.	0.	.00
+	HYDROGRAPH AT	R	5.	10.00	1.	0.	0.	.00
+	HYDROGRAPH AT	XJ	34.	10.25	11.	4.	4.	.05
+	6 COMBINED AT	SUM4	293.	10.17	89.	35.	33.	.38
+	ROUTED TO	WMP3	283.	10.25	89.	35.	33.	.38
+								545.56
10.25								
+	ROUTED TO	RCX2	282.	10.33	89.	35.	33.	.38
+	HYDROGRAPH AT	F	37.	10.00	8.	3.	3.	.03
+	HYDROGRAPH AT	XT	4.	10.00	1.	0.	0.	.00
+	HYDROGRAPH AT	XU	12.	10.33	4.	1.	1.	.01
+	4 COMBINED AT	POINT2	311.	10.33	102.	40.	38.	.43
+	ROUTED TO	CC14B	311.	10.42	102.	40.	38.	.43
+	HYDROGRAPH AT	CX3N	115.	10.17	33.	13.	13.	.11
+	HYDROGRAPH AT	POINTM	53.	10.08	14.	6.	5.	.05
+	3 COMBINED AT	SUMCX	456.	10.33	148.	59.	56.	.60
+	HYDROGRAPH AT	CX4	205.	10.42	70.	28.	27.	.24
+	2 COMBINED AT	SUMCX	659.	10.33	219.	87.	83.	.84
+	2 COMBINED AT	POINT3	5894.	10.67	3091.	1880.	1827.	10.06
+	ROUTED TO	CHSTOR	5889.	10.75	3091.	1878.	1821.	10.06
+	HYDROGRAPH AT	CZ1'	33.	10.42	12.	5.	5.	.05
+	2 COMBINED AT	+CZ1'	5918.	10.75	3102.	1883.	1826.	10.11
	HYDROGRAPH AT							

+	ROUTED TO	CC-16	6035.	11.17	3532.	2034.	1963.	12.04
+	HYDROGRAPH AT	CZ2'	125.	10.75	53.	21.	20.	.23
+	2 COMBINED AT	+CZ2	6137.	11.17	3584.	2054.	1982.	12.26
+	HYDROGRAPH AT	XF	45.	10.17	13.	5.	5.	.06
+	HYDROGRAPH AT	AD	6.	10.00	1.	1.	0.	.00
+	2 COMBINED AT	SUM1	49.	10.08	14.	5.	5.	.06
+	ROUTED TO	RTE	49.	10.25	14.	5.	5.	.06
+	HYDROGRAPH AT	XE	13.	10.17	4.	1.	1.	.02
+	HYDROGRAPH AT	XD	41.	10.17	12.	5.	4.	.05
+	HYDROGRAPH AT	XC	41.	10.17	12.	5.	4.	.05
+	HYDROGRAPH AT	AC	4.	10.00	1.	0.	0.	.00
+	HYDROGRAPH AT	V	145.	10.08	37.	14.	14.	.16
+	6 COMBINED AT	SUM2	282.	10.08	79.	31.	30.	.35
+	ROUTED TO	RTE	283.	10.17	79.	31.	30.	.35
+	HYDROGRAPH AT	AE	102.	10.00	24.	9.	9.	.09
+	ROUTED TO	RTE	101.	10.08	24.	9.	9.	.09
+	HYDROGRAPH AT	XG	37.	10.42	13.	5.	5.	.06
+	3 COMBINED AT	ROD	406.	10.17	116.	45.	44.	.51
+	HYDROGRAPH AT	W	13.	10.00	3.	1.	1.	.01
+	HYDROGRAPH AT	AB	92.	10.08	23.	9.	9.	.09
+	3 COMBINED AT	SUM3	499.	10.17	142.	55.	53.	.61
+	ROUTED TO	RTE	490.	10.17	142.	55.	53.	.61
+	HYDROGRAPH AT	M	26.	10.08	7.	3.	3.	.03
+	HYDROGRAPH AT	U	3.	10.00	1.	0.	0.	.00
+	2 COMBINED AT	SUM4	29.	10.08	8.	3.	3.	.03
+	ROUTED TO	RTE	29.	10.17	8.	3.	3.	.03
+	HYDROGRAPH AT	XH	56.	10.17	16.	6.	6.	.07
+	HYDROGRAPH AT	X	18.	10.00	4.	2.	2.	.01
+	HYDROGRAPH AT	T	41.	10.00	9.	4.	4.	.04
+	5 COMBINED AT	SUM5	615.	10.17	178.	70.	67.	.76
+	ROUTED TO	WMP1	616.	10.17	178.	70.	67.	.76
+								541.32
10.17								
+	ROUTED TO	WMP2	609.	10.17	178.	71.	69.	.76
+								537.60
10.17								
	HYDROGRAPH AT							

