Study of the

Central Drainage Basin

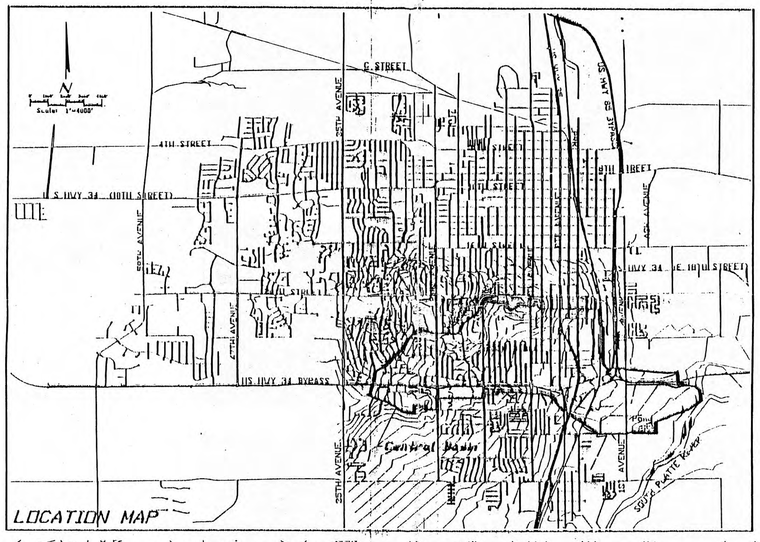
for the City of Greeley Colorado

May, 1994

City of Greeley

Burnett Consulting Engineers LTD

CITY OF GREELEY CENTRAL BASIN



LOCATION MAP

Block data included in ACAD file "Basinmap.dwg"

SB # BASIN#
AREA
LENGTH
ELEV UP
ELEV DN
SLOPE
WIDTH
IMP

STR # XX.XXX
Line #
Str #
SIZE
SLOPE
ELEV UP
ELEV DN
PIPE OUT

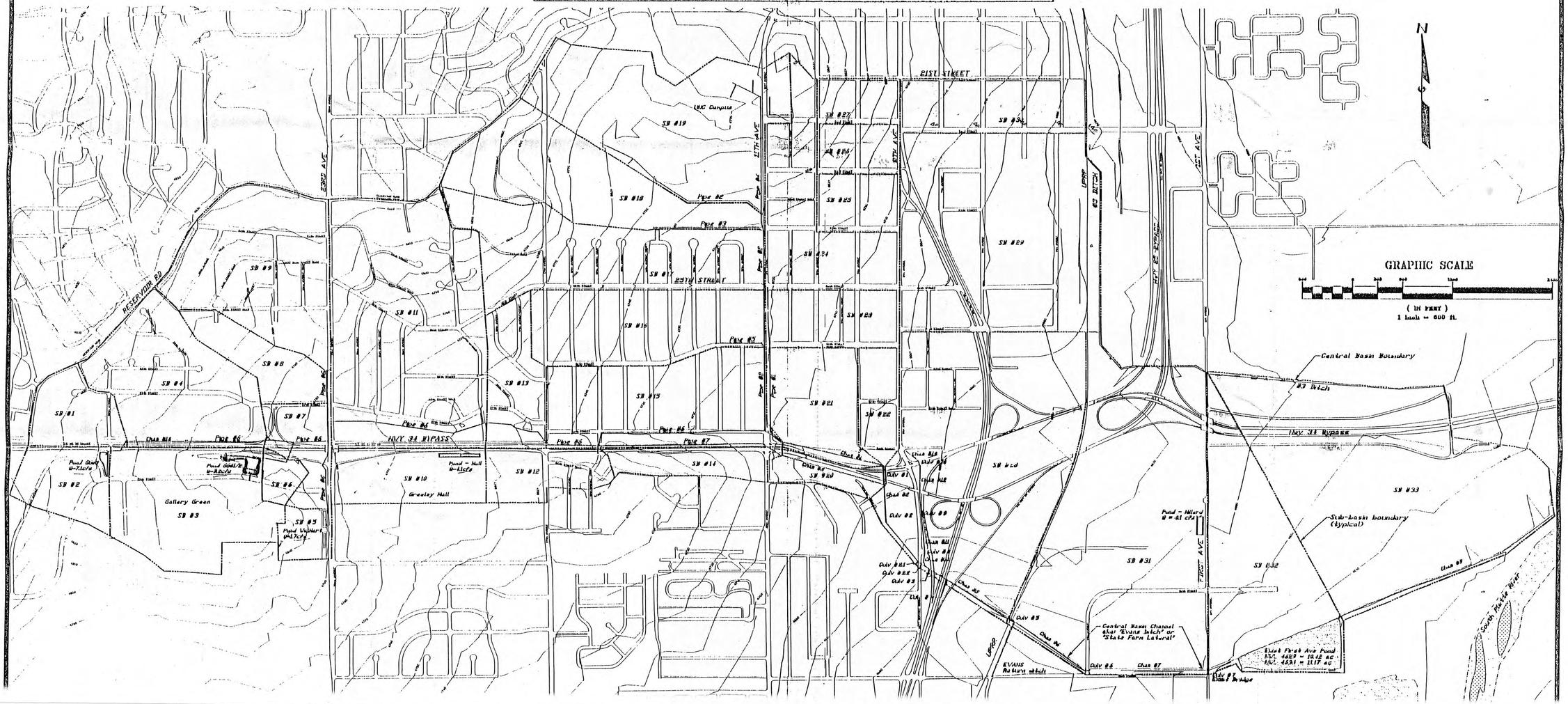
Chan # CHAN#
DESCRIPTION
LENGTH
ELEV UP
ELEV DN
SLOPE
BOTT W
MAX H
Z1
N

Culv # CULV#
DESCRIPTION
LENGTH
ELEV UP
ELEV DN
SLOPE
SIZE
BARRELS
WINGS
N

Q = Q5 / Q10 / Q100 = Sub-basin runoff

Q = Q5 / Q10 / Q100 = Non-routed accum runoff

CupCaE: Q_5 = Q5, Q_{10} = Q10, Q_{100} = Q100 = Chan pipe, or culvert flows. Q quantity does not reflect amount lost to ponding or overland flows



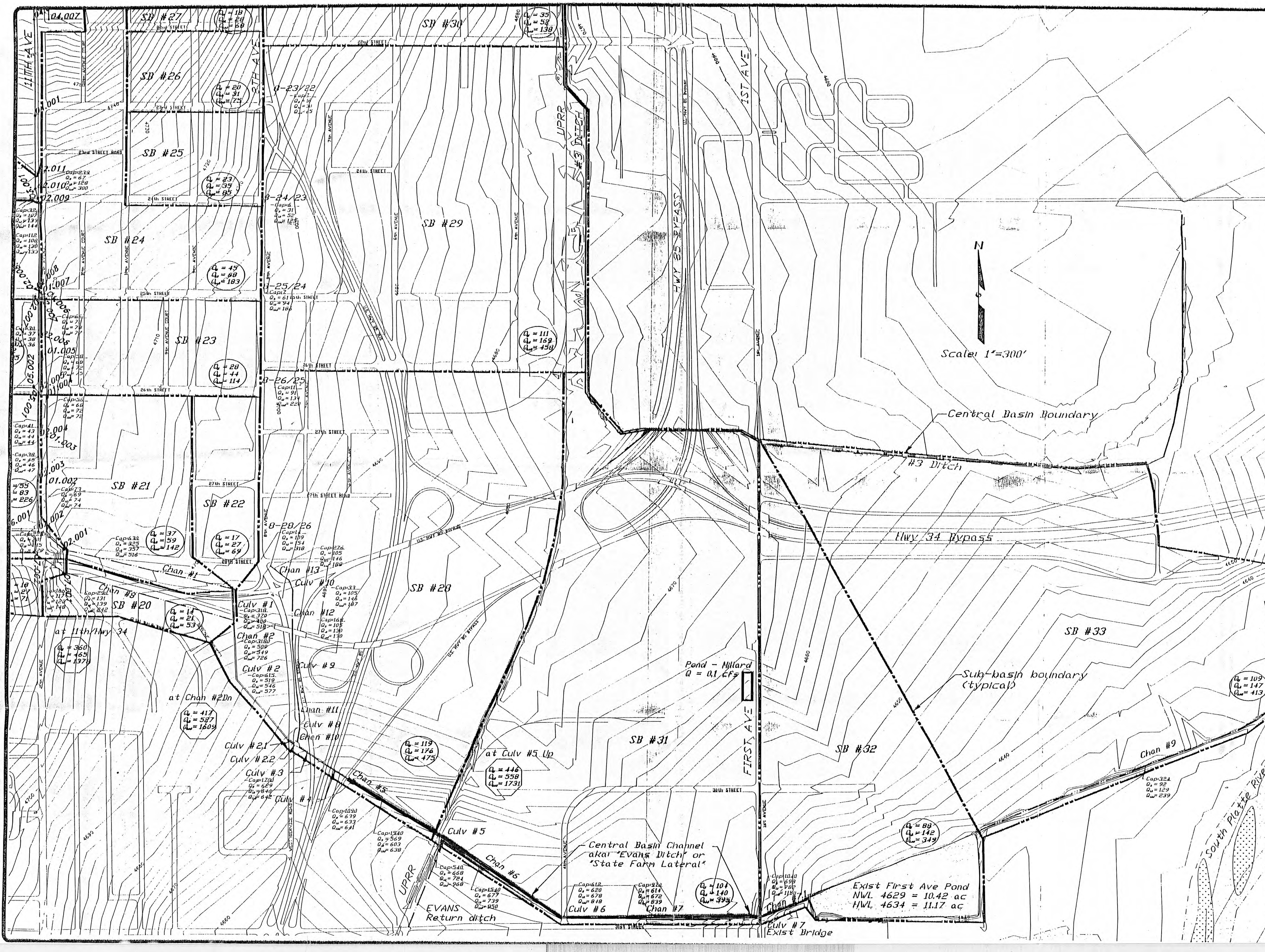
REVISIONS	BY

CENTRAL BASIN STUDY
LOCATION MAP
BASIN OVERVIEW

CITY OF GREELEY
COLORADO

Burnett Consulting Engineers
p.o. box 1265
frisco, colo
80443
(303)668-1606

DRAWN	DOS
CHECKED	TEB
DATE	5/15/94
SCALE	as noted
JOB NO.	93.13
SHEET	CB-1



CITY OF GREELEY

COLORADO

CENTRAL BASIN DRAINAGE STUDY

EAST OF ELEVENTH AVENUE

burnett consulting engineers

p.o. box 1263
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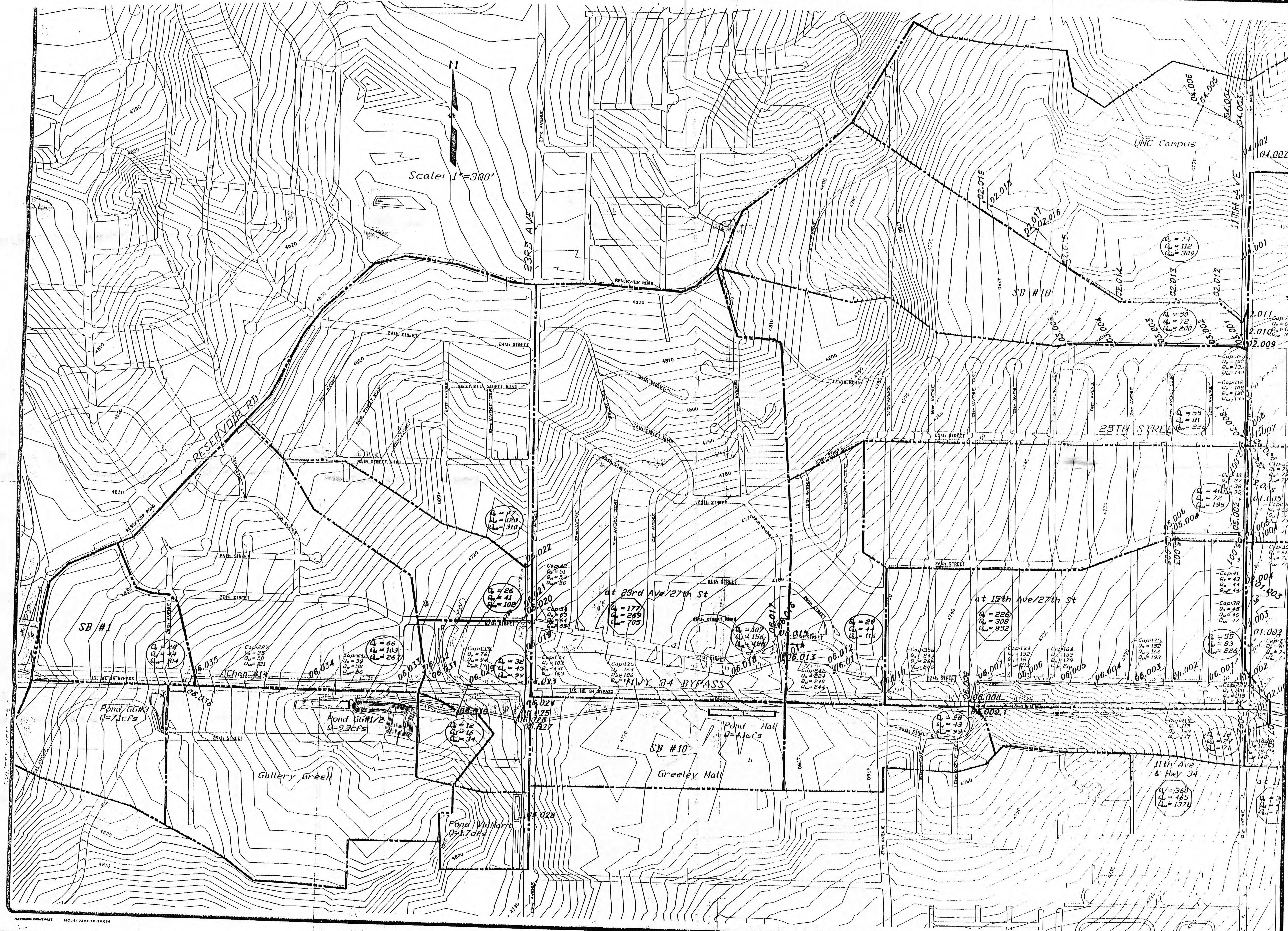
DRAWN	DOS
CHECKED	TEB
DATE	5/15/94
SCALE	1"=300'
JOB NO.	93.13
SHEET	CB-2



REVISIONS | BY

CENTRAL BASIN
DRAINAGE STUDY
WEST OF ELEVENTH AVENUE

CITY OF GREELEY

COLORADO

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DRAWN DOS
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DATE 5/15/94
SCALE 1"=300'
JOB NO. 93.13
SHEET

CB-3

G:\CB\BasinMap

OF SHEETS

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water, wastewater, drainage, streets

May 15, 1994

Bert F. Leautaud, P.E.
City of Greeley
1000 Tenth Street
Greeley, CO 80631

re: **CENTRAL BASIN DRAINAGE STUDY**

Dear Bert:

Enclosed is my report of the study of the Greeley Central Drainage Basin. As we've discussed, the study took longer than expected partly because of the complexity of the analysis program, XPSWMM. The computer program is very powerful with hydraulic simulation ability probably second to none. But it requires a price to be paid in learning. And getting the results in other than excellent graphics on a computer monitor is a little rough.

To assist in visualizing the simulation results, I've prepared three drawings to depict the Basin at different scales. I've tried to show all the pipe, manholes, inlets, channels, culverts - all the components of the drainage system for which we gathered important data from field surveys. Hopefully, the material is presented in such a way that this information can be retained in the City's GIS databases.

I have submitted along with this report floppy disks containing:

AutoCAD drawing file "BasinMap.dwg" with blocks for structures
ASCII point file of all points used in the TIN
XPSWMM databases for the three design storm analyses

I will be pleased to meet and discuss the report. Please let me know if you find any significant problems needing attention.

Thanks for the assignment.

Sincerely,

Tom Burnett

Thomas E. Burnett, P.E.

