Appendix F
Drainage Report

DRAINAGE REPORT

CREEKSIDE VILLAGE

Prepared: August 2021

Prepared Under The Direction Of:

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1.0 - INTRODUCTION

Creekside Village is a proposed 208-acre community in the south part of El Dorado Hills, El Dorado County, California. Creekside Village lies on the west side of Latrobe Road approximately two miles south of the Latrobe Road/White Rock Road intersection.

2.0 - EXISTING CONDITIONS

The project site is currently undeveloped land consisting of non-native grasslands with drainage flows from east to west. The project site is situated on relatively flat terrain considering that the surrounding region marks the first foothills of the Sierra Nevada on the east margin of the Sacramento Valley. The Carson Creek watershed encompasses approximately 15 square miles (9,600 acres), 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 project lies within the larger drainage shed CY5E of the Carson Creek watershed. Drainage shed CY5E encompasses 280 acres and the proposed project takes up 208 of those acres. There is an unnamed creek that flows through the project site from the east to the west. This creek ultimately reaches the Carson Creek.

3.0 - PROPOSED CONDITIONS

The proposed project will be a master planned neighborhood featuring a mix of home types, a community center, parks, trails and open space, which will allow connections to the Business Park and surrounding communities. Proposed conditions retain the existing drainage pattern through the project site. The proposed grading would increase the drainage area at Point D by 7.6 acres. The project will result in an approximate impervious area of 97.4 acres including roads.

4.0 - DESIGN RUNOFF

Design runoff was computed using HEC-HMS computer program. These computations also validate the effectiveness of on-site detention storage. Proposed facilities operate in concert so that the 2-year flows do not exceed pre-project levels as required by “Hydromodifications Project” of the *West Slope Development and Redevelopment Standards and Post Construction Storm Water Plan Requirements*. HEC-HMS computations simulate the rainfall-runoff process for a 24-hour storm assumed to occur uniformly over the study area. The computations utilize the SCS dimensionless unit hydrograph method to transform precipitation excess, defined as rainfall *not* lost to surface retention by vegetation, cracks and crevices, local depressions, etc., or infiltrated into the ground, into runoff. Precipitation losses are computed within the program on the basis of a runoff curve number (CN) assigned to each shed. CN values reflect land usage and the runoff potential of underlying soils. Input datum required for the development of a unit hydrograph for each sub basin is the estimated lag time, defined as the time between the center of mass of precipitation excess and the unit hydrograph peak, and simplified as 0.6X time of concentration. Input parameters used for each contributing shed in hydrograph computations are: a runoff curve number used in the computation of precipitation losses, and; a lag time, from which the SCS dimensionless unit hydrograph is constructed.

5.0 – HYDROMODIFICATION

As required by “Hydromodifications Project” of the *West Slope Development and Redevelopment Standards and Post Construction Storm Water Plan Requirements,* this project requires verification showing post project flows will not exceed pre-project flow rate for the 2-year, 24-hour storm. A preliminary study was conducted to confirm that this requirement is achievable. A portion of the project will be directed to the pond where it can be detained and released at pre development flows. See Appendix C for Hydromodification Shed Map. The shed map depicts the general areas that will be draining to the pond. Hydrograph calculations show a more detailed breakdown of the areas within the shed that are contributing to the pond. See Appendix C for hydrograph calculations.

Table 1 – Flow Summary

SHED/KEY POINT	***2-YEAR RUNOFF***	
	PRE-DEVEL	***POST-DEVEL***
D	68.85 cfs	68.84 cfs

6.0 –WATER QUALITY

Water quality considerations will be reviewed at the project improvement plan stage and appropriate analyses will be included in a subsequent drainage report. The El Dorado County Storm Water Management Plan (SWMP), dated August 2004, serves as a regulatory document related to reducing the discharge of pollutants associated with storm water drainage systems. There are 4 Post Construction Water Quality (PCSWQ) lots that will be used for water quality treatment.

The final water quality methods and details will be worked out at improvement plans stage.

The following Treatment Control BMPs also may be incorporated into final design of the project if a project proponent would like to reduce water quality flow (WQF) requirements:

1. Incorporation within the site's plan or design, land use planning measures to minimize water quality impacts, including stream buffers and restoration activities.

2. Reduction of the site's imperviousness, conserving natural resources and areas, maintaining and using natural drainage courses in the storm water conveyance system and minimizing clearing and grading.

3. When landscaping is required or proposed, provision of runoff storage measures dispersed uniformly throughout the site's landscape with the use of a variety of detention, retention, and runoff practices.

4. Implementation of on-site hydrologically functioning landscape design and management practices.

5. Minimize project's impervious footprint and conserve natural areas. Minimize directly connected impervious areas.

6. Where landscaping is proposed in or adjacent to parking areas, to the extent feasible, incorporate landscaped areas into a site drainage design that minimizes runoff.

7.0 –CONCLUSIONS

The 10 and 100 year flows for this site were evaluated with the *Carson Creek Regional Drainage Study 2005 Update* and that the study shows that additional storage (detention ponds) would provide no notable mitigation of peak flows. The Shed CY5E was analyzed with a CN value of 84 which equates to residential 1 acre lots but the project proposes a higher residential density. However, Key node 10, which is downstream of the project, shows a decrease of flow by 400cfs. Refer to the *Carson Creek Regional Drainage Study 2005 Update* for more information and data analysis in the Appendix E. The project is located on the lower end of the Carson Creek Regional shed. The objective with this property is to discharge the runoff from this development before the upstream drainage area reaches the property. The detention pond as proposed is designed to meet the hydromodification requirements that mitigate the 2-year, 24 hour storm alone. No detention is needed nor proposed to provide mitigation for the 10 and 100 year flows as noted hereinbefore.

APPENDIX A

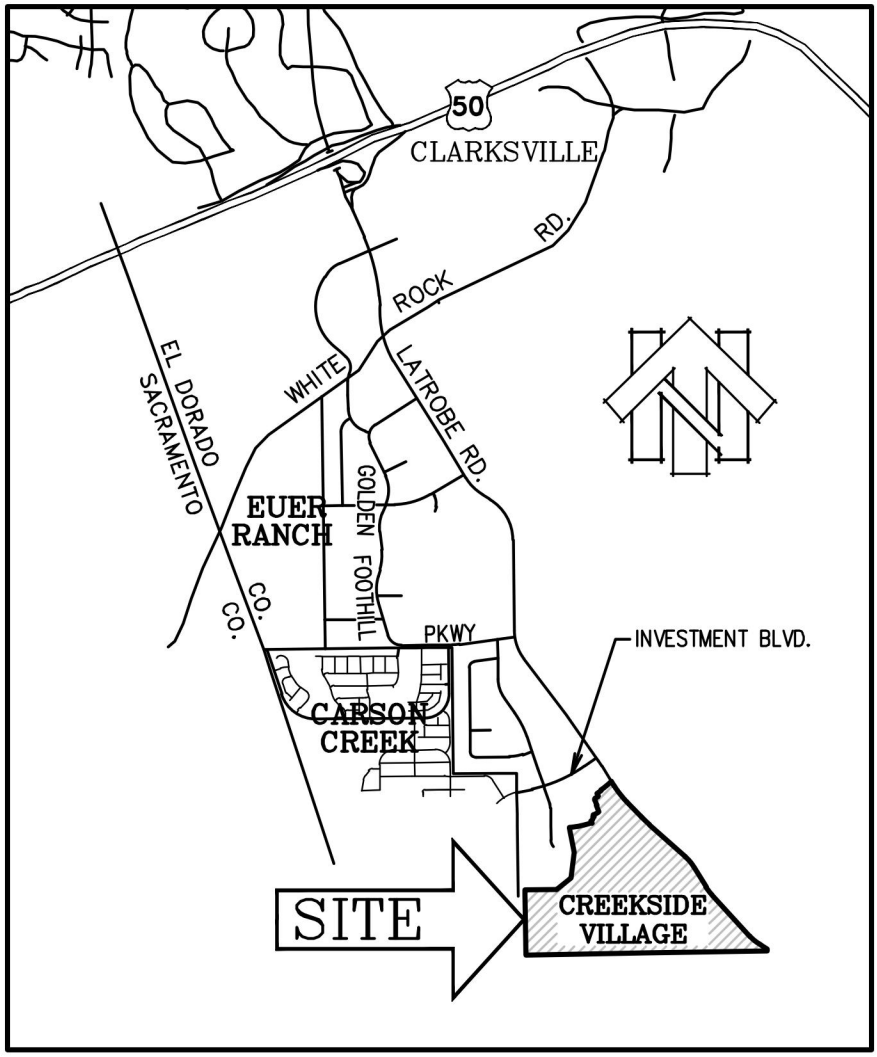
VICINITY MAP

CREEKSIDE VILLAGE

VICINITY MAP

EL DORADO COUNTY, CALIFORNIA

AUGUST, 2021



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APPENDIX B

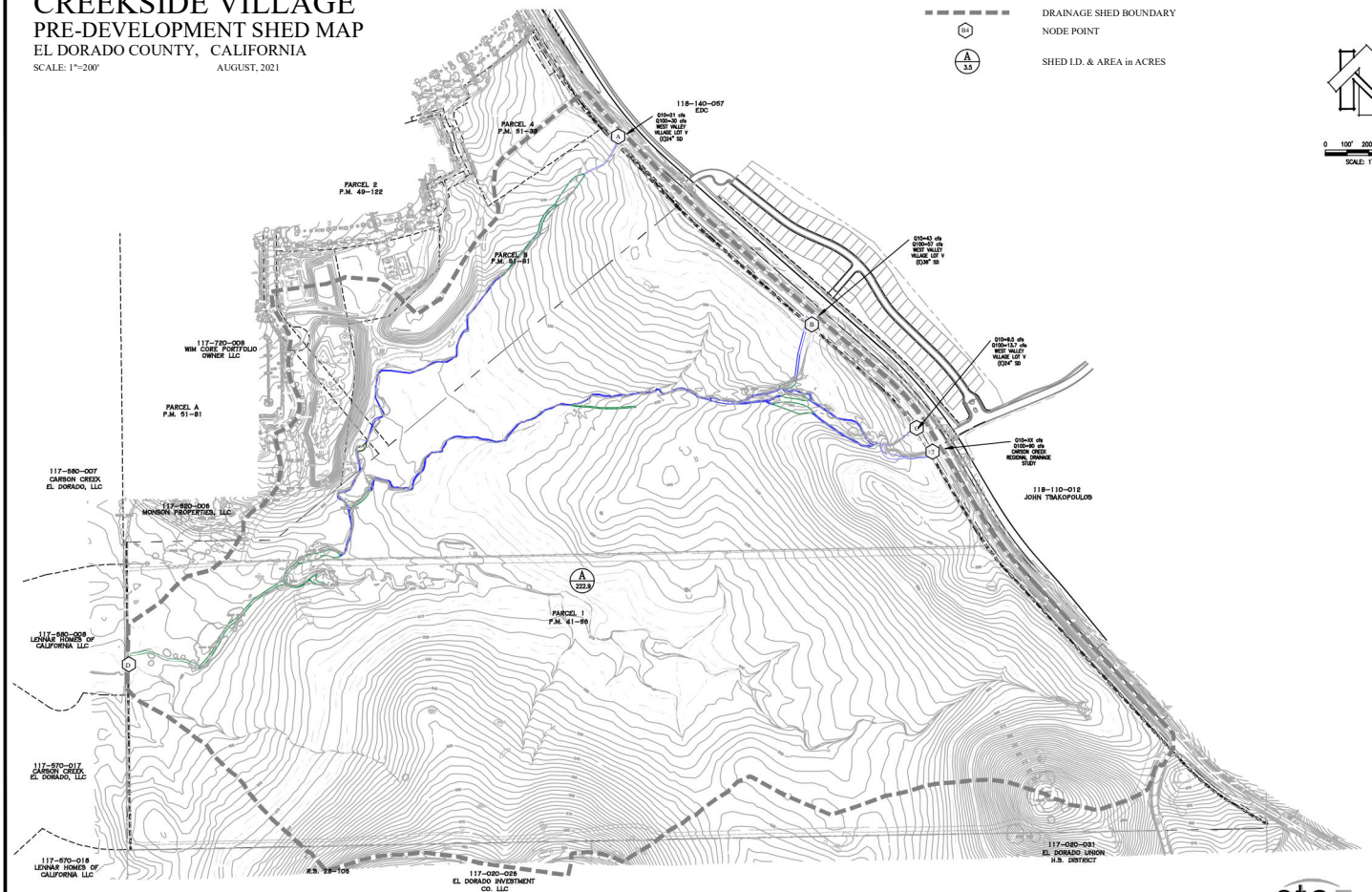
PRE-DEVELOPMENT SHED MAP

CREEKSIDE VILLAGE

PRE-DEVELOPMENT SHED MAP

EL DORADO COUNTY, CALIFORNIA

SCALE: 1"=200' AUGUST, 2021



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APPENDIX C

HYDROMODIFICATION SHED MAP

CREEKSIDE VILLAGE

HYDROMODIFICATION SHED MAP

EL DORADO COUNTY, CALIFORNIA

SCALE: 1"=200' AUGUST, 2021

LEGEND:

DRAINAGE SHED BOUNDARY

NODE POINT

SHED I.D. & AREA in ACRES



0 100' 200' 400'

SCALE: 1" = 200'

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APPENDIX D

HYDROGRAPH ANALYSES

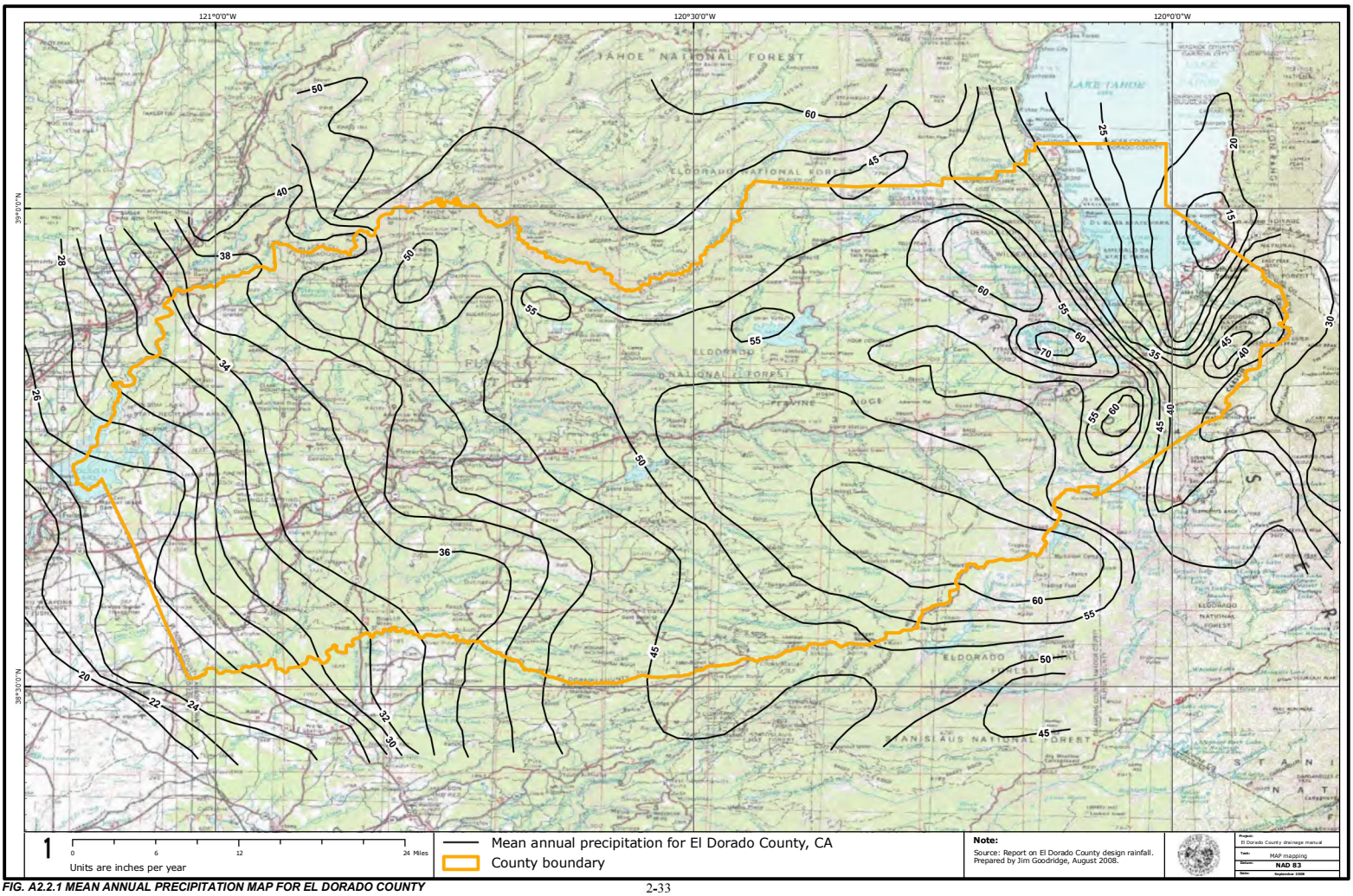


FIG. A2.2.1 MEAN ANNUAL PRECIPITATION MAP FOR EL DORADO COUNTY

Table A2.2.1 Rainfall Depth Table with Return Period of 2 Years

El Dorado County Design Rainfall
Precipitation Depth Duration Frequency
Return Period 2 Years

Mean Annual Precipitation	5 Min	10 Min	15 Min	30 Min	1 Hour	2 Hour	3 Hour	6 Hour	12 Hour	1 Day	2 Day	3 Day	4 Day	5 Day	6 Day	8 Day	10 Day	15 Day	20 Day	30 Day	60 Day	365 Day
8	0.04	0.06	0.07	0.10	0.14	0.19	0.23	0.33	0.46	0.65	0.87	1.01	1.11	1.20	1.27	1.44	1.60	1.93	2.18	2.69	3.91	7.81
10	0.05	0.07	0.09	0.12	0.17	0.24	0.29	0.41	0.58	0.81	1.09	1.26	1.39	1.50	1.59	1.80	2.00	2.41	2.72	3.36	4.89	9.76
12	0.06	0.08	0.10	0.14	0.20	0.29	0.35	0.49	0.69	0.98	1.31	1.51	1.67	1.81	1.91	2.16	2.40	2.89	3.26	4.03	5.87	11.71
14	0.07	0.10	0.12	0.17	0.24	0.33	0.41	0.57	0.81	1.14	1.53	1.77	1.94	2.11	2.23	2.52	2.80	3.38	3.81	4.70	6.85	13.66
16	0.08	0.11	0.14	0.19	0.27	0.38	0.47	0.66	0.93	1.30	1.75	2.02	2.22	2.41	2.55	2.88	3.21	3.86	4.35	5.38	7.83	15.61
18	0.09	0.13	0.15	0.22	0.31	0.43	0.52	0.74	1.04	1.47	1.97	2.27	2.50	2.71	2.86	3.24	3.61	4.34	4.90	6.05	8.81	17.57
20	0.10	0.14	0.17	0.24	0.34	0.48	0.58	0.82	1.16	1.63	2.19	2.52	2.78	3.01	3.18	3.60	4.01	4.82	5.44	6.72	9.78	19.52
22	0.11	0.15	0.19	0.26	0.37	0.53	0.64	0.90	1.27	1.79	2.40	2.78	3.06	3.31	3.50	3.96	4.41	5.30	5.98	7.39	10.76	21.47
24	0.12	0.17	0.21	0.29	0.41	0.57	0.70	0.99	1.39	1.95	2.62	3.03	3.33	3.61	3.82	4.32	4.81	5.79	6.53	8.06	11.74	23.42
26	0.13	0.18	0.22	0.31	0.44	0.62	0.76	1.07	1.50	2.12	2.84	3.28	3.61	3.91	4.14	4.68	5.21	6.27	7.07	8.73	12.72	25.37
28	0.14	0.20	0.24	0.34	0.47	0.67	0.82	1.15	1.62	2.28	3.06	3.53	3.89	4.21	4.45	5.04	5.61	6.75	7.62	9.41	13.70	27.33
30	0.15	0.21	0.26	0.36	0.51	0.72	0.87	1.23	1.74	2.44	3.28	3.78	4.17	4.51	4.77	5.40	6.01	7.23	8.16	10.08	14.68	29.28
35	0.17	0.24	0.30	0.42	0.59	0.84	1.02	1.44	2.02	2.85	3.83	4.42	4.86	5.26	5.57	6.30	7.01	8.44	9.52	11.76	17.12	34.16
40	0.20	0.28	0.34	0.48	0.68	0.95	1.17	1.64	2.31	3.26	4.37	5.05	5.56	6.02	6.36	7.20	8.01	9.64	10.88	13.44	19.57	39.04
45	0.22	0.31	0.38	0.54	0.76	1.07	1.31	1.85	2.60	3.67	4.92	5.68	6.25	6.77	7.16	8.10	9.02	10.85	12.24	15.12	22.02	43.92
50	0.25	0.35	0.43	0.60	0.85	1.19	1.46	2.05	2.89	4.07	5.47	6.31	6.94	7.52	7.95	9.00	10.02	12.06	13.60	16.80	24.46	48.80
55	0.27	0.38	0.47	0.66	0.93	1.31	1.60	2.26	3.18	4.48	6.01	6.94	7.64	8.27	8.75	9.91	11.02	13.26	14.96	18.48	26.91	53.68
60	0.30	0.42	0.51	0.72	1.02	1.43	1.75	2.46	3.47	4.89	6.56	7.57	8.33	9.03	9.54	10.81	12.02	14.47	16.32	20.16	29.35	58.55
65	0.32	0.45	0.56	0.78	1.10	1.55	1.90	2.67	3.76	5.29	7.10	8.20	9.03	9.78	10.34	11.71	13.02	15.67	17.68	21.84	31.80	63.43
70	0.35	0.49	0.60	0.84	1.19	1.67	2.04	2.87	4.05	5.70	7.65	8.83	9.72	10.53	11.13	12.61	14.02	16.88	19.04	23.52	34.25	68.31

Source: Design Rainfall Tables for El Dorado County prepared by Jim Goodridge, August 30, 2008

Urban Hydrology for Small Watersheds, US Department of Agriculture, Natural Resources Conservation Service – Technical Release 55

Table 2-2a. – Runoff curve numbers for urban areas[1]

Cover description		Curve numbers for hydrologic soil group -			
Cover type and hydrologic condition	Average percent impervious area[2]	A	B	C	D
Fully developed urban areas (vegetation established)					
Open space (lawns, parks, golf courses, cemeteries, etc.)[3]:					
Poor condition (grass cover < 50%)……		68	79	86	89
Fair condition (grass cover 50% to 75%)……..		49	69	79	84
Good condition (grass cover > 75%)…….....		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way)…….		98	98	98	98
Paved; open ditches (including right-of-way)…….		83	89	92	93
Gravel (including right of way)……..		76	85	89	91
Dirt (including right-of-way)…….....		72	82	87	89
Western desert urban areas:					
Natural desert landscaping (pervious areas only)[4]……		63	77	85	88
Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders)……		96	96	96	96
Urban districts:					
Commercial and business……	85	89	92	94	95
Industrial……..	72	81	88	91	93
Residential districts by average lot size:					
1/8 acre or less (town houses)……..	65	77	85	90	92
1/4 acre……	38	61	75	83	87
1/3 acre……	30	57	72	81	86
1/2 acre……	25	54	70	80	85
1 acre……	20	51	68	79	84
2 acres……	12	46	65	77	82
Developing urban areas					
Newly graded areas (pervious areas only, no vegetation)[5]……..		77	86	91	94
Idle lands (CN's are determined using cover types similar to those in table 2-2c).					

[1]Average runoff condition, and $I_a = 0.2S$.
[2]The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using figure 2-3 or 2-4.
[3]CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.
[4]Composite CN's for natural desert landscaping should be computed using figures 2-3 or 2-4 based on the impervious area percentage (CN = 98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrub in poor hydrologic condition.
[5]Composite CN's to use for the design of temporary measures during grading and construction should be computed using figures 2-3 or 2-4, based on the degree of development (impervious area percentage) and the CN's for the newly graded pervious areas.