+	2 COMBINED AT	POINT6	1081.	10.33	321.	128.	124.	1.28
+	HYDROGRAPH AT	XN/PTE	26.	10.08	6.	3.	2.	.03
+	ROUTED TO	RTE	26.	10.25	6.	3.	2.	.03
+	HYDROGRAPH AT	AH	18.	10.08	5.	2.	2.	.02
+	ROUTED TO	RTE	18.	10.08	5.	2.	2.	.02
+	HYDROGRAPH AT	XM	36.	10.08	9.	3.	3.	.04
+	2 COMBINED AT	POINTF	53.	10.08	13.	5.	5.	.06
+	HYDROGRAPH AT	XL	5.	10.08	1.	0.	0.	.00
+	HYDROGRAPH AT	AJ	4.	10.00	1.	0.	0.	.00
+	HYDROGRAPH AT	AG	10.	10.00	2.	1.	1.	.01
+	HYDROGRAPH AT	XK	75.	10.17	22.	9.	8.	.10
+	4 COMBINED AT	POINT7	89.	10.08	26.	10.	10.	.12
+	2 COMBINED AT	SUM3	142.	10.08	40.	16.	15.	.18
+	ROUTED TO	RTE	142.	10.25	40.	16.	15.	.18
+	HYDROGRAPH AT	CY5E	288.	10.50	105.	41.	40.	.44
+	3 COMBINED AT	POINTL	438.	10.33	152.	59.	57.	.64
+	ROUTED TO	RTE	366.	10.67	151.	59.	57.	.64
+	HYDROGRAPH AT	CY5W	170.	10.58	68.	26.	25.	.28
+	2 COMBINED AT	POINT8	535.	10.67	218.	85.	82.	.92
+	2 COMBINED AT	POINT9	1514.	10.33	538.	213.	206.	2.21
+	ROUTED TO	RTE	1471.	10.50	538.	212.	205.	2.21
+	HYDROGRAPH AT	CY6'	20.	10.08	5.	2.	2.	.03
+	3 COMBINED AT	PT10	7085.	11.08	4120.	2269.	2189.	14.50

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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)
CC-1	MANE	5.00	91.96	640.00	3.25	5.00	91.96	640.00	3.25

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3433E+02 EXCESS= .0000E+00 OUTFLOW= .3417E+02 BASIN STORAGE= .1855E+00 PERCENT ERROR= -.1

CC-2	MANE	4.83	107.77	666.30	3.20	5.00	107.71	670.00	3.20

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5298E+02 EXCESS= .0000E+00 OUTFLOW= .5279E+02 BASIN STORAGE= .2056E+00 PERCENT ERROR= .0

CC-3	MANE	5.00	364.02	620.00	3.35	5.00	364.02	620.00	3.35

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1250E+03 EXCESS= .0000E+00 OUTFLOW= .1246E+03 BASIN STORAGE= .4816E+00 PERCENT ERROR= -.1

CC-3A	MANE	5.00	86.13	615.00	3.29	5.00	86.13	615.00	3.29

TR2-1	MANE	5.00	110.75	660.00	3.07	5.00	110.75	660.00	3.07

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4258E+02 EXCESS= .0000E+00 OUTFLOW= .4234E+02 BASIN STORAGE= .2935E+00 PERCENT ERROR= -.1

TR2-2	MANE	4.36	625.55	619.76	3.43	5.00	625.41	620.00	3.44

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1818E+03 EXCESS= .0000E+00 OUTFLOW= .1816E+03 BASIN STORAGE= .3413E+00 PERCENT ERROR= -.1

TR2-4	MANE	5.00	1151.68	610.00	29.86	5.00	1151.68	610.00	29.86

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2275E+04 EXCESS= .0000E+00 OUTFLOW= .2259E+04 BASIN STORAGE= .1585E+02 PERCENT ERROR= .0