TEB/mac

STUDY

of the

CENTRAL DRAINAGE BASIN

for the

CITY of GREELEY

May, 1994

Burnett Consulting Engineers, Ltd.

P.O. Box 1263
Frisco, Colorado 80443
(303) 668 - 1606

Project No. 93.13

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I. SUMMARY, CONCLUSIONS, RECOMMENDATIONS

Summary

1. This study mapped the City of Greeley Central Drainage Basin and its storm sewer, channels, and culverts from GIS elevation point data, field surveys, and aerial photogrammetric points.

2. The mapping was prepared in an AutoCAD R 12 drawing file on the same datum and coordinate base as the City's GIS system.

3. Runoff from 33 sub-basins within the Central Basin was calculated in the SWMM module of the computer program, XP-SWMM v1.04, for the 5 year, 10 year, and 100 year rain storms derived from the City's Comprehensive Drainage Plan.

4. A computer model of the Basin's storm drainage system including pipe, manholes, inlets, culverts, channels, detention ponds, and three streets was created in the EXTRAN module of XP-SWMM to simulate the hydraulic behavior of the system for each of the three design storms.

5 The results of the EXTRAN simulation are submitted as database files on floppy disk for analysis in the City's own version of XP-SWMM.

6. Simulation of the 5 year and the 10 year storms is fairly straightforward since most of the flow is contained within the drainage system.

7. Simulation of the flows of the 100 year storm is very difficult because the major drainage channel is ill defined and flows are lost to overtopping of street and channels, generating only approximate results.

Conclusions

1. XP-SWMM yields runoff peaks approximately 14% greater than previous studies using CUHP indicated, probably due to uncertainty in selecting appropriate infiltration and depression storage parameters.

2. Storm water runoff at each street intersection along Eighth Ave was simulated and compared to previous studies. Design for a current Eighth Ave drainage project will make use of refined runoff data.

3. Storm drainage pipe and manholes in 11th Ave are surcharged by runoff from the 5 year storm on the UNC Campus and all other 5 year and 10 year flow remains in the west half of the street.

4. Storm drainage pipe along 27th St and along Hwy 34 Bypass is surcharged by the 5 year and the 10 year runoff which forces the pipe to adequately discharge runoff from those storms.

5. All culverts and channels in the Basin main channel (known as the "State Farm Lateral" or the "Evans Ditch") can convey runoff from the 10 year storm with some surcharging of the culverts.

6. An estimated peak 1,300 cfs runoff from the 100 year storm on the combined sub-basins west of 11th Ave is carried principally in 27th St which has more than sufficient capacity for that flow to its junction with 11th Ave.

7. From 11th Ave east however, a significant portion of the 100 year storm runoff is not contained within existing channels or streets.

8. It is estimated that the maximum flow (from any storm) in the main channel at First Ave is limited to approximately 1,100 cfs with a depth of 7.5 feet. Flow greater than that will overtop the channel further upstream.

9. No additional construction is required within the Central Basin to alleviate flooding from the 5 year storm since most of the Basin to the west is already developed, and the existing system can accommodate runoff from that storm, albeit with some street flooding.

10. However, the City should continue to require on-site detention for any new development west of First Ave to release at the historic 5 year rate.

11. The City has an opportunity to acquire the existing on-line detention pond east of First Ave and hold it for future development as a storm water discharge quality facility.

12. The Colorado Department of Transportation is primarily responsible for maintenance of all channels and culverts from 11th Ave east to the First Ave pond: the City is responsible for all other components of the drainage system.

13. Maintenance of pipe and channels is badly needed and long neglected.

STEVE,
SEE NOTE
NO 12.

Bert

Recommendations

It is the recommendations of this report that:

1. The City immediately attempt to acquire the First Ave detention pond and the main channel leading to that pond.

2. The City hold that pond for future development of storm water quality discharge features.

3. The City determine whether the irrigation splitter box at 17th Ave and Hwy 34 Bypass can be decommissioned, cleaned, and closed in.

4. The City create a drainage utility and adequately fund the utility to allow long neglected maintenance of storm drainage facilities.

5. The City Public Works staff engineers be allotted sufficient time and assistance to learn the use of the already acquired program XP-SWMM so the City can perform in-house simulation of drainage systems.

II. GENERAL

Purpose

In December, 1993, Burnett Consulting Engineers, Ltd. was retained by the City of Greeley, Colorado to perform a detailed hydrologic and hydraulic analysis of the City's Central Basin.

It was the purpose of this study to:

- o inventory existing storm drainage structures within the Basin
- o prepare topographic mapping of the Basin
- o calculate runoff at key points throughout the Basin for various return period storms
- o analyze the hydraulic capacity of the existing drainage structures for each design storm
- o identify any possible improvements to the existing drainage system
- o estimate cost of any recommended improvements
- o determine feasibility of allowing greater storm discharge in the Basin
- o consider possibility of future storm water discharge quality improvements
- o refine analysis of runoff to Eighth Ave prior to design of Eighth Ave drainage project

Location

Drawing CB-1 in the envelope at the rear of this report contains both a location map at 1" = 4000' scale showing the Central Drainage Basin within the City, and an overview map of the Basin at 1" = 600' scale. As shown on the overview map, the basin boundaries can be described as:

- o on the north and west by Reservoir Road and 21st Street
- o on the south by high ground lying 400' to 1000' south of U.S. Highway 34 Bypass from the west end of the Basin to 11th Avenue
- o then continuing along the south by existing drainage channel known variously as "Evans Ditch" or "State Farm Lateral" to its juncture with the South Platte River
- o on the east by the Greeley #3 Ditch and a line from the ditch to the Platte River

The Basin is shown in greater detail on two drawings labeled CB-2 and CB-3 also in the envelope at the rear of this report. Those two drawings are at 1" = 300' scale to allow clearer illustration of existing structures, ponds, channels, and pipe - and to graphically report the results of the hydrologic and hydraulic analyses.

Participants

Information for this study was obtained in numerous meetings with the City of Greeley Public Works Department engineering staff. Public Works field crews and the Greeley Fire Department assisted with field reconnaissance of storm sewer facilities in two difficult-access locations.

The Colorado Department of Transportation provided copies of previous construction plans for Highways 85 and 34. John Kessenich of that Department also provided information concerning the maintenance responsibility for the Central Basin channel.

The Town of Garden City did not participate financially in this study, but did provide funding for an earlier effort by Burnett Consulting Engineers, Ltd. titled "Preliminary Report of Eighth Ave / Highway 85 Drainage" which was very useful to this effort. The Town staff and Board were updated during this study effort and remain, of course very interested in the resolution of the Eighth Ave drainage problems.

One meeting was held with representatives with the Town of Evans staff during the course of this study to discuss common Basin borders and possible transfers of storm water runoff from the Basin at its west end.

Previous studies

Five previous engineering studies addressed some aspect of drainage in the Central Basin. Those studies have been evaluated and incorporated into this study to the extent possible. The previous studies used are:

- "East and South Drainage Improvements"
  for the City of Greeley
  by Parker & Associates, April, 1961
  hereinafter referred to as "1961 Parker"

- "Comprehensive Drainage Plan"
  for the City of Greeley
  by Hogan & Olhausen, P.C, June, 1974
  hereinafter referred to as "1974 Comp Plan"

- "Drainage and Paving"
  for the Town of Garden City
  by Burnett Consulting Engineers, Ltd., April, 1982
  hereinafter referred to as "1982 Burnett"

- "Central Drainage Basin Project"
  for the City of Greeley
  by ARIX, P.C., June, 1983
  hereinafter referred to as "1983 ARIX"

- "Eighth Ave/Highway 85 Drainage"
  for the City of Greeley
  by Burnett Consulting Engineers, Ltd., July, 1991
  hereinafter referred to as "1991 Burnett"

Mapping

The drawings submitted with this report were developed in AutoCAD Release 12 and Softdesk CIVIL software on a 486/66 computer. The City's Public Works staff furnished base street mapping and random point data taken from the City's GIS mapping. That base mapping was supplemented by detailed field surveys performed by King & Associates of Windsor.

The field surveys located and measured elevations for each storm sewer manhole, inlet, channel, and culvert that could be found within the Central Basin. (Some of the field survey data was collected in the "1991 Burnett" study.) All field survey data was related to the City's state plane coordinate base used in the GIS mapping and to the NGS 27 datum.

Field survey and GIS data were supplemented by points with x,y,z coordinates extracted from the City's 1987 aerial photography on Kern photogrammetric equipment by Arnold Analytical Services of Evans.

Additional field reconnaissance surveys made by Bert Leautaud and Tom Burnett consisted of entering (in one case with Fire Department special access equipment) storm sewers at the intersection of 11th Ave and 25th Street and at Highway 34 Bypass and 15th Ave. The reconnaissance surveys were made to determine configuration and size of junction boxes and pipe at those locations. In both cases, the reconnaissance found buried manholes and pipe not shown or unclear on existing mapping. Sketches of storm sewer at those two intersections have been included as separate submittals for the City's mapping.

One significant find was an existing 42" RCP storm sewer constructed in the north side of Highway 34 Bypass right-of-way from 15th Ave to 11th Ave. That pipe does not show up on any City mapping that we could find. Nor is it included on CDOT as-built plans. The pipe was shown in the "1974 Comp Plan" as recommended in the "1961 Parker" and probably built as part of the Hwy 34 Bypass. Its existence was reported in the "1991 Burnett" but detailed information about the junction with the 54" and 48" pipes at 15th Ave was unknown then.

CAD Drawings

Approximately 6000 points from the sources described above in "Mapping" were used to generate two foot contours shown on drawings CB-2 and CB-3. Errors were discovered and eliminated from the point file so the resulting contour map is considered fairly accurate with the exception of the Highway 34 and 85 Bypass embankments. No attempt was made to reproduce the embankments in the contour mapping. A separate ASCII file of data points is submitted with this report for the City's GIS maps. Copies of the CAD files for the three drawings are also submitted.

The survey data was also used to map the location of all manholes and inlets. The structures were entered in the CAD file as a block named "STR" with hidden attributes including accurate x and y coordinates and elevation data for connecting pipe. The elevation data of field surveyed pipe inverts is considered accurate to within 0.10'± since elevations were established by level circuits.

Hydrology/Hydraulic Program

Analyses of hydrology and hydraulics were made in a computer program called "XP-SWMM", v1.04. The program was purchased for use in this study since the City had previously acquired it and could therefore utilize the database created in this study in future analyses in the Central Basin. A copy of the XP-SWMM databases is submitted with this report.

XP-SWMM uses the EPA-developed SWMM "RUNOFF" module to generate hydrographs for storm runoff from a basin. The program has the facility to generate hydrographs based on SCS methods as an alternative. Two sub-basins were checked for runoff peak amounts by the Rational Method to compare the data from XP-SWMM. The checks showed peak flows within 1%.

The analysis of hydraulics and routing of storm hydrographs was done within XP-SWMM by the "EXTRAN" module. The module is a very sophisticated (complex and difficult to learn) routine for the analysis of flows with backwater effects in a pipe/channel/culvert/pond system.

Drainage Basin

The "1974 Comp Plan" states the total area of the Central Basin as 1,937 acres. This study modifies the boundaries of the Basin by removing the portion south and east of the Channel (aka "State Farm Lateral" or "Evans Ditch") from First Avenue to the South Platte. That land drains directly to the River, not into the channel or pond structures that define the logical south boundary of the Central basin. The Basin boundaries were established anew from three sources:

- the TIN (Triangulated Irregular Network) developed in AutoCAD from new point data
- bearings and distances shown on the Gallery Green development plans to locate the Basin boundary along the high ground west and south of Gallery Green
- digitized Basin boundaries from the "1974 Comp Plan"

The revised Basin has the following characteristics:

- Area = 1,724 acres
- High elevation = 4836 at Reservoir Road in sub-basin #1
- Low elevation = 4625 at the South Platte River discharge of Channel #9

- o Length of 18,650 feet
- o Width of 4,800 feet
- o Average slope of 1.12%

The Basin has been subdivided into thirty three sub-basins for analysis. The sub-basins are labeled on the drawings as "SB #xx". Sub-basin boundaries were selected to calculate storm runoff at a particular "design" point such as a pipe or channel entrance or street section. The sub-basins are shown on the drawings and listed in Table #1 below.

Table 1 - Sub-basins

Basin #	Area (ac)	Length (ft)	Elev Up	Elev Dn	Slope (%)	Width (ft)	Imperv (%)	Design Point
1	19.58	1,259	4836.00	4813.00	1.83	677	70	06.035
2	21.01	1,337	4843.00	4816.00	2.02	685	85	Pond GG#3
3	56.35	2,016	4821.00	4788.00	1.64	1,218	85	Ponds GG#1&2
4	60.62	2,230	4834.00	4792.00	1.88	1,184	60	06.032
5	8.41	579	4812.00	4787.00	4.32	633	85	Pond - WalMart
6	5.77	547	4800.00	4786.00	2.56	459	85	06.030
7	17.18	900	4804.00	4779.00	2.78	832	85	06.023
8	21.44	2,107	4824.00	4779.00	2.14	443	70	06.020
9	70.30	2,437	4832.00	4777.00	2.26	1,257	60	06.022
10	28.08	1,990	4784.00	4758.00	1.31	615	95	Pond - Mall
11	126.30	3,280	4827.00	4755.00	2.20	1,677	40	06.015
12	19.15	1,467	4762.00	4733.00	1.98	569	85	06.009
13	26.11	1,667	4779.00	4747.00	1.92	682	45	06.010
14	15.66	2,019	4759.00	4707.00	2.58	338	50	07.001
15	65.95	2,975	4752.00	4706.00	1.55	966	45	02.001
16	54.65	2,934	4774.00	4721.00	1.81	811	45	11\26
17	71.88	4,133	4819.00	4722.00	2.35	758	40	11\25
18	62.92	3,605	4816.00	4727.00	2.47	760	35	03.001
19	92.05	3,233	4800.00	4733.00	2.07	1,240	50	02.011
20	10.64	1,449	4712.00	4693.00	1.31	320	70	Culv#1 Dn
21	33.92	2,033	4720.00	4694.00	1.28	727	95	Culv #1 Up
22	14.96	1,436	4705.00	4694.00	0.77	454	75	Culv #1 Up
23	25.80	1,770	4722.00	4701.00	1.19	635	60	8\26
24	49.87	3,385	4780.00	4702.00	2.30	642	50	8\25
25	16.32	1,227	4738.00	4704.00	2.77	579	52	8\24
26	14.03	1,179	4755.00	4710.00	3.82	518	50	8\23
27	12.46	1,142	4770.00	4717.00	4.64	475	50	8\22
28	145.49	3,632	4702.00	4660.00	1.16	1,745	85	Culv#5 Up
29	131.71	3,395	4715.00	4674.00	1.21	1,690	78	UC3-26th
30	33.13	2,324	4724.00	4676.00	2.07	621	50	UC3-22nd
31	155.54	4,218	4676.00	4646.00	0.71	1,606	85	BrdgeUp
32	77.07	2,040	4666.00	4634.00	1.57	1,646	85	Pond
33	159.76	4,643	4666.00	4626.00	0.86	1,499	85	River
Sum	1,724.1	acres						
CAD	1,723.9	acres						

III. HYDROLOGY

Rainfall

Runoff was calculated for the Central Basin for the 5, 10, and 100 year storms. Rainfall amounts for each storm were taken from intensity-duration-frequency curves developed in the "1974 Comp Plan", modified to represent 24 hour depths for each return period storm. For input to the hydrology computer program used in this study, the Greeley rainfall curves were disaggregated into hyetographs with discrete rainfall increments calculated for each 10 minute interval. The rainfall distribution was rearranged to create a storm of greater intensity within the first hour as suggested by the UDFCD (Urban Drainage and Flood Control District). The rainfall tables are included in Appendix #1 and the 24 hour total depths for each storm are shown in the table below.

Table 2 - Rainfall Depths

Storm Return Period	5 Yr	10 Yr	100 Yr
Total 24 hr depth (in)	2.16	2.40	3.84

Land use

Field surveys and mapping provided by the City were used to evaluate present land use throughout the Basin. Land use was then used to estimate the percentage of impervious surface in each sub-basin. Generally most of the west portion of the basin is residential with the exception of major commercial development along Hwy 34 Bypass, along 23rd Avenue, and adjacent to Eighth Avenue. Sub-basins #18 and #19 consist primarily of the UNC Campus. Sub-basin #31 is the Industrial Park. Sub-basins #32 and #33 are essentially undeveloped land at the east end of the Basin.