TABLE B-1 - CN VALUES

SHED	AREA (AC)	LOT TYPE (AC) [1/]			S TREETS[2/] (AC)	LAND-SCAPE (AC)	OPEN SPACE (AC)	CN [3/]
		TYPE 1	TYPE 2	TYPE 3				
PRE DEVELOPMENT								
A	222.8	CN value from Carson Creek Regional Drainage Study 2005 Update.						84.0
POST DEVELOPMENT								
A	2.36	0.00	0.00	0.00	0.32	0.00	2.04	82.4
B	1.08	0.00	0.00	0.00	0.00	0.00	1.08	80.0
C	31.51	31.51	0.00	0.00	0.00	0.00	0.00	92.0
D	8.64	7.44	0.00	0.00	0.31	0.00	0.89	91.0
E	6.56	4.97	0.00	0.00	0.84	0.75	0.00	91.4
F	26.62	22.41	0.00	0.00	0.00	4.21	0.00	90.1
G	3.08	0.00	0.00	0.00	0.00	0.00	3.08	80.0
H1	21.89	19.86	0.00	0.00	0.00	2.03	0.00	90.9
H2	22.41	16.24	2.86	0.00	0.00	0.00	3.31	89.6
I	17.27	15.92	1.35	0.00	0.00	0.00	0.00	91.6
J	8.56	0.00	8.56	0.00	0.00	0.00	0.00	87.0
K	9.30	9.30	0.00	0.00	0.00	0.00	0.00	92.0
L	49.37	0.00	0.00	0.00	2.55	0.00	46.82	80.9
M	9.14	0.00	0.00	0.00	0.00	0.00	9.14	80.0
N	13.26	13.26	0.00	0.00	0.00	0.00	0.00	92.0
O	9.25	0.00	0.00	0.00	0.00	0.00	9.25	80.0

[1/] TYPICAL LOT DEVELOPMENT - (AREAS IN AC)

LOT TYPE	
1	Residential, average lot size .125 acre - CN=92
2	Residential, average lot size .25 acre - CN=87
3	Residential, average lot size 2 acre - CN=82
LS	Landscape lot - CN=80
OS*	Undeveloped open space area - CN=80

[2/] TYPICAL ROADWAY WIDTH = 32' EP TO EP

[3/] Weighted CN

TABLE B-2 SHED PARAMETERS

DRAINAGE ID #	Shed Area (AC)	Shed Area (Mi^2)	L1 (ft)	SHEET FLOW TRAVEL TIME n	P (IN)	S1	Tt1 (HR)	Tt1 (MIN)	CONCENTRATED FLOW TIME Unpaved Flow Length (FT)	S2	V2 (FT/SEC)	Tt2 (MIN)	Channel Flow Length (FT)	S3	V3 (FT/SEC)	Tt3 (MIN)	SUM Tt
PRE DEVELOPMENT																	
A	222.80	0.3481	300	0.24	2.16	0.05	0.50	29.8	540	0.056	3.82	2.4	3290		6.00	9.1	41.3
POST DEVELOPMENT																	
A	2.4	0.003688															15.0
B	1.1	0.001688	182	0.24	2.16	0.18	0.19	11.6	68	0.440	10.70	0.1			0.00	0.0	11.8
C	31.5	0.049234															10.0
D	8.6	0.013500															10.0
E	6.6	0.010250															10.0
F	26.6	0.041594															10.0
G	3.1	0.004813	252	0.24	2.16	0.17	0.26	15.5	255	0.117	5.52	0.8					16.2
H1	21.9	0.034203															10.0
H2	22.4	0.035016															10.0
I	17.3	0.026984															10.0
J	8.6	0.013375															10.0
K	9.3	0.014531															10.0
L	49.4	0.077141	300	0.24	2.16	0.06	0.45	27.0	189	0.063	4.05	0.8	3189		6.00	8.9	36.6
M	9.1	0.014281															10.0
N	13.3	0.020719															10.0
O	9.3	0.014453															15.0

$$T_{sh} = \frac{0.007 \times (nL)^{0.8}}{[(P_2)^{0.5} \times (S)^{0.4}]} \quad \text{Eq 2.4.7}$$

Where,

n = overland flow roughness

L = length of overland flow surface

P_2 = 2-yr, 24 hr rainfall depth

(For MAP = 26.5"/yr, P_2=2.16")

S = land slope (ft/ft)

T_{sc} = L/V

Where,

$V_{UNPAVED}$ = 16.1345 S^0.5 Eq 2.4.8

PRE-DEVELOPMENT SCHEMATIC

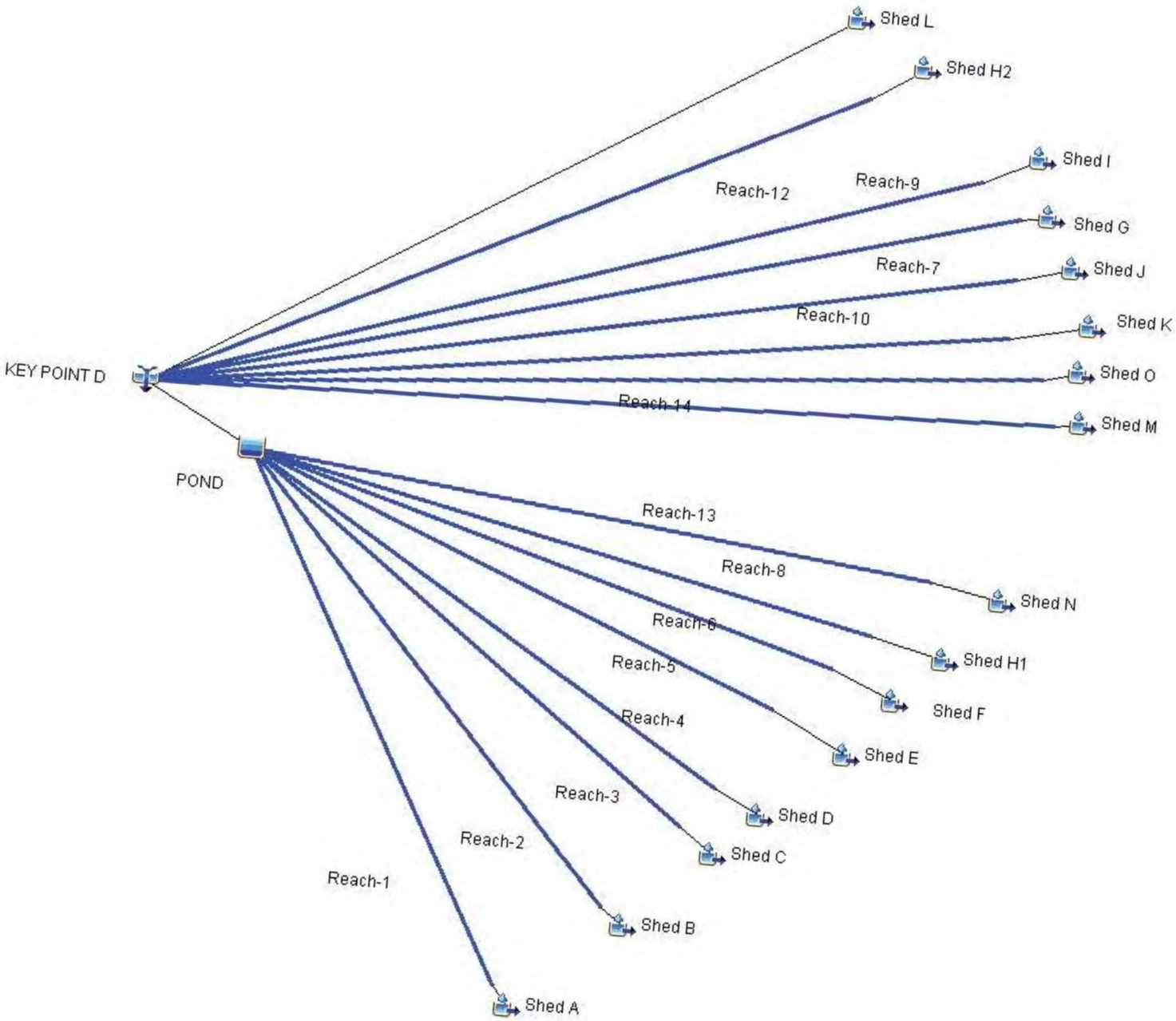


Project: Creekside Update Simulation Run: Pre-2YR

Start of Run: 01Jan2020, 00:00 Basin Model: PRE-DEV
End of Run: 02Jan2020, 12:00 Meteorologic Model: 2-YEAR
Compute Time: 07Jun2021, 15:19:53 Control Specifications: Control 1

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
SHED A	0.348125	68.85	01Jan2020, 10:19	0.86
KEY POINT D	0.348125	68.85	01Jan2020, 10:19	0.86

POST DEVELOPMENT SCHEMATIC



Project: Creekside Village Update Simulation Run: Post-2YR

Start of Run: 01Jan2020, 00:00 Basin Model: POST-DEV
End of Run: 02Jan2020, 12:00 Meteorologic Model: 2-YEAR
Compute Time: 02Aug2021, 10:29:23 Control Specifications: Control 1

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Shed C	0.049234	32.39	01Jan2020, 09:59	1.38
Reach-3	0.049234	32.22	01Jan2020, 10:04	1.38
Shed F	0.041594	24.21	01Jan2020, 09:59	1.24
Reach-6	0.041594	24.12	01Jan2020, 10:02	1.24
Shed H1	0.034203	20.98	01Jan2020, 09:59	1.30
Reach-8	0.034203	20.89	01Jan2020, 10:01	1.30
Shed N	0.020719	13.63	01Jan2020, 09:59	1.38
Reach-13	0.020719	13.58	01Jan2020, 10:00	1.38
Shed D	0.013500	8.34	01Jan2020, 09:59	1.30
Reach-4	0.013500	8.31	01Jan2020, 10:04	1.30
Shed E	0.010250	6.49	01Jan2020, 09:59	1.33
Reach-5	0.010250	6.48	01Jan2020, 10:04	1.33
Shed A	0.003688	1.05	01Jan2020, 10:03	0.78
Reach-1	0.003688	1.05	01Jan2020, 10:13	0.78
Shed B	0.001688	0.41	01Jan2020, 10:01	0.66
Reach-2	0.001688	0.41	01Jan2020, 10:13	0.67
POND	0.174876	9.87	01Jan2020, 12:30	1.20

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Shed L	0.077141	12.22	01Jan2020, 10:17	0.70
Shed H2	0.035016	19.70	01Jan2020, 09:59	1.20
Reach-12	0.035016	19.64	01Jan2020, 10:01	1.20
Shed I	0.026984	17.31	01Jan2020, 09:59	1.35
Reach-9	0.026984	17.26	01Jan2020, 10:00	1.35
Shed K	0.014531	9.56	01Jan2020, 09:59	1.38
Reach-11	0.014531	9.55	01Jan2020, 10:01	1.38
Shed O	0.014453	3.26	01Jan2020, 10:03	0.66
Reach-15	0.014453	3.26	01Jan2020, 10:15	0.66
Shed M	0.014281	3.66	01Jan2020, 10:00	0.66
Reach-14	0.014281	3.65	01Jan2020, 10:06	0.66
Shed J	0.013375	6.25	01Jan2020, 09:59	1.03
Reach-10	0.013375	6.24	01Jan2020, 10:02	1.03
Shed G	0.004813	1.05	01Jan2020, 10:04	0.66
Reach-7	0.004813	1.05	01Jan2020, 10:10	0.66
KEY POINT D	0.375470	68.84	01Jan2020, 10:02	1.06

Project: Creekside Village Update Simulation Run: Post-2YR
Reservoir: POND

Start of Run:	01Jan2020, 00:00	Basin Model:	POST-DEV
End of Run:	02Jan2020, 12:00	Meteorologic Model:	2-YEAR
Compute Time:	02Aug2021, 10:29:23	Control Specifications:	Control 1

Volume Units: IN

Computed Results

Peak Inflow:	103.50 (CFS)	Date/Time of Peak Inflow:	01Jan2020, 10:02
Peak Discharge:	9.87 (CFS)	Date/Time of Peak Discharge	01Jan2020, 12:30
Inflow Volume:	1.30 (IN)	Peak Storage:	4.87 (AC-FT)
Discharge Volume	1.20 (IN)	Peak Elevation:	481.54 (FT)

Pond Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2010 by Autodesk, Inc. v9.25 Monday, Jun 7, 2021

Pond No. 1 - CREEKSIDE POND

Pond Data

Contours -User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 477.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	477.00	41,028	0	0
1.00	478.00	43,463	42,235	42,235
2.00	479.00	45,956	44,699	86,934
3.00	480.00	48,505	47,220	134,154
4.00	481.00	51,111	49,797	183,952
5.00	482.00	53,773	52,431	236,383
6.00	483.00	56,493	55,122	291,504

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .000	.000	.000	n/a
Orifice Coeff.	= 0.00	0.00	0.00	0.00
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 0	0.00	0.00	0.00
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr)	= 0 (by Contour)
TW Elev. (ft)	= 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	477.00	---	---	---	---	---	---	---	---	---	---	0.000
1.00	42,235	478.00	---	---	---	---	---	---	---	---	---	---	0.000
2.00	86,934	479.00	---	---	---	---	---	---	---	---	---	---	0.000
3.00	134,154	480.00	---	---	---	---	---	---	---	---	---	---	0.000
4.00	183,952	481.00	---	---	---	---	---	---	---	---	---	---	0.000
5.00	236,383	482.00	---	---	---	---	---	---	---	---	---	---	0.000
6.00	291,504	483.00	---	---	---	---	---	---	---	---	---	---	0.000

APPENDIX E

CARSON CREEK REGIONAL DRAINAGE STUDY 2005 UPDATE

SHAR1

CARSON CREEK REGIONAL DRAINAGE STUDY

2005 UPDATE

DECEMBER, 2005

Prepared by:

cta

Civil Engineering
Land Surveying
Land Planning

3233 Monier Circle
Rancho Cordova
(916) 638-0919

CARSON CREEK REGIONAL DRAINAGE STUDY

2005 UPDATE

DECEMBER, 2005

Prepared by:
CTA ENGINEERS / SURVEYORS
3233 Monier Circle
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Appendix B – Channel Storage Using TD 30
Appendix C – HEC-1 Output Summary
Appendix D – Business Park Runoff Hydrographs
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EXHIBIT B – Flood Plain Map

2005 UPDATE
CARSON CREEK REGIONAL DRAINAGE STUDY

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.

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) 638-2679 Fax

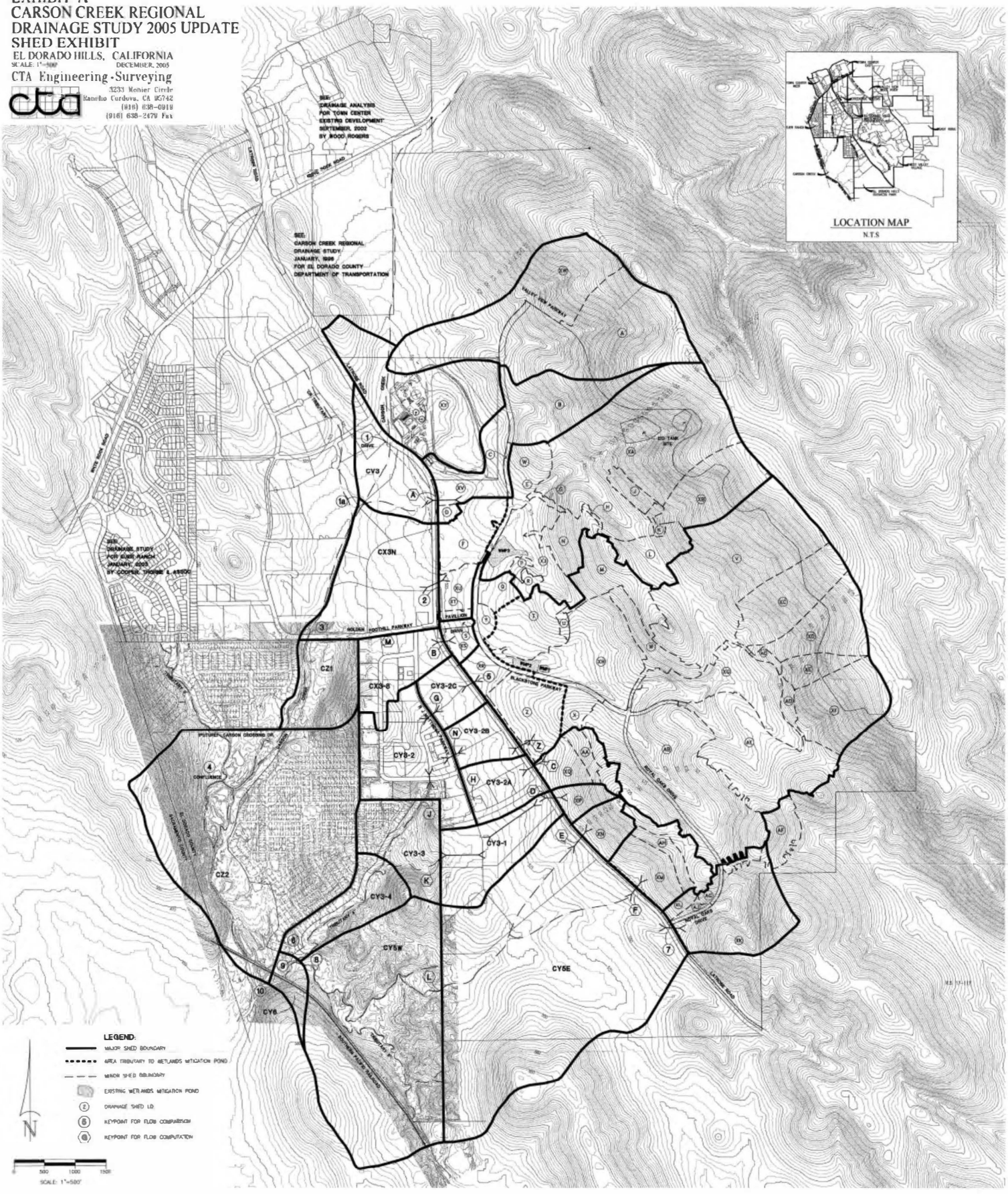


EXHIBIT 'B'
CARSON CREEK REGIONAL DRAINAGE STUDY 2005 UPDATE
100 YEAR FLOOD BOUNDARIES

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

CTA Engineering • Surveying
3233 Monier Circle, Suite 1
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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

	AC	MI²	C	CN												
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 CROSSING DRIVE

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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
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CARSON CREEK

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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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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
```

7/20/05
TAPE 7 FOR RRTD30.OUT
FLOODPLAIN STORAGE COMPUTED PER 'TD30'
TRIBUTARIES '4' AND '5' ADJACENT TO RAILROAD EMBANKMENT
CARSON CREEK PROJECT

'TRIBS' ALONG 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

```
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 PORTRAN77 VERSION

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


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

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

  48      KK    PCA2  DETENTION ROUTING - POND CA2 (EDHDC)
  49      KM          POND OUTFLOW AS PER EL DORADO HILLS SPEC PLAN MASTER DRAINAGE STUDY
  50      RS      1    ELEV     100
  51      SV      0    1.26    2.52    3.81     5.1    6.41    7.71   10.31
  52      SQ      0     6.5      18      33      51      71      93     144
  53      SE    100   100.5     101   101.5     102   102.5     103     104

  54      KK    CC-2 CHANNEL ROUTING
  55      KM         ROUTE CA1 + CA2
  56      RD   1300    .035     .07            TRAP      10       5

  57      KK     CA3  SUBBASIN CA3
  58      KM          SUBBASIN CA3 RUNOFF FOR 100 YEAR STORM
  59      BA    .083
  60      LS       0      83
  61      UD    .279

  62      KK     CA4  SUBBASIN CA4
  63      KM          SUBBASIN CA4 RUNOFF FOR 100 YEAR STORM
  64      BA    .305
  65      LS       0      84
  66      UD     .42

  67      KK   CA1-4  COMBINE HYDROGRAPHS
  68      KM          COMBINE CA1-CA4
  69      HC       3

  70      KK    CC-3  CHANNEL ROUTING
  71      KM          ROUTE CA1-CA4 TO CONFLUENCE
  72      RD   2350    .032     .07            TRAP      15       5

  73      KK     CA5  SUBBASIN CA5
  74      KM          SUBBASIN CA5 RUNOFF FOR 100 YEAR STORM
  75      BA      .1
  76      LS       0      83
  77      UD     .28

  78      KK   CA1-5  COMBINE HYDROGRAPHS
  79      KM          SUBBBASINS CA1-CA5
  80      HC       2

  81      KK     CB1  SUBBASIN CB1
  82      KM          SUBBASIN CB1 RUNOFF FOR 100 YEAR STORM
  83      BA    .105
  84      LS       0      82
  85      UD    .172