RTA	MANE	5.00	112.58	620.00	3.51	5.00	112.58	620.00	3.51

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2545E+02 EXCESS= .0000E+00 OUTFLOW= .2543E+02 BASIN STORAGE= .4618E-01 PERCENT ERROR= -.1

ROUTE	MANE	3.32	4884.18	637.61	7.80	5.00	4872.59	640.00	7.80

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3420E+04 EXCESS= .0000E+00 OUTFLOW= .3411E+04 BASIN STORAGE= .1107E+02 PERCENT ERROR= -.1

ROUTE	MANE	5.00	51.41	615.00	3.51	5.00	51.41	615.00	3.51

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1104E+02 EXCESS= .0000E+00 OUTFLOW= .1104E+02 BASIN STORAGE= .2062E-01 PERCENT ERROR= -.1

RT CV	MANE	5.00	94.85	615.00	3.52	5.00	94.85	615.00	3.52

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2124E+02 EXCESS= .0000E+00 OUTFLOW= .2121E+02 BASIN STORAGE= .5188E-01 PERCENT ERROR= -.1

CR-1	MANE	5.00	252.66	620.00	3.61	5.00	252.66	620.00	3.61

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5831E+02 EXCESS= .0000E+00 OUTFLOW= .5828E+02 BASIN STORAGE= .8225E-01 PERCENT ERROR= -.1

CR-2	MANE	5.00	468.35	620.00	3.98	5.00	468.35	620.00	3.98

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1082E+03 EXCESS= .0000E+00 OUTFLOW= .1079E+03 BASIN STORAGE= .3701E+00 PERCENT ERROR= -.1

RTE	MANE	5.00	69.16	610.00	3.31	5.00	69.16	610.00	3.31

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1501E+02 EXCESS= .0000E+00 OUTFLOW= .1500E+02 BASIN STORAGE= .2425E-01 PERCENT ERROR= -.1

RTE	MANE	3.49	76.36	614.26	3.35	5.00	75.76	615.00	3.35

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1700E+02 EXCESS= .0000E+00 OUTFLOW= .1699E+02 BASIN STORAGE= .2067E-01 PERCENT ERROR= -.1

RTE	MANE	4.47	224.81	612.98	3.33	5.00	223.35	615.00	3.33

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5012E+02 EXCESS= .0000E+00 OUTFLOW= .5009E+02 BASIN STORAGE= .6798E-01 PERCENT ERROR= -.1

RCX2	MANE	3.39	281.72	621.13	3.35	5.00	281.59	620.00	3.35

CONTINUITY SUMMARY (AC-FT) - INFLOW= .6864E+02 EXCESS= .0000E+00 OUTFLOW= .6857E+02 BASIN STORAGE= .1216E+00 PERCENT ERROR= -.1

CC14B	MANE	5.00	311.15	625.00	3.39	5.00	311.15	625.00	3.39

CONTINUITY SUMMARY (AC-FT) - INFLOW= .7874E+02 EXCESS= .0000E+00 OUTFLOW= .7857E+02 BASIN STORAGE= .2407E+00 PERCENT ERROR= -.1

TR3-1A	MANE	5.00	459.95	635.00	3.48	5.00	459.95	635.00	3.48

ERROR= .0

RTE MANE 5.00 13.86 610.00 3.22 5.00 13.86 610.00 3.22

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2574E+01 EXCESS= .0000E+00 OUTFLOW= .2574E+01 BASIN STORAGE= .1811E-02 PERCENT ERROR= -.1

RTE MANE 3.27 88.49 610.96 4.15 5.00 87.78 610.00 4.15

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1925E+02 EXCESS= .0000E+00 OUTFLOW= .1925E+02 BASIN STORAGE= .1050E-01 PERCENT ERROR= .0

RTE MANE 4.52 1032.54 619.86 3.70 5.00 1031.05 620.00 3.70

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2425E+03 EXCESS= .0000E+00 OUTFLOW= .2423E+03 BASIN STORAGE= .3757E+00 PERCENT ERROR= .0

RTE MANE 5.00 25.55 615.00 3.22 5.00 25.55 615.00 3.22

CONTINUITY SUMMARY (AC-FT) - INFLOW= .4976E+01 EXCESS= .0000E+00 OUTFLOW= .4975E+01 BASIN STORAGE= .6402E-02 PERCENT ERROR= -.1