With the exception of the three sub-basins #31, #32, and #33 on the east, land within the Basin is almost completely developed. The analyses assumed full development in all sub-basins.

Land use categories and their corresponding percentage of impervious surface (and Rational Method "C" coefficient) used in the analysis of runoff are as follows:

Table 3 - Land Uses

Land Use	Percent Impervious	Rational "C" * 5 & 10 yr	100 yr
Commercial	85%	0.70	0.88
Residential (high density)	45%	0.50	0.63
Residential (medium)	40%	0.40	0.50
Residential (low)	25%	0.25	0.31
Park	10%	0.25	0.31
School	30%	0.30	0.38

* Rational method used to check XP-SWMM output in selected sub-basins.

These percentages of impervious surface were used to calculate a weighted average percent of impervious area for each sub-basin.

Runoff Comparisons

This study utilized a very complex computer model of the existing storm drainage structures within the Basin, then simulated storm runoff through that system of basins, pipes, channels, streets, ponds, and culverts.

To check the relative accuracy of the XP-SWMM computer model, we have calculated a gross overland runoff from the Basin west of 11th Avenue to compare that peak runoff quantity to calculated peak runoffs given in the "1991 Burnett" study. That study calculated peak runoff from overland flow to the intersection of 11th Ave and the Hwy 34 Bypass by means of both the CUHP (Colorado Urban Hydrograph Procedure) and the Rational Method. Results of the previous study and the XP-SWMM overland flow peaks are shown in Table 4 below. The comparison indicates XP-SWMM runoff peaks are about 14% higher than previous CUHP peaks.

The difference may be partly due to assumptions concerning infiltration rate and surface depression storage which differ for the CUHP and the XP-SWMM models. XP-SWMM results are consistently higher and therefore perhaps more conservative. Since there is a great deal of uncertainty in calibrating the storm system model and in selecting the parameters to which the calculated runoff peaks are so sensitive, we did not try to manipulate the model to achieve closer agreement. We carefully selected the model parameters, ran the simulation, then compared the results. And let the difference stand rather than modify the parameters.

The differences are shown in the table below.

Table 4 - Runoff to 11th Ave/Hwy 34

Sub-basins: SB#1-19, but not including SB #2, #3, #5, #10 which runoff to ponds
Land area: 729.56 acres, 46% impervious, 1.42% slope
Design point: 11th Ave and Hwy 34 Bypass

Storm Runoff (cfs) Source	5 Year	10 Year	100 Year
"1991 Burnett" Hydrograph (CUHP)	291	380	1,153
Rational Method	291	362	807
XP-SWMM - not routed	328	441	1,326

In addition, "1991 Burnett" calculated peak runoff by the Rational Method at design points along Eighth Ave and favorably compared those runoff peaks with the "1983 ARIX" study. This study computed routed flows along a channel formed by Eighth Ave from 22nd Street to 28th Street. Contributing sub-basins are somewhat different in this study - 10th Ave is assumed here to drain south from 21st Street to 25th Street. And flows are expected to peak sooner than the "1991 Burnett" flows since the runoff is routed down a channel rather than accumulated overland. The earlier time to peak would be expected to increase peak quantity because of greater rainfall intensity earlier in the storm. That in fact appears to be the case further south on Eighth Ave at 26th Street and at 28th Street.

Table 5 - Runoff along Eighth Ave

Location	Sub-Basins	Area	5 Year	10 Year	100 Year
22nd St	27	12.46 (20)	18 (13)	28 (16)	68 (53)
23rd St	26 - 27	26.49 (31)	16 (24)	30 (29)	65 (82)
24th St	25 - 27	42.81 (69)	31 (47)	52 (58)	125 (161)
25th St	24 - 27	92.68 (95)	61 (58)	94 (73)	186 (213)
26th St	23 - 27	118.48 (121)	91 (67)	134 (83)	220 (238)
28th St/Hwy 34	22 - 27	133.44 (151)	109 (81)	154 (110)	318 (309)

(xx) = Area and Runoff calculated in "1991 Burnett"

These revised peak runoff quantities calculated by XP-SWMM by routing flows along Eighth Avenue will be used to refine the size of storm sewer and location of inlets for the future Eighth Avenue storm sewer project.

IV. STORM DRAINAGE SYSTEM

Existing Facilities

Existing drainage facilities within the Central Basin are shown on drawings CB-2 and CB-3. The drainage system components can be summarized as:

From 11th Ave/Hwy 34 intersection east to the Basin discharge at the South Platte River -
Open channel, with culverts at road and railroad crossings, with one large in-line detention pond

From 11th Ave/Hwy 34 intersection north along 11th Ave -
One 30"RCP and parallel 36"RCP storm sewers to 25th St, then 48"RCP equiv to UNC Campus

From 11th Ave/Hwy 34 intersection west along Hwy 34 and along 27th St -
One 42"RCP and parallel 48"RCP storm sewers to a 54" RCP at 15th Ave to a split at 23rd Ave

From 23rd Ave/Hwy 34 intersection west along Hwy 34 -
One 42"RCP to 36"RCP to the open Channel #14 near the west end of the Basin

Locations, sizes, and elevations of most of the existing storm drainage components were obtained in field surveys from this and the "1991 Burnett" studies. The field survey information and the data used in the XP-SWMM model are stored in the CAD file as blocks with invisible attributes.

Manhole and inlet structures were assigned a unique number to serve as a "tag" for future references, including uses in routine maintenance reports, and for GIS mapping. The existing seven pipe lines were assigned numbers from 01 to 07. Each structure on the line was numbered with the two digit pipe line number, separated by a period from a three digit structure number. So an identifier of "06.015" on the drawings refers to structure number "15" on pipe line number "6". The structures are plotted on the CAD drawings with x,y coordinates that correspond to the City's GIS coordinate system. The coordinates and the additional available information for each structure have been extracted from the CAD file and listed in Appendix #2. Similar extractions were made for the fourteen open channels, and the twelve culverts making up the drainage system. The channel and culvert data is also included in Appendix #2.

The 33 drainage sub-basins were assigned to discharge to one of the pipe structures or channel ends where appropriate. Because of the complexity of simulating runoff to the basin's numerous small pipe and inlets, the XP-SWMM model was simplified by ignoring the existence of smaller pipe.

Major Storm System

From 11th Ave west, the major storm drainage system consists principally of 27th Street. The street was apparently constructed in the historic drainage channel and the need to convey considerable storm runoff from the major storm was recognized. The homes on each side of the street are built approximately 2.5 feet above the gutter flowline elevation. Analysis of the street channel with a maximum allowable depth of 2.5' above gutter flowline indicates a capacity of 2700 cfs - more than double the theoretical 100 year runoff from the combined area upstream of 1300 cfs.

From 11th Ave east, the major drainage system consists of open channels with concrete box culverts or pipe culverts under the State Farm parking lot, Highway 85, the UPRR tracks, 4th Ave, and a timber bridge across First Ave. Channels #1 and #8 on each side of Hwy 34 Bypass from 11th Ave to 8th Ave have a combined capacity of 920 cfs. The 100 year runoff at 11th Ave, calculated as overland flow from the combined 730 acres upstream is estimated to be 1300 cfs - half again the capacity of the two channels. The excess will flow down the highway to 8th Ave, then turn south and east to follow the channel towards the river.

The capacity of Channel #7 at the upstream side of the First Ave bridge is approximately 1,040 cfs. Flows greater than that will have overtopped the channel further upstream and spilled across 31st Street towards the River. Barring improvements to the channel and culvert system upstream of First Ave, the bridge at that location needs to pass 1,100 cfs, with a depth of flow in the channel of approximately 7.5 feet.

The only significant detention pond on the system, located east of First Ave, is the result of excavation as a borrow pit for Hwy 34 construction. The pond is on-line, has a permanent pool at approximately elevation 4629, a surface area of 11 acres, and a maximum possible depth with existing bank elevations of approximately 5.0 feet. The pond is apparently in private ownership and is for sale.

Four smaller detention ponds have been included in the model as shown on drawing CB-2 and CB-3. Runoff from the sub-basins draining to those ponds has been replaced in the model simulation by constant discharge equivalent to the historic 5 year storm runoff above each pond.

At a number of locations the model is set up to allow ponding at pipe inlets - based on field observations of actual flow conditions. Three of the principal ponding locations are:

- Pipe Str 06.022 - the Willows apartments building complex on 23rd Ave which has a small detention pond with a permanent wet pool and very little additional freeboard
- Pipe Str 06.032 - west side of the on ramp to the Hwy 34 Bypass west of 23rd Ave
- Culv #1 - upstream end of the concrete box culvert at 8th Ave and Hwy 34 Bypass

Unfortunately, because of the absence of a well defined channel for the 100 year storm runoff, ponding and indeterminate flow loss to side streets makes accurate modeling of the 100 year runoff impossible. The uncertainties are too great. Nonetheless, an attempt was made to model 8th Ave, 11th Ave and 27th Street by either a trapezoidal channel for half the street width in the case of 11th Ave or a natural channel for the entire street width for both 27th St and for 8th Ave. On 11th Ave, orifices were installed to connect the street channel to the 30"RCP on the west side of the street at each existing Type R inlet location. The model fairly accurately simulated these inlets, with the surcharged pipe even reversing flow in one case back into the street.

Because of the uncertainties in simulating the 100 year storm flows in the system, a special analysis was made to determine theoretical runoff from each storm at selected points in the Basin. These results are shown on the drawings in "octagon" boxes. This special analysis modeled combined sub-basins upstream of the particular design point as a single basin with all flows being conveyed overland to that point.

The drawings also show pipe, channel, and culvert flows at various locations for runoff from each storm - including that portion of the 100 year storm not lost to spillage - to aid in visualizing simulation results.

In general, analysis of the major storm on the Central Basin indicates the following:

- West of 11th Ave, 27th Street is the principal drainage channel and has capacity for the 100 year storm runoff.
- East of 11th Ave, the 100 year storm runoff will overtop the existing channel and culverts, pond at the intersection of 8th Ave and Hwy 34 Bypass, then flow south and east overland to the River.
- Some undetermined portion of the 100 year storm runoff from sub-basins north of 25th St and west of 8th Ave will flow east on 25th Street to the Greeley #3 Ditch.
- The existing system does not provide a means to convey the 100 year storm runoff to its discharge at the South Platte River.
- The existing detention pond east of First Ave provides detention too late to alleviate upstream flooding. But the pond could be of value in addressing future storm discharge quality.

Initial Storm System

The initial storm system consists of the pipe and structures described above and plotted on drawings CB-2 and CB-3. The parameters for each component of the system are also listed in Appendix #2.

Analysis of the 5 and 10 year storms on the storm drainage system indicates the following:

- Pipe lines #01 and #02 in 11th Ave are surcharged by runoff from the UNC Campus. Excess flow is in the street and additional inlets in 11th Ave would have no value. Street flows could not get into either the 36"RCP or the 30"RCP.

- Pipe lines #06 and #07 in 27th St and in the Hwy 34 Bypass right-of-way experience minor surcharge by the 5 year storm runoff. The pipe have capacity for the runoff from the 10 year storm with surcharge of 2.3 feet at some junctions.

- In general, it appears that all storm sewers in the Basin were sized for the 5 year storm, though Lines #06 and #07 approach 10 year capacity under surcharged condition.

- The construction of detention ponds in the Basin to reduce runoff peaks to the 5 year historic rate is current policy. Relaxing that standard would have the effect of increasing the load on an already surcharged drainage system.

- The channel and culverts downstream of 11th Ave have capacity for the 10 year storm runoff under surcharged conditions. Table 6 below presents a comparison of the channel components calculated in the "1991 Burnett" versus the XP-SWMM simulated flows and capacities. The table indicates that the channel system is adequate for the 10 year storm runoff - with ponding to provide sufficient surcharge on some of the components such as Culvert #1.

Table 6 - Existing Main Channel

		"1991 Burnett"			This Study			
1991 Name	Location	Q_5	Q_{10}	Cap *	1994 Name	Q_5	Q_{10}	Cap**
Pipe #1	30"RCP in 11th Ave	30	40	40	Pipe #02	45	46	40
Pipe #2	36"RCP in 11th Ave	40	60	61	Pipe #01	69	74	73
Pipe #3	48"RCP in 27th St	110	140	169	Pipe #06	152	166	165
Pipe #4	48"RCP in Hwy 34	110	140	169	Pipe #07	117	123	166
Channel #1	North side of Hwy 34	180	240	590	Chan #1	325	357	630
CBC #1	Under Hwy 34 Bypass	261	350	324	Culv #1	370	400	318
Channel #8	South side of Hwy 34	110	140	310	Chan #8	131	139	290
Channel #2	State Farm site	371	490	2000	Chan #2	509	549	318 0
CBC #2	Under State Farm lot	371	490	560	Culv #2	519	546	615
Channel #3	Service Rd to Hwy 85	420	565	3600	in #2 & #3			
CBC #3	Hwy 85 SB On ramp	420	565	660	Culv #3	629	640	170 0
Channel #4	85 SB ramp to 85 Bus	420	565	3800	in #3 & #4			
CBC #4	85 Bus & NB Bypass	420	565	760	Culv #4	639	633	109 0
Channel #5	85 to UPRR	420	565	1050	Chan #5	569	603	154 0
Pipe #5	UPRR Culverts (4)	420	565	520	Culv #5 (4)	668	784	540
Channel #6	UPRR to 4th Ave	520	665	1130	Chan #6	677	739	154 0
Pipe #6	4th Ave Culverts (2)	520	665	760	Culv #6 (2)	620	678	612
Channel #7	4th Ave to First Ave	520	665	900	Chan #7	614	672	970
Bridge	Under First Ave	520	665	1425	Bridge	698	782	104 0

* Capacity calculated by Manning's

** Capacity determined by flood routing in XP-SWMM with surcharged conditions

V. ANALYSIS

Infiltration & Initial Storage

As discussed, selection of infiltration and initial depression storage parameters can have a significant effect on the computed peak runoff from each sub-basin.

The parameters recommended by UDFCD for use in the CUHP analysis are compared in Table #7 below to the parameters recommended, and used, within XP-SWMM.

		XP-SWMM	CUHP
Depression Storage			
Impervious	D= 0.0303 * S ^ -0.49		
	where D = depression storage, inches		
	S = sub-basin slope, percent		
	For average slope = 1.3%,		
		D = 0.02	D = 0.1
Pervious	For grassed urban surface		
		D = 0.1 in	D = 0.35
Horton Infiltration Parameters			
Loamy soil		Fo = 1.00 in/hr	Fo = 3.5
Soil group B to C		Fi = 0.2 in/hr	Fi = 0.55
Decay rate		= 0.00115	= 0.0018

The UDFCD indicates that values for these parameters have been chosen as a means of calibrating CUHP results with observed runoff flows. Obviously, such calibration may have been partly required by factors other than depression storage and infiltration. In addition, UDFCD is careful to state that its findings and recommendations apply only to the area within its boundaries - not including Weld County. For these reasons, the parametric values recommended within XP-SWMM have been adopted for this analysis.

Simulation Results

Results of the simulations of the 5, 10, and 100 year storms on the Basin are included in Appendix #3, #4, and #5 respectively. These results are only a portion of the information generated by XP-SWMM for each simulation, selected to provide documentation for the analyses. In addition, to assist in visualizing the Basin response to each simulation, flows for a number of conduits and runoff from each sub-basin are shown on the drawings CB-2 and CB-3.

The City has acquired the program XP-SWMM. The disk submitted separately with this report contains each of the databases for the three return period simulations. With some little effort, City staff can access the simulation database and run the routine to allow graphic visualization of the flow, depth, and velocity in each system component. The program's output of results is far superior as color simulations on the computer monitor than in printed tabular form.