  86      KK    PCB1  DETENTION ROUTING - POND CB1 (EDHDC)
  87      KM          OUTFLOW RATING AS PER EL DORADO HILLS SPEC PLAN MASTER DRAINAGE STUDY
  88      RS      1    ELEV      68
  89      SV      0     .27     .55     .82      1.1    1.38    1.66    1.94    2.23
  90      SQ      0     5.4      15      28       43      60      79      99     121
  91      SE     68    68.2    68.4    68.6     68.8      69    69.2    69.4    69.6
```



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

  92      KK   CC-3A  CHANNEL ROUTING
  93      KM          SUBBASIN CB1 ROUTED TO CB2
  94      RD   2500    .048     .07           TRAP      10       5

  95      KK     CB2  SUBBASIN CB2
  96      KM          SUBBASIN CB2 RUNOFF FOR 100 YEAR STORM
  97      BA    .094
  98      LS       0      82
  99      UD    .323

 100      KK   CB1+2  COMBINE HYDROGRAPHS
 101      KM          SUBBASINS CB1 + CB2
 102      HC       2

 103      KK   CA+CB  COMBINE HYDROGRAPHS
 104      KM          TRIBUTARY BASINS CA + CB
 105      HC       2

 106      KK    CC-4  CHANNEL ROUTING - MAIN CHANNEL
 107      KM          ROUTE TRIBUTARY BASINS (CA + CB)
 108      RD   1700    .056    .065            TRAP      20       5

 109      KK      CC  SUBBASIN CC
 110      KM          SUBBASIN CC RUNOFF FOR 100 YEAR STORM
 111      BA    .442
 112      LS       0      80
 113      UD    .595

 114      KK     CD1  SUBBASIN CD1
 115      KM          SUBBASIN CD1 RUNOFF FOR 100 YEAR STORM
 116      BA    .069
 117      LS       0      83
 118      UD    .187

 119      KK    PCD1  DETENTION ROUTING - POND CD1 (EDHDC)
 120      KM          OUTFLOW RATING AS PER MAY'92 GOLF COURSE GRADING REV, THORNE & ASSOC
 121      RS      1    ELEV     100
 122      SV      0     .39     .78    1.18     1.58    1.99    2.40    2.82    3.24
```

```
 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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347          HC       2

348          KK    WMP4  DETENTION ROUTING - WETLANDS MITIGATION POND #4 (EDHDC)
349          KM          POND OUTFLOW RATING AS PER THORNE & ASSOC 10-92 ANALYSIS
350          RS       1    ELEV     732
351          SV       0    .284     .704    1.262    1.927
352          SE     732     733      734      735      736
353          SQ       0      23      148      407      580
354          SE     732     733      734      735    735.5

355          KK   TR1-6  CHANNEL ROUTING - TRIB 1
356          KM          SUBBASINS CH1 - CH9A ROUTED TO WETLANDS MITIGATION POND #5
357          RM       1   .0162      .3

358          KK    CH9B  SUBBASIN CH9B
359          KM          SUBBASIN CH9B RUNOFF FOR 100 YEAR STORM
360          BA   .0122
361          LS       0      82
362          UD   .0588

363          KK   +CH9B  COMBINE HYDROGRAPHS
364          KM          SUBBASINS CH1 - CH9B @ POND #5
365          HC       2

366          KK    WMP5  DETENTION ROUTING - WETLANDS MITIGATION POND #5 (EDHDC)
367          KM          POND OUTFLOW RATING AS PER THORNE & ASSOC 10-92 ANALYSIS
368          RS       1    ELEV     725
369          SV       0      .3     .704    1.181    1.743    2.382
370          SE     725     726      727      728      729      730
371          SQ       0     8.6       29       72      155      269      413      586
372          SE     725   725.5      726    726.5      727    727.5      728    728.5

373          KK   TR1-7  CHANNEL ROUTING - TRIB 1
374          KM          SUBBASINS CH1 - CH9B ROUTED TO WETLANDS MITIGATION POND #6
375          RM       1   .0162      .3

376          KK    CH10  SUBBASIN CH10
377          KM          SUBBASIN CH10 RUNOFF FOR 100 YEAR STORM
378          BA   .0173
379          LS       0      81
380          UD   .0924
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LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

381          KK  CH1-10  COMBINE HYDROGRAPHS
382          KM          SUBBASINS CH1 - CH10 AT POND #6
383          HC       2

384          KK    WMP6  DETENTION ROUTING - WETLANDS MITIGATION POND #6 (EDHDC)
385          KM          POND OUTFLOW RATING AS PER THORNE & ASSOC 10-92 ANALYSIS
386          RS       1    ELEV     719
387          SV       0    .347     .860    1.439    2.071    2.752
388          SE     719     720      721      722      723      724
389          SQ       0     8.6       29       72      155      269      413      586
390          SE     719   719.5      720    720.5      721    721.5      722    722.5

391          KK   TR1-8  CHANNEL ROUTING - TRIB 1
392          KM          SUBBASINS CH1 - CH10 ROUTED TO WETLANDS MITIGATION POND #7
393          RM       1    .009      .3

394          KK    CH11  SUBBASIN CH11
395          KM          SUBBASIN CH11 RUNOFF FOR 100 YEAR STORM
396          BA   .0082
397          LS       0      81
398          UD   .0649

399          KK  CH1-11  COMBINE HYDROGRAPHS
400          KM          SUBBASINS CH1 - CH11 @ POND #7
401          HC       2

402          KK    WMP7  DETENTION ROUTING - WETLANDS MITIGATION POND #7 (EDHDC)
403          KM          POND OUTFLOW RATING AS PER THORNE & ASSOC 10-92 ANALYSIS
404          RS       1    ELEV     713
405          SV       0    .228     .547     .938    1.393    1.897
406          SE     713     714      715      716      717      718
407          SQ       0     8.6       29       72      155      269      413      586
408          SE     713   713.5      714    714.5      715    715.5      716    716.5

409          KK   TR1-9  CHANNEL ROUTING - TRIB 1
410          KM          SUBBASINS CH1 - CH11 ROUTED TO CH12
411          RM       1   .0153      .3

412          KK    CH12  SUBBASIN CH12
413          KM          SUBBASIN CH12 RUNOFF FOR 100 YEAR STORM
414          BA   .0052
415          LS       0      81
416          UD    .056

417          KK  CH1-12  COMBINE HYDROGRAPHS
418          KM          SUBBASINS CH1 - CH12 @ CONFLUENCE W/CI TRIB
419          HC       2

420          KK     CI1  SUBBASIN CI1
421          KM          SUBBASIN CI1 RUNOFF FOR 100 YEAR STORM
422          BA       .1
423          LS       0      83
424          UD     .21
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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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500          HC       2

501          KK    +SOWL  COMBINE HYDROGRAPHS
502          KM           ADD SCREECH OWL CREEK TO MAIN CHANNEL
503          HC       2

504          KK    CC-10  CHANNEL ROUTING - MAIN CHANNEL
505          KM           ROUTE COMBINED HYDROGRAPH TO SUBBASIN CQ
506          RD
507          RC     .045     .055     .045      900      .03
508          RX        0       75      105      153      168      198      243      328
509          RY      105      100       98       92       92       98      100      105
1                                      HEC-1 INPUT                                                    PAGE 13

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

510          KK      CQ  SUBBASIN CQ
511          KM           SUBBASIN CQ RUNOFF FOR 100 YEAR STORM
512          BA     .034
513          LS        0       86
514          UD     .183

515          KK     +CQ  COMBINE HYDROGRAPHS
516          KM           COMBINE CQ W/ ROUTED HYDROGRAPH
517          HC       2

518          KK     CT1  SUBBASIN CT1
519          KM           SUBBASIN CT1 RUNOFF FOR 100 YEAR STORM
520          BA     .152
521          LS        0     82.5
522          UD     .315

523          KK    +CT1  COMBINE HYDROGRAPHS
524          KM           ADD CT1 TO MAIN CHANNEL
525          HC       2

526          KK    CC-11  CHANNEL ROUTING - MAIN CHANNEL
527          KM           ROUTE TO CONFLUENCE W/TRIB 2 (THROUGH SUBBASIN CT2)
528          RD
529          RC     .045     .055     .045     2000     .015
530          RX        0       25       50       90      115      140      150      160
531          RY      100       99       98       90       90       98       99      100

532          KK     CM6  SUBBASIN CM6
533          KM           SUBBASIN CM6 RUNOFF FOR 100 YEAR STORM
534          BA     .219
535          LS        0       80
536          UD      .97

537          KK     CM2  SUBBASIN CM2
538          KM           SUBBASIN CM2 RUNOFF FOR 100 YEAR STORM
539          BA     .039
540          LS        0       80
541          UD      .25

542          KK   CM2+6  COMBINE HYDROGRAPHS
543          KM           SUBBASINS CM2 + CM6 @ E.D.H. BLVD.
544          HC       2

545          KK    TR2-1  CHANNEL ROUTING - GOLF COURSE TRIB
546          KM           ROUTE CM2 + CM6 TO CM3/CM5
547          RD     2000     .015     .055              TRAP       15       15

548          KK     CM1  SUBBASIN CM1
549          KM           SUBBASIN CM1 RUNOFF FOR 100 YEAR STORM
550          BA     .561
551          LS        0       86
552          UD       .5
1                                      HEC-1 INPUT                                                    PAGE 14

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

553          KK     CM3  SUBBASIN CM3
554          KM           SUBBASIN CM3 RUNOFF FOR 100 YEAR STORM
555          BA     .117
556          LS        0       80
557          UD      .25

558          KK     CM5  SUBBASIN CM5
559          KM           SUBBASIN CM5 RUNOFF FOR 100 YEAR STORM
560          BA     .055
561          LS        0       80
562          UD      .39

563          KK      CM  COMBINE HYDROGRAPHS
564          KM           SUBBASINS CM1, CM2, CM3, CM5, CM6
565          HC       4

566          KK    TR2-2  CHANNEL ROUTING - G.C. TRIB
567          KM           ROUTE COMBINED HYDROGRAPH TO HWY. 50
568          RD     1100      .01     .055              TRAP       15       15

569          KK     CM4  SUBBASIN CM4
570          KM           SUBBASIN CM4 RUNOFF FOR 100 YEAR STORM
571          BA      .15
572          LS        0       83
573          UD     .269

574          KK    CM1-6  COMBINE HYDROGRAPHS
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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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650          KK      CU  SUBBASIN CU
651          BA   0.086
652          LS       0      88
653          UD    0.48

654          KK     CT2  SUBBASIN CT2
655          KM          SUBBASIN CT2 RUNOFF FOR 100 YEAR STORM
656          BA    .211
657          LS       0      85
658          UD    .287

659          KK    WWTP  COMBINE HYDROGRAPHS - MAIN CHANNEL
660          KM          FLOW IN CARSON CREEK @ CONFLUENCE W/ TRIB 2
661          HC       4

662          KK       A  WEST VALLEY SHED A (PORTION OF OLD CV1)
663          BA    .136
664          LS       0      84
665          UD    .370

666          KK     RTA  ROUTE SHED A TO CARSON CREEK
667          RD    2900    .015    .035            TRAP       5       2       2

668          KK      XW  WEST VALLEY SHED XW (PORTION OF OLD CV1)
669          BA    .109
670          LS       0      82
671          UD    .268

672          KK    'CV1'  SUM HYDROGRAPHS = OLD CV1
673          HC       2

674          KK   +'CV1'  FLOW IN CARSON CREEK ABOVE WWTP
675          HC       2
1                                        HEC-1 INPUT                                        PAGE 17

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

676          KK    ROUTE  ROUTE CARSON CREEK FLOW FROM CONFLUENCE TO LATROBE ROAD
677          RD     2000   .0033     .04            TRAP      20       3       3

678          KK      XY  WEST VALLEY SHED XY (PORTION OF OLD CV2)
679          BA    .125
680          LS       0      80
681          UD   0.246

682          KK   POINT1  CARSON CREEK FLOW @ LATROBE ROAD @ POINT 1
683          HC       2

684          KK    CC-13  CHANNEL ROUTING - MAIN CHANNEL
685          KM          STORAGE-OUTFLOW RATING FROM CCRDS
686          RS       1    FLOW      -1
687          SV       0       4       6       9      15      18      19      20      24      25
688          SV      30
689          SQ       0     300     500    1000    1500    2000    2500    3000    3500    4000
690          SQ    5000

691          KK     CV3  SUBASIN CV3
692          KM          SUBBASIN CV3 RUNOFF FOR 100 YEAR STORM
693          BA    .062
694          LS       0      87
695          UD    .308

696          KK       B  WEST VALLEY SHED B (PORTION OF OLD CV2)
697          BA    .059
698          LS       0      84
699          UD   0.325

700          KK    ROUTE  ROUTE SHED B TO LATROBE ROAD
701          RD     2000     .01     .04            TRAP       8       2       2

702          KK       C  WEST VALLEY SHED C (PORTION OF OLD CV2)
703          BA    .004
704          LS       0      98
705          UD    .123

706          KK      XV  WEST VALLEY SHED XV (PORTION OF OLD CV2)
707          BA    .047
708          LS       0      83
709          UD    .260

710          KK       D  WEST VALLEY SHED D
711          BA    .003
712          LS          85
713          UD    .104

714          KK   POINTA  FLOW @ LATROBE ROAD @ POINT A (CV2)
715          HC       4
1                                        HEC-1 INPUT                                        PAGE 18

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

716          KK   RT CV  ROUTE 'CV' FLOW FROM LATROBE ROAD TO CARSON CREEK CHANNEL
717          RD    1600     .005     .04            TRAP       8       3       3

718          KK     PT1a  COMBINE HYDROGRAPHS - CARSON CREEK FLOW @ POINT 1a (CV3)
719          KM          ADD CV3 AND 'CV' TO MAIN CHANNEL
720          HC       3
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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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797          KK       G  WEST VALLEY SHED G
798          BA    .001
799          LS              98
800          UD    .103

801          KK    SUM3  COMBINED FLOW @ CORNERSTONE DR
802          HC       3

803          KK     RTE  ROUTE TO WMP3
804          RD    1250    .004    .035            TRAP      10       3       3

805          KK       N  WEST VALLEY SHED N
806          BA    .025
807          LS              85
808          UD    .168

809          KK       E  WEST VALLEY SHED E
810          BA    .023
811          LS              83
812          UD     .13

813          KK       P  WEST VALLEY SHED P
814          BA    .003
815          LS              86
816          UD    .102

817          KK       R  WEST VALLEY SHED R
818          BA    .004
819          LS              86
820          UD    .119

821          KK      XJ  WEST VALLEY SHED XJ
822          BA    .047
823          LS              82
824          UD    .443

825          KK    SUM4  WMP3 INFLOW
826          HC       6

827          KK    WMP3  ROUTE THROUGH VALLEY VIEW WETLANDS MITIGATION POND 3
828          KM          POND OUTFLOW RATING AS PER NOV 2004 CTA SURVEY DATA
829          KM          30' WEIR CREST @ ELEV 543.2
830          KM          FLOW @ BLACKSTONE PKWY
831          RS       1    ELEV   543.2
832          SV       0    0.37       1    1.98    3.26     4.8
833          SE     542     543     544     545     546     547
834          SL
835          SS   543.2      30     2.6     1.5
1                                    HEC-1 INPUT                                                    PAGE 21

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

836          KK    RCX2  ROUTE TO LATROBE RD - PT 2/CX2
837          RD    1000    .004    .035            TRAP      12       3       3

838          KK       F  WEST VALLEY SHED F
839          BA    .033
840          LS              86
841          UD    .142

842          KK      XT  WEST VALLEY SHED XT
843          BA    .003
844          LS              92
845          UD     .15

846          KK      XU  WEST VALLEY SHED XU
847          BA    .014
848          LS              88
849          UD    .480

850          KK  POINT2  COMBINED FLOW @ LATROBE RD @ POINT 2 (PT CX2)
851          HC       4

852          KK   CC14B  CHANNEL ROUTING
853          KM          SUBBASINS CX1+CX2 ROUTED TO SUBBASIN CX3
854          RD
855          RC     .04     .05     .04    2300    .017
856          RX       0     250     350     356     370     380     480     730
857          RY     105     100      98      95      95      98     100     105

858          KK    CX3N  REVISED CCRDS SHED CX3N
859          BA    .114
860          LS              92
861          UD    .390

862          KK  POINTM  REVISED CCRDS SHED CX3S - POINT M @ GOLDEN FOOTHILL PKY
863          BA    .048
864          LS              92
865          UD     0.3

866          KK   SUMCX  COMBINED RUNOFF FROM CX1-CX3
867          HC       3

868          KK     CX4  CCRDS SHED CX4
869          BA    .241
870          LS              92
871          UD    .581
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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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  949          HC       3

  950          KK    CW1+2  COMBINE HYDROGRAPHS
  951          KM           COMBINE CW1+CW2
  952          HC       2

  953          KK     CW3  SUBBASIN CW3
  954          KM          SUBBASIN CW3 RUNOFF FOR 100 YEAR STORM
  955          BA    .414
  956          LS       0      82
  957          UD    .747
1                                        HEC-1 INPUT                                                    PAGE 24

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

  958          KK    CW1-3  COMBINE HYDROGRAPHS
  959          KM           COMBINE CW1-CW3
  960          HC       2

  961          KK   TR3-1A  CHANNEL ROUTING
  962          KM           ROUTE CW1-CW3 TO CW4 (WHITE ROCK ROAD)
  963          RD     1500    .013    .055            TRAP      10      20

  964          KK     CW4  SUBBASIN CW4
  965          KM          SUBBASIN CW4 RUNOFF FOR 100 YEAR STORM
  966          BA    .072
  967          LS       0      86
  968          UD    .215

  969          KK     CW5  SUBBASIN CW5
  970          KM          SUBBASIN CW5 RUNOFF FOR 100 YEAR STORM
  971          BA    .116
  972          LS       0      83
  973          UD    .283

  974          KK    CW1-5  COMBINE HYDROGRAPHS @ WHITE ROCK ROAD
  975          KM           COMBINE CW1-CW5
  976          HC       3

  977          KK    TR3-2  CHANNEL ROUTING - TRIB 3
  978          KM           ROUTE CW1-CW5 TO CW6
  979          RD     5500    .007    .045            TRAP      20       3

  980          KK     CW6'
  981          KM          SUBBASIN CW6' RUNOFF FOR 100 YEAR STORM
  982          KM          NO DETENTION
  983          BA    .012
  984          LS       0    85.2
  985          UD    .742

  986          KK   CW1-6'  COMBINE HYDROGRAPHS
  987          KM           COMBINE CW1-CW6'
  988          HC       2

  989          KK     CW7  SUBBASIN CW7 (@ WHITE ROCK ROAD)
  990          KM          SUBBASIN CW7 RUNOFF FOR 100 YEAR STORM
  991          BA    .311
  992          LS       0      79
  993          UD    .636

  994          KK   TR3-2A  CHANNEL ROUTING
  995          KM           ROUTE CW7 TO CW8'
  996          RD     3000    .017    .045            TRAP      20       3
1                                        HEC-1 INPUT                                                    PAGE 25

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

  997          KK    CW8'  SUBBASIN CW8' - PORTION NOT TRIBUTARY TO DETENTION @ CAR CRK RNCH
  998          KM          SUBBASIN CW8' RUNOFF FOR 100 YEAR STORM
  999          KM          NO DETENTION
 1000          BA    .141
 1001          LS       0    82.1
 1002          UD    .466

 1003          KK    CW7+8  COMBINE HYDROGRAHS
 1004          KM           COMBINE CW7+CW8
 1005          HC       2

 1006          KK    CW1-8  COMBINE HYDROGRAPHS
 1007          KM           COMBINE CW1-CW8
 1008          HC       2

 1009          KK    TR3-3  CHANNEL ROUTING
 1010          KM           ROUTE CW1-CW8 TO CW9
 1011          RD     2600    .006    .045            TRAP      20       3

 1012          KK     CW9'  SUBBASIN CW9' - PORTION NOT TRIBUTARY TO DETENTION
 1013          KM          SUBBASIN CW9' RUNOFF FOR 100 YEAR STORM
 1014          KM          NO DETENTION
 1015          BA    .079
 1016          LS       0    82.6
 1017          UD    .446

 1018          KK     CWP  PORTIONS OF CW6, CW8, CW9
 1019          BA     .38
 1020          LS       0      84
 1021          UD    1.28

 1022          KK   TRIB3  COMBINE HYDROGRAPHS
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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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1096          KK      AB  WEST VALLEY SHED AB
1097          BA    .089
1098          LS              86
1099          UD    .222

1100          KK    SUM3  COMBINED FLOW BELOW ROYAL OAKS DR
1101          HC       3

1102          KK     RTE  ROUTE TO WMP 1/2
1103          RD    1500    .005    .035            TRAP      12       3       3

1104          KK       M  WEST VALLEY SHED M
1105          BA    .028
1106          LS              84
1107          UD    .269

1108          KK       U  WEST VALLEY SHED U
1109          BA    .003
1110          LS              86
1111          UD     .11

1112          KK    SUM4  COMBINED RUNOFF
1113          HC       2
1                                        HEC-1 INPUT                                                    PAGE 28

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


1114          KK     RTE  ROUTE TO WMP 1/2
1115          RD    1300     .01    .035            TRAP       6       2       2

1116          KK      XH  WEST VALLEY SHED XH
1117          BA     .07
1118          LS              81
1119          UD    .314

1120          KK       X  WEST VALLEY SHED X
1121          BA    .015
1122          LS              88
1123          UD    .125

1124          KK       T  WEST VALLEY SHED T
1125          BA    .037
1126          LS              86
1127          UD    .139

1128          KK    SUM5  INFLOW TO WMP 1/2
1129          HC       5

1130          KK    WMP1  DETENTION ROUTING THROUGH ON-SITE WETLANDS MITIGATION POND 1
1131          KM          OUTFLOW RATING PER NOV 2004 CTA SURVEY DATA
1132          KM          150' WEIR @ CREST ELEV 540
1133          KM          ASSUME WATER SURFACE @ OVERFLOW CREST @ ONSET OF STORM
1134          KM          WMP1 OUTFLOW ENTERS WMP2
1135          RS       1    ELEV     540
1136          SV       0     0.7     1.5
1137          SQ       0     390    1100
1138          SE     540     541     542

1139          KK    WMP2  DETENTION ROUTING THROUGH ON-SITE WETLANDS MITIGATION POND 2
1140          KM          OUTFLOW RATING PER NOV 2004 SURVEY DATA & 2005 IMPROVEMNT PLANS
1141          KM          40' WEIR @ CREST ELEV 534.5
1142          KM          24" LOW LEVEL OUTLET @ CL ELEV 531.5
1143          KM          ASSUME WATER SURFACE @ ELEV 532 @ ONSET OF STORM
1144          KM          POND OUTFLOW @ 2ND ST (BLACKSTONE PKWY)
1145          RS       1    ELEV     532
1146          SV    0.21    0.43    0.92     1.6    2.45    3.62    5.17    6.92    8.77
1147          SE     532     533     534     535     536     538     540     541     542
1148          SL   531.5    3.14     0.6     0.5
1149          SS   534.5      40     2.6     1.5

1150          KK       Q  WEST VALLEY SHED Q
1151          BA    .011
1152          LS              86
1153          UD    .113

1154          KK       Y  WEST VALLEY SHED Y
1155          BA    .001
1156          LS              98
1157          UD     .10
1                                        HEC-1 INPUT                                                    PAGE 29

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


1158          KK       Z  WEST VALLEY SHED Z
1159          BA    .046
1160          LS              86
1161          UD    .142

1162          KK      XR  WEST VALLEY SHED XR
1163          BA    .013
1164          LS              86
1165          UD    .210

1166          KK  POINT5  FLOW @ LATROBE RD - POINT 5 (CY2)
1167          KO                2
1168          HC       5

1169          KK     RTE  RTE TO ROBT J MATTHEWS PKWY
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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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1240          KK     RTE  RTE TO CY3-3
1241          RD    1000     .01    .035            TRAP       6       3       3

1242          KK    CY3-3  CARSON CREEK SHED CY3-3
1243          BA     .064
1244          LS             86
1245          UD     .303

1246          KK      SUM  COMBINED FLOW OF TRIB 4 N & S FORKS
1247          HC        3

1248          KK     RTE  RTE THROUGH CY3-4
1249          RD    2500     .008    .035            TRAP      15       3       3

1250          KK    CY3-4  CARSON CREEK SHED CY3-4
1251          BA     .055
1252          LS             90
1253          UD     .409

1254          KK   POINT6  FLOW IN 'TRIBUTARY 4' - POINT 6
1255          HC        2

1256          KK   XN/PTE  WEST VALLEY SHED XN - FLOW @ LATROBE RD POINT E
1257          BA     .029
1258          LS             81
1259          UD     .216

1260          KK     RTE  RTE THROUGH CY5E
1261          RD    3500     .028    .035            TRAP       6       3       3

1262          KK      AH  WEST VALLEY SHED AH
1263          BA     .018
1264          LS             86
1265          UD     .256

1266          KK     RTE  RTE THROUGH XM TO LATROBE RD
1267          RD    1000     0.13    .035            TRAP       2       2       2

1268          KK      XM  WEST VALLEY SHED XM
1269          BA     .041
1270          LS             80
1271          UD      .2
1                                    HEC-1 INPUT                                    PAGE 32

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

1272          KK   POINTF  FLOW @ LATROBE RD @ POINT F
1273          HC        2

1274          KK      XL  WEST VALLEY SHED XL
1275          BA     .005
1276          LS             86
1277          UD      .20

1278          KK      AJ  WEST VALLEY SHED AJ
1279          BA     .003
1280          LS             98
1281          UD      .10

1282          KK      AG  WEST VALLEY SHED AG
1283          BA     .008
1284          LS             90
1285          UD     .125

1286          KK      XK  WEST VALLEY SHED XK
1287          BA     .102
1288          LS             80
1289          UD     .353

1290          KK   POINT7  FLOW @ LATROBE RD @ POINT 7 (XK+XL+AG+AJ)
1291          HC        4

1292          KK    SUM3  FLOW THROUGH CY5E (ADDED AH+XM)
1293          HC        2

1294          KK     RTE  RTE COMBINED HYDROGRAPH THROUGH CY5E TO PL
1295          RD    5000     .017    .035            TRAP       8       3       3

1296          KK    CY5E  BUSINESS PARK SHED CY5E
1297          BA     .438
1298          LS             84
1299          UD     .628

1300          KK   POINTL  'TRIBUTARY 5' @ POINT L (CARSON CREEK PROJECT PL)
1301          HC        3

1302          KK     RTE  RTE THROUGH CY5W
1303          KM          CHANNEL STORAGE ROUTING IN TRIB 5 ABOVE CARSON CREEK
1304          KM          REACH EXTENDS FROM X-SEC 500 TO E-SEC 500.7
1305          RS        1    FLOW      -1
1306          SV        0       7      12      16      20       2      26      29      31      33
1307          SQ        0     200     400     600     800    1000    1200    1400    1600    1800

1308          KK    CY5W  CARSON CREEK SHED CY5W
1309          BA     .281
1310          LS             84
1311          UD     .741
1                                    HEC-1 INPUT                                    PAGE 33
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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
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
 *
 *                                      *                                                    *
 *
 *****************************************
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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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***** WARNING *****  POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH   TR1-6.
      ADJUST NSTPS AND/OR COMPUTATION INTERVAL TO MEET CRITERIA IN USER MANUAL).
***** WARNING *****  POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH   TR1-7.
      ADJUST NSTPS AND/OR COMPUTATION INTERVAL TO MEET CRITERIA IN USER MANUAL).
***** WARNING *****  POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH   TR1-8.
      ADJUST NSTPS AND/OR COMPUTATION INTERVAL TO MEET CRITERIA IN USER MANUAL).
***** WARNING *****  POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH   TR1-9.
      ADJUST NSTPS AND/OR COMPUTATION INTERVAL TO MEET CRITERIA IN USER MANUAL).
***** WARNING *****  POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH  TR1-9A.
      ADJUST NSTPS AND/OR COMPUTATION INTERVAL TO MEET CRITERIA IN USER MANUAL).
***** WARNING *****  POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH   TR3-1.
      ADJUST NSTPS AND/OR COMPUTATION INTERVAL TO MEET CRITERIA IN USER MANUAL).


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

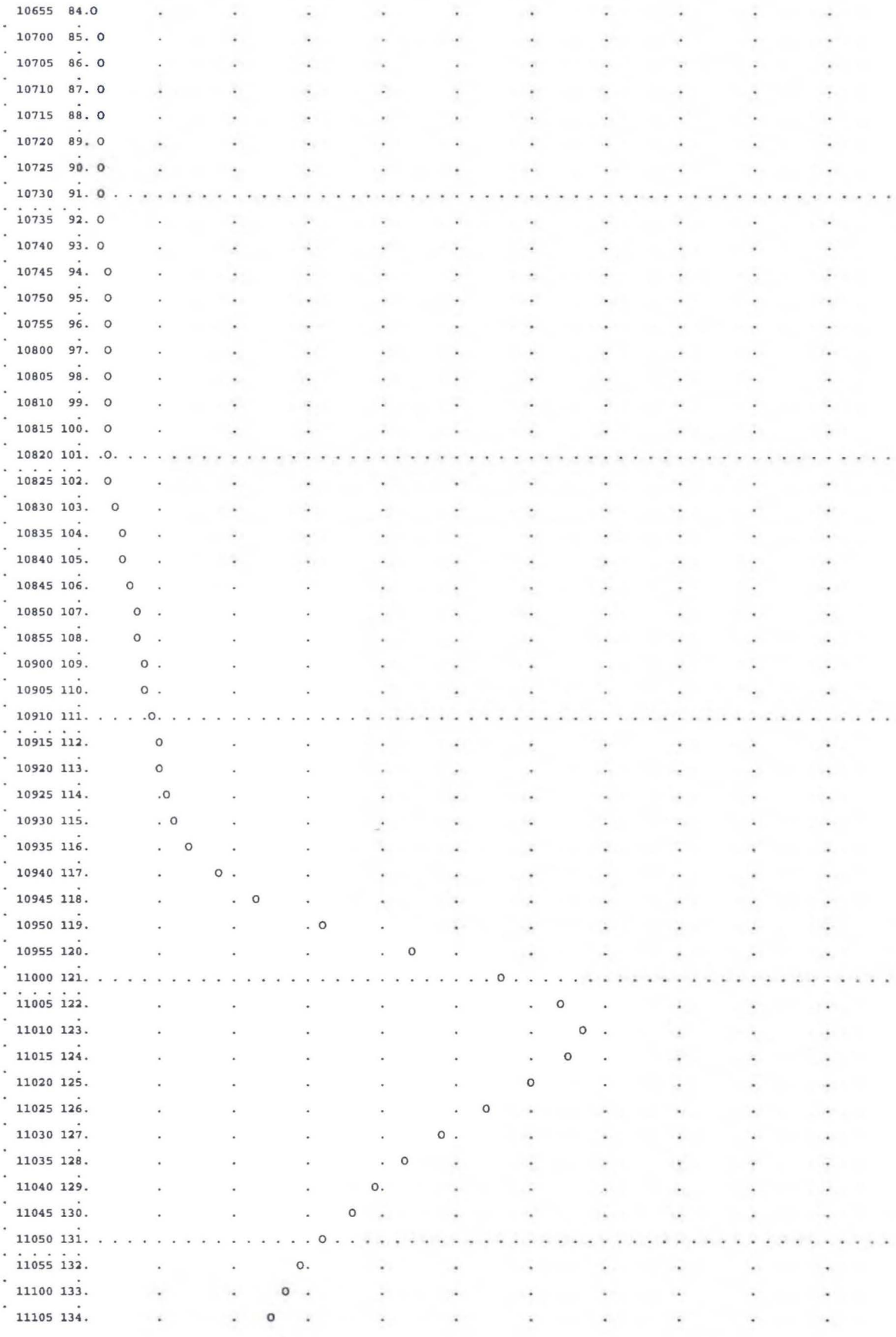
              **************
              *            *
 1166 KK      *   POINT5   *       FLOW @ LATROBE RD - POINT 5 (CY2)
              *            *
              **************

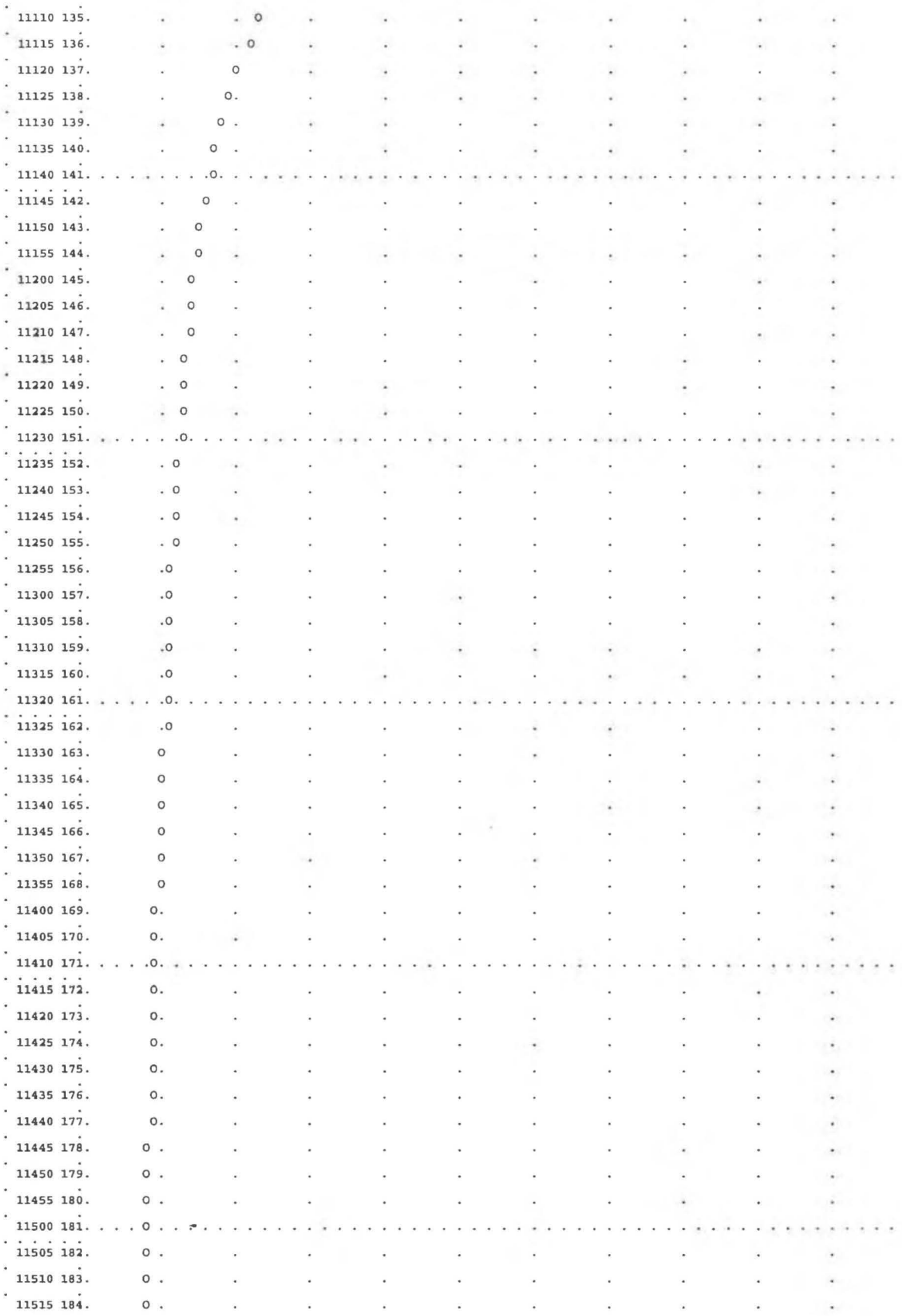
 1167 KO           OUTPUT CONTROL VARIABLES
                         IPRNT          5  PRINT CONTROL
                         IPLOT          2  PLOT CONTROL
                         QSCAL         0.  HYDROGRAPH PLOT SCALE
1                                                         STATION   POINT5

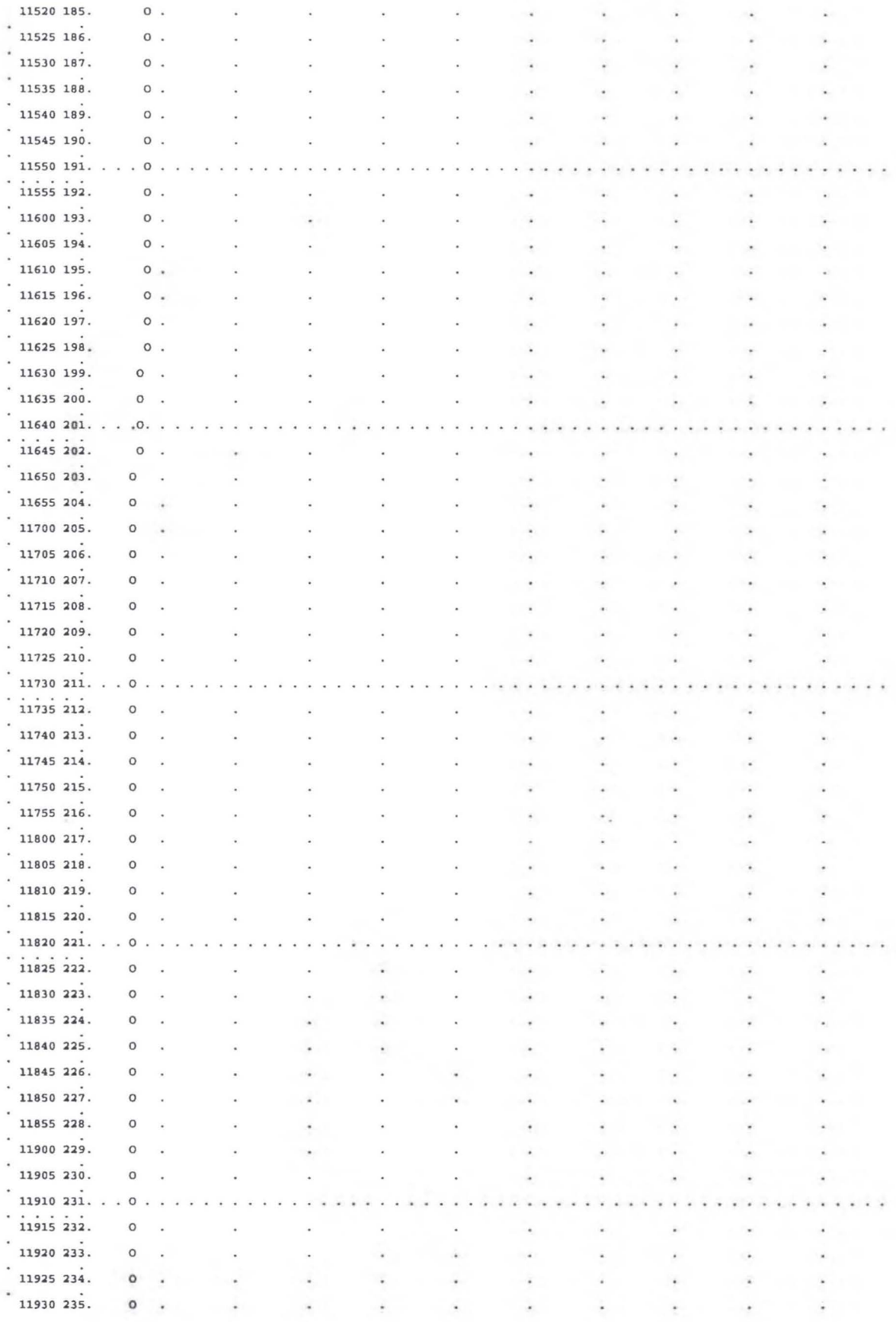
                         (O) OUTFLOW
          0.       100.       200.       300.       400.       500.       600.       700.       0.       0.       0.
0.        0.
 DAHRMN PER
  10000
1.0---------.---------.---------.---------.---------.---------.---------.---------.---------.---------.---------.--------
-.
  10005   2.0      .         .         .         .         .         .         .         .         .         .
.         .
  10010   3.0      .         .         .         .         .         .         .         .         .         .
.         .
  10015   4.0      .         .         .         .         .         .         .         .         .         .
.         .
  10020   5.0      .         .         .         .         .         .         .         .         .         .
.         .
  10025   6.0      .         .         .         .         .         .         .         .         .         .
.         .
  10030   7.0      .         .         .         .         .         .         .         .         .         .
.         .
  10035   8.0      .         .         .         .         .         .         .         .         .         .
.         .
  10040   9.0      .         .         .         .         .         .         .         .         .         .
.         .
  10045  10.0      .         .         .         .         .         .         .         .         .         .
.         .
  10050  11.0. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
. . . . . .
  10055  12.0      .         .         .         .         .         .         .         .         .         .
.         .
  10100  13.0      .         .         .         .         .         .         .         .         .         .
.         .
  10105  14.0      .         .         .         .         .         .         .         .         .         .
.         .
  10110  15.0      .         .         .         .         .         .         .         .         .         .
.         .
  10115  16.0      .         .         .         .         .         .         .         .         .         .
.         .
  10120  17.0      .         .         .         .         .         .         .         .         .         .
.         .
  10125  18.0      .         .         .         .         .         .         .         .         .         .
.         .
  10130  19.0      .         .         .         .         .         .         .         .         .         .
.         .
  10135  20.0      .         .         .         .         .         .         .         .         .         .
.         .
  10140  21.0. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
. . . . . .
  10145  22.0      .         .         .         .         .         .         .         .         .         .
.         .
  10150  23.0      .         .         .         .         .         .         .         .         .         .
.         .
  10155  24.0      .         .         .         .         .         .         .         .         .         .
.         .
  10200  25.0      .         .         .         .         .         .         .         .         .         .
.         .
  10205  26.0      .         .         .         .         .         .         .         .         .         .
.         .
  10210  27.0      .         .         .         .         .         .         .         .         .         .
.         .
  10215  28.0      .         .         .         .         .         .         .         .         .         .
.         .
  10220  29.0      .         .         .         .         .         .         .         .         .         .
.         .
  10225  30.0      .         .         .         .         .         .         .         .         .         .
.         .
  10230  31.0. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
. . . . . .
  10235  32.0      .         .         .         .         .         .         .         .         .         .
.         .
  10240  33.0      .         .         .         .         .         .         .         .         .         .
```