RTE MANE 1.71 17.92 606.36 3.71 5.00 17.72 605.00 3.71

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3563E+01 EXCESS= .0000E+00 OUTFLOW= .3563E+01 BASIN STORAGE= .3512E-03 PERCENT ERROR= .0

RTE MANE 5.00 141.87 615.00 3.27 5.00 141.87 615.00 3.27

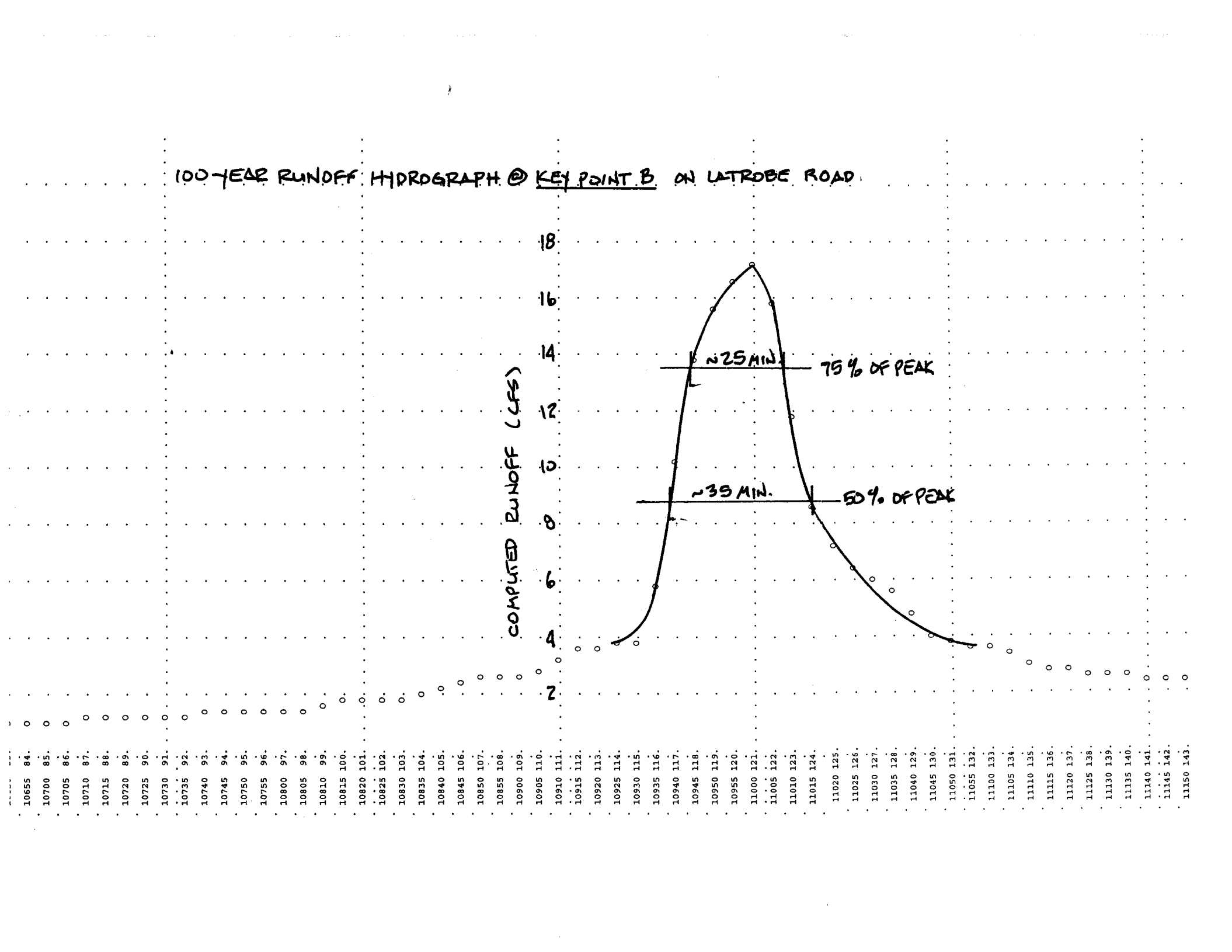
CONTINUITY SUMMARY (AC-FT) - INFLOW= .3092E+02 EXCESS= .0000E+00 OUTFLOW= .3088E+02 BASIN STORAGE= .9857E-01 PERCENT ERROR= -.2