VI. OTHER CONCERNS

Maintenance

Discussions with City Public Works staff and with Colorado Department of Transportation staff indicate that maintenance of storm drainage facilities is desired but not adequately funded. The results of that under-funding are obvious. Field investigations in open channels and in closed junction boxes and concrete box culverts reveal trash, debris, and litter that apparently has accumulated for years. Channel #8 along the south side of Hwy 34 Bypass east of 11th Ave is reported by the neighbors to harbor rats - in quantity. The channel itself is shown on CDOT construction plans as a rock lined channel. No rock lining is apparent in the thick vegetation and trash that has accumulated. The channel's condition is not unique.

Channel #1 across Hwy 34 Bypass from Channel #8 is also littered - though not as thick. Shopping carts, car batteries, trash of all shades lies in the channel bottom.

The downstream end of Culvert #1 is partially plugged with debris wedged in the narrow opening of the 3' high box - apparently placed there by children at play.

Channel #7 supports a luxurious growth of trees within the channel. While attractive for wildlife and birds, the trees severely reduce the carrying capacity of the channel. The trees average about 3" to 4" in diameter now. If not removed, the trees will eventually block the channel.

All of the above instances of maintenance lack are problems attributed to the Colorado Department of Transportation which has responsibility for the channels within the highway right-of-way, and reportedly has a maintenance agreement for the main channel (the "State Farm Lateral" or "Evans Ditch").

In both instances where Bert Leautaud and Tom Burnett entered the piping system, we found blockages in the pipe consisting of a number of concrete chunks each approximately one cubic foot in size, or timbers left from construction as in Str #06.009.

Pipe Str #06.010 is an open junction box at the corner of 17th Ave on the north side of Hwy 34 Bypass. The box measures 10' on a side. A 54"RCP enters and leaves. The box was apparently used to split flows and direct irrigation water into a 24" RCP that crosses under Hwy 34 Bypass. The internal wall and slide gates in the box constitute a major impediment to flow through the 54" pipe. The screen top on the box is insufficient to prevent accumulation of debris on the walls and gates. The open box is in a residential neighborhood, not more than 50' from the nearest house. It is an obvious nuisance. The gates appear to be rusted shut, indicating that the junction box is no longer necessary to divert flow to what may be an abandoned irrigation source.

Even if the box must continue to function, it seems possible to develop a splitter box that would be less intrusive and obnoxious to the pipe hydraulics and to the neighborhood.

A short time in the field reveals that CDOT is not able to maintain that portion of the drainage system left in its care. Likewise, the City's significant investment in storm drainage pipe and structures is not receiving the level of funding and maintenance required to prolong its useful life - let alone to function with effect.

Quality Concerns

Storm runoff now requires a discharge permit similar to that required for a wastewater treatment plant before discharging to the nation's waters. At present only larger cities face that requirement. But it seems likely that in the near future, the storm water discharge permit system will be required of cities the

size of Greeley. When that happens, some method of capturing and treating at the end of the pipe will be necessary.

Very few drainage basins can offer the opportunity that already exists in the Central Basin. Just a few hundred feet upstream of the Basin's discharge into the South Platte River is an existing detention pond. The Basin's main channel already passes through that pond. The pond has approximately 50 acre feet of storage available above the existing wet pool. Additional storage could be made available by raising the east and south embankment around the pond.

Discharge controls for the lower intensity storm could be constructed fairly inexpensively at the outlet into Channel #9. The controls would allow a greater detention period to allow sedimentation of particulate matter in the runoff. Something of a forebay already exists at the entrance to the pond though construction of improvements would be required.

The only negative item about this existing pond is that it is not in City ownership. Nor does the City have ownership and ability to protect the channel leading into the pond. The pond is for sale - apparently aimed at a boating or hunting club. If that happens, the City would of course not be able to use the pond for quality control. And may very likely have to build another nearby.

Acquisition of the pond by the City would appear to be an opportunity to address what will most likely be a future problem with storm water quality. The acquisition might be multi-use facility since it could serve as a park with access to the nearby river bottoms.

Additional Problems

Other problems identified in this study effort include:

- pipe not yet shown on City maps
- existence of flow junction boxes not previously identified

The City is making great strides in getting a GIS system up and in service. One of the attributes of such a system will be the ability to record and then store data such as the location, diameter, material, and elevation of storm drainage system components. When the GIS can provide that vehicle for the storing and retrieval of information, it will be more difficult to lose large pipe or junction boxes.

The data compiled in this study effort and the CAD based maps on which the data is recorded are intended to provide a direct source of information for entry to the GIS.

Detention Policy

Runoff shown on the drawings for sub-basins #31, #32, and #33 is based on no on-site detention in those three basins as a "worst case" scenario. Analysis indicates that the City could relax its detention policy in these three basins with little effect on the channel downstream, though the policy might better apply to any future development east of First Ave - that is, sub-basins #32 and #33.

However, any development upstream of these basins should continue to detain and release storm runoff at the historic 5 year rate, as with the planned expansion of the Gallery Green detention pond.

VI. RECOMMENDATIONS

Construction

This study has identified no specific instances where construction of additional storm drainage facilities could alleviate flooding caused by the major storm. It is a little late to construct major drainage channels now since most of the Basin is developed. Upstream detention ponds can assist in restraining loading on existing piping. But, other than retrofitting a detention facility onto the UNC Campus and possibly constructing a new pond near the Brentwood School, few new detention sites are available in the upper reaches of the Basin.

It is recommended that the City attempt to acquire the main channel from Hwy 85 to the First Ave pond to prevent any further degradation of the channel and to control development immediately adjacent to the channel.

Acquisition of the First Ave pond to hold for probable future construction of storm water quality facilities is recommended. The extent and cost of possible pond improvements are uncertain, though probably not very great. The improvements would most likely include only a forebay dike and overflow, and the construction of a quality discharge outlet at the existing channel to the river.

Construction of those two items in the existing pond configuration is estimated at less than $30,000.

Maintenance

It is recommended that the City ascertain if the existing junction box #06.010 at 17th Ave and Hwy 34 Bypass can be decommissioned as an irrigation flow splitter. If so, the box interior walls and gates should be removed and a concrete lid with access manhole placed on the structure. The work is minor in cost - estimated at not more than $5000.

It is recommended that the City create a drainage utility and fund it adequately to allow aggressive maintenance and repairs of the storm drainage system. A drainage utility could actively seek acquisition of the existing channels and culverts in the Basin's discharge channel to take over maintenance of those ignored facilities.

Future Analysis

It is recommended that the City Public Works staff acquire experience with the XP-SWMM computer program to allow in-house re-simulation of storm runoff on each modeled basin. The output of a computer simulation of a very complex nature such as this is better visualized at the computer than in words or in tables of data. Staff needs only the time. It certainly has the interest.

APPENDIX ONE

GREELEY 24 HOUR RAINFALLS

Greeley 24 Hour Rainfall (inches)

Hour	Min	5 Yr	10 Yr	100 Yr	Hour	Min	5 Yr	10 Yr	100 Yr
0	10	0.060	0.100	0.060	6	10	0.010	0.010	0.020
0	20	0.100	0.200	0.120	6	20	0.010	0.010	0.020
0	30	0.390	0.490	0.310	6	30	0.010	0.008	0.020
0	40	0.180	0.140	1.000	6	40	0.010	0.008	0.020
0	50	0.130	0.110	0.390	6	50	0.010	0.008	0.020
1	0	0.080	0.090	0.170	7	0	0.010	0.008	0.010
1	10	0.070	0.090	0.100	7	10	0.010	0.008	0.010
1	20	0.070	0.080	0.090	7	20	0.010	0.005	0.010
1	30	0.060	0.070	0.090	7	30	0.010	0.005	0.010
1	40	0.040	0.070	0.080	7	40	0.010	0.005	0.010
1	50	0.030	0.050	0.070	7	50	0.010	0.005	0.010
2	0	0.020	0.050	0.060	8	0	0.010	0.005	0.010
2	10	0.020	0.040	0.050	8	10	0.010	0.005	0.010
2	20	0.020	0.040	0.040	8	20	0.010	0.005	0.010
2	30	0.020	0.040	0.040	8	30	0.010	0.005	0.010
2	40	0.020	0.030	0.040	8	40	0.010	0.005	0.010
2	50	0.020	0.030	0.040	8	50	0.010	0.005	0.010
3	0	0.020	0.030	0.040	9	0	0.010	0.005	0.008
3	10	0.020	0.020	0.040	9	10	0.010	0.005	0.008
3	20	0.020	0.020	0.040	9	20	0.010	0.005	0.008
3	30	0.020	0.020	0.040	9	30	0.010	0.005	0.008
3	40	0.020	0.020	0.040	9	40	0.010	0.005	0.008
3	50	0.020	0.020	0.040	9	50	0.010	0.005	0.008
4	0	0.020	0.020	0.030	10	0	0.010	0.003	0.006
4	10	0.020	0.020	0.030	10	10	0.010	0.003	0.006
4	20	0.020	0.020	0.030	10	20	0.010	0.003	0.006
4	30	0.020	0.020	0.030	10	30	0.010	0.003	0.006
4	40	0.020	0.020	0.030	10	40	0.010	0.003	0.006
4	50	0.020	0.020	0.030	10	50	0.010	0.003	0.006
5	0	0.020	0.020	0.020	11	0	0.008	0.003	0.006
5	10	0.020	0.020	0.020	11	10	0.008	0.003	0.006
5	20	0.020	0.020	0.020	11	20	0.005	0.003	0.006
5	30	0.020	0.020	0.020	11	30	0.005	0.003	0.006
5	40	0.020	0.020	0.020	11	40	0.005	0.003	0.006
5	50	0.020	0.020	0.020	11	50	0.005	0.003	0.006
6	0	0.020	0.020	0.020	12	0	0.005	0.003	0.006

(cont'd on next page)

Hour	Min	5 Yr	10 Yr	100 Yr	Hour	Min	5 Yr	10 Yr	100 Yr
12	10	0.004	0.003	0.004	18	10	0.001	0.001	0.002
12	20	0.004	0.003	0.004	18	20	0.001	0.001	0.002
12	30	0.004	0.003	0.004	18	30	0.001	0.001	0.002
12	40	0.004	0.003	0.004	18	40	0.001	0.001	0.002
12	50	0.004	0.003	0.004	18	50	0.001	0.001	0.002
13	0	0.003	0.003	0.004	19	0	0.001	0.001	0.002
13	10	0.003	0.003	0.004	19	10	0.001	0.001	0.002
13	20	0.003	0.003	0.004	19	20	0.001	0.001	0.002
13	30	0.003	0.003	0.004	19	30	0.001	0.001	0.002
13	40	0.003	0.003	0.004	19	40	0.001	0.001	0.002
13	50	0.003	0.003	0.004	19	50	0.001	0.001	0.002
14	0	0.002	0.002	0.004	20	0	0.001	0.001	0.001
14	10	0.002	0.002	0.004	20	10	0.001	0.001	0.001
14	20	0.002	0.002	0.004	20	20	0.001	0.001	0.001
14	30	0.002	0.002	0.004	20	30	0.001	0.001	0.001
14	40	0.002	0.002	0.004	20	40	0.001	0.001	0.001
14	50	0.002	0.002	0.004	20	50	0.001	0.001	0.001
15	0	0.002	0.002	0.004	21	0	0.001	0.001	0.001
15	10	0.002	0.002	0.004	21	10	0.001	0.001	0.001
15	20	0.002	0.002	0.004	21	20	0.001	0.001	0.001
15	30	0.002	0.002	0.004	21	30	0.001	0.001	0.001
15	40	0.002	0.002	0.004	21	40	0.001	0.001	0.001
15	50	0.002	0.002	0.004	21	50	0.001	0.001	0.001
16	0	0.002	0.002	0.004	22	0	0.001	0.001	0.001
16	10	0.002	0.002	0.004	22	10	0.001	0.001	0.001
16	20	0.002	0.002	0.004	22	20	0.001	0.001	0.001
16	30	0.002	0.002	0.004	22	30	0.001	0.001	0.001
16	40	0.002	0.002	0.004	22	40	0.001	0.001	0.001
16	50	0.002	0.001	0.004	22	50	0.001	0.001	0.001
17	0	0.002	0.001	0.003	23	0	0.001	0.001	0.001
17	10	0.002	0.001	0.003	23	10	0.001	0.001	0.001
17	20	0.001	0.001	0.003	23	20	0.001	0.001	0.001
17	30	0.001	0.001	0.003	23	30	0.001	0.001	0.001
17	40	0.001	0.001	0.003	23	40	0.001	0.001	0.001
17	50	0.001	0.001	0.003	23	50	0.001	0.001	0.001
18	0	0.001	0.001	0.003	24	0	0.001	0.001	0.001
				Total 24 hr depth (in) =			2.160	2.400	3.840

GREELEY CENTRAL BASIN

5 YEAR, 24 HR STORM - 3 HR SIMULATION

S U B C A T C H M E N T D A T A

Note that the labels for Infiltration refer to either Horton, Green-Ampt or SCS parameters.

Subcatchment No. - Name	Channel or inlet	Zero Detentn.	Width (ft)	Area (ac)	Percent Imperv.	Slope (ft/ft)	Resistance Imperv.	SCS Green-Ampt Factor Perv.	Depres. Imperv.	Parameters-> Storage(in) Perv.	CN Suction Max Rate	Time Con. Hyd Con Min Rate	Shape Facto Initial MD Decay Rate (1/sec)
1 02.011#1	02.011	.00	1027.00	92.05	50.00	.0207	.013	.030	.020	.100	1.00	.20	.00115
2 03.001#1	03.001	.00	760.00	62.92	35.00	.0247	.013	.030	.020	.100	1.00	.20	.00115
3 11/25#1	11/25	.00	755.00	71.88	40.00	.0235	.013	.030	.020	.100	1.00	.20	.00115
4 11/26#1	11/26	.00	811.00	54.65	45.00	.0181	.013	.030	.020	.100	1.00	.20	.00115
5 06.037#1	06.037	.00	685.00	21.01	85.00	.0202	.013	.030	.020	.100	1.00	.20	.00115
6 06.035#1	06.035	.00	677.00	19.58	70.00	.0183	.013	.030	.020	.100	1.00	.20	.00115
7 06.032#1	06.032	.00	1184.00	60.62	60.00	.0188	.013	.030	.020	.100	1.00	.20	.00115
8 Pnd-GG-1/2#1	Pnd-GG-1/2	.00	1218.00	56.35	85.00	.0164	.013	.030	.020	.100	1.00	.20	.00115
9 06.030#1	06.030	.00	459.00	5.77	85.00	.0256	.013	.030	.020	.100	1.00	.20	.00115
→ 10 Pnd-WM#1	Pnd-WM	.00	633.00	8.41	85.00	.0432	.013	.030	.020	.100	1.00	.20	.00115
11 06.023#1	06.023	.00	832.00	17.18	85.00	.0278	.013	.030	.020	.100	1.00	.20	.00115
12 06.022#1	06.022	.00	1257.00	70.30	60.00	.0226	.013	.030	.020	.100	1.00	.20	.00115
13 06.020#1	06.020	.00	443.00	21.44	70.00	.0214	.013	.030	.020	.100	1.00	.20	.00115
14 Pnd-Mall#1	Pnd-Mall	.00	615.00	28.08	95.00	.0131	.013	.030	.020	.100	1.00	.20	.00115
15 06.015#1	06.015	.00	1677.00	126.30	40.00	.0220	.013	.030	.020	.100	1.00	.20	.00115
16 06.010#1	06.010	.00	682.00	26.11	45.00	.0192	.013	.030	.020	.100	1.00	.20	.00115
17 06.009#1	06.009	.00	569.00	19.15	85.00	.0198	.013	.030	.020	.100	1.00	.20	.00115
18 02.001#1	02.001	.00	966.00	65.95	45.00	.0155	.013	.030	.020	.100	1.00	.20	.00115
19 Culv1-Up#1	Culv1-Up	.00	727.00	33.92	95.00	.0128	.013	.030	.020	.100	1.00	.20	.00115
20 Culv1-Up#2	Culv1-Up	.00	454.00	14.96	75.00	.0077	.013	.030	.020	.100	1.00	.20	.00115
21 07.001#1	07.001	.00	338.00	15.66	50.00	.0258	.013	.030	.020	.100	1.00	.20	.00115
22 Culv1-Dn#1	Culv1-Dn	.00	320.00	10.64	70.00	.0131	.013	.030	.020	.100	1.00	.20	.00115
23 8/22#1	8/22	.00	475.00	12.46	50.00	.0464	.013	.030	.020	.100	1.00	.20	.00115
24 UC3-22nd#1	UC3-22nd	.00	621.00	33.13	50.00	.0207	.013	.030	.020	.100	1.00	.20	.00115
25 UC3-26th#1	UC3-26th	.00	1690.00	131.71	78.00	.0121	.013	.030	.020	.100	1.00	.20	.00115
26 8/23#1	8/23	.00	518.00	14.03	50.00	.0382	.013	.030	.020	.100	1.00	.20	.00115
27 8/24#1	8/24	.00	579.00	16.32	52.00	.0277	.013	.030	.020	.100	1.00	.20	.00115
28 8/25#1	8/25	.00	642.00	49.87	50.00	.0230	.013	.030	.020	.100	1.00	.20	.00115
29 8/26#1	8/26	.00	635.00	25.80	60.00	.0119	.013	.030	.020	.100	1.00	.20	.00115
30 Culv5-Up#1	Culv5-Up	.00	1734.00	145.49	85.00	.0116	.013	.030	.020	.100	1.00	.20	.00115
31 Brdge-Up#1	Brdge-Up	.00	1586.00	155.54	85.00	.0071	.013	.030	.020	.100	1.00	.20	.00115
32 Pond#1	Pond	.00	1629.00	77.07	85.00	.0157	.013	.030	.020	.100	1.00	.20	.00115
33 River#1	River	.00	1507.00	159.76	85.00	.0086	.013	.030	.020	.100	1.00	.20	.00115