10245 34.0
10250 35.0
10255 36.0
10300 37.0
10305 38.0
10310 39.0
10315 40.0
10320 41.0
10325 42.0
10330 43.0
10335 44.0
10340 45.0
10345 46.0
10350 47.0
10355 48.0
10400 49.0
10405 50.0
10410 51.0
10415 52.0
10420 53.0
10425 54.0
10430 55.0
10435 56.0
10440 57.0
10445 58.0
10450 59.0
10455 60.0
10500 61.0
10505 62.0
10510 63.0
10515 64.0
10520 65.0
10525 66.0
10530 67.0
10535 68.0
10540 69.0
10545 70.0
10550 71.0
10555 72.0
10600 73.0
10605 74.0
10610 75.0
10615 76.0
10620 77.0
10625 78.0
10630 79.0
10635 80.0
10640 81.0
10645 82.0
10650 83.0

POINT 5


10655 84.
10700 85.
10705 86.
10710 87.
10715 88.
10720 89.
10725 90.
10730 91.
10735 92.
10740 93.
10745 94.
10750 95.
10755 96.
10800 97.
10805 98.
10810 99.
10815 100.
10820 101.
10825 102.
10830 103.
10835 104.
10840 105.
10845 106.
10850 107.
10855 108.
10900 109.
10905 110.
10910 111.
10915 112.
10920 113.
10925 114.
10930 115.
10935 116.
10940 117.
10945 118.
10950 119.
10955 120.
11000 121.
11005 122.
11010 123.
11015 124.
11020 125.
11025 126.
11030 127.
11035 128.
11040 129.
11045 130.
11050 131.
11055 132.
11100 133.
11105 134.


11110 135
11115 136
11120 137
11125 138
11130 139
11135 140
11140 141
11145 142
11150 143
11155 144
11200 145
11205 146
11210 147
11215 148
11220 149
11225 150
11230 151
11235 152
11240 153
11245 154
11250 155
11255 156
11300 157
11305 158
11310 159
11315 160
11320 161
11325 162
11330 163
11335 164
11340 165
11345 166
11350 167
11355 168
11400 169
11405 170
11410 171
11415 172
11420 173
11425 174
11430 175
11435 176
11440 177
11445 178
11450 179
11455 180
11500 181
11505 182
11510 183
11515 184


11520 185.
11525 186.
11530 187.
11535 188.
11540 189.
11545 190.
11550 191.
11555 192.
11600 193.
11605 194.
11610 195.
11615 196.
11620 197.
11625 198.
11630 199.
11635 200.
11640 201.
11645 202.
11650 203.
11655 204.
11700 205.
11705 206.
11710 207.
11715 208.
11720 209.
11725 210.
11730 211.
11735 212.
11740 213.
11745 214.
11750 215.
11755 216.
11800 217.
11805 218.
11810 219.
11815 220.
11820 221.
11825 222.
11830 223.
11835 224.
11840 225.
11845 226.
11850 227.
11855 228.
11900 229.
11905 230.
11910 231.
11915 232.
11920 233.
11925 234.
11930 235.

```
11935 236.     O
11940 237.     O
11945 238.     O
11950 239.     O
11955 240.     O
12000 241. . .O. . . . . .
12005 242.    O
12010 243.    O
12015 244.    O
12020 245.    O
12025 246.    O
12030 247.    O
12035 248.    O
12040 249.    O
12045 250.    O
12050 251. . .O. . . . . .
12055 252.    O
12100 253.    O
12105 254.    O
12110 255.    O
12115 256.    O
12120 257.    O
12125 258.    O
12130 259.    O
12135 260.    O
12140 261. . .O. . . . . .
12145 262.    O
12150 263.    O
12155 264.    O
12200 265.    O
12205 266.    O
12210 267.    O
12215 268.    O
12220 269.    O
12225 270.    O
12230 271. . .O. . . . . .
12235 272.    O
12240 273.    O
12245 274.    O
12250 275.    O
12255 276.    O
12300 277.    O
12305 278.    O
12310 279.    O
12315 280.    O
12320 281. . .O. . . . . .
12325 282.    O
12330 283.    O
12335 284.    O
12340 285.    O
```

```
  12345 286.    O    .       .       .       .       .       .       .       .       .       .
.       .
  12350 287.    O    .       .       .       .       .       .       .       .       .       .
.       .
  12355 288.    O    .       .       .       .       .       .       .       .       .       .
.       .
  20000 289.   O     .       .       .       .       .       .       .       .       .       .
.       .
  20005 290.   O     .       .       .       .       .       .       .       .       .       .
.       .
  20010 291. . O . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
. . . . .
  20015 292.   O     .       .       .       .       .       .       .       .       .       .
.       .
  20020 293.   O     .       .       .       .       .       .       .       .       .       .
.       .
  20025 294.  O      .       .       .       .       .       .       .       .       .       .
.       .
  20030 295.  O      .       .       .       .       .       .       .       .       .       .
.       .
  20035 296.  O      .       .       .       .       .       .       .       .       .       .
.       .
  20040 297.  O      .       .       .       .       .       .       .       .       .       .
.       .
  20045 298.  O      .       .       .       .       .       .       .       .       .       .
.       .
  20050 299. O       .       .       .       .       .       .       .       .       .       .
.       .
  20055 300.-
O-------.---------.---------.---------.---------.---------.---------.---------.---------.---------.---------.---------.
1


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

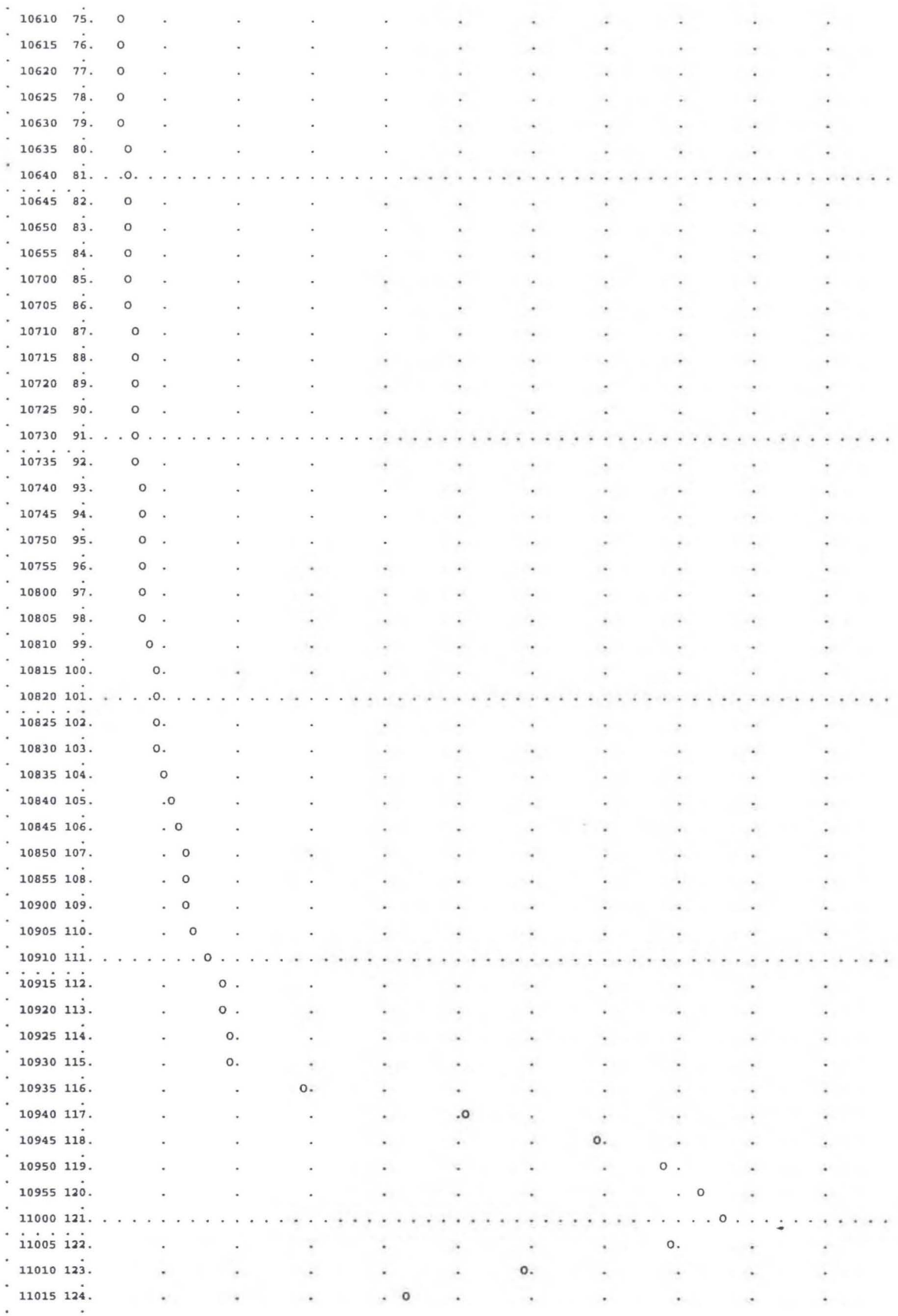
              **************
              *            *
 1179 KK      *    POINTB  *       S+XS @ LATROBE RD - POINT B
              *            *
              **************

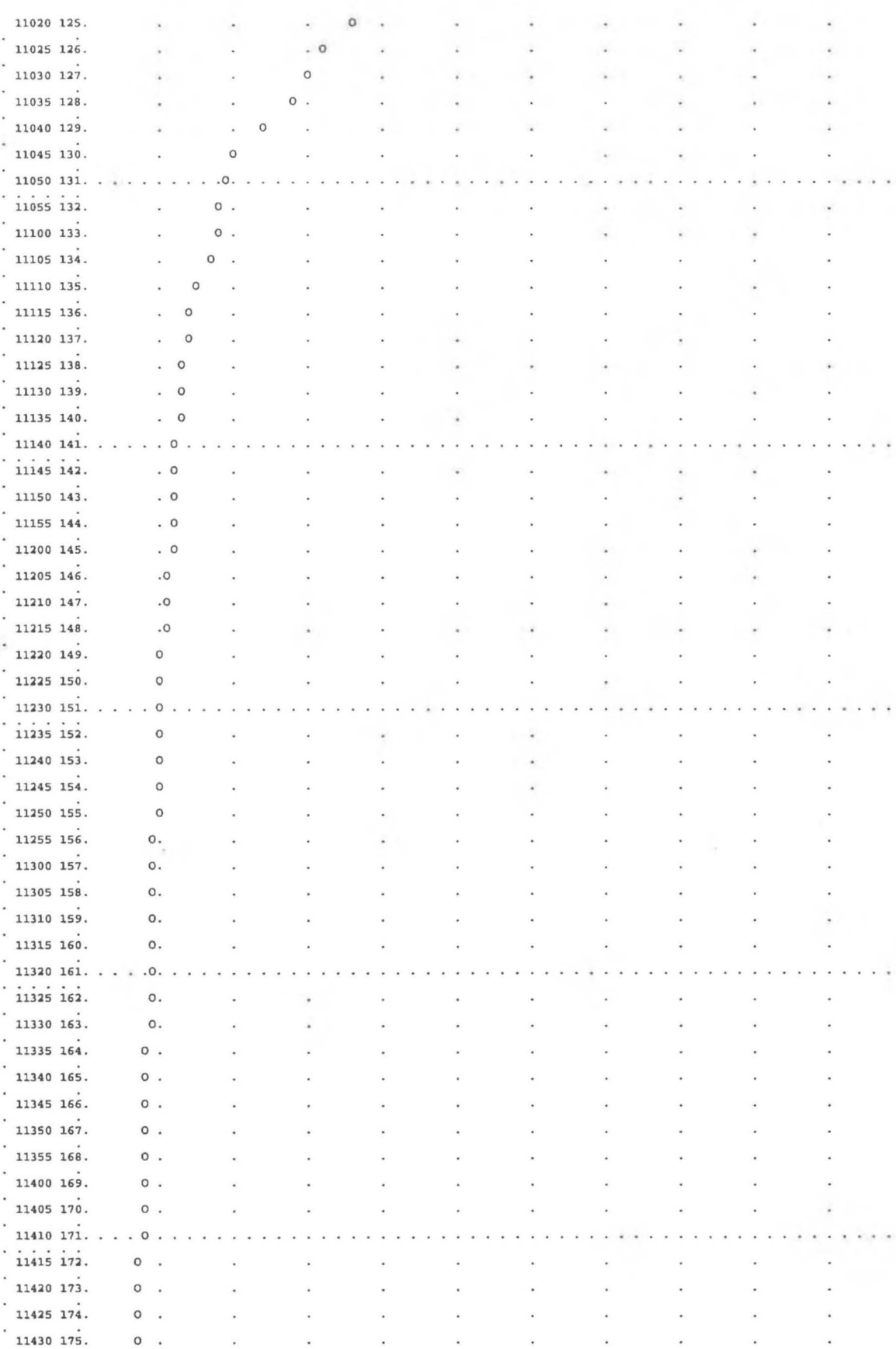
 1180 KO           OUTPUT CONTROL VARIABLES
                        IPRNT          5  PRINT CONTROL
                        IPLOT          2  PLOT CONTROL
                        QSCAL          0.  HYDROGRAPH PLOT SCALE
1                                                  STATION   POINTB

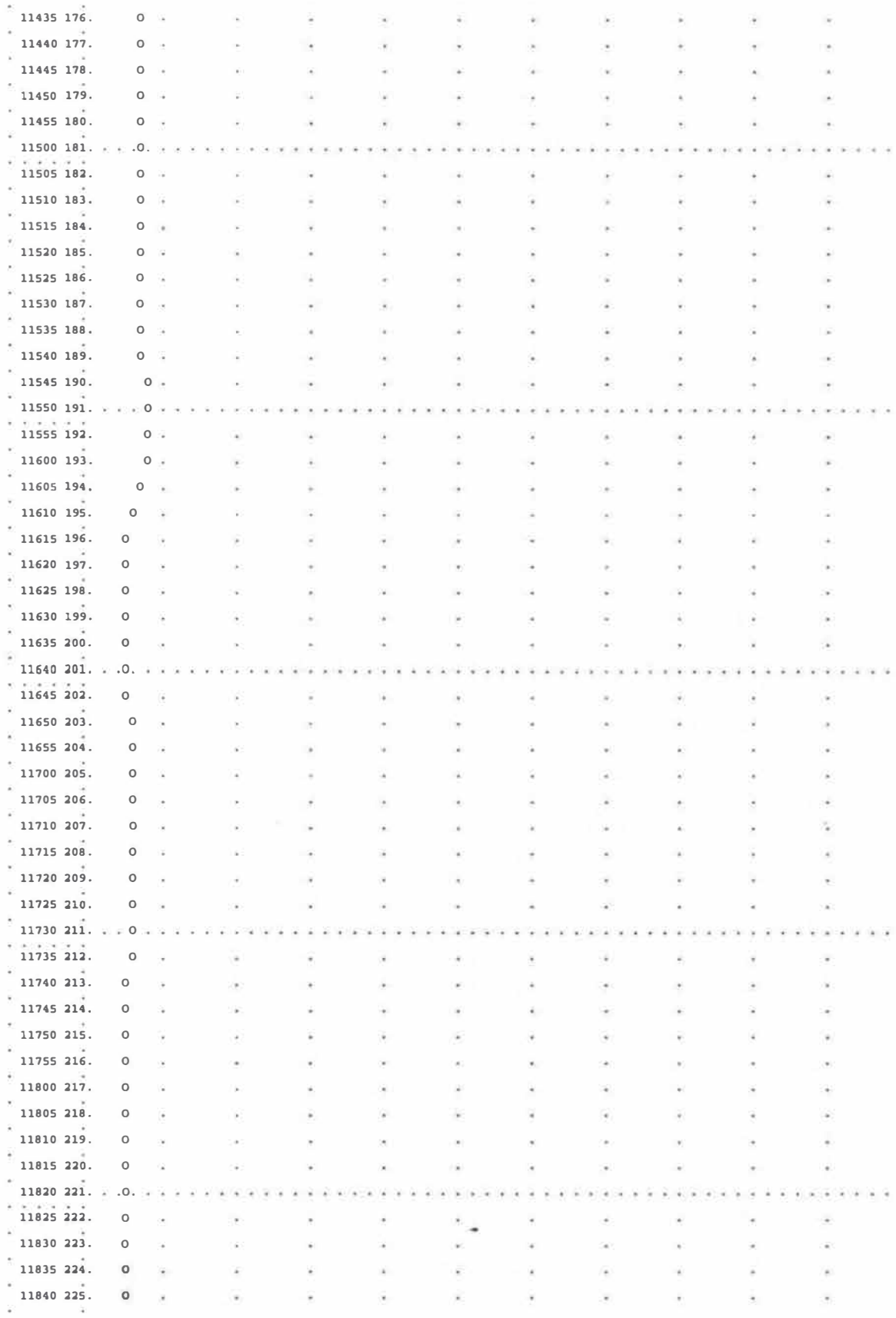
                          (O) OUTFLOW
          0.        2.        4.        6.        8.       10.       12.       14.       16.       18.       0.
0.        0.
 DAHRMN PER
  10000
10O---------.---------.---------.---------.---------.---------.---------.---------.---------.---------.---------.
-.
  10005   2O        .       .       .       .       .       .       .       .       .       .
.       .
  10010   3O        .       .       .       .       .       .       .       .       .       .
.       .
  10015   4O        .       .       .       .       .       .       .       .       .       .
.       .
  10020   5O        .       .       .       .       .       .       .       .       .       .
.       .
  10025   6O        .       .       .       .       .       .       .       .       .       .
.       .
  10030   7O        .       .       .       .       .       .       .       .       .       .
.       .
  10035   8O        .       .       .       .       .       .       .       .       .       .
.       .
  10040   9O        .       .       .       .       .       .       .       .       .       .
.       .
  10045  10O        .       .       .       .       .       .       .       .       .       .
.       .
  10050  11O . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
. . . . .
  10055  12O        .       .       .       .       .       .       .       .       .       .
.       .
  10100  13O        .       .       .       .       .       .       .       .       .       .
.       .
  10105  14O        .       .       .       .       .       .       .       .       .       .
.       .
  10110  15O        .       .       .       .       .       .       .       .       .       .
.       .
  10115  16O        .       .       .       .       .       .       .       .       .       .
.       .
  10120  17.O       .       .       .       .       .       .       .       .       .       .
.       .
  10125  18.O       .       .       .       .       .       .       .       .       .       .
.       .
  10130  19.O       .       .       .       .       .       .       .       .       .       .
.       .
  10135  20.O       .       .       .       .       .       .       .       .       .       .
.       .
  10140  21.O. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
. . . . .
  10145  22.O       .       .       .       .       .       .       .       .       .       .
.       .
  10150  23.O       .       .       .       .       .       .       .       .       .       .
.       .
```