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

APPENDIX D

BUSINESS PARK RUNOFF HYDROGRAPHS

100-YEAR RUNOFF HYDROGRAPH @ KEY POINT B ON LATROBE ROAD



POINT 5

100-YEAR RUNOFF HYDROGRAPH @ KEY POINT 5 ON LATROBE ROAD

100-YEAR RUNOFF HYDROGRAPH @ KEY POINT D ON LATROBE ROAD
COMPUTED RUNOFF (CFS)
14
12
10
8
6
4
2
75% OF PEAK
50% OF PEAK
~25 MIN.
~40 MIN.
POINT D

100-YEAR RUNOFF HYDROGRAPH @ KEY POINT H ON R.J. MATHEWS PKWY.
COMPUTED RUNOFF (CFS)
10
20
30
40
50
60
70
75% OF PEAK
50% OF PEAK
~25 MIN.
~50 MIN.
POINT H

APPENDIX E

HEC-RAS OUTPUT SUMMARY

HEC-RAS Plan: Plan 28 Profile: PF 1

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
CARSON CREEK	UPPER CARSON CRE	116	PF 1	5900.00	479.00	486.46		487.20	0.003276	7.07	889.79	179.75	0.50
CARSON CREEK	UPPER CARSON CRE	115	PF 1	5900.00	479.00	485.54	484.55	486.64	0.005963	8.56	727.75	174.26	0.66
CARSON CREEK	UPPER CARSON CRE	114	PF 1	5900.00	477.50	483.11		484.03	0.006307	8.66	793.65	206.42	0.68
CARSON CREEK	UPPER CARSON CRE	113	PF 1	5900.00	474.00	481.38		482.10	0.004445	7.48	888.64	193.39	0.53
CARSON CREEK	UPPER CARSON CRE	112	PF 1	5900.00	472.00	479.47		480.16	0.004080	7.69	904.30	192.83	0.51
CARSON CREEK	UPPER CARSON CRE	111.8	PF 1	5900.00	470.70	478.74		479.34	0.003285	7.07	966.09	192.96	0.46
CARSON CREEK	UPPER CARSON CRE	111.6	PF 1	5900.00	470.90	478.53	475.99	479.10	0.002691	6.45	982.13	162.16	0.42
CARSON CREEK	UPPER CARSON CRE	111.55		Bridge									
CARSON CREEK	UPPER CARSON CRE	111.5	PF 1	5900.00	470.50	475.44	475.44	477.17	0.015783	11.78	566.68	159.62	0.94
CARSON CREEK	UPPER CARSON CRE	111.45	PF 1	6900.00	466.50	473.10		473.13	0.000412	1.48	4653.75	1411.77	0.14
CARSON CREEK	UPPER CARSON CRE	111	PF 1	6900.00	464.90	472.99		473.01	0.000150	1.16	5930.92	1210.77	0.09
CARSON CREEK	UPPER CARSON CRE	110.8	PF 1	6900.00	463.30	472.90		472.93	0.000192	2.03	7039.79	938.44	0.12
CARSON CREEK	UPPER CARSON CRE	110.6	PF 1	6900.00	463.00	472.88		472.90	0.000059	1.12	6415.23	871.01	0.06
CARSON CREEK	LOWER CARSON CRE	110.4	PF 1	6900.00	462.00	472.67		472.82	0.000510	3.50	2312.12	837.11	0.19
CARSON CREEK	LOWER CARSON CRE	110.2	PF 1	6900.00	460.00	470.39	468.72	472.04	0.005919	11.25	712.24	624.50	0.64
CARSON CREEK	LOWER CARSON CRE	110	PF 1	6900.00	457.00	466.62		468.70	0.011011	12.91	732.76	496.97	0.83
CARSON CREEK	LOWER CARSON CRE	109	PF 1	6900.00	456.00	465.91		466.88	0.003686	8.62	912.98	357.15	0.51
CARSON CREEK	LOWER CARSON CRE	108	PF 1	6900.00	455.00	465.63		466.27	0.002257	7.13	1113.55	330.49	0.40
CARSON CREEK	LOWER CARSON CRE	107	PF 1	6900.00	451.00	463.14	461.80	464.45	0.004581	10.66	821.71	671.47	0.57