Total Number of Subcatchments..	33
Total Tributary Area (acres)....	1724.11
Impervious Area (acres).....	1153.32
Pervious Area (acres).....	570.79
Total Width (feet).....	28705.00
Percent Imperviousness.....	66.89

```
************************************************************
* Hydrographs will be stored for the following  32 INLETS *
************************************************************
02.011     03.001     11/25      11/26      06.037     06.035
06.032     Pnd-GG-1/206.030      Pnd-WH     06.023     06.022
06.020     Pnd-Hall   06.015     06.010     06.009     02.001
Culv1-Up   07.001     Culv1-Dn   8/22       UC3-22nd   UC3-26th
8/23       8/24       8/25       8/26       Culv5-Up   Brdge-Up
Pond       River

*********************************************
*       Continuity Check for Surface Water  *
*********************************************

                                                    Inches over
                                        cubic feet  Total Basin
Total Precipitation (Rain plus Snow)    6.133349E+06     .980
Total Infiltration                      1.109908E+06     .177
Total Evaporation                       1.434244E+05     .023
Surface Runoff from Watersheds          3.896522E+06     .623
Total Water remaining in Surface Storage 1.033897E+06    .165
Infiltration over the Pervious Area...  1.109908E+06     .536
                  --------
Infiltration + Evaporation +
Surface Runoff + Snow removal +
Water remaining in Surface Storage +
Water remaining in Snow Cover.........  6.183752E+06     .988
Total Precipitation + Initial Storage.  6.133349E+06     .980


The error in continuity is calculated as
*****************************************
* Precipitation + Initial Snow Cover  *
*       - Infiltration -              *
*Evaporation - Snow removal -         *
*Surface Runoff from Watersheds -     *
*Water in Surface Storage -           *
*Water remaining in Snow Cover        *
*-------------------------------------*
* Precipitation + Initial Snow Cover  *
*****************************************
Error.....................................  -.822 Percent
```

SUMMARY STATISTICS FOR SUBCATCHMENTS

SUBCATCHMENT NO.	GUTTER OR INLET NO.	AREA (AC)	PERCENT IMPER.	TOTAL SIMULATED RAINFALL (IN)	PERVIOUS AREA TOTAL RUNOFF DEPTH (IN)	PERVIOUS AREA TOTAL LOSSES (IN)	PERVIOUS AREA PEAK RUNOFF RATE (CFS)	IMPERVIOUS AREA RUNOFF DEPTH (IN)	IMPERVIOUS AREA PEAK RUNOFF RATE (CFS)	TOTAL SUBCATCHMENT AREA RUNOFF DEPTH (IN)	TOTAL SUBCATCHMENT AREA PEAK RUNOFF RATE (CFS)	TOTAL SUBCATCHMENT AREA PEAK UNIT RUNOFF (IN/HR)
02.011#1	02.011	92.05	50.0	1.33	.249	1.081	17.14	.835	56.56	.542	73.70	.801
03.001#1	03.001	62.92	35.0	1.33	.241	1.089	14.40	.874	35.53	.462	49.93	.794
11/25#1	11/25	71.88	40.0	1.33	.232	1.098	14.41	.854	40.14	.481	54.55	.759
11/26#1	11/26	54.65	45.0	1.33	.260	1.070	11.99	.861	36.10	.531	48.09	.880
06.037#1	06.037	21.01	85.0	1.33	.381	.949	3.49	.874	28.88	.800	32.37	1.541
06.035#1	06.035	19.58	70.0	1.33	.354	.976	4.36	.885	24.07	.725	28.43	1.452
06.032#1	06.032	60.62	60.0	1.33	.308	1.022	12.68	.862	53.55	.640	66.23	1.093
Pnd-GG-1	Pnd-GG-1	56.35	85.0	1.33	.361	.969	6.76	.837	59.36	.765	66.12	1.173
06.030#1	06.030	5.77	85.0	1.33	.408	.922	1.45	.912	10.60	.837	12.05	2.088
Pnd-WM#1	Pnd-WM	8.41	85.0	1.33	.411	.919	2.20	.917	15.89	.841	18.09	2.151
06.023#1	06.023	17.18	85.0	1.33	.398	.932	3.72	.899	28.71	.824	32.43	1.888
06.022#1	06.022	70.30	60.0	1.33	.308	1.022	14.74	.862	62.22	.640	76.95	1.095
06.020#1	06.020	21.44	70.0	1.33	.332	.998	4.11	.859	21.73	.701	25.84	1.205
Pnd-Mall	Pnd-Mall	28.08	95.0	1.33	.396	.934	1.97	.815	29.01	.795	30.98	1.103
06.015#1	06.015	126.30	40.0	1.33	.251	1.079	28.59	.868	78.00	.498	106.59	.844
06.010#1	06.010	26.11	45.0	1.33	.306	1.024	7.44	.893	22.00	.570	29.44	1.127
06.009#1	06.009	19.15	85.0	1.33	.378	.952	3.00	.868	25.12	.794	28.12	1.468
02.001#1	02.001	65.95	45.0	1.33	.252	1.078	13.76	.855	41.58	.523	55.34	.839
Culv1-Up	Culv1-Up	33.92	95.0	1.33	.395	.935	2.35	.812	34.49	.791	36.84	1.086
Culv1-Up	Culv1-Up	14.96	75.0	1.33	.335	.995	2.45	.844	14.62	.717	17.07	1.141
07.001#1	07.001	15.66	50.0	1.33	.310	1.020	4.18	.886	13.94	.598	18.11	1.157
Culv1-Dn	Culv1-Dn	10.64	70.0	1.33	.339	.991	2.15	.868	11.49	.709	13.64	1.282
8/22#1	8/22	12.46	50.0	1.33	.356	.974	4.68	.915	13.65	.635	18.34	1.472
UC3-22nd	UC3-22nd	33.13	50.0	1.33	.293	1.037	7.96	.873	26.66	.583	34.61	1.045
UC3-26th	UC3-26th	131.71	78.0	1.33	.305	1.025	14.82	.767	96.20	.665	111.02	.843
8/23#1	8/23	14.03	50.0	1.33	.350	.980	5.10	.911	15.08	.631	20.18	1.438
8/24#1	8/24	16.32	52.0	1.33	.342	.988	5.41	.905	17.43	.635	22.84	1.399
8/25#1	8/25	49.87	50.0	1.33	.267	1.063	10.34	.852	34.25	.559	44.58	.894
8/26#1	8/26	25.80	60.0	1.33	.308	1.022	5.41	.862	22.82	.640	28.23	1.094
Culv5-Up	Culv5-Up	145.49	85.0	1.33	.323	1.007	12.97	.738	106.09	.676	119.06	.818
Brdge-Up	Brdge-Up	155.54	85.0	1.33	.297	1.033	11.47	.662	93.47	.607	104.94	.675
Pond#1	Pond	77.07	85.0	1.33	.359	.971	8.96	.832	79.07	.762	88.03	1.142
River#1	River	159.76	85.0	1.33	.298	1.032	11.86	.666	96.81	.611	108.67	.680

*** NOTE *** IMPERVIOUS AREA STATISTICS AGGREGATE IMPERVIOUS AREAS WITH AND WITHOUT DEPRESSION STORAGE

SUMMARY STATISTICS FOR CHANNEL/PIPES

CHANNEL NUMBER	FULL FLOW (CFS)	FULL VELOCITY (FPS)	FULL DEPTH (FT)	MAXIMUM COMPUTED INFLOW (CFS)	MAXIMUM COMPUTED OUTFLOW (CFS)	MAXIMUM COMPUTED DEPTH (FT)	MAXIMUM COMPUTED VELOCITY (FPS)	TIME OF OCCURRENCE DAY	TIME OF OCCURRENCE HR.	LENGTH OF SURCHARGE (HOUR)	MAXIMUM SURCHARGE VOLUME (AC-FT)	RATIO OF MAX. TO FULL FLOW	RATIO OF MAX. DEPTH TO FULL DEPTH
River				108.7				6/ 1/94	2.00				
Pond				88.0				6/ 1/94	1.67				
Brdge-Up				104.9				6/ 1/94	2.00				
Culv5-Up				119.1				6/ 1/94	1.83				
8/26				26.5				6/ 1/94	1.67				
8/25				39.7				6/ 1/94	1.67				
8/24				22.1				6/ 1/94	1.67				
8/23				19.8				6/ 1/94	1.67				
UC3-26th				111.0				6/ 1/94	1.83				
UC3-22nd				31.5				6/ 1/94	1.67				
8/22				18.2				6/ 1/94	1.67				
Culv1-Dn				13.3				6/ 1/94	1.67				
07.001				16.8				6/ 1/94	1.67				
Culv1-Up				53.2				6/ 1/94	1.67				
02.001				48.4				6/ 1/94	1.67				
06.009				28.1				6/ 1/94	1.67				
06.010				27.0				6/ 1/94	1.67				
06.015				92.1				6/ 1/94	1.67				
Pnd-Hall				31.0				6/ 1/94	1.67				
06.020				25.0				6/ 1/94	1.67				
06.022				72.3				6/ 1/94	1.67				
06.023				32.4				6/ 1/94	1.67				
Pnd-WM				18.1				6/ 1/94	1.67				
06.030				12.1				6/ 1/94	1.67				
Pnd-GG-1/2				66.1				6/ 1/94	1.67				
06.032				62.2				6/ 1/94	1.67				
06.035				28.2				6/ 1/94	1.67				
06.037				32.4				6/ 1/94	1.67				
11/26				42.3				6/ 1/94	1.67				
11/25				46.8				6/ 1/94	1.67				
03.001				42.4				6/ 1/94	1.67				
02.011				67.3				6/ 1/94	1.83				

TOTAL NUMBER OF CHANNELS/PIPES = 32

Integration cycles.....	720	
Length of integration step is.....	15.00	seconds
Simulation length.....	3.00	hours
Do not create equiv. pipes(NEQUAL).	0	
Use U.S. customary units for I/O...	0	
Printing starts in cycle.....	1000	
Intermediate printout intervals of.	2500	cycles
Intermediate printout intervals of.	625.00	minutes
Summary printout intervals of.....	1440	cycles
Summary printout time interval of..	360.00	minutes
Hot start file parameter (REDO)....	0	
Initial time.....	.00	hours
Iteration variables: SURTOL.....	.0100	
SURJUN.....	.1200	mm or inch
QREF.....	1.0000	
Minimum depth (m or ft).....	.0030	
Underrelaxation parameter.....	.6500	
Time weighting parameter.....	.6500	
Default Expansion/Contraction K	.0100	
Default Entrance/Exit K.....	.0100	
Default surface area of junctions..	12.60	square feet.
NJSW input hydrograph junctions....	0	

Natural Cross-Section information for Channel 8-23/22
==========
Cross-Section ID (from X1 card) : 1.0 Channel sequence number : 1

Length : 600.0 ft

Manning N : .015 to Station 25.0
" " : .013 in main Channel
" " : .015 Beyond station 85.0

Maximum Elevation : 1.25 ft.
Maximum depth : 1.25 ft.
Maximum Section Area : 79.25 ft^2
Maximum hydraulic radius : .72 ft.
Max topwidth : 110.00 ft.
Maximum Wetted Perimeter : 1.10E+02 ft
Max left bank area : 15.62 ft^2
Max right bank area : 15.62 ft^2
Max center channel area : 48.00 ft^2

Natural Cross-Section information for Channel 8-24/23
==========
Cross-Section ID (from X1 card) : 2.0 Channel sequence number : 2

Length : 706.0 ft

Manning N : .015 to Station 25.0
" " : .013 in main Channel
" " : .015 Beyond station 85.0

Maximum Elevation : 1.25 ft.
Maximum depth : 1.25 ft.
Maximum Section Area : 79.25 ft^2
Maximum hydraulic radius : .72 ft.
Max topwidth : 110.00 ft.
Maximum Wetted Perimeter : 1.10E+02 ft
Max left bank area : 15.62 ft^2
Max right bank area : 15.62 ft^2
Max center channel area : 48.00 ft^2

Natural Cross-Section information for Channel 8-25/24
==========
Cross-Section ID (from X1 card) : 3.0 Channel sequence number : 3

Length : 720.0 ft

Manning N : .015 to Station 25.0
" " : .013 in main Channel
" " : .015 Beyond station 85.0

Maximum Elevation : 1.25 ft.
Maximum depth : 1.25 ft.
Maximum Section Area : 79.25 ft^2
Maximum hydraulic radius : .72 ft.
Max topwidth : 110.00 ft.
Maximum Wetted Perimeter : 1.10E+02 ft
Max left bank area : 15.62 ft^2
Max right bank area : 15.62 ft^2
Max center channel area : 48.00 ft^2

Natural Cross-Section information for Channel 8-26/25
==========
Cross-Section ID (from X1 card) : 4.0 Channel sequence number : 4

Length : 670.0 ft

Manning N : .015 to Station 25.0
" " : .013 in main Channel
" " : .015 Beyond station 85.0

Maximum Elevation : 1.25 ft.
Maximum depth : 1.25 ft.
Maximum Section Area : 79.25 ft^2
Maximum hydraulic radius : .72 ft.
Max topwidth : 110.00 ft.
Maximum Wetted Perimeter : 1.10E+02 ft
Max left bank area : 15.62 ft^2
Max right bank area : 15.62 ft^2
Max center channel area : 48.00 ft^2

Natural Cross-Section information for Channel 8-28/26
==========
Cross-Section ID (from X1 card) : 5.0 Channel sequence number : 5

Length : 1250.0 ft

Manning N : .015 to Station 25.0
" " : .013 in main Channel
" " : .015 Beyond station 85.0