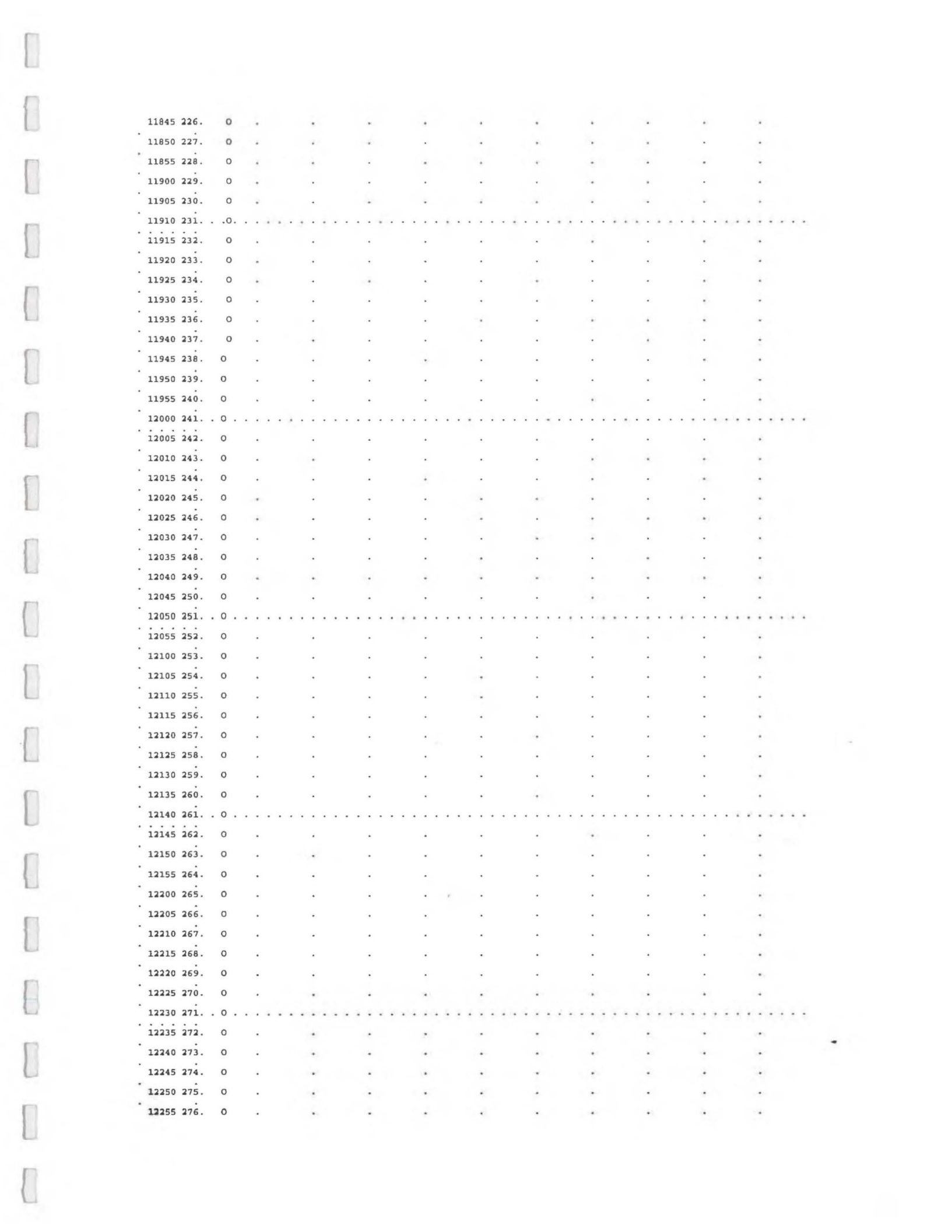
```
10155  24.O
10200  25.O
10205  26.O
10210  27.O
10215  28.O
10220  29.O
10225  30.O
10230  31.O
10235  32.O
10240  33.O
10245  34.O
10250  35. O
10255  36. O
10300  37. O
10305  38. O
10310  39. O
10315  40. O
10320  41. O
10325  42. O
10330  43. O
10335  44. O
10340  45. O
10345  46. O
10350  47. O
10355  48. O
10400  49. O
10405  50. O
10410  51. .O.
10415  52.  O
10420  53.  O
10425  54.  O
10430  55.  O
10435  56.  O
10440  57.  O
10445  58.  O
10450  59.  O
10455  60.  O
10500  61. .O.
10505  62.  O
10510  63.  O
10515  64.   O
10520  65.   O
10525  66.   O
10530  67.   O
10535  68.   O
10540  69.   O
10545  70.   O
10550  71. . O
10555  72.   O
10600  73.   O
10605  74.   O
```

POINT B


10610 75.
10615 76.
10620 77.
10625 78.
10630 79.
10635 80.
10640 81.
10645 82.
10650 83.
10655 84.
10700 85.
10705 86.
10710 87.
10715 88.
10720 89.
10725 90.
10730 91.
10735 92.
10740 93.
10745 94.
10750 95.
10755 96.
10800 97.
10805 98.
10810 99.
10815 100.
10820 101.
10825 102.
10830 103.
10835 104.
10840 105.
10845 106.
10850 107.
10855 108.
10900 109.
10905 110.
10910 111.
10915 112.
10920 113.
10925 114.
10930 115.
10935 116.
10940 117.
10945 118.
10950 119.
10955 120.
11000 121.
11005 122.
11010 123.
11015 124.


11020 125.
11025 126.
11030 127.
11035 128.
11040 129.
11045 130.
11050 131.
11055 132.
11100 133.
11105 134.
11110 135.
11115 136.
11120 137.
11125 138.
11130 139.
11135 140.
11140 141.
11145 142.
11150 143.
11155 144.
11200 145.
11205 146.
11210 147.
11215 148.
11220 149.
11225 150.
11230 151.
11235 152.
11240 153.
11245 154.
11250 155.
11255 156.
11300 157.
11305 158.
11310 159.
11315 160.
11320 161.
11325 162.
11330 163.
11335 164.
11340 165.
11345 166.
11350 167.
11355 168.
11400 169.
11405 170.
11410 171.
11415 172.
11420 173.
11425 174.
11430 175.


11435 176.
11440 177.
11445 178.
11450 179.
11455 180.
11500 181.
11505 182.
11510 183.
11515 184.
11520 185.
11525 186.
11530 187.
11535 188.
11540 189.
11545 190.
11550 191.
11555 192.
11600 193.
11605 194.
11610 195.
11615 196.
11620 197.
11625 198.
11630 199.
11635 200.
11640 201.
11645 202.
11650 203.
11655 204.
11700 205.
11705 206.
11710 207.
11715 208.
11720 209.
11725 210.
11730 211.
11735 212.
11740 213.
11745 214.
11750 215.
11755 216.
11800 217.
11805 218.
11810 219.
11815 220.
11820 221.
11825 222.
11830 223.
11835 224.
11840 225.