CARSON CREEK	LOWER CARSON CRE	106	PF 1	6900.00	450.00	459.97	459.97	462.70	0.011497	14.05	551.66	645.73	0.87
CARSON CREEK	LOWER CARSON CRE	105	PF 1	6900.00	448.00	456.41	456.41	457.91	0.009048	11.67	791.21	880.46	0.76
CARSON CREEK	LOWER CARSON CRE	104	PF 1	6900.00	448.00	455.98		456.34	0.002117	5.72	1473.27	838.79	0.37
CARSON CREEK	LOWER CARSON CRE	103	PF 1	6900.00	445.00	455.34	451.54	455.67	0.001271	5.27	1501.07	959.02	0.30
CARSON CREEK	LOWER CARSON CRE	102	PF 1	6900.00	443.00	451.91	451.91	454.55	0.011540	14.26	556.83	460.81	0.88
CARSON CREEK	LOWER CARSON CRE	101	PF 1	6900.00	439.20	452.82	443.11	452.89	0.000123	2.09	3329.61	1189.14	0.10
CARSON CREEK	LOWER CARSON CRE	100.9		Bridge									
CARSON CREEK	LOWER CARSON CRE	100.8	PF 1	6900.00	439.20	452.80		452.86	0.000123	2.09	3322.66	1188.97	0.10
CARSON CREEK	LOWER CARSON CRE	100.5	PF 1	6900.00	436.00	452.15		452.63	0.001146	5.52	1248.67	366.00	0.27
CARSON CREEK	LOWER CARSON CRE	100.3	PF 1	6900.00	434.20	451.07	443.83	452.16	0.001891	8.40	821.18	275.00	0.38
CARSON CREEK	LOWER CARSON CRE	100.2		Bridge									
CARSON CREEK	LOWER CARSON CRE	100.1	PF 1	6900.00	434.20	443.83	443.83	447.82	0.016268	16.03	430.55	267.66	1.00
CARSON CREEK	LOWER CARSON CRE	100	PF 1	6900.00	434.00	444.12	443.53	445.13	0.006002	10.38	935.97	259.59	0.62
TRIBUTARY 3	UPPER TRIB 3	3500	PF 1	1000.00	478.00	481.38	481.15	481.54	0.012585	3.15	316.84	405.93	0.63
TRIBUTARY 3	UPPER TRIB 3	3400	PF 1	1000.00	477.00	479.47	478.93	479.64	0.007759	3.26	306.92	258.16	0.53
TRIBUTARY 3	UPPER TRIB 3	3300	PF 1	1000.00	475.00	478.24		478.34	0.003987	2.52	397.44	298.88	0.38
TRIBUTARY 3	LOWER TRIB 3	3250	PF 1	1000.00	474.00	477.68	477.28	477.93	0.004823	5.15	274.81	175.48	0.49
TRIBUTARY 3	LOWER TRIB 3	3020	PF 1	1000.00	469.80	474.67		475.09	0.007760	6.02	206.12	123.98	0.60
TRIBUTARY 3	LOWER TRIB 3	3010	PF 1	1000.00	469.10	474.51		474.55	0.000340	1.83	686.30	228.01	0.14
TRIBUTARY 3	LOWER TRIB 3	3007	PF 1	1000.00	467.40	474.14	470.90	474.41	0.001553	4.36	249.60	43.03	0.31
TRIBUTARY 3	LOWER TRIB 3	3006		Bridge									
TRIBUTARY 3	LOWER TRIB 3	3005	PF 1	1000.00	467.20	472.92		473.22	0.001926	4.54	232.00	44.87	0.34
TRIBUTARY 3	LOWER TRIB 3	111.45	PF 1	6900.00	466.50	472.94		472.97	0.000484	1.56	4427.52	1405.44	0.15
TRIBUTARY 3	LOWER TRIB 3	111	PF 1	6900.00	464.90	472.90		472.92	0.000160	1.19	5808.21	1207.74	0.10
TRIBUTARY 3	LOWER TRIB 3	110.8	PF 1	6900.00	463.00	472.87		472.89	0.000046	0.96	7059.67	940.22	0.06
TRIBUTARY 3	LOWER TRIB 3	110.6	PF 1	6900.00	461.00	472.86		472.88	0.000061	1.24	6352.07	870.57	0.07
WEST CHANNEL	W CHANNEL	3500	PF 1	1000.00	478.00	481.86	481.17	481.92	0.002653	1.95	512.07	415.21	0.31