Maximum Elevation : 1.25 ft.
Maximum depth : 1.25 ft.
Maximum Section Area : 79.25 ft^2
Maximum hydraulic radius : .72 ft.
Max topwidth : 110.00 ft.
Maximum Wetted Perimeter : 1.10E+02 ft

```
                                        Max left bank area      :    15.62  ft^2
                                        Max right bank area     :    15.62 ft^2
                                        Max center channel area :    48.00 ft^2

     Natural Cross-Section information for Channel 28th
     ==================================================
      Cross-Section ID (from X1 card) :     6.0 Channel sequence number :     6

Length    :    100.0 ft                     Maximum Elevation       :     1.25     ft.
                                            Maximum depth           :     1.25     ft.
Manning N :       .018  to Station      25.0 Maximum Section Area    :    79.25 ft^2
  "    "  :       .013  in main Channel      Maximum hydraulic radius :     .72     ft.
  "    "  :       .018  Beyond station  85.0 Max topwidth            :   110.00     ft.
                                            Maximum Wetted Perimeter : 1.10E+02 ft
                                            Max left bank area      :    15.62  ft^2
                                            Max right bank area     :    15.62 ft^2
                                            Max center channel area :    48.00 ft^2

     Natural Cross-Section information for Channel 27th
     ==================================================
      Cross-Section ID (from X1 card) :     7.0 Channel sequence number :     7

Length    :   2650.0 ft                     Maximum Elevation       :     2.50     ft.
                                            Maximum depth           :     2.50     ft.
Manning N :       .020  to Station      20.0 Maximum Section Area    :   147.80 ft^2
  "    "  :       .013  in main Channel      Maximum hydraulic radius :     1.71     ft.
  "    "  :       .020  Beyond station  66.0 Max topwidth            :    86.00     ft.
                                            Maximum Wetted Perimeter : 8.63E+01 ft
                                            Max left bank area      :    25.00  ft^2
                                            Max right bank area     :    25.00 ft^2
                                            Max center channel area :    97.80 ft^2

     Natural Cross-Section information for Channel 27 to Chan
     ========================================================
      Cross-Section ID (from X1 card) :     8.0 Channel sequence number :     8

Length    :    200.0 ft                     Maximum Elevation       :     1.50     ft.
                                            Maximum depth           :     1.50     ft.
Manning N :       .020  to Station      20.0 Maximum Section Area    :    81.80 ft^2
  "    "  :       .013  in main Channel      Maximum hydraulic radius :      .95     ft.
  "    "  :       .020  Beyond station  66.0 Max topwidth            :    86.00     ft.
                                            Maximum Wetted Perimeter : 8.61E+01 ft
                                            Max left bank area      :    15.00  ft^2
                                            Max right bank area     :    15.00 ft^2
                                            Max center channel area :    51.80 ft^2

     Natural Cross-Section information for Channel To 27th
     =====================================================
      Cross-Section ID (from X1 card) :     9.0 Channel sequence number :     9

Length    :    100.0 ft                     Maximum Elevation       :     2.00     ft.
                                            Maximum depth           :     2.00     ft.
Manning N :       .020  to Station      20.0 Maximum Section Area    :   114.80 ft^2
  "    "  :       .013  in main Channel      Maximum hydraulic radius :     1.33     ft.
  "    "  :       .020  Beyond station  66.0 Max topwidth            :    86.00     ft.
                                            Maximum Wetted Perimeter : 8.62E+01 ft
                                            Max left bank area      :    20.00  ft^2
                                            Max right bank area     :    20.00 ft^2
                                            Max center channel area :    74.80 ft^2
```

Conduit Data

Inp Num	Conduit Number	Length (ft)	Conduit class	Area (ft^2)	Manning coef.	Max Width (ft)	Depth (ft)	Junctions At The Ends		Invert Height Above Junctions		Trapezoid Side Slopes	
1	6.35-36	135.	Circular	4.91	.02500	2.50	2.50	06.036	06.035				
2	Chan #14	848.	Trapezoid	15.00	.01400	2.00	3.00	06.035	06.034			1.00	1.00
3	6.33-34	665.	Circular	7.07	.01100	3.00	3.00	06.034	06.033				
4	6.31-33	240.	Circular	7.07	.01100	3.00	3.00	06.033	06.031				
5	6.29-31	277.	Circular	7.07	.01100	3.00	3.00	06.031	06.029				
6	6.23-29	417.	Circular	9.62	.01100	3.50	3.50	06.029	06.023				
7	6.19-23	243.	Circular	9.62	.01100	3.50	3.50	06.023	06.019				
8	6.18-19	1537.	Circular	12.57	.01100	4.00	4.00	06.019	06.018				
9	6.14-18	368.	Circular	15.90	.01100	4.50	4.50	06.018	06.014				
10	6.13-14	43.	Circular	15.90	.01100	4.50	4.50	06.014	06.013				
11	6.12-13	320.	Circular	15.90	.01100	4.50	4.50	06.013	06.012				
12	6.11-12	78.	Circular	15.90	.01100	4.50	4.50	06.012	06.011				
13	6.10-11	377.	Circular	15.90	.01100	4.50	4.50	06.011	06.010	.00	2.26		
14	6.9-10	692.	Circular	15.90	.01100	4.50	4.50	06.010	06.009				
15	6.7-9	179.	Circular	12.57	.01100	4.00	4.00	06.009	06.007				
16	6.6-7	290.	Circular	12.57	.01100	4.00	4.00	06.007	06.006				
17	6.5-6	327.	Circular	12.57	.01100	4.00	4.00	06.006	06.005				
18	6.4-5	256.	Circular	12.57	.01100	4.00	4.00	06.005	06.004				
19	6.3-4	292.	Circular	12.57	.01100	4.00	4.00	06.004	06.003				
20	6.2-3	276.	Circular	12.57	.01100	4.00	4.00	06.003	06.002				
21	6.1-2	272.	Circular	12.57	.01100	4.00	4.00	06.002	06.001				
22	2.2-6.1	245.	Circular	12.57	.01100	4.00	4.00	06.001	02.002				
23	2.1-2	239.	Circular	12.57	.01100	4.00	4.00	02.002	02.001				
24	6.31-32	87.	Circular	1.77	.01100	1.50	1.50	06.032	06.031				
25	6.29-30	240.	Circular	4.91	.02500	2.50	2.50	06.030	06.029				
26	6.27-28	649.	Circular	1.23	.01100	1.25	1.25	06.028	06.027				
27	6.26-27	68.	Circular	1.77	.01100	1.50	1.50	06.027	06.026				
28	6.25-26	58.	Circular	1.77	.01100	1.50	1.50	06.026	06.025				
29	6.24-25	85.	Circular	1.77	.01100	1.50	1.50	06.025	06.024				
30	6.21-22	328.	Circular	3.98	.01100	2.25	2.25	06.022	06.021				
31	6.20-21	46.	Circular	4.91	.01100	2.50	2.50	06.021	06.020				
32	6.19-20	258.	Circular	4.91	.01100	2.50	2.50	06.020	06.019				
33	6.23-24	163.	Circular	3.14	.01100	2.00	2.00	06.024	06.023				
34	6.13-15	178.	Circular	4.91	.01100	2.50	2.50	06.015	06.013				
35	7.2-6.9	1987.	Circular	9.62	.01100	3.50	3.50	06.009	07.002	.35	.00		
36	7.1-2	261.	Circular	12.57	.01100	4.00	4.00	07.002	07.001				
37	4.4-5	224.	Circular	1.77	.01100	1.50	1.50	04.005	04.004				
38	4.3-4	106.	Circular	1.77	.01100	1.50	1.50	04.004	04.003				
39	4.2-3	213.	Circular	1.77	.01100	1.50	1.50	04.003	04.002				
40	4.1-2	736.	Circular	3.14	.01100	2.00	2.00	04.002	04.001				
41	2.11-4.1	425.	Circular	3.14	.01100	2.00	2.00	04.001	02.011				
42	4.2-7	109.	Circular	3.14	.01100	2.00	2.00	04.007	04.002				
43	2.18-19	62.	Rectangle	6.00	.01100	3.00	2.00	02.019	02.018				
44	2.16-18	379.	Circular	3.98	.01100	2.25	2.25	02.018	02.016				
45	2.15-16	368.	Circular	3.98	.01100	2.25	2.25	02.016	02.015				
46	2.14-15	472.	Circular	4.91	.01100	2.50	2.50	02.015	02.014				
47	2.13-14	398.	Circular	12.57	.01100	4.00	4.00	02.014	02.013				
48	2.12-13	322.	Circular	12.57	.01100	4.00	4.00	02.013	02.012				
49	2.11-12	212.	Circular	15.90	.01100	4.50	4.50	02.012	02.011				
50	2.10-11	129.	Circular	15.90	.01100	4.50	4.50	02.011	02.010				
51	3.1-2.10	77.	Circular	15.90	.01100	4.50	4.50	02.010	03.001				
52	2.9-3.1	24.	Circular	15.90	.01100	4.50	4.50	03.001	02.009				
53	2.16-17	81.	Circular	1.23	.01100	1.25	1.25	02.017	02.016				
54	3.4-5	363.	Circular	3.98	.01100	2.25	2.25	03.005	03.004				
55	3.3-4	379.	Circular	3.98	.01100	2.25	2.25	03.004	03.003				
56	3.2-3	379.	Circular	5.94	.01100	2.75	2.75	03.003	03.002				
57	3.1-2	198.	Circular	5.94	.01100	2.75	2.75	03.002	03.001	.00	1.00		
58	2.8-9	663.	Circular	12.57	.01100	4.00	4.00	02.009	02.008				
59	1.7-2.8	24.	Circular	7.07	.01100	3.00	3.00	02.008	01.007				

Inp Num	Conduit Number	Length (ft)	Conduit class	Area (ft^2)	Manning coef.	Max Width (ft)	Depth (ft)	Junctions At The Ends		Invert Height Above Junctions		Trapezoid Side Slopes	
60	2.6-7	278.	Circular	4.91	.01100	2.50	2.50	02.007	02.006				
61	2.5-6	414.	Circular	4.91	.01100	2.50	2.50	02.006	02.005				
62	2.4-5	331.	Circular	4.91	.01100	2.50	2.50	02.005	02.004				
63	2.3-4	336.	Circular	4.91	.01100	2.50	2.50	02.004	02.003				
64	2.2-3	369.	Circular	4.91	.01100	2.50	2.50	02.003	02.002				
65	5.3-5	71.	Circular	1.77	.01100	1.50	1.50	05.005	05.003				
66	5.1-3	482.	Circular	1.77	.01100	1.50	1.50	05.003	05.001				
67	2.5-5.1	49.	Circular	1.77	.01100	1.50	1.50	05.001	02.005	.00	3.68		
68	1.5-6	440.	Circular	7.07	.01100	3.00	3.00	01.006	01.005				
69	1.4-5	315.	Circular	7.07	.01100	3.00	3.00	01.005	01.004				
70	1.3-4	288.	Circular	7.07	.01100	3.00	3.00	01.004	01.003				
71	1.2-3	352.	Circular	7.07	.01100	3.00	3.00	01.003	01.002				
72	2.1-1.2	531.	Circular	7.07	.01100	3.00	3.00	01.002	02.001				
73	Chan #1	1272.	Trapezoid	39.00	.01400	10.00	3.00	02.001	Culv1-Up			1.00	1.00
74	Culv #1	230.	Rectangle	18.00	.01400	6.00	3.00	Culv1-Up	Culv1-Dn				
75	Chan #2	120.	Trapezoid	100.00	.03000	10.00	5.00	Culv1-Dn	Culv2-Up			2.00	2.00
76	Chan #8	1293.	Trapezoid	48.00	.04500	8.00	4.00	07.001	Culv1-Dn			1.00	1.00
77	Culv #2	905.	Rectangle	40.00	.01400	8.00	5.00	Culv2-Up	Culv2-Dn				
78	Culv #2.2	45.	Rectangle	196.00	.01400	28.00	7.00	Culv2.1Dn	Culv3-Up				
79	Culv #4	254.	Rectangle	70.00	.01400	10.00	7.00	Culv4-Up	Culv4-Dn				
80	Chan #5	731.	Trapezoid	144.00	.03500	12.00	6.00	Culv4-Dn	Culv5-Up			2.00	2.00
81	Culv #5	80.	Circular	19.63	.02500	5.00	5.00	Culv5-Up	Culv5-Dn				
82	Chan #6	1035.	Trapezoid	168.00	.03500	10.00	7.00	Culv5-Dn	Culv6-Up			2.00	2.00
83	Culv #6	60.	Circular	38.48	.02500	7.00	7.00	Culv6-Up	Culv6-Dn				
84	Chan #7	1340.	Trapezoid	135.00	.04000	6.00	9.00	Culv6-Dn	Brdge-Up			1.00	1.00
85	Bridge	21.	Rectangle	133.00	.04000	19.00	7.00	Brdge-Up	Brdge-Dn				
86	Chan #7.1	464.	Trapezoid	184.00	.04000	15.00	8.00	Brdge-Dn	Pond			1.00	1.00
87	Chan #9	3103.	Trapezoid	85.25	.03500	10.00	5.50	Pond	River			1.00	1.00
88	Chan #13	170.	Trapezoid	15.00	.01400	2.00	3.00	Chan13-Up	Culv10-Up			1.00	1.00
89	Culv #10	80.	Circular	12.57	.01100	4.00	4.00	Culv10-Up	Culv10-Dn				
90	Chan #12	330.	Trapezoid	12.50	.01400	2.50	2.50	Culv10-Dn	Culv9-Up			1.00	1.00
91	Culv #9	453.	Circular	4.91	.01100	2.50	2.50	Culv9-Up	Culv9-Dn				
92	Chan #11	197.	Trapezoid	24.00	.01400	2.00	4.00	Culv9-Dn	Culv8-Up			1.00	1.00
93	Culv #8	60.	Circular	7.07	.01100	3.00	3.00	Culv8-Up	Culv8-Dn				
94	Culv #3	188.	Rectangle	72.00	.01400	12.00	6.00	Culv3-Up	Culv4-Up				
95	1.6-7	17.	Circular	3.14	.01100	2.00	2.00	01.007	01.006				
96	2.7-8	45.	Circular	1.77	.01100	1.50	1.50	02.008	02.007				
97	8-23/22	600.	Natural	79.25	.01300	110.00	1.25	8/22	8/23				
98	8-24/23	706.	Natural	79.25	.01300	110.00	1.25	8/23	8/24				
99	8-25/24	720.	Natural	79.25	.01300	110.00	1.25	8/24	8/25				
100	8-26/25	670.	Natural	79.25	.01300	110.00	1.25	8/25	8/26				
101	8-28/26	1250.	Natural	79.25	.01300	110.00	1.25	8/26	8/28				
102	28th	100.	Natural	79.25	.01300	110.00	1.25	8/28	Chan13-Up	.00	3.09		
103	27th	2650.	Natural	147.80	.01300	86.00	2.50	27th/17	11/27	1.00	.00		
104	27 to Chan	200.	Natural	81.80	.01300	86.00	1.50	11/27	02.001	.00	2.40		
105	To 27th	100.	Natural	114.80	.01300	86.00	2.00	06.010	27th/17	4.97	.00		
106	11-5	286.	Trapezoid	12.32	.01400	.10	.70	11/25	11-Orf4			13.00	37.00
107	11-4	415.	Trapezoid	12.32	.01400	.10	.70	11-Orf4	11/26			13.00	37.00
108	11-3	327.	Trapezoid	12.32	.01400	.10	.70	11/26	11-Orf6			13.00	37.00
109	11-2	332.	Trapezoid	12.32	.01400	.10	.70	11-Orf6	11-Orf7			13.00	37.00
110	11-1	402.	Trapezoid	12.32	.01400	.10	.70	11-Orf7	11/27			13.00	37.00
111	CBC #2.1	50.	Rectangle	45.00	.01100	10.00	4.50	Culv2-Dn	Culv2.1Dn	.00	2.10		
112	Pipe #2.1	50.	Circular	28.27	.01100	6.00	6.00	Culv2-Dn	Culv2.1Dn	.00	2.10		
113	Chan #10	125.	Trapezoid	12.00	.02000	4.00	2.00	Culv8-Dn	Culv2.1Dn	.00	5.10	1.00	1.00