11845 226.
11850 227.
11855 228.
11900 229.
11905 230.
11910 231.
11915 232.
11920 233.
11925 234.
11930 235.
11935 236.
11940 237.
11945 238.
11950 239.
11955 240.
12000 241.
12005 242.
12010 243.
12015 244.
12020 245.
12025 246.
12030 247.
12035 248.
12040 249.
12045 250.
12050 251.
12055 252.
12100 253.
12105 254.
12110 255.
12115 256.
12120 257.
12125 258.
12130 259.
12135 260.
12140 261.
12145 262.
12150 263.
12155 264.
12200 265.
12205 266.
12210 267.
12215 268.
12220 269.
12225 270.
12230 271.
12235 272.
12240 273.
12245 274.
12250 275.
12255 276.

```
  12300 277.   O
  12305 278.   O
  12310 279.   O
  12315 280.   O
  12320 281. . O . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
  12325 282.   O
  12330 283.   O
  12335 284.   O
  12340 285.   O
  12345 286.   O
  12350 287.   O
  12355 288.   O
  20000 289.  O
  20005 290.  O
  20010 291. O . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
  20015 292.O
  20020 2930
  20025 2940
  20030 2950
  20035 2960
  20040 2970
  20045 2980
  20050 2990
  20055
3000---------.---------.---------.---------.---------.---------.---------.---------.---------.---------.---------.---------
---.
1

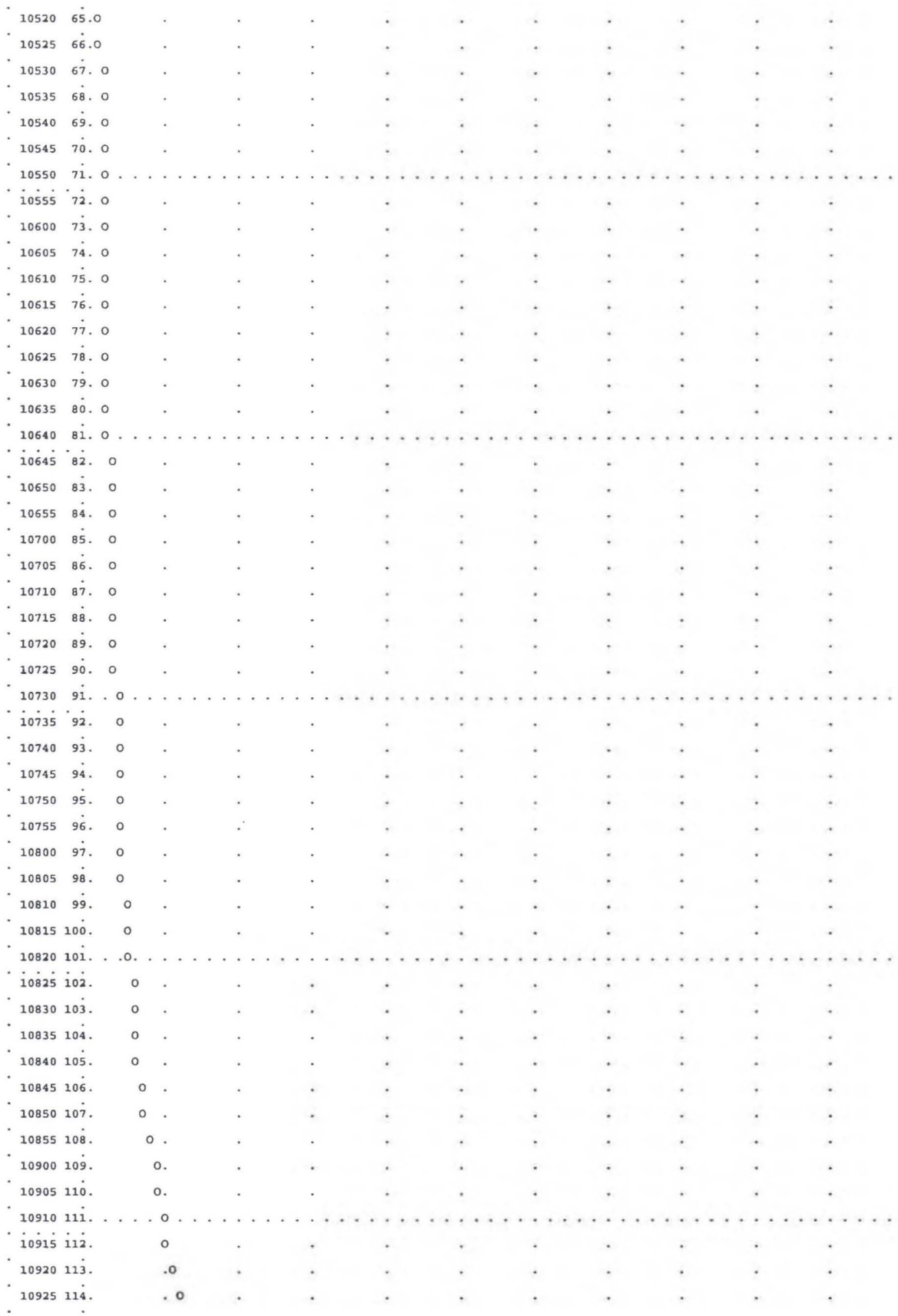

 *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***
*** *** ***

              **************
              *            *
  1216 KK     *   POINTH   *       FLOW @ ROBT J MATTHEWS PKY - POINT H
              *            *
              **************

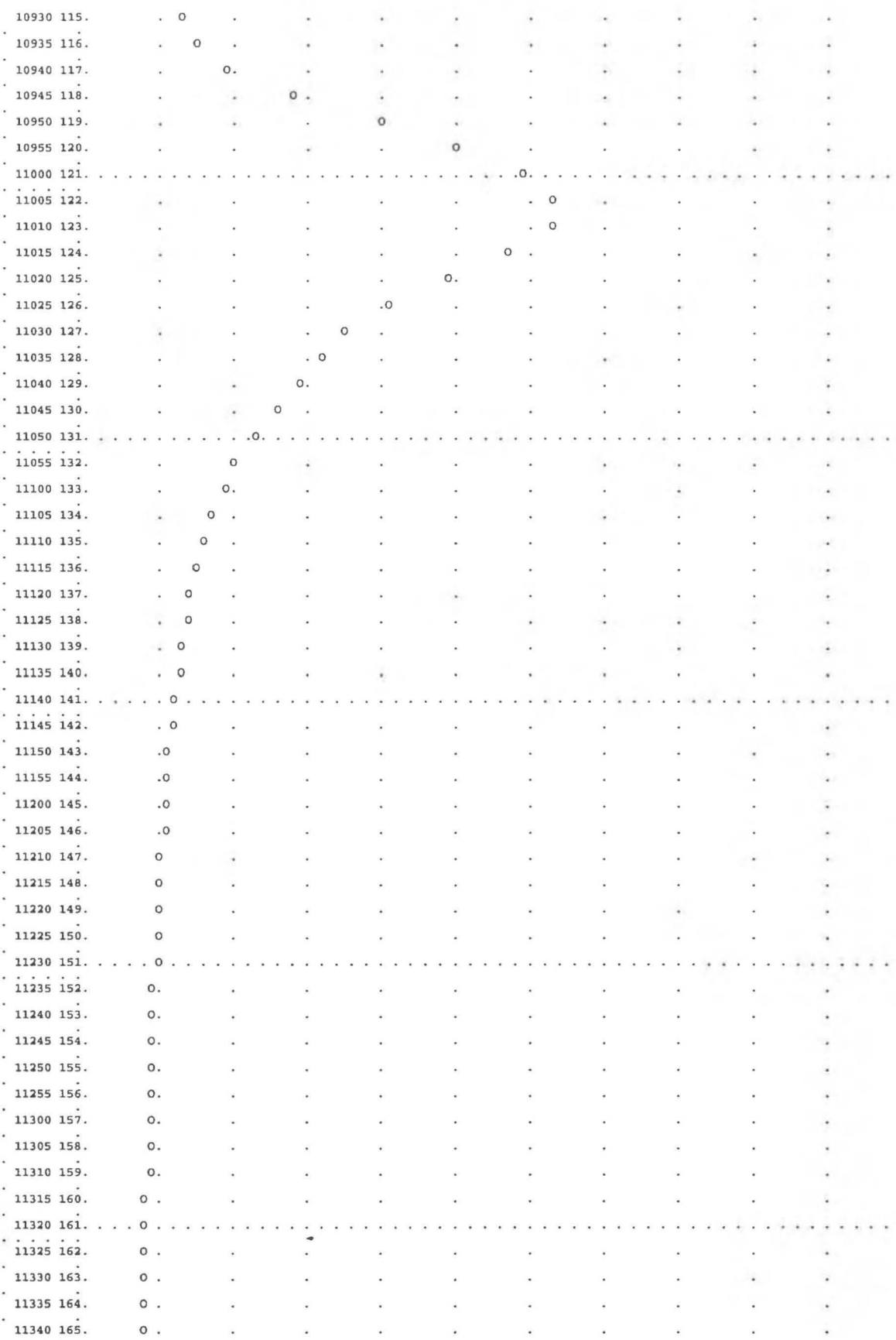
  1217 KO          OUTPUT CONTROL VARIABLES
                        IPRNT            5  PRINT CONTROL
                        IPLOT            2  PLOT CONTROL
                        QSCAL           0.  HYDROGRAPH PLOT SCALE
1                                                              STATION    POINTH

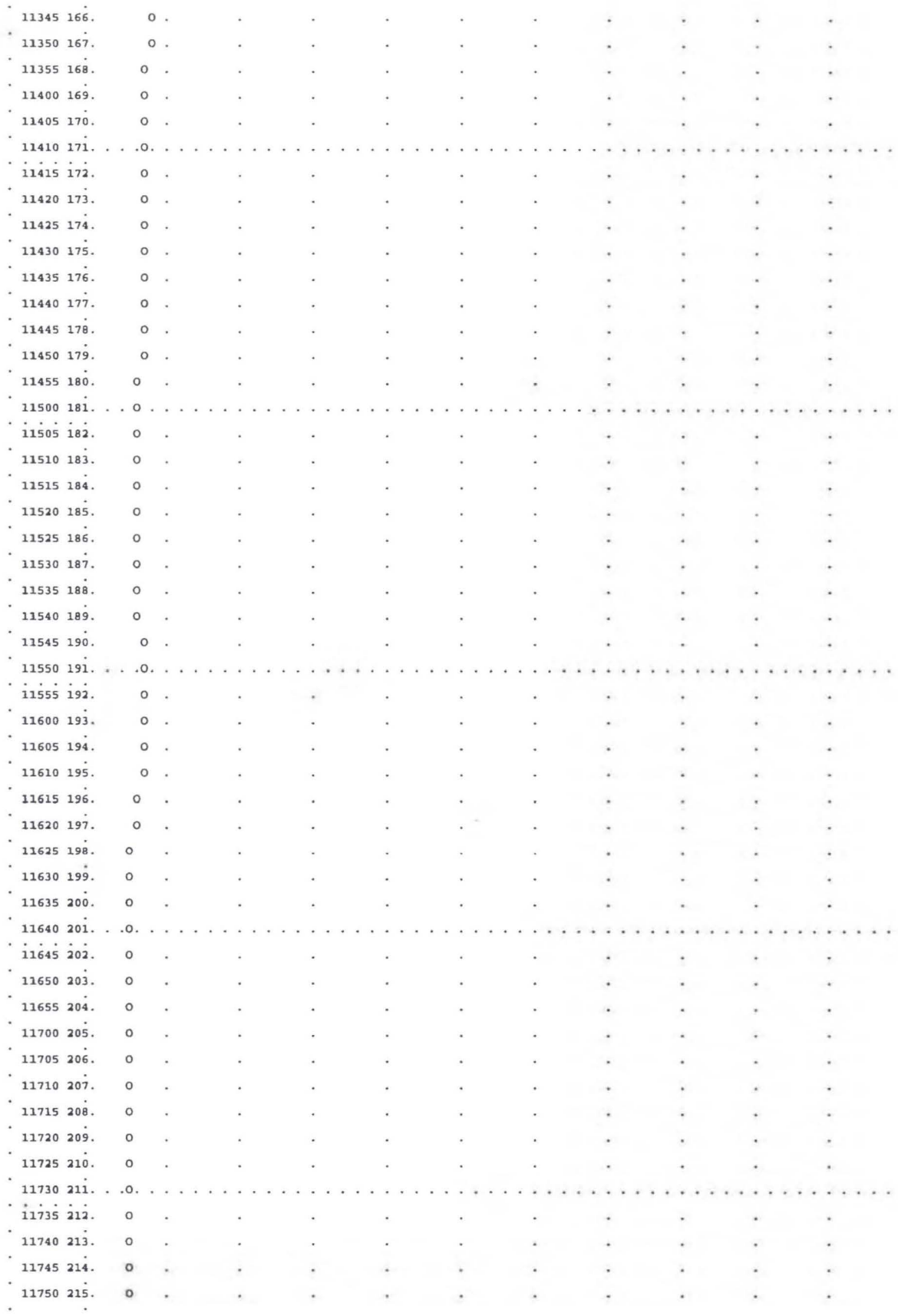
                         (O) OUTFLOW
          0.        10.       20.       30.       40.       50.       60.       70.        0.        0.        0.
0.        0.
 DAHRMN PER
  10000
10---------.---------.---------.---------.---------.---------.---------.---------.---------.---------.---------.--------
-.
  10005   20
  10010   30
  10015   40
  10020   50
  10025   60
  10030   70
  10035   80
  10040   90
  10045  100
  10050  110 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
  10055  120
  10100  130
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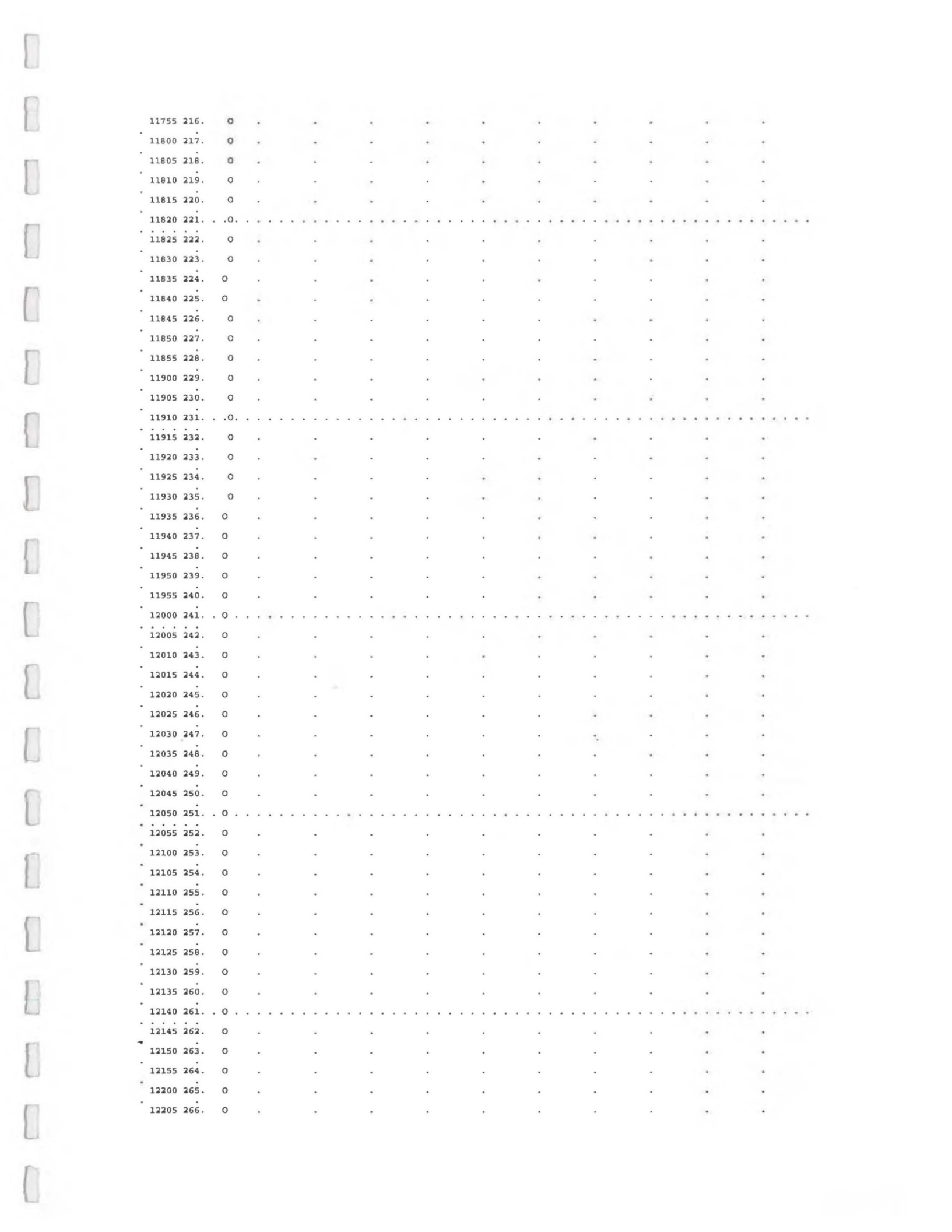
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10230 310
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POINT H


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              *            *
 1227 KK      *   XP/PTD   *       WEST VALLEY SHED XP - FLOW @ LATROBE RD @ POINT D
              *            *
              **************

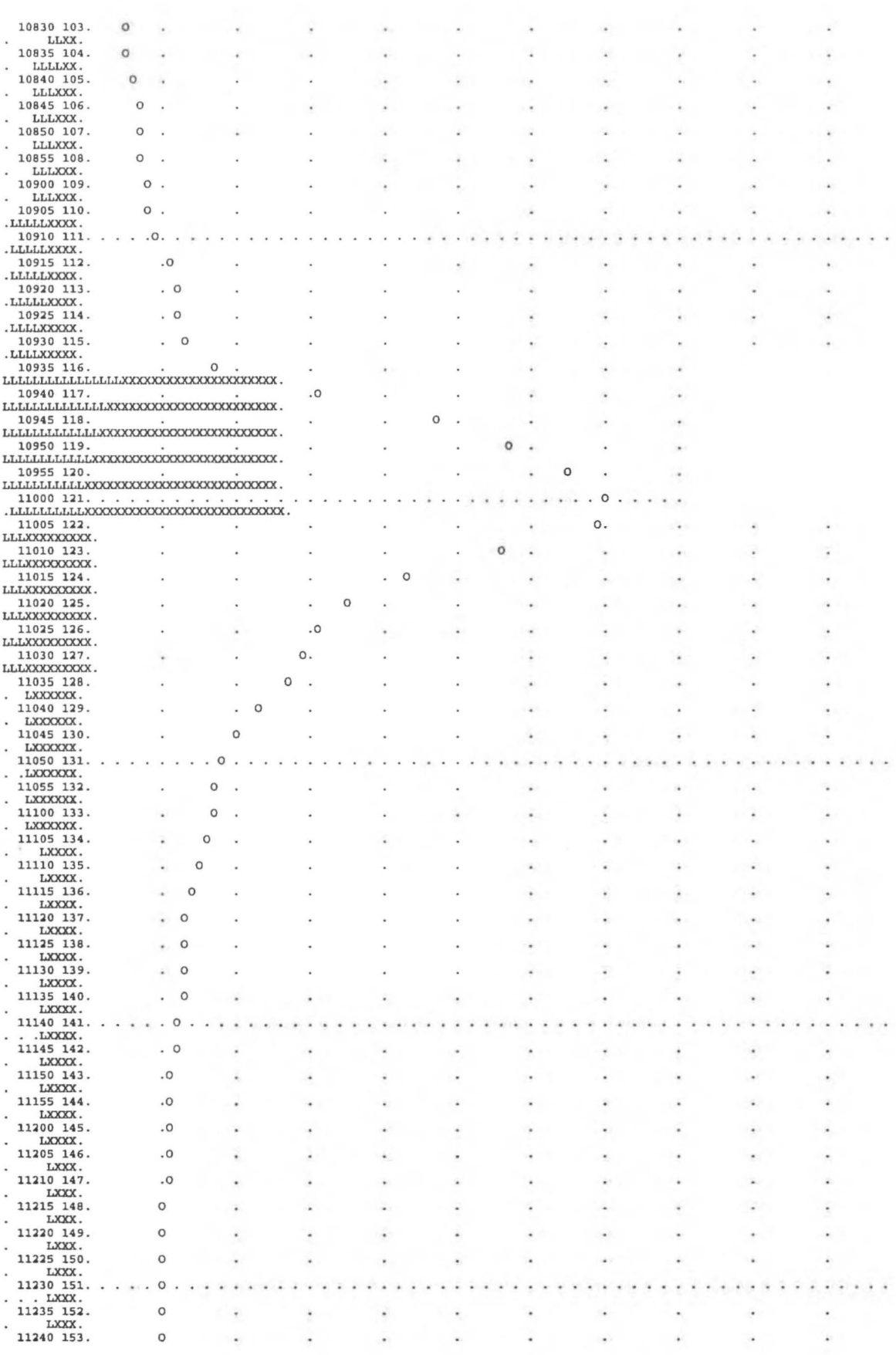
 1228 KO           OUTPUT CONTROL VARIABLES
                        IPRNT          5  PRINT CONTROL
                        IPLOT          2  PLOT CONTROL
                        QSCAL         0.  HYDROGRAPH PLOT SCALE
1                                                    STATION   XP/PTD

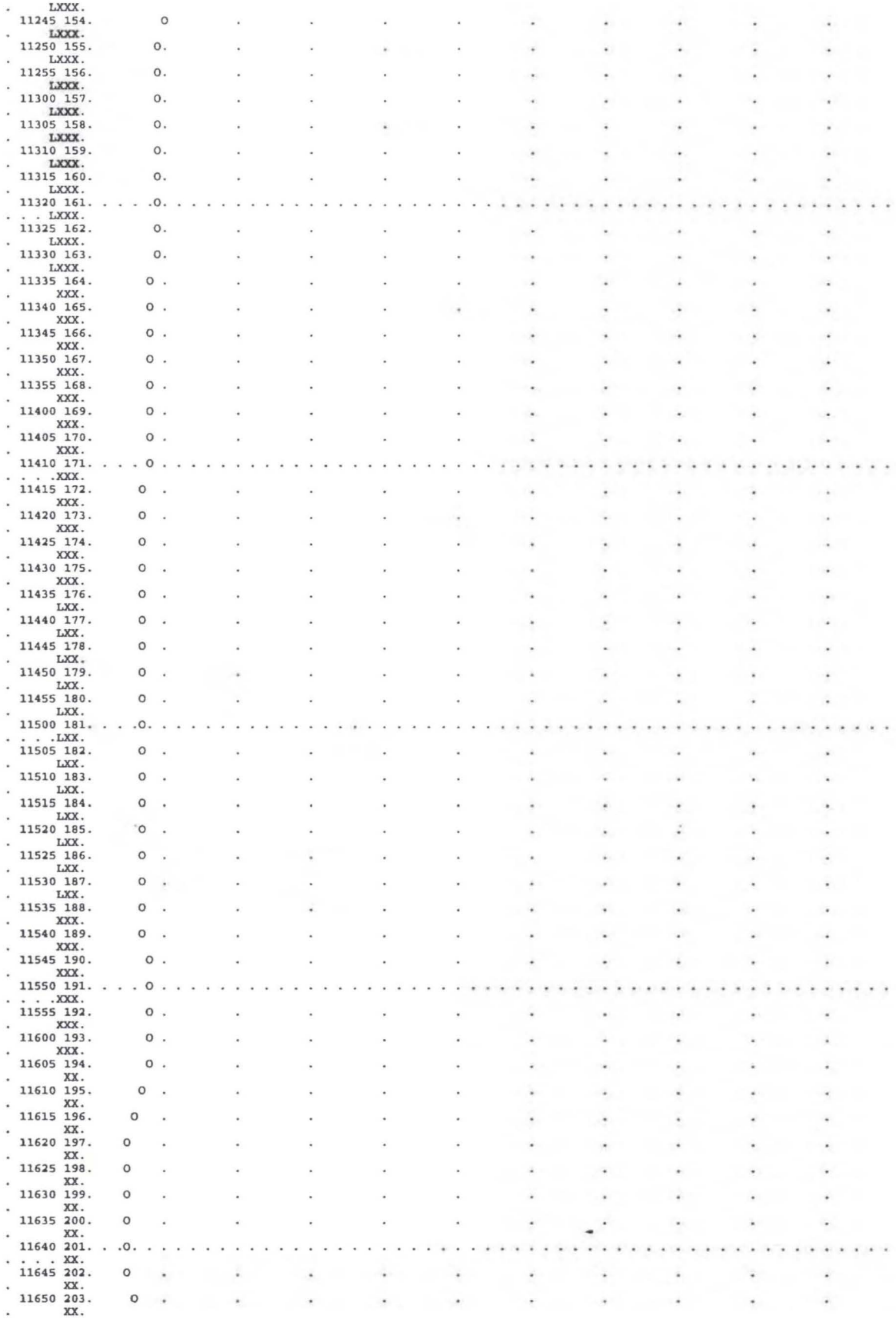
                        (O) OUTFLOW
         0.        2.        4.        6.        8.       10.       12.       14.        0.        0.        0.
0.       0.
                                                                                                  (L) PRECIP,
(X) EXCESS
        .00       .00       .00       .00       .00       .00       .00       .00       .20       .15       .10
.05      .00
 DAHRMN PER
  10000
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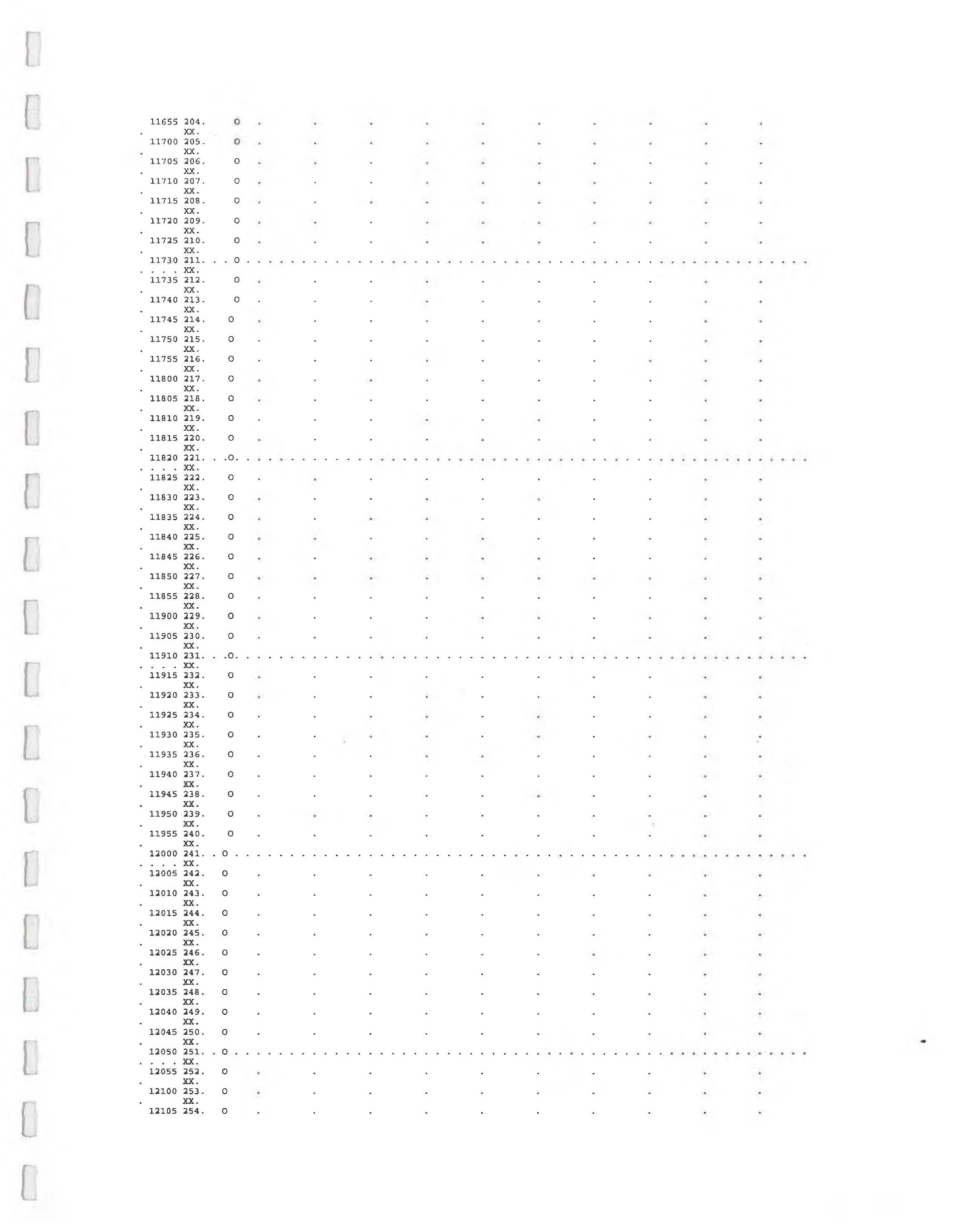
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 10010   30       .         .         .         .         .         .         .         .         .         .
.        L.
 10015   40       .         .         .         .         .         .         .         .         .         .
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 10020   50       .         .         .         .         .         .         .         .         .         .
.        L.
 10025   60       .         .         .         .         .         .         .         .         .         .
.        L.
 10030   70       .         .         .         .         .         .         .         .         .         .
.        L.
 10035   80       .         .         .         .         .         .         .         .         .         .
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 10040   90       .         .         .         .         .         .         .         .         .         .
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 10045  100       .         .         .         .         .         .         .         .         .         .
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 10050  110 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
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 10100  130       .         .         .         .         .         .         .         .         .         .
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.       LL.
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.       LL.
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.       LL.
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.       LL.
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10425  54O
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10450  59O
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10515  64O
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10525  66O
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10530  67O
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10545  70.O
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10550  71.O. . . . . .
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10600  73.O
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10610  75.O
       LL.
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10625  78.O
       LL.
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       LL.
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      LLX.
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10655  84. O
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10705  86. O
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10710  87. O
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10715  88. O
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10725  90. O
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10730  91. O . . . . . .
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     LLLX.
10740  93.  O
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10745  94.  O
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10750  95.  O
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10800  97.  O
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     LLXX.
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10825 102.    O
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POINT D


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  12235 272.   O    .        .        .        .        .        .        .        .        .        .
.          LX.
  12240 273.   O    .        .        .        .        .        .        .        .        .        .
.          LX.
  12245 274.   O    .        .        .        .        .        .        .        .        .        .
.          LX.
  12250 275.   O    .        .        .        .        .        .        .        .        .        .
.          LX.
  12255 276.   O    .        .        .        .        .        .        .        .        .        .
.          LX.
  12300 277.   O    .        .        .        .        .        .        .        .        .        .
.          LX.
  12305 278.   O    .        .        .        .        .        .        .        .        .        .
.          LX.
  12310 279.   O    .        .        .        .        .        .        .        .        .        .
.          LX.
  12315 280.   O    .        .        .        .        .        .        .        .        .        .
.          LX.
  12320 281. . O . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
. . . . LX.
  12325 282.   O    .        .        .        .        .        .        .        .        .        .
.          LX.
  12330 283.   O    .        .        .        .        .        .        .        .        .        .
.          LX.
  12335 284.   O    .        .        .        .        .        .        .        .        .        .
.           X.
  12340 285.   O    .        .        .        .        .        .        .        .        .        .
.           X.
  12345 286.   O    .        .        .        .        .        .        .        .        .        .
.           X.
  12350 287.   O    .        .        .        .        .        .        .        .        .        .
.           X.
  12355 288.   O    .        .        .        .        .        .        .        .        .        .
.           X.
  20000 289.   O    .        .        .        .        .        .        .        .        .        .
.           X.
  20005 290.  O     .        .        .        .        .        .        .        .        .        .
.           .
  20010 291. O . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
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  20015 292.O       .        .        .        .        .        .        .        .        .        .
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  20020 293.O       .        .        .        .        .        .        .        .        .        .
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  20025 2940        .        .        .        .        .        .        .        .        .        .
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  20030 2950        .        .        .        .        .        .        .        .        .        .
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  20035 2960        .        .        .        .        .        .        .        .        .        .
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  20040 2970        .        .        .        .        .        .        .        .        .        .
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  20045 2980        .        .        .        .        .        .        .        .        .        .
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  20050 2990        .        .        .        .        .        .        .        .        .        .
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  20055
3000---------.---------.---------.---------.---------.---------.---------.---------.---------.---------.---------.------
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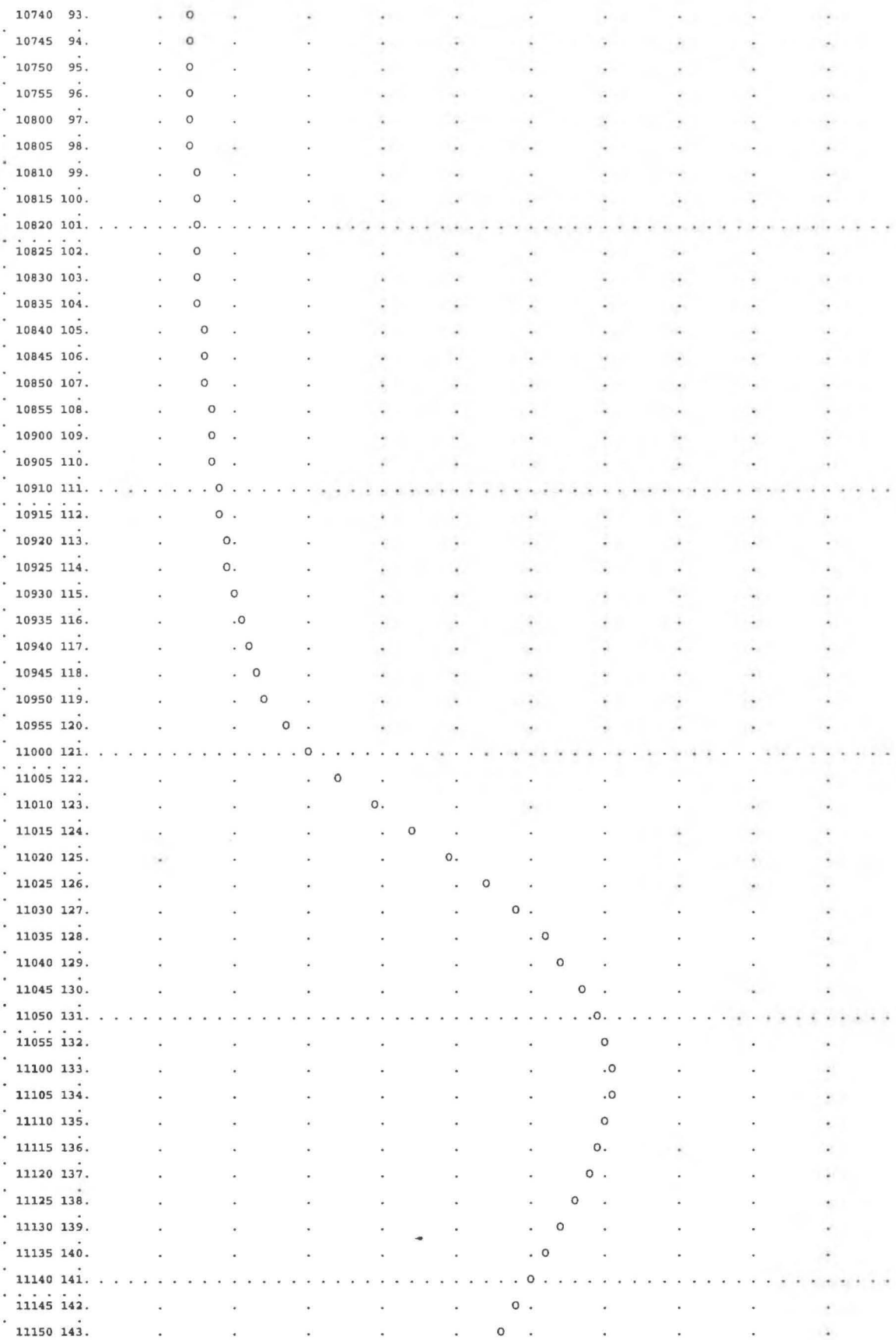

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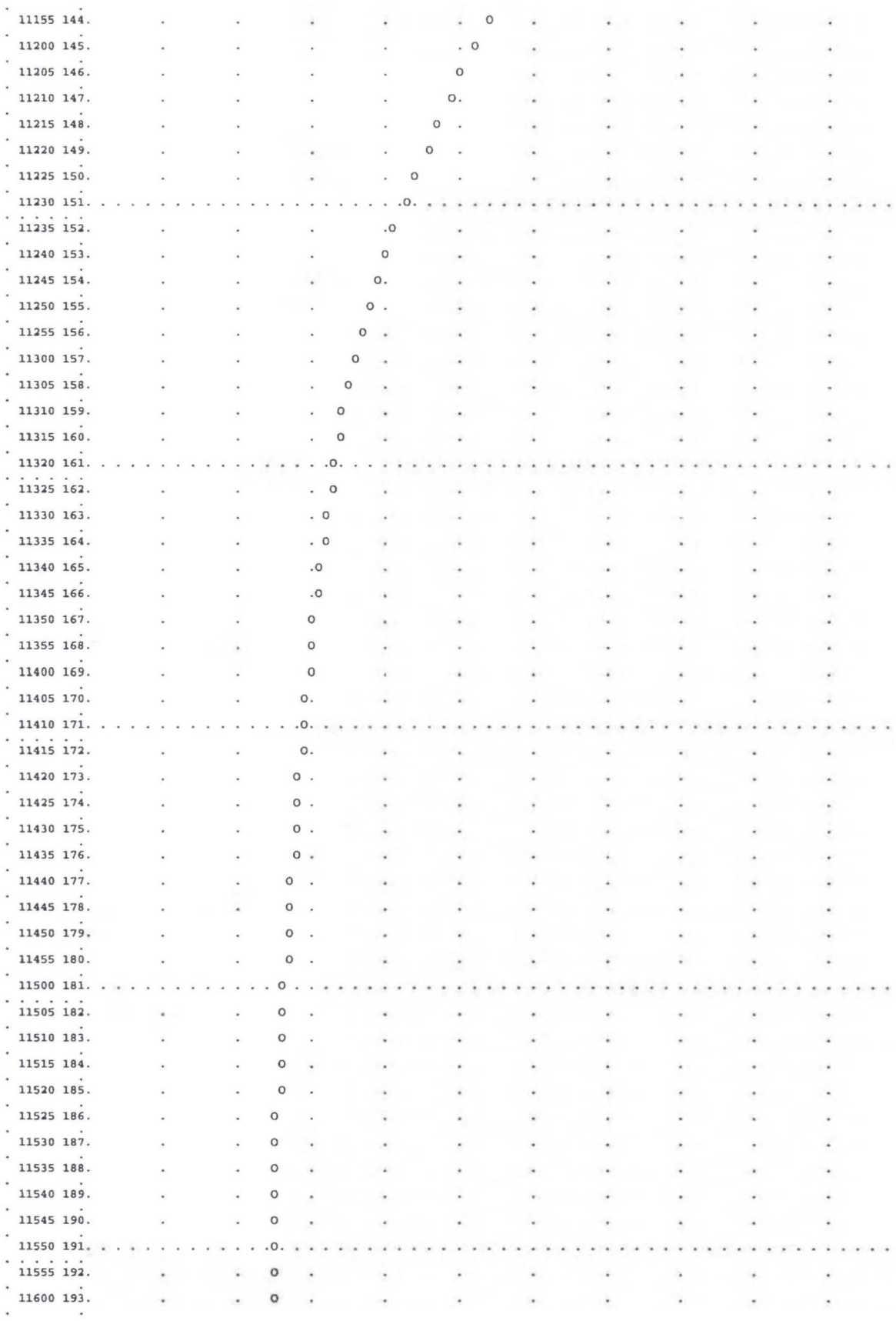
```
            **************
            *            *
 1325 KK    *      PT10  *      FLOW IN CARSON CREEK @ LIMIT OF STUDY - POINT 10
            *            *
            **************