HEC-RAS Plan: Plan 28 Profile: PF 1

River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
TRIBUTARY 5	SOUTH	504	PF 1	440.00	468.00	471.49		471.68	0.005570	4.43	144.96	144.19	0.50
TRIBUTARY 5	SOUTH	503	PF 1	440.00	464.00	467.18	466.92	467.68	0.011118	6.54	81.47	203.00	0.70
TRIBUTARY 5	NORTH	504	PF 1	60.00	469.50	470.19	470.19	470.41	0.037246	3.71	16.49	41.23	0.98
TRIBUTARY 5	NORTH	503	PF 1	60.00	464.80	466.13	465.62	466.17	0.002244	1.80	42.24	151.42	0.29
TRIBUTARY 5	TRIB 5	502.5	PF 1	500.00	461.00	464.54		464.78	0.006313	4.40	130.70	234.78	0.52
TRIBUTARY 5	TRIB 5	502	PF 1	500.00	458.00	463.63		463.72	0.001771	3.30	219.82	131.66	0.29
TRIBUTARY 5	TRIB 5	501	PF 1	500.00	457.00	461.92	460.75	462.35	0.004901	5.53	100.60	127.48	0.50
TRIBUTARY 5	TRIB 5	500.6	PF 1	450.00	453.00	455.76	455.76	456.17	0.012606	5.68	104.32	282.51	0.72
TRIBUTARY 5	TRIB 5	500.5	PF 1	450.00	450.00	453.77		453.80	0.000688	1.71	329.83	373.96	0.18
TRIBUTARY 5	TRIB 5	500	PF 1	450.00	448.00	453.75		453.76	0.000026	0.52	1080.34	338.31	0.04
TRIBUTARY 4	S FORK	406.4	PF 1	90.00	480.50	481.06	480.96	481.16	0.017927	2.53	35.58	135.54	0.68
TRIBUTARY 4	S FORK	406.2	PF 1	90.00	476.00	476.70	476.52	476.79	0.013723	2.43	37.06	74.47	0.61
TRIBUTARY 4	S FORK	406	PF 1	90.00	469.00	469.71	469.71	470.03	0.034813	4.57	19.70	30.66	1.00
TRIBUTARY 4	N FORK	409	PF 1	770.00	478.00	481.70	481.70	482.52	0.012700	8.38	122.36	108.46	0.80
TRIBUTARY 4	N FORK	408	PF 1	770.00	475.00	477.88		478.50	0.013075	6.98	129.61	152.46	0.77
TRIBUTARY 4	N FORK	407	PF 1	770.00	472.00	474.99	474.65	475.34	0.008245	5.80	174.22	122.50	0.62
TRIBUTARY 4	N FORK	406	PF 1	770.00	467.00	471.17	471.17	471.78	0.011846	7.69	142.87	170.15	0.75
TRIBUTARY 4	LOWER	405	PF 1	1040.00	463.50	466.67	466.11	466.83	0.004043	3.92	347.94	269.33	0.43
TRIBUTARY 4	LOWER	404	PF 1	1040.00	459.00	463.18		463.99	0.012316	7.99	147.98	212.74	0.78
TRIBUTARY 4	LOWER	403	PF 1	1040.00	456.00	460.02		460.36	0.005323	4.83	226.52	143.36	0.50
TRIBUTARY 4	LOWER	402	PF 1	1040.00	452.00	455.77	455.52	456.34	0.010512	6.80	178.11	193.50	0.71
TRIBUTARY 4	LOWER	401.5	PF 1	1040.00	451.00	454.65		454.88	0.003758	4.45	267.74	298.58	0.43
TRIBUTARY 4	LOWER	401	PF 1	1040.00	449.00	453.84		454.12	0.003033	4.45	245.39	327.13	0.40
TRIBUTARY 4	MAIN	142	PF 1	1400.00	446.00	453.61		453.68	0.000360	2.11	678.28	508.32	0.15
TRIBUTARY 4	MAIN	141	PF 1	1400.00	442.40	453.62		453.62	0.000026	0.77	2164.27	330.00	0.04
TRIBUTARY 4	MAIN	101	PF 1	6900.00	442.40	453.37	449.66	453.55	0.000703	3.97	2083.56	330.00	0.22
TRIBUTARY 4	MAIN	100.95		Bridge									
TRIBUTARY 4	MAIN	100.9	PF 1	6900.00	438.20	453.35		453.36	0.000020	0.91	9970.53	1197.00	0.04
TRIBUTARY 4	MAIN	100.5	PF 1	6900.00	436.00	452.87		453.29	0.000895	4.81	1335.29	366.00	0.22
TRIBUTARY 4	MAIN	100.3	PF 1	6900.00	434.20	453.05	443.69	453.11	0.000119	2.29	3398.82	275.00	0.10
TRIBUTARY 4	MAIN	100.2		Bridge									
TRIBUTARY 4	MAIN	100.1	PF 1	6900.00	434.20	453.01		453.07	0.000121	2.30	3387.44	275.00	0.10
TRIBUTARY 4	MAIN	100	PF 1	6900.00	434.00	453.00	443.77	453.07	0.000125	2.40	3341.25	275.00	0.10