Junction Data

Inp Num	Junction Number	Ground Elev.	Crown Elev.	Invert Elev.	Qinst Cfs	Initial Depth(ft)	Connecting Conduits and Conduit Invert Elevations					
1	01.002	4712.65	4708.82	4705.82	.00	.00	1.2-3	4705.82	2.1-1.2	4705.82		
2	01.003	4717.70	4714.03	4711.03	.00	.00	1.3-4	4711.03	1.2-3	4711.03		
3	01.004	4720.17	4715.46	4712.46	.00	.00	1.4-5	4712.46	1.3-4	4712.46		
4	01.005	4721.26	4717.16	4714.16	.00	.00	1.5-6	4714.16	1.4-5	4714.16		
5	01.006	5000.00	4720.20	4717.20	.00	.00	1.5-6	4717.20	1.6-7	4717.20		
6	01.007	4722.30	4720.50	4717.50	.00	.00	1.7-2.8	4717.50	1.6-7	4717.50		
7	02.001	4705.40	4705.30	4701.30	.00	.00	2.1-2	4701.30	2.1-1.2	4701.30	Chan #1	4701.30 27 to Chan 470
8	02.002	4711.26	4709.60	4705.60	.00	.00	2.2-6.1	4705.60	2.1-2	4705.60	2.2-3	4705.60
9	02.003	4713.90	4710.36	4707.86	.00	.00	2.3-4	4707.86	2.2-3	4707.86		
10	02.004	4718.95	4712.41	4709.91	.00	.00	2.4-5	4709.91	2.3-4	4709.91		
11	02.005	4721.37	4717.50	4712.32	.00	.00	2.5-6	4712.32	2.4-5	4712.32	2.5-5.1	4716.00
12	02.006	4720.87	4716.90	4714.40	.00	.00	2.6-7	4714.40	2.5-6	4714.40		
13	02.007	4721.87	4717.97	4715.47	.00	.00	2.6-7	4715.47	2.7-8	4715.47		
14	02.008	5000.00	4721.60	4717.60	.00	.00	2.8-9	4717.60	1.7-2.8	4717.60	2.7-8	4717.60
15	02.009	4727.03	4724.98	4720.48	.00	.00	2.9-3.1	4720.48	2.8-9	4720.48		
16	02.010	4729.82	4726.86	4722.36	.00	.00	2.10-11	4722.36	3.1-2.10	4722.36		
17	02.011	4732.52	4728.22	4723.72	.00	.00	2.11-4.1	4723.72	2.11-12	4723.72	2.10-11	4723.72
18	02.012	4736.00	4732.50	4728.00	.00	.00	2.12-13	4728.00	2.11-12	4728.00		
19	02.013	4738.34	4734.22	4730.22	.00	.00	2.13-14	4730.22	2.12-13	4730.22		
20	02.014	4742.21	4738.06	4734.06	.00	.00	2.14-15	4734.06	2.13-14	4734.06		
21	02.015	4749.69	4739.83	4737.33	.00	.00	2.15-16	4737.33	2.14-15	4737.33		
22	02.016	4754.56	4750.04	4747.79	.00	.00	2.16-18	4747.79	2.15-16	4747.79	2.16-17	4747.79
23	02.017	4754.02	4749.92	4748.67	.00	.00	2.16-17	4748.67				
24	02.018	4757.90	4752.45	4750.20	.00	.00	2.18-19	4750.20	2.16-18	4750.20		
25	02.019	4760.85	4758.50	4756.50	.00	.00	2.18-19	4756.50				
26	03.001	4727.00	4725.43	4720.93	.00	.00	3.1-2.10	4720.93	2.9-3.1	4720.93	3.1-2	4721.93
27	03.002	4728.87	4727.21	4724.46	.00	.00	3.2-3	4724.46	3.1-2	4724.46		
28	03.003	4732.85	4730.19	4727.44	.00	.00	3.3-4	4727.44	3.2-3	4727.44		
29	03.004	4737.63	4734.83	4732.58	.00	.00	3.4-5	4732.58	3.3-4	4732.58		
30	03.005	4743.45	4739.98	4737.73	.00	.00	3.4-5	4737.73				
31	04.001	4743.21	4738.41	4736.41	.00	.00	4.1-2	4736.41	2.11-4.1	4736.41		
32	04.002	4769.00	4756.26	4754.26	.00	.00	4.2-3	4754.26	4.1-2	4754.26	4.2-7	4754.26
33	04.003	4771.88	4757.35	4755.85	.00	.00	4.3-4	4755.85	4.2-3	4755.85		
34	04.004	4770.70	4759.07	4757.57	.00	.00	4.4-5	4757.57	4.3-4	4757.57		
35	04.005	4765.94	4762.90	4761.40	.00	.00	4.4-5	4761.40				
36	04.007	4771.58	4762.77	4760.77	.00	.00	4.2-7	4760.77				
37	05.001	4721.54	4718.43	4716.93	.00	.00	5.1-3	4716.93	2.5-5.1	4716.93		
38	05.003	4724.04	4722.62	4721.12	.00	.00	5.3-5	4721.12	5.1-3	4721.12		
39	05.005	4724.65	4723.40	4721.90	.00	.00	5.3-5	4721.90				
40	06.001	4713.16	4710.26	4706.26	.00	.00	6.1-2	4706.26	2.2-6.1	4706.26		
41	06.002	4715.54	4712.69	4708.69	.00	.00	6.2-3	4708.69	6.1-2	4708.69		
42	06.003	4718.02	4714.69	4710.69	.00	.00	6.3-4	4710.69	6.2-3	4710.69		
43	06.004	4722.50	4717.80	4713.80	.00	.00	6.4-5	4713.80	6.3-4	4713.80		
44	06.005	4727.29	4720.49	4716.49	.00	.00	6.5-6	4716.49	6.4-5	4716.49		
45	06.006	4730.41	4723.55	4719.55	.00	.00	6.6-7	4719.55	6.5-6	4719.55		
46	06.007	4732.80	4727.30	4723.30	.00	.00	6.7-9	4723.30	6.6-7	4723.30		
47	06.009	4746.49	4728.15	4723.65	.00	.00	6.9-10	4723.65	6.7-9	4723.65	7.2-6.9	4724.00
48	06.010	4747.12	4747.00	4740.03	.00	.00	6.10-11	4742.29	6.9-10	4740.03	To 27th	4745.00
49	06.011	4750.40	4749.53	4745.03	.00	.00	6.11-12	4745.03	6.10-11	4745.03		
50	06.012	4751.05	4750.10	4745.60	.00	.00	6.12-13	4745.60	6.11-12	4745.60		
51	06.013	4755.03	4753.53	4749.03	.00	.00	6.13-14	4749.03	6.12-13	4749.03	6.13-15	4749.03
52	06.014	4755.00	4754.15	4749.65	4.10	.00	6.14-18	4749.65	6.13-14	4749.65		
53	06.015	4756.20	4755.97	4753.47	.00	.00	6.13-15	4753.47				
54	06.018	4760.00	4757.80	4753.30	.00	.00	6.18-19	4753.30	6.14-18	4753.30		
55	06.019	4777.37	4773.55	4769.55	.00	.00	6.19-23	4769.55	6.18-19	4769.55	6.19-20	4769.55
56	06.020	4776.72	4775.22	4772.72	.00	.00	6.20-21	4772.72	6.19-20	4772.72		
57	06.021	4778.83	4775.60	4773.10	.00	.00	6.21-22	4773.10	6.20-21	4773.10		
58	06.022	4783.00	4779.72	4777.47	.00	.00	6.21-22	4777.47				
59	06.023	4779.01	4776.08	4772.58	.00	.00	6.23-29	4772.58	6.19-23	4772.58	6.23-24	4772.58

Inp Num	Junction Number	Ground Elev.	Crown Elev.	Invert Elev.	Qinst Cfs	Initial Depth(ft)	Connecting Conduits and Conduit Invert Elevations							
60	06.024	4779.96	4776.73	4774.73	.00	.00	6.24-25	4774.73	6.23-24	4774.73				
61	06.025	4778.38	4776.79	4775.29	.00	.00	6.25-26	4775.29	6.24-25	4775.29				
62	06.026	4778.12	4777.57	4776.07	.00	.00	6.26-27	4776.07	6.25-26	4776.07				
63	06.027	4781.68	4778.26	4776.76	.00	.00	6.27-28	4776.76	6.26-27	4776.76				
64	06.028	4786.60	4785.87	4784.62	1.70	.00	6.27-28	4784.62						
65	06.029	4790.00	4783.00	4779.50	.00	.00	6.29-31	4779.50	6.23-29	4779.50	6.29-30	4779.50		
66	06.030	4785.77	4783.84	4781.34	9.10	.00	6.29-30	4781.34						
67	06.031	4790.61	4787.09	4784.09	.00	.00	6.31-33	4784.09	6.29-31	4784.09	6.31-32	4784.09		
68	06.032	4786.74	4786.04	4784.54	.00	.00	6.31-32	4784.54						
69	06.033	4791.49	4789.14	4786.14	.00	.00	6.33-34	4786.14	6.31-33	4786.14				
70	06.034	4800.00	4798.33	4795.33	.00	.00	Chan #14	4795.33	6.33-34	4795.33				
71	06.035	4812.00	4809.00	4806.00	.00	.00	6.35-36	4806.00	Chan #14	4806.00				
72	06.036	4810.80	4809.30	4806.80	7.10	.00	6.35-36	4806.80						
73	07.001	4707.00	4705.70	4701.70	.00	.00	7.1-2	4701.70	Chan #8	4701.70				
74	07.002	4713.00	4708.20	4704.20	.00	.00	7.2-6.9	4704.20	7.1-2	4704.20				
75	Culv1-Up	4695.10	4693.40	4690.40	.00	.00	Chan #1	4690.40	Culv #1	4690.40				
76	Culv1-Dn	4693.80	4693.80	4688.80	.00	.00	Culv #1	4688.80	Chan #2	4688.80	Chan #8	4688.80		
77	Culv2-Up	4690.80	4682.80	4677.80	.00	.00	Chan #2	4677.80	Culv #2	4677.80				
78	Culv2-Dn	4674.00	4673.10	4667.10	.00	.00	Culv #2	4667.10	CBC #2.1	4667.10	Pipe #2.1	4667.10		
79	Culv2.1Dn	4674.00	4672.50	4664.40	.00	.00	Culv #2.2	4664.40	CBC #2.1	4666.50	Pipe #2.1	4666.50	Chan #10	4669
80	Culv3-Up	4674.00	4670.20	4663.20	.00	.00	Culv #2.2	4663.20	Culv #3	4663.20				
81	Culv4-Up	4668.40	4666.50	4659.50	.00	.00	Culv #4	4659.50	Culv #3	4659.50				
82	Culv4-Dn	4666.50	4664.40	4657.40	.00	.00	Culv #4	4657.40	Chan #5	4657.40				
83	Culv5-Up	4660.00	4655.30	4649.30	.00	.00	Chan #5	4649.30	Culv #5	4649.30				
84	Culv5-Dn	4660.00	4655.50	4648.50	.00	.00	Culv #5	4648.50	Chan #6	4648.50				
85	Culv6-Up	4651.00	4648.10	4641.10	.00	.00	Chan #6	4641.10	Culv #6	4641.10				
86	Culv6-Dn	4650.00	4649.59	4640.59	.00	.00	Culv #6	4640.59	Chan #7	4640.59				
87	Brdge-Up	4643.40	4642.40	4633.40	.00	.00	Chan #7	4633.40	Bridge	4633.40				
88	Brdge-Dn	4643.40	4641.30	4633.30	.00	.00	Bridge	4633.30	Chan #7.1	4633.30				
89	Pond	4637.00	4637.00	4629.00	.00	.00	Chan #7.1	4629.00	Chan #9	4629.00				
90	River	4630.00	4629.50	4624.00	.00	.00	Chan #9	4624.00						
91	Chan13-Up	4696.25	4696.25	4691.91	.00	.00	Chan #13	4691.91	28th	4695.00				
92	Culv10-Up	4696.00	4692.74	4688.74	.00	.00	Chan #13	4688.74	Culv #10	4688.74				
93	Culv10-Dn	4696.00	4692.71	4688.71	.00	.00	Culv #10	4688.71	Chan #12	4688.71				
94	Culv9-Up	4689.00	4687.50	4685.00	.00	.00	Chan #12	4685.00	Culv #9	4685.00				
95	Culv9-Dn	4682.00	4679.81	4675.81	.00	.00	Culv #9	4675.81	Chan #11	4675.81				
96	Culv8-Up	4676.00	4675.31	4671.31	.00	.00	Chan #11	4671.31	Culv #8	4671.31				
97	Culv8-Dn	4675.00	4672.93	4669.93	.00	.00	Culv #8	4669.93	Chan #10	4669.93				
98	8/22	4717.70	4716.98	4715.73	.00	.00	8-23/22	4715.73						
99	8/23	4711.04	4710.29	4709.04	.00	.00	8-23/22	4709.04	8-24/23	4709.04				
100	8/24	4705.73	4704.98	4703.73	.00	.00	8-24/23	4703.73	8-25/24	4703.73				
101	8/25	4703.39	4702.64	4701.39	.00	.00	8-25/24	4701.39	8-26/25	4701.39				
102	8/26	4702.68	4701.93	4700.68	.00	.00	8-26/25	4700.68	8-28/26	4700.68				
103	8/28	4697.20	4696.95	4695.70	.00	.00	8-28/26	4695.70	28th	4695.70				
104	11/27	4713.50	4713.50	4711.00	.00	.00	27th	4711.00	27 to Chan	4711.00	11-1	4711.00		
105	27th/17	4748.50	4747.50	4744.00	.00	.00	27th	4745.00	To 27th	4744.00				
106	11/25	4722.10	4721.90	4721.20	.00	.00	11-5	4721.20						
107	11-Orf4	4721.20	4721.00	4720.30	.00	.00	11-5	4720.30	11-4	4720.30				
108	11/26	4721.00	4720.80	4720.10	.00	.00	11-4	4720.10	11-3	4720.10				
109	11-Orf6	4719.30	4719.10	4718.40	.00	.00	11-3	4718.40	11-2	4718.40				
110	11-Orf7	4714.20	4714.00	4713.30	.00	.00	11-2	4713.30	11-1	4713.30				

Storage Junction Data

STORAGE JUNCTION NUMBER OR NAME	JUNCTION TYPE	MAXIMUM OR CONSTANT SURFACE AREA (FT2)	PEAK OR CONSTANT VOLUME (CUBIC FEET)	CROWN ELEVATION (FT)
Pond	Stage/Area	486565.20	2351151.00	4637.000

Orifice Data

From Junction	To Junction	Type	Area (ft2)	Depth (ft)	Discharge Coefficient	Height Above Junction (ft)
Culv8-Dn	Culv2.1Dn	Circ Sump	4.20	.00	.800	.000
11/25	02.007	Rect Side	2.50	.50	.700	.000
11/25	02.008	Rect Side	2.50	.50	.700	.000
11-Orf4	02.006	Rect Side	2.50	.50	.700	.000
11/26	02.005	Rect Side	2.50	.50	.700	.000
11-Orf6	02.004	Rect Side	2.50	.50	.700	.000
11-Orf7	02.003	Rect Side	2.50	.50	.700	.000

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====> EQUIVALENT PIPE INFORMATION FOR ORIFICE          1
      CONDUIT NAME..........................  ORF # 1
      PIPE DIAMETER.........................      2.31
      PIPE LENGTH...........................    258.87
      MANNINGS ROUGHNESS....................     .0100
      INVERT ELEVATION AT UPSTREAM END.....  4667.7100
      INVERT ELEVATION AT DOWNSTREAM END...  4667.7000

====> EQUIVALENT PIPE INFORMATION FOR ORIFICE          2
      CONDUIT NAME..........................  ORF # 2
      PIPE DIAMETER.........................      .50
      PIPE LENGTH...........................    120.37
      MANNINGS ROUGHNESS....................     .0090
      INVERT ELEVATION AT UPSTREAM END.....  4721.2000
      INVERT ELEVATION AT DOWNSTREAM END...  4721.1900

====> EQUIVALENT PIPE INFORMATION FOR ORIFICE          3
      CONDUIT NAME..........................  ORF # 3
      PIPE DIAMETER.........................      .50
      PIPE LENGTH...........................    120.37
      MANNINGS ROUGHNESS....................     .0090
      INVERT ELEVATION AT UPSTREAM END.....  4721.2000
      INVERT ELEVATION AT DOWNSTREAM END...  4721.1900

====> EQUIVALENT PIPE INFORMATION FOR ORIFICE          4
      CONDUIT NAME..........................  ORF # 4
      PIPE DIAMETER.........................      .50
      PIPE LENGTH...........................    120.37
      MANNINGS ROUGHNESS....................     .0090
      INVERT ELEVATION AT UPSTREAM END.....  4720.3000
      INVERT ELEVATION AT DOWNSTREAM END...  4720.2900