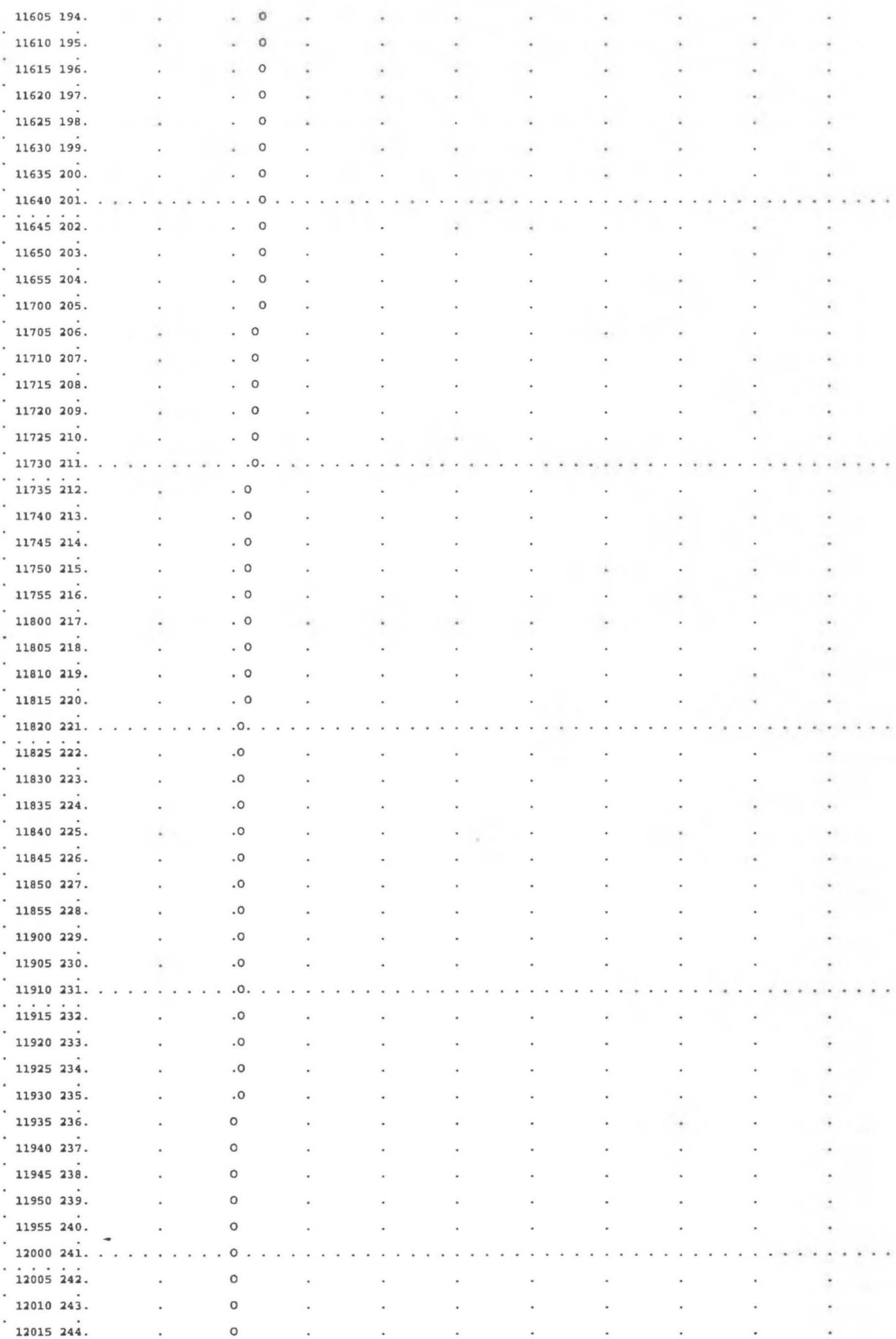
 1326 KO          OUTPUT CONTROL VARIABLES
                       IPRNT          5  PRINT CONTROL
                       IPLOT          2  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE
1                                                  STATION     PT10

                        (O) OUTFLOW
          0.     1000.     2000.     3000.     4000.     5000.     6000.     7000.     8000.        0.        0.
0.        0.
 DAHRMN PER
  10000
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  10005   20         .         .         .         .         .         .         .         .         .         .
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  10010   30         .         .         .         .         .         .         .         .         .         .
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  10015   40         .         .         .         .         .         .         .         .         .         .
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  10020   50         .         .         .         .         .         .         .         .         .         .
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  10025   60         .         .         .         .         .         .         .         .         .         .
.   .
  10030   70         .         .         .         .         .         .         .         .         .         .
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  10035   8.O        .         .         .         .         .         .         .         .         .         .
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  10040   9. O       .         .         .         .         .         .         .         .         .         .
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  10045   10.  O     .         .         .         .         .         .         .         .         .         .
.   .
  10050   11. .O. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
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  10055   12.   O    .         .         .         .         .         .         .         .         .         .
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  10100   13.    O   .         .         .         .         .         .         .         .         .         .
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  10105   14.     O  .         .         .         .         .         .         .         .         .         .
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  10110   15.      O .         .         .         .         .         .         .         .         .         .
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  10115   16.       O.         .         .         .         .         .         .         .         .         .
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  10120   17.       O.         .         .         .         .         .         .         .         .         .
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  10125   18.        O.        .         .         .         .         .         .         .         .         .
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  10130   19.        O.        .         .         .         .         .         .         .         .         .
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  10135   20.        O.        .         .         .         .         .         .         .         .         .
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  10140   21. . . . . O . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
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  10150   23.         O        .         .         .         .         .         .         .         .         .
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  10155   24.         O        .         .         .         .         .         .         .         .         .
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  10200   25.         O        .         .         .         .         .         .         .         .         .
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  10205   26.         O        .         .         .         .         .         .         .         .         .
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  10215   28.         .O       .         .         .         .         .         .         .         .         .
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  10220   29.         .O       .         .         .         .         .         .         .         .         .
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  10230   31. . . . . .O. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
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  10235   32.         .O       .         .         .         .         .         .         .         .         .
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  10240   33.         .O       .         .         .         .         .         .         .         .         .
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  10245   34.         .O       .         .         .         .         .         .         .         .         .
.   .
  10250   35.         .O       .         .         .         .         .         .         .         .         .
.   .
  10255   36.         .O       .         .         .         .         .         .         .         .         .
.   .
  10300   37.         .O       .         .         .         .         .         .         .         .         .
.   .
  10305   38.         .O       .         .         .         .         .         .         .         .         .
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.   .
  10315   40.         .O       .         .         .         .         .         .         .         .         .
.   .
  10320   41. . . . . .O. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
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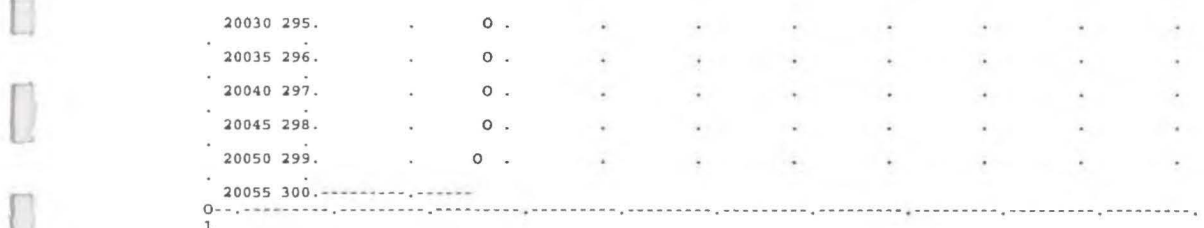
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10405  50.        .O
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10430  55.        .O
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10445  58.        .O
10450  59.        .O
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10525  66.        . O
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10545  70.        . O
10550  71. . . . . O . . . . . .
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10600  73.        . O
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10620  77.        . O
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10635  80.        . O
10640  81. . . . . O . . . . . .
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10650  83.        .  O
10655  84.        .  O
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10705  86.        .  O
10710  87.        .  O
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10720  89.        .  O
10725  90.        .  O
10730  91. . . . . .O. . . . . .
10735  92.        .  O
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10745 94.
10750 95.
10755 96.
10800 97.
10805 98.
10810 99.
10815 100.
10820 101.
10825 102.
10830 103.
10835 104.
10840 105.
10845 106.
10850 107.
10855 108.
10900 109.
10905 110.
10910 111.
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10920 113.
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10930 115.
10935 116.
10940 117.
10945 118.
10950 119.
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11000 121.
11005 122.
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11140 141.
11145 142.
11150 143.


11155 144
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12005 242
12010 243
12015 244

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12035 248.        o
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12045 250.        o
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12255 276.        o.
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20000 289.        o .
20005 290.        o .
20010 291. . . . . o . . . . . .
20015 292.        o .
20020 293.        o .
20025 294.        o .
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RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

TIME OF STAGE	OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	MAX
+	HYDROGRAPH AT	CA1	170.	10.17	46.	18.	17.	.20		
+	ROUTED TO	PCA1	92.	10.58	44.	17.	17.	.20		
+ 10.58									103.33	
+	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		
+ 11.08									103.29	
+	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		
+ 10.17									69.27	
+	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		
+ 10.33									102.01	

+	ROUTED TO	CC-4A	39.	10.50	15.	5.	5.	.07	
+	HYDROGRAPH AT	CD2	118.	10.08	30.	12.	11.	.13	
+	2 COMBINED AT	CD1+2	128.	10.17	43.	17.	17.	.20	
+	ROUTED TO	PCD2	124.	10.25	43.	17.	16.	.20	
+									101.22
10.25									
+	ROUTED TO	CC-4B	123.	10.33	43.	17.	16.	.20	
+	HYDROGRAPH AT	CD3	122.	10.00	29.	11.	11.	.13	
+	2 COMBINED AT	CD1-3	225.	10.08	72.	29.	27.	.32	
+	ROUTED TO	PCD3	218.	10.17	72.	28.	27.	.32	
+									101.80
10.17									
+	ROUTED TO	CC-4C	219.	10.25	72.	28.	27.	.32	
+	HYDROGRAPH AT	CD4	73.	10.08	18.	7.	7.	.08	
+	2 COMBINED AT	CD1-4	276.	10.17	90.	35.	34.	.40	
+	ROUTED TO	PCD4	251.	10.33	90.	35.	34.	.40	
+									953.15
10.33									
+	3 COMBINED AT	CA-CD	1089.	10.33	410.	162.	156.	1.83	
+	ROUTED TO	CC-5	1079.	10.42	410.	162.	156.	1.83	
+	HYDROGRAPH AT	CE	62.	10.08	15.	6.	6.	.06	
+	HYDROGRAPH AT	CW	53.	10.00	12.	5.	4.	.05	
+	3 COMBINED AT	+CE,CW	1130.	10.33	437.	172.	166.	1.95	
+	ROUTED TO	CC-6	1128.	10.42	436.	172.	166.	1.95	
+	HYDROGRAPH AT	CN1	520.	10.50	196.	77.	74.	.92	
+	HYDROGRAPH AT	CN2	80.	10.17	22.	9.	8.	.10	
+	2 COMBINED AT	CN1+2	569.	10.50	218.	85.	82.	1.02	
+	HYDROGRAPH AT	CX	22.	10.00	5.	2.	2.	.02	
+	3 COMBINED AT	+CN,CX	1704.	10.42	659.	259.	250.	2.99	
+	ROUTED TO	CC-7	1698.	10.42	659.	259.	249.	2.99	
+	HYDROGRAPH AT	CF	68.	10.08	17.	7.	6.	.07	
+	HYDROGRAPH AT	CO	153.	10.25	47.	18.	17.	.20	
+	ROUTED TO	PCO	103.	10.67	47.	18.	17.	.20	
+									110.79
10.67									
+	3 COMBINED AT	+CF,CO	1832.	10.42	722.	284.	273.	3.25	
+	ROUTED TO	CC-8	1834.	10.50	722.	283.	273.	3.25	
+	HYDROGRAPH AT	CG	34.	10.08	9.	3.	3.	.04	
+	2 COMBINED AT	+CG	1851.	10.50	730.	286.	276.	3.29	

+	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	
+									773.39
10.25									
+	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	
+									764.52
10.33									
+	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	
+									735.40
10.33									
+	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	
+									728.40
10.33									
+	ROUTED TO	TR1-7	548.	10.33	184.	71.	68.	.78	
+	HYDROGRAPH AT	CH10	17.	10.00	4.	1.	1.	.02	

	2 COMBINED AT							
+		CH1-10	554.	10.33	188.	72.	70.	.80	
	ROUTED TO							
+		WMP6	556.	10.42	188.	72.	70.	.80	
+									722.41
10.42									
	ROUTED TO							
+		TR1-8	556.	10.42	188.	72.	70.	.80	
	HYDROGRAPH AT							
+		CH11	8.	10.00	2.	1.	1.	.01	
	2 COMBINED AT							
+		CH1-11	559.	10.42	189.	73.	70.	.81	
	ROUTED TO							
+		WMP7	559.	10.42	189.	73.	70.	.81	
+									716.42
10.42									
	ROUTED TO							
+		TR1-9	559.	10.42	189.	73.	70.	.81	
	HYDROGRAPH AT							
+		CH12	5.	10.00	1.	0.	0.	.01	
	2 COMBINED AT							
+		CH1-12	560.	10.42	191.	73.	71.	.81	
	HYDROGRAPH AT							
+		CI1	96.	10.08	24.	9.	9.	.10	
	ROUTED TO							
+		TR1-9A	94.	10.08	24.	9.	9.	.10	
	HYDROGRAPH AT							
+		CI2	32.	10.00	7.	3.	3.	.03	
	ROUTED TO							
+		TR1-9B	31.	10.08	7.	3.	3.	.03	
	HYDROGRAPH AT							
+		CI3	55.	10.17	15.	6.	6.	.07	
	3 COMBINED AT							
+		CI1-3	180.	10.08	46.	18.	17.	.20	
	2 COMBINED AT							
+		CI+CH	665.	10.33	236.	91.	88.	1.01	
	ROUTED TO							
+		TR1-10	665.	10.42	236.	91.	88.	1.01	
	HYDROGRAPH AT							
+		CJ	58.	10.08	16.	6.	6.	.07	
	HYDROGRAPH AT							
+		CK	33.	10.00	8.	3.	3.	.03	
	3 COMBINED AT							
+		CH-CK	717.	10.42	259.	100.	96.	1.11	
	ROUTED TO							
+		TR1-11	716.	10.50	259.	100.	96.	1.11	
	HYDROGRAPH AT							
+		CP	63.	10.33	21.	8.	8.	.09	
	2 COMBINED AT							
+		TRIB1	778.	10.42	280.	108.	104.	1.21	
	2 COMBINED AT							
+		+TRIB1	2607.	10.58	1010.	394.	379.	4.50	
	HYDROGRAPH AT							
+		CS1	268.	10.75	119.	47.	45.	.58	
	HYDROGRAPH AT							
+		CS2	344.	10.33	115.	45.	43.	.54	
	ROUTED TO							
+		CC-9A	344.	10.50	115.	45.	43.	.54	
	HYDROGRAPH AT							
+		CS3	237.	10.42	87.	34.	33.	.43	
	2 COMBINED AT							
+		CS1+2	579.	10.50	201.	78.	76.	.97	
	2 COMBINED AT							
+		CS1-3	820.	10.50	320.	125.	120.	1.55	
	2 COMBINED AT							
+		+SOWL	3426.	10.58	1330.	518.	499.	6.05	
	ROUTED TO							
+		CC-10	3422.	10.58	1330.	518.	499.	6.05	
	HYDROGRAPH AT							

+		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	

+	ROUTED TO	TR2-4	1152.	10.17	1112.	1105.	1095.	1.42
+	HYDROGRAPH AT	CU	72.	10.33	23.	9.	9.	.09
+	HYDROGRAPH AT	CT2	197.	10.08	52.	20.	20.	.21
+	4 COMBINED AT	WWTP	4769.	10.58	2557.	1668.	1638.	7.95
+	HYDROGRAPH AT	A	113.	10.17	33.	13.	12.	.14
+	ROUTED TO	RTA	113.	10.33	33.	13.	12.	.14
+	HYDROGRAPH AT	XW	95.	10.08	25.	10.	9.	.11
+	2 COMBINED AT	'CV1'	196.	10.17	58.	23.	22.	.25
+	2 COMBINED AT	+'CV1'	4901.	10.58	2614.	1691.	1660.	8.19
+	ROUTED TO	ROUTE	4873.	10.67	2614.	1690.	1655.	8.19
+	HYDROGRAPH AT	XY	104.	10.08	27.	10.	10.	.13
+	2 COMBINED AT	POINT1	4917.	10.67	2640.	1701.	1665.	8.32
+	ROUTED TO	CC-13	4896.	10.67	2640.	1699.	1659.	8.32
+	HYDROGRAPH AT	CV3	60.	10.17	16.	6.	6.	.06
+	HYDROGRAPH AT	B	52.	10.17	14.	6.	5.	.06
+	ROUTED TO	ROUTE	51.	10.25	14.	6.	5.	.06
+	HYDROGRAPH AT	C	6.	10.00	1.	1.	1.	.00
+	HYDROGRAPH AT	XV	43.	10.08	11.	4.	4.	.05
+	HYDROGRAPH AT	D	3.	10.00	1.	0.	0.	.00
+	4 COMBINED AT	POINTA	95.	10.17	27.	11.	10.	.11
+	ROUTED TO	RT CV	95.	10.25	27.	11.	10.	.11
+	3 COMBINED AT	PT1a	4987.	10.67	2682.	1716.	1675.	8.49
+	HYDROGRAPH AT	CR1	253.	10.25	75.	29.	28.	.30
+	ROUTED TO	CR-1	253.	10.33	75.	29.	28.	.30
+	HYDROGRAPH AT	CR2	232.	10.08	62.	25.	24.	.20
+	2 COMBINED AT	CR1+2	466.	10.25	137.	55.	53.	.51
+	ROUTED TO	CR-2	468.	10.33	137.	54.	52.	.51
+	HYDROGRAPH AT	CR3'	141.	10.75	61.	24.	23.	.22
+	2 COMBINED AT	CR1-3'	577.	10.33	198.	78.	75.	.73
+	2 COMBINED AT	+CR'	5467.	10.67	2878.	1794.	1751.	9.22
+	ROUTED TO	CC-14	5407.	10.75	2877.	1793.	1744.	9.22
+	HYDROGRAPH AT	XB	38.	10.17	11.	4.	4.	.05
+	HYDROGRAPH AT	K	3.	10.00	1.	0.	0.	.00
	HYDROGRAPH AT							

+		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							

+		CW1-P	169.	10.17	47.	18.	18.	.19	
	ROUTED TO								
+		RANDO	124.	10.42	47.	18.	18.	.19	
+									644.54
10.42									
	HYDROGRAPH AT								
+		CW1-W	21.	10.00	5.	2.	2.	.02	
	HYDROGRAPH AT								
+		CW1-E	16.	10.00	3.	1.	1.	.02	
	3 COMBINED AT								
+		CW1	138.	10.42	56.	22.	21.	.22	
	ROUTED TO								
+		TR3-1	136.	10.67	56.	22.	21.	.22	
	HYDROGRAPH AT								
+		CW2-1	76.	10.08	20.	8.	7.	.08	
	ROUTED TO								
+		POND1	76.	10.08	20.	8.	7.	.08	
+									575.39
10.08									
	HYDROGRAPH AT								
+		CW2-2	65.	10.00	15.	6.	6.	.06	
	ROUTED TO								
+		POND2	55.	10.17	15.	6.	6.	.06	
+									567.60
10.17									
	HYDROGRAPH AT								
+		CW2-3	42.	10.08	11.	4.	4.	.04	
	3 COMBINED AT								
+		CW2	171.	10.08	46.	18.	17.	.18	
	2 COMBINED AT								
+		CW1+2	268.	10.17	101.	40.	38.	.40	
	HYDROGRAPH AT								
+		CW3	233.	10.58	94.	37.	35.	.41	
	2 COMBINED AT								
+		CW1-3	460.	10.50	195.	76.	74.	.81	
	ROUTED TO								
+		TR3-1A	460.	10.58	195.	76.	73.	.81	
	HYDROGRAPH AT								
+		CW4	75.	10.08	18.	7.	7.	.07	
	HYDROGRAPH AT								
+		CW5	102.	10.08	27.	11.	10.	.12	
	3 COMBINED AT								
+		CW1-5	569.	10.25	240.	94.	91.	1.00	
	ROUTED TO								
+		TR3-2	570.	10.50	240.	93.	90.	1.00	
	HYDROGRAPH AT								
+		CW6'	8.	10.58	3.	1.	1.	.01	
	2 COMBINED AT								
+		CW1-6'	577.	10.50	243.	94.	91.	1.01	
	HYDROGRAPH AT								
+		CW7	171.	10.50	65.	25.	24.	.31	
	ROUTED TO								
+		TR3-2A	170.	10.58	65.	25.	24.	.31	
	HYDROGRAPH AT								
+		CW8'	100.	10.33	32.	13.	12.	.14	
	2 COMBINED AT								
+		CW7+8	254.	10.50	97.	38.	36.	.45	
	2 COMBINED AT								
+		CW1-8	831.	10.50	340.	132.	127.	1.47	
	ROUTED TO								
+		TR3-3	830.	10.58	340.	132.	127.	1.47	
	HYDROGRAPH AT								
+		CW9'	58.	10.25	18.	7.	7.	.08	
	HYDROGRAPH AT								
+		CWP	171.	11.25	90.	35.	34.	.38	
	3 COMBINED AT								
+		TRIB3	1003.	10.67	448.	174.	168.	1.93	
	2 COMBINED AT								
+		POINT4	6910.	10.75	3550.	2057.	1993.	12.04	

+	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							

+		Q	13.	10.00	3.	1.	1.	.01
+	HYDROGRAPH AT	Y	1.	10.00	0.	0.	0.	.00
+	HYDROGRAPH AT	Z	51.	10.00	12.	5.	4.	.05
+	HYDROGRAPH AT	XR	14.	10.08	3.	1.	1.	.01
+	5 COMBINED AT	POINT5	666.	10.17	196.	78.	76.	.83
+	ROUTED TO	RTE	660.	10.17	196.	78.	76.	.83
+	HYDROGRAPH AT	S	6.	10.00	1.	1.	1.	.00
+	HYDROGRAPH AT	XS	12.	10.00	3.	1.	1.	.01
+	2 COMBINED AT	POINTB	17.	10.00	4.	2.	2.	.01
+	ROUTED TO	RTE	17.	10.08	4.	2.	2.	.01
+	HYDROGRAPH AT	CY3-2C	40.	10.08	11.	4.	4.	.04
+	3 COMBINED AT	POINTG	715.	10.17	210.	84.	81.	.88
+	ROUTED TO	RTE	706.	10.25	210.	84.	81.	.88
+	HYDROGRAPH AT	CY3-2B	25.	10.08	7.	3.	3.	.02
+	2 COMBINED AT	SUM	730.	10.25	217.	87.	84.	.91
+	HYDROGRAPH AT	AA	9.	10.08	2.	1.	1.	.01
+	ROUTED TO	RTE	9.	10.08	2.	1.	1.	.01
+	HYDROGRAPH AT	XQ	22.	10.08	6.	2.	2.	.03
+	2 COMBINED AT	POINTC	31.	10.08	8.	3.	3.	.03
+	ROUTED TO	RTE	30.	10.08	8.	3.	3.	.03
+	HYDROGRAPH AT	CY3-2A	33.	10.08	9.	4.	3.	.03
+	2 COMBINED AT	POINTH	63.	10.08	17.	7.	6.	.06
+	HYDROGRAPH AT	CY3-2	119.	10.08	32.	13.	12.	.11
+	3 COMBINED AT	POINTJ	896.	10.17	265.	106.	102.	1.08
+	ROUTED TO	RTE	898.	10.25	265.	106.	102.	1.08
+	HYDROGRAPH AT	XP/PTD	14.	10.00	3.	1.	1.	.01
+	ROUTED TO	RTE	14.	10.17	3.	1.	1.	.01
+	HYDROGRAPH AT	CY3-1	76.	10.17	21.	8.	8.	.07
+	2 COMBINED AT	POINTK	90.	10.17	24.	10.	9.	.09
+	ROUTED TO	RTE	88.	10.17	24.	10.	9.	.09
+	HYDROGRAPH AT	CY3-3	60.	10.17	16.	6.	6.	.06
+	3 COMBINED AT	SUM	1041.	10.25	305.	122.	118.	1.23
+	ROUTED TO	RTE	1031.	10.33	305.	122.	118.	1.23
+	HYDROGRAPH AT	CY3-4	52.	10.25	15.	6.	6.	.05