EXHIBIT 'A'
CARSON CREEK REGIONAL DRAINAGE STUDY 2005 UPDATE
SHED EXHIBIT

EL DORADO HILLS, CALIFORNIA

SCALE: 1"=500' DECEMBER, 2005

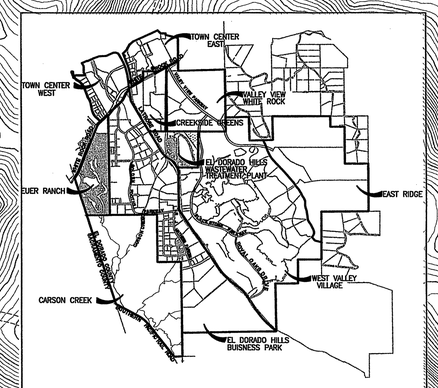
CTA Engineering • Surveying

3233 Monier Circle
Rancho Cordova, CA 95742
(916) 638-0919
(916) 638-2479 Fax

SEE:
'DRAINAGE ANALYSIS FOR TOWN CENTER EXISTING DEVELOPMENT' SEPTEMBER, 2002 BY WOOD ROGERS

SEE:
CARSON CREEK REGIONAL DRAINAGE STUDY JANUARY, 1998 FOR EL DORADO COUNTY DEPARTMENT OF TRANSPORTATION

SEE:
DRAINAGE STUDY FOR EUER RANCH JANUARY, 2003 BY COOPER, THORNE & ASSOC.



LOCATION MAP

N.T.S

LATROBE ROAD
WHITE ROCK ROAD
VALLEY VIEW PARKWAY
CARSON CREEK
ON TRIBUTARY
1 DRIVE
EID TANK SITE
CV3
1a
CX3N
WMP3
2 PAVILLION DRIVE
GOLDEN FOOTHILL PARKWAY
3
WMP2
WMP1
BLACKSTONE PARKWAY
CZ1
CX3-8
CY3-2C
TRIBUTARY B
CARSON CREEK
(FUTURE) CARSON CROSSING DR.
CY3-2B
FT. MATTHEWS PARKWAY
CY3-2
4 CONFLUENCE
CY3-2A
ROYAL OAKS DRIVE
EL DORADO COUNTY SACRAMENTO COUNTY
CZ2
CY3-3
CY3-1
CY3-4
TRIBUTARY A
5
6
CY5W
CY5E
7
8
9
10
CY6
TRIBUTARY C
SOUTHERN PACIFIC RAILROAD
LATROBE ROAD
R.S. 17-17

LEGEND:

- MAJOR SHED BOUNDARY
- AREA TRIBUTARY TO WETLANDS MITIGATION POND
- MINOR SHED BOUNDARY
- EXISTING WETLANDS MITIGATION POND
- (Z) DRAINAGE SHED I.D.
- (5) KEYPOINT FOR FLOW COMPARISON
- (G) KEYPOINT FOR FLOW COMPUTATION

0 500 1000 1500

SCALE: 1"=500'

EXHIBIT 'B'
CARSON CREEK REGIONAL DRAINAGE STUDY 2005 UPDATE
100 YEAR FLOOD BOUNDARIES

EL DORADO COUNTY, CALIFORNIA
SCALE: 1"=200' DECEMBER, 2005

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(916) 638-0919
(916) 638-2479 Fax

N

0 200 400 600
SCALE: 1"=200'

LEGEND:

- 400 — CROSS SECTION LOCATION AND NUMBER
- 455 — BASE FLOOD ELEVATION
- 100 YEAR FLOOD INUNDATION AREA