+	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

1

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

ISTAQ	ELEMENT	DT	PEAK	TIME TO PEAK	VOLUME	INTERPOLATED TO COMPUTATION INTERVAL DT	PEAK	TIME TO PEAK	VOLUME
		(MIN)	(CFS)	(MIN)	(IN)	(MIN)	(CFS)	(MIN)	(IN)
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

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1847E+02 EXCESS= .0000E+00 OUTFLOW= .1841E+02 BASIN STORAGE= .9353E-01 PERCENT ERROR= -.2

CC-4	MANE	3.28	588.42	619.02	3.34	5.00	586.70	620.00	3.34

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1778E+03 EXCESS= .0000E+00 OUTFLOW= .1775E+03 BASIN STORAGE= .3605E+00 PERCENT ERROR= -.1

CC-4A	MANE	5.00	38.60	630.00	2.96	5.00	38.60	630.00	2.96

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1097E+02 EXCESS= .0000E+00 OUTFLOW= .1090E+02 BASIN STORAGE= .9608E-01 PERCENT ERROR= -.2

CC-4B	MANE	3.83	123.06	616.04	3.23	5.00	122.70	620.00	3.24

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3388E+02 EXCESS= .0000E+00 OUTFLOW= .3383E+02 BASIN STORAGE= .7798E-01 PERCENT ERROR= -.1

CC-4C	MANE	5.00	219.06	615.00	3.29	5.00	219.06	615.00	3.29

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5645E+02 EXCESS= .0000E+00 OUTFLOW= .5634E+02 BASIN STORAGE= .1714E+00 PERCENT ERROR= -.1

CC-5	MANE	2.23	1086.72	623.81	3.28	5.00	1079.45	625.00	3.28

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3211E+03 EXCESS= .0000E+00 OUTFLOW= .3208E+03 BASIN STORAGE= .4523E+00 PERCENT ERROR= .0

CC-6	MANE	1.74	1131.02	622.59	3.28	5.00	1128.24	625.00	3.28

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3415E+03 EXCESS= .0000E+00 OUTFLOW= .3413E+03 BASIN STORAGE= .3602E+00 PERCENT ERROR= .0

CC-7	MANE	1.37	1701.39	626.71	3.22	5.00	1697.71	625.00	3.22

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5140E+03 EXCESS= .0000E+00 OUTFLOW= .5137E+03 BASIN STORAGE= .4054E+00 PERCENT ERROR= .0

CC-8	MANE	5.00	1834.21	630.00	3.23	5.00	1834.21	630.00	3.23

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5629E+03 EXCESS= .0000E+00 OUTFLOW= .5616E+03 BASIN STORAGE= .2056E+01 PERCENT ERROR= -.1

CC-9	MANE	5.00	1851.03	635.00	3.23	5.00	1851.03	635.00	3.23

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5682E+03 EXCESS= .0000E+00 OUTFLOW= .5666E+03 BASIN STORAGE= .2513E+01 PERCENT ERROR= -.2

TR1-10	MANE	3.32	665.15	625.02	3.35	5.00	665.13	625.00	3.35

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1806E+03 EXCESS= .0000E+00 OUTFLOW= .1803E+03 BASIN STORAGE= .3659E+00 PERCENT ERROR= -.1

TR1-11	MANE	5.00	715.93	630.00	3.33	5.00	715.93	630.00	3.33

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1984E+03 EXCESS= .0000E+00 OUTFLOW= .1979E+03 BASIN STORAGE= .6624E+00 PERCENT ERROR= -.1

CC-9A	MANE	5.00	344.10	630.00	3.06	5.00	344.10	630.00	3.06

CONTINUITY SUMMARY (AC-FT) - INFLOW= .8877E+02 EXCESS= .0000E+00 OUTFLOW= .8843E+02 BASIN STORAGE= .6091E+00 PERCENT ERROR= -.3

CC-10	MANE	1.31	3422.48	635.97	3.18	5.00	3421.59	635.00	3.19

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1028E+04 EXCESS= .0000E+00 OUTFLOW= .1027E+04 BASIN STORAGE= .8390E+00 PERCENT ERROR= .0

CC-11	MANE	3.29	3494.26	635.78	3.18	5.00	3486.76	635.00	3.19

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1061E+04 EXCESS= .0000E+00 OUTFLOW= .1059E+04 BASIN STORAGE= .2578E+01 PERCENT ERROR= .0

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

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1514E+03 EXCESS= .0000E+00 OUTFLOW= .1512E+03 BASIN STORAGE= .3946E+00 PERCENT ERROR= -.1

TR3-2	MANE	5.00	569.92	630.00	3.46	5.00	569.92	630.00	3.46

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1865E+03 EXCESS= .0000E+00 OUTFLOW= .1852E+03 BASIN STORAGE= .2039E+01 PERCENT ERROR= -.3

TR3-2A	MANE	5.00	170.09	635.00	3.00	5.00	170.09	635.00	3.00

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5006E+02 EXCESS= .0000E+00 OUTFLOW= .4985E+02 BASIN STORAGE= .3233E+00 PERCENT ERROR= -.2

TR3-3	MANE	5.00	830.23	635.00	3.34	5.00	830.23	635.00	3.34

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2623E+03 EXCESS= .0000E+00 OUTFLOW= .2613E+03 BASIN STORAGE= .1544E+01 PERCENT ERROR= -.2

RTE	MANE	5.00	48.94	615.00	3.17	5.00	48.94	615.00	3.17

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1084E+02 EXCESS= .0000E+00 OUTFLOW= .1083E+02 BASIN STORAGE= .1564E-01 PERCENT ERROR= -.1

RTE	MANE	5.00	283.03	610.00	3.24	5.00	283.03	610.00	3.24

CONTINUITY SUMMARY (AC-FT) - INFLOW= .6091E+02 EXCESS= .0000E+00 OUTFLOW= .6089E+02 BASIN STORAGE= .6379E-01 PERCENT ERROR= -.1

RTE	MANE	3.41	101.55	602.83	3.71	5.00	101.07	605.00	3.71

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1880E+02 EXCESS= .0000E+00 OUTFLOW= .1880E+02 BASIN STORAGE= .2241E-02 PERCENT ERROR= .0

RTE	MANE	3.97	494.43	611.60	3.39	5.00	489.83	610.00	3.39

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1100E+03 EXCESS= .0000E+00 OUTFLOW= .1100E+03 BASIN STORAGE= .1347E+00 PERCENT ERROR= -.1

RTE	MANE	5.00	28.80	610.00	3.53	5.00	28.80	610.00	3.53

CONTINUITY SUMMARY (AC-FT) - INFLOW= .5835E+01 EXCESS= .0000E+00 OUTFLOW= .5834E+01 BASIN STORAGE= .3576E-02 PERCENT ERROR= .0

RTE	MANE	1.47	664.68	611.57	3.51	5.00	659.64	610.00	3.51

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1561E+03 EXCESS= .0000E+00 OUTFLOW= .1560E+03 BASIN STORAGE= .6644E-01 PERCENT ERROR= .0

RTE	MANE	5.00	16.99	605.00	4.55	5.00	16.99	605.00	4.55

CONTINUITY SUMMARY (AC-FT) - INFLOW= .3157E+01 EXCESS= .0000E+00 OUTFLOW= .3157E+01 BASIN STORAGE= .8586E-03 PERCENT ERROR= .0

RTE	MANE	3.51	709.60	614.01	3.56	5.00	706.49	615.00	3.56

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1676E+03 EXCESS= .0000E+00 OUTFLOW= .1674E+03 BASIN STORAGE= .1836E+00 PERCENT ERROR= .0

RTE	MANE	2.13	9.22	602.97	3.61	5.00	9.21	605.00	3.61

CONTINUITY SUMMARY (AC-FT) - INFLOW= .1733E+01 EXCESS= .0000E+00 OUTFLOW= .1733E+01 BASIN STORAGE= .2041E-03 PERCENT ERROR= .0

RTE	MANE	3.14	30.52	606.24	3.32	5.00	30.18	605.00	3.32

CONTINUITY SUMMARY (AC-FT) - INFLOW= .6022E+01 EXCESS= .0000E+00 OUTFLOW= .6021E+01 BASIN STORAGE= .1311E-02 PERCENT ERROR= .0

RTE	MANE	2.27	898.55	614.78	3.67	5.00	897.55	615.00	3.67

CONTINUITY SUMMARY (AC-FT) - INFLOW= .2107E+03 EXCESS= .0000E+00 OUTFLOW= .2106E+03 BASIN STORAGE= .1416E+00 PERCENT

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

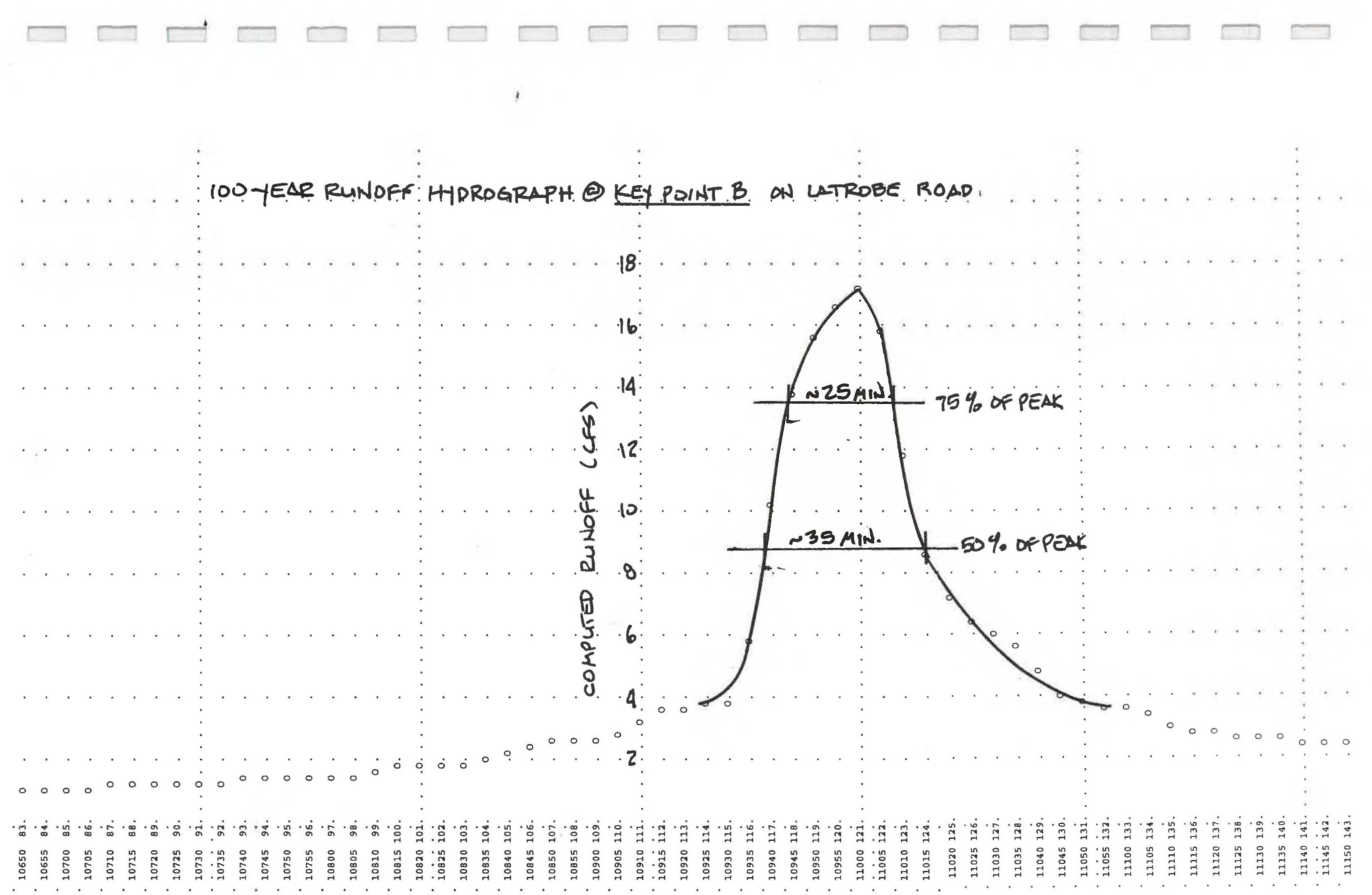
CONTINUITY SUMMARY (AC-FT) - INFLOW= .3092E+02 EXCESS= .0000E+00 OUTFLOW= .3088E+02 BASIN STORAGE= .9857E-01 PERCENT ERROR= -.2

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

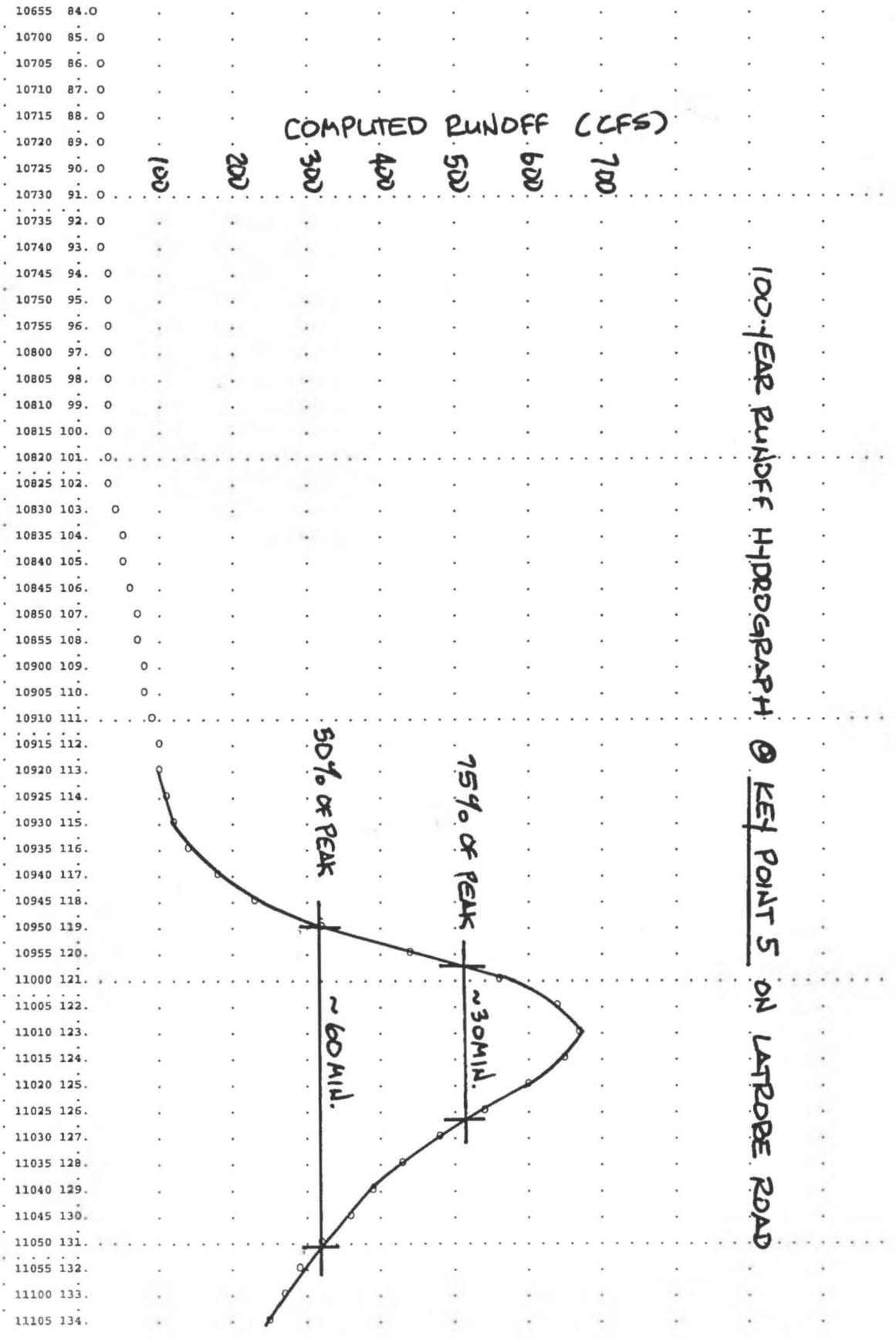
APPENDIX D

BUSINESS PARK RUNOFF HYDROGRAPHS

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

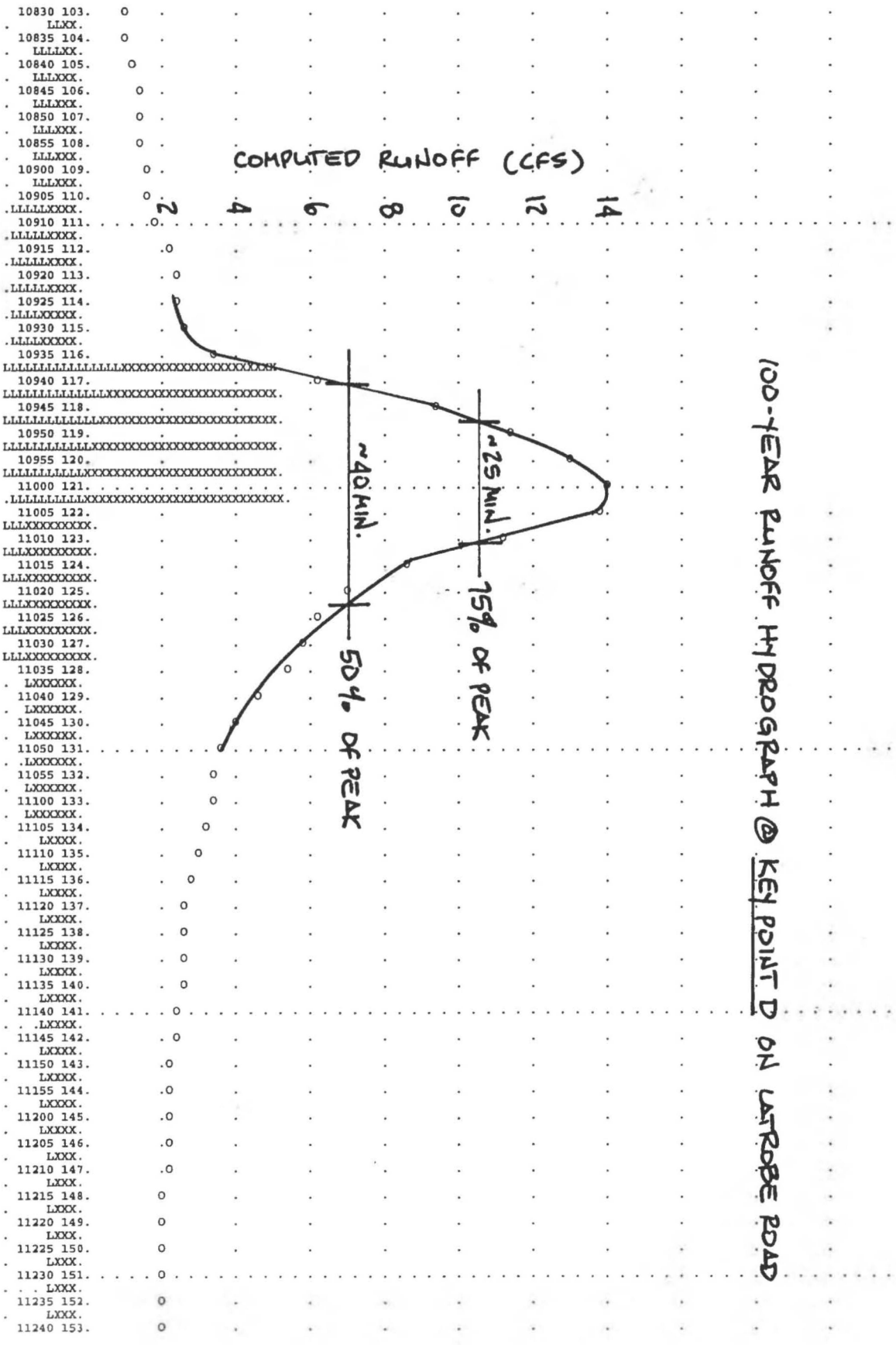


POINT 5



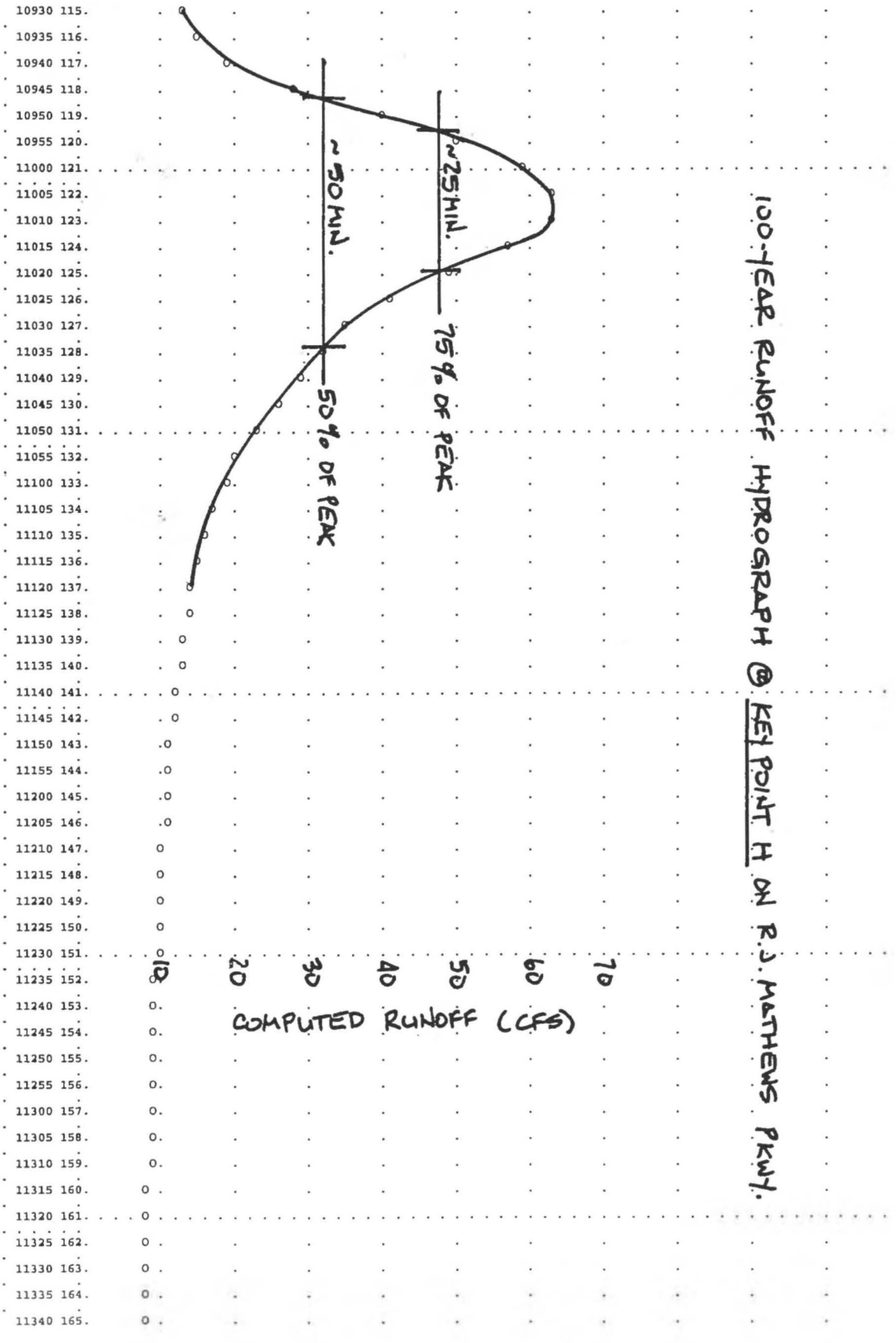
100-YEAR RUNOFF HYDROGRAPH @ KEY POINT 5 ON LATROBE ROAD

POINT D



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

POINT H


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

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	793.85	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	0.007780	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