====> EQUIVALENT PIPE INFORMATION FOR ORIFICE          5
      CONDUIT NAME..........................  ORF # 5
      PIPE DIAMETER.........................      .50
      PIPE LENGTH...........................    120.37
      MANNINGS ROUGHNESS....................     .0090
      INVERT ELEVATION AT UPSTREAM END.....  4720.1000
      INVERT ELEVATION AT DOWNSTREAM END...  4720.0900
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====> EQUIVALENT PIPE INFORMATION FOR ORIFICE          6
      CONDUIT NAME.......................... ORF # 6
      PIPE DIAMETER.........................        .50
      PIPE LENGTH...........................     120.37
      MANNINGS ROUGHNESS....................      .0090
      INVERT ELEVATION AT UPSTREAM END.....  4718.4000
      INVERT ELEVATION AT DOWNSTREAM END...  4718.3900

====> EQUIVALENT PIPE INFORMATION FOR ORIFICE          7
      CONDUIT NAME.......................... ORF # 7
      PIPE DIAMETER.........................        .50
      PIPE LENGTH...........................     120.37
      MANNINGS ROUGHNESS....................      .0090
      INVERT ELEVATION AT UPSTREAM END.....  4713.3000
      INVERT ELEVATION AT DOWNSTREAM END...  4713.2900

Outfall at Junction....River      has boundary condition number...        1


    GREELEY CENTRAL BASIN
    5 YR, 24 HR STORM - 3 HR SIMULATION


        INTERNAL CONNECTIVITY INFORMATION

    CONDUIT      JUNCTION     JUNCTION

    ORF # 1      Culv8-Dn     Culv2.1Dn
    ORF # 2      11/25        02.007
    ORF # 3      11/25        02.008
    ORF # 4      11-Orf4      02.006
    ORF # 5      11/26        02.005
    ORF # 6      11-Orf6      02.004
    ORF # 7      11-Orf7      02.003
    FREE # 1     River        BOUNDARY
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Junction Summary Statistics

GREELEY CENTRAL BASIN
5 YR, 24 HR STORM - 3 HR SIMULATION

Junction Name	Ground Elevation (ft)	Uppermost Pipe Crown Elevation (ft)	Mean Junction Elevation (ft)	Junction Average % Change	Maximum Junction Elev. (ft)	Time of Occurence Hr.	Time of Occurence Min.	Feet of Surcharge at Max Elevation	Feet Max. Depth is Below Ground Elevation	Maximum Junction Area ft^2
01.002	4712.65	4708.82	4706.41	.0625	4708.47	1	44	.00	4.18	12.6
01.003	4717.70	4714.03	4711.53	.0463	4712.83	1	42	.00	4.87	12.6
01.004	4720.17	4715.46	4713.31	.0755	4715.88	1	44	.42	4.29	12.6
01.005	4721.26	4717.16	4715.06	.0914	4718.09	1	52	.93	3.17	12.6
01.006	5000.00	4720.20	4718.14	.4931	4721.70	1	52	1.50	278.30	12.6
01.007	4722.30	4720.50	4718.35	1.0170	4722.01	1	51	1.51	.29	12.6
02.001	4704.30	4705.30	4702.11	.0607	4703.34	1	55	.00	.96	12.6
02.002	4711.26	4709.60	4707.14	.2160	4709.00	1	54	.00	2.26	12.6
02.003	4713.90	4710.36	4709.39	.1496	4712.80	1	53	2.44	1.10	12.6
02.004	4718.95	4712.41	4711.60	.1725	4715.60	2	1	3.19	3.35	12.6
02.005	4721.37	4717.50	4713.95	.1659	4718.17	1	53	.67	3.20	12.6
02.006	4720.87	4716.90	4716.08	.1665	4720.60	1	54	3.70	.27	12.6
02.007	4721.87	4717.97	4717.17	.1659	4721.72	1	54	3.75	.15	12.6
02.008	5000.00	4721.60	4718.63	.1073	4722.42	1	53	.82	277.58	12.6
02.009	4727.03	4724.98	4721.68	.1043	4724.78	1	51	.00	2.25	12.6
02.010	4729.82	4726.86	4722.87	.0536	4724.49	1	51	.00	5.33	12.6
02.011	4732.52	4728.22	4724.33	.0420	4725.37	1	50	.00	7.15	12.6
02.012	4736.00	4732.50	4728.00	.0003	4728.00	0	0	.00	8.00	12.6
02.013	4738.34	4734.22	4730.22	.0003	4730.22	0	0	.00	8.12	12.6
02.014	4742.21	4738.06	4734.06	.0003	4734.06	0	0	.00	8.15	12.6
02.015	4749.69	4739.83	4737.33	.0003	4737.33	0	0	.00	12.36	12.6
02.016	4754.56	4750.04	4747.79	.0003	4747.79	0	0	.00	6.77	12.6
02.017	4754.02	4749.92	4748.67	.0003	4748.67	0	0	.00	5.35	12.6
02.018	4757.90	4752.45	4750.20	.0003	4750.20	0	0	.00	7.70	12.6
02.019	4760.85	4758.50	4756.50	.0003	4756.50	0	0	.00	4.35	12.6
03.001	4727.00	4725.43	4721.89	.0983	4724.76	1	51	.00	2.24	12.6
03.002	4728.87	4727.21	4724.48	.0052	4724.76	1	54	.00	4.11	12.6
03.003	4732.85	4730.19	4727.44	.0003	4727.44	0	0	.00	5.41	12.6
03.004	4737.63	4734.83	4732.58	.0004	4732.58	0	0	.00	5.05	12.6
03.005	4743.45	4739.98	4737.73	.0004	4737.73	0	0	.00	5.72	12.6
04.001	4743.21	4738.41	4736.41	.0003	4736.41	0	0	.00	6.80	12.6
04.002	4769.00	4756.26	4754.26	.0003	4754.26	0	0	.00	14.74	12.6
04.003	4771.88	4757.35	4755.85	.0003	4755.85	0	0	.00	16.03	12.6
04.004	4770.70	4759.07	4757.57	.0003	4757.57	0	0	.00	13.13	12.6
04.005	4765.94	4762.90	4761.40	.0003	4761.40	0	0	.00	4.54	12.6
04.007	4771.58	4762.77	4760.77	.0003	4760.77	0	0	.00	10.81	12.6
05.001	4721.54	4718.43	4717.08	.0216	4718.15	2	1	.00	3.39	12.6
05.003	4724.04	4722.62	4721.12	.0003	4721.12	0	0	.00	2.92	12.6
05.005	4724.65	4723.40	4721.90	.0003	4721.90	0	0	.00	2.75	12.6
06.001	4713.16	4710.26	4708.12	.3677	4710.89	1	53	.63	2.27	12.6
06.002	4715.54	4712.69	4710.11	.3020	4712.95	1	53	.26	2.59	12.6
06.003	4718.02	4714.69	4712.21	.3494	4715.06	1	53	.37	2.96	12.6
06.004	4722.50	4717.80	4715.07	.2745	4717.27	1	53	.00	5.23	12.6
06.005	4727.29	4720.49	4717.77	.2429	4719.50	1	52	.00	7.79	12.6
06.006	4730.41	4723.55	4720.87	.1959	4722.64	1	50	.00	7.77	12.6
06.007	4732.80	4727.30	4724.45	.1319	4725.96	1	50	.00	6.84	12.6
06.009	4746.49	4728.15	4725.57	.1276	4728.16	1	50	.01	18.33	12.6
06.010	4747.12	4747.00	4741.34	.0960	4742.91	1	49	.00	4.21	12.6
06.011	4750.40	4749.53	4747.11	.1396	4750.06	1	48	.53	.34	12.6
06.012	4751.05	4750.10	4747.69	.1552	4750.78	1	48	.68	.27	12.6
06.013	4755.03	4753.53	4750.79	.1377	4753.67	1	48	.14	1.36	12.6
06.014	4755.00	4754.15	4751.27	.1374	4753.87	1	48	.00	1.13	12.6
06.015	4756.20	4755.97	4754.11	.0768	4756.20	1	38	.23	.00	12.6
06.018	4760.00	4757.80	4754.71	.0839	4756.18	1	47	.00	3.82	12.6

Junction Name	Ground Elevation (ft)	Uppermost Pipe Crown Elevation (ft)	Mean Junction Elevation (ft)	Junction Average % Change	Maximum Junction Elev. (ft)	Time of Occurence Hr.	Time of Occurence Min.	Feet of Surcharge at Max Elevation	Feet Max. Depth is Below Ground Elevation	Maximum Junction Area ft^2
06.019	4777.37	4773.55	4771.13	.1151	4772.88	1	44	.00	4.49	12.6
06.020	4776.72	4775.22	4773.90	.1679	4776.72	1	36	1.50	.00	12.6
06.021	4778.83	4775.60	4774.30	.5505	4777.61	1	36	2.01	1.22	12.6
06.022	4783.00	4779.72	4779.36	.1553	4784.70	2	1	4.98	.00	22320.8
06.023	4779.01	4776.08	4773.81	.1259	4775.02	1	43	.00	3.99	12.6
06.024	4779.96	4776.73	4775.04	.0180	4775.07	0	6	.00	4.89	12.6
06.025	4778.38	4776.79	4775.74	.0329	4775.83	0	3	.00	2.55	12.6
06.026	4778.12	4777.57	4776.41	.0218	4776.44	0	5	.00	1.68	12.6
06.027	4781.68	4778.26	4777.14	.0257	4777.18	0	5	.00	4.50	12.6
06.028	4786.60	4785.87	4785.00	.0521	4785.10	0	2	.00	1.50	12.6
06.029	4790.00	4783.00	4780.50	.1030	4780.92	2	6	.00	9.08	12.6
06.030	4785.77	4783.84	4782.92	.2521	4784.95	1	40	1.11	.82	12.6
06.031	4790.61	4787.09	4785.01	.0706	4785.84	1	45	.00	4.77	12.6
06.032	4786.74	4786.04	4786.64	.1546	4789.07	2	8	3.03	.00	46407.4
06.033	4791.49	4789.14	4786.94	.0581	4787.61	1	44	.00	3.88	12.6
06.034	4800.00	4798.33	4795.99	.0501	4796.56	1	42	.00	3.44	12.6
06.035	4809.00	4809.00	4806.61	.0689	4807.17	1	41	.00	1.83	12.6
06.036	4810.80	4809.30	4808.11	.1929	4808.26	0	1	.00	2.54	12.6
07.001	4705.70	4705.70	4703.10	.0689	4704.70	1	51	.00	1.00	12.6
07.002	4713.00	4708.20	4705.39	.0836	4706.70	1	54	.00	6.30	12.6
Culv1-Up	4695.10	4693.40	4691.49	.0742	4693.74	1	57	.34	1.36	12.6
Culv1-Dn	4693.80	4693.80	4689.58	.0416	4690.73	1	56	.00	3.07	12.6
Culv2-Up	4690.80	4682.80	4679.40	.0919	4682.14	1	53	.00	8.66	12.6
Culv2-Dn	4674.00	4673.10	4668.03	.1002	4669.97	1	53	.00	4.03	12.6
Culv2.1D	4674.00	4672.50	4665.10	1.0887	4667.73	1	54	.00	6.27	12.6
Culv3-Up	4674.00	4670.20	4664.06	.6422	4666.32	1	54	.00	7.68	12.6
Culv4-Up	4668.40	4666.50	4660.88	.2274	4664.08	1	54	.00	4.32	12.6
Culv4-Dn	4663.40	4664.40	4658.59	.0898	4660.44	1	58	.00	2.96	12.6
Culv5-Up	4660.00	4655.30	4651.09	.1102	4654.02	2	3	.00	5.98	12.6
Culv5-Dn	4655.50	4655.50	4649.82	.1283	4652.58	2	7	.00	2.92	12.6
Culv6-Up	4651.00	4648.10	4644.33	.1469	4649.74	2	10	1.64	1.26	12.6
Culv6-Dn	4649.59	4649.59	4643.73	.1317	4648.40	2	12	.00	1.19	12.6
Brdge-Up	4643.40	4642.40	4635.51	.1137	4639.15	2	6	.00	4.25	12.6
Brdge-Dn	4643.40	4641.30	4635.39	.1155	4639.00	2	6	.00	4.40	12.6
Pond	4637.10	4637.00	4629.76	.0322	4632.05	3	0	.00	5.05	473813.4
River	4630.00	4629.50	4626.00	.2778	4626.00	0	0	.00	4.00	12.6
Chan13-U	4694.91	4696.25	4692.44	.0308	4693.78	2	6	.00	1.13	12.6
Culv10-U	4696.00	4692.74	4689.63	.0509	4691.88	2	6	.00	4.12	12.6
Culv10-D	4691.21	4692.71	4689.19	.0469	4690.90	2	6	.00	.31	12.6
Culv9-Up	4689.00	4687.50	4686.11	.0678	4689.00	1	0	1.50	.00	12.6
Culv9-Dn	4679.81	4679.81	4676.15	.0252	4676.77	2	0	.00	3.04	12.6
Culv8-Up	4676.00	4675.31	4671.89	.0366	4673.03	2	0	.00	2.97	12.6
Culv8-Dn	4675.00	4672.93	4668.97	.0551	4671.22	2	1	.00	3.78	12.6
8/22	4716.98	4716.98	4715.82	.0096	4716.04	1	42	.00	.94	12.6
8/23	4710.29	4710.29	4709.17	.0144	4709.50	2	2	.00	.79	12.6
8/24	4704.98	4704.98	4703.87	.0170	4704.16	1	44	.00	.82	12.6
8/25	4702.64	4702.64	4701.71	.0202	4702.33	1	55	.00	.31	12.6
8/26	4701.93	4701.93	4700.96	.0163	4701.50	1	0	.00	.43	12.6
8/28	4697.20	4696.95	4695.92	.0113	4696.38	2	5	.00	.82	12.6
11/27	4712.50	4713.50	4711.13	.0050	4711.36	2	17	.00	1.14	12.6
27th/17	4748.50	4747.50	4744.00	.0004	4744.00	0	0	.00	4.50	12.6
11/25	4721.90	4721.90	4721.46	.0187	4721.90	1	40	.00	.00	12.6
11-Orf4	4721.00	4721.00	4720.56	.0155	4721.00	1	41	.00	.00	12.6
11/26	4720.80	4720.80	4720.40	.0180	4720.80	1	40	.00	.00	12.6
11-Orf6	4719.10	4719.10	4718.54	.0134	4718.84	1	41	.00	.26	12.6
11-Orf7	4714.20	4714.00	4713.52	.0151	4714.01	1	46	.01	.19	12.6

5yr

Conduit Summary Statistics

GREELEY CENTRAL BASIN
5 YR, 24 HR STORM - 3 HR SIMULATION

Conduit Name	Design Flow (cfs)	Design Velocity (ft/s)	Conduit Vertical Depth (in)	Maximum Computed Flow (cfs)	Time of Occurence Hr.	Time of Occurence Min.	Maximum Computed Velocity (ft/s)	Time of Occurence Hr.	Time of Occurence Min.	Ratio of Max. to Design Flow	Maximum Depth > at Pipe Ends Upstream (ft)	Maximum Depth > at Pipe Ends Dwnstrm (ft)
6.35-36	1.64E+01	3.34	30.00	7.70E+00	0	1	4.21	0	1	.47	1.45	1.17
Chan #14	2.27E+02	15.12	36.00	3.54E+01	1	41	9.40	1	42	.16	1.17	1.23
6.33-34	9.27E+01	13.11	36.00	3.57E+01	1	43	11.86	1	44	.39	1.23	1.47
6.31-33	7.29E+01	10.31	36.00	3.53E+01	1	44	9.25	1	44	.48	1.47	1.75
6.29-31	1.01E+02	14.35	36.00	5.70E+01	1	45	14.98	1	46	.56	1.75	1.42
6.23-29	1.53E+02	15.92	42.00	7.56E+01	1	44	14.78	1	47	.49	1.42	2.44
6.19-23	1.33E+02	13.80	42.00	1.03E+02	1	44	12.69	1	48	.78	2.44	3.33
6.18-19	1.75E+02	13.89	48.00	1.64E+02	1	45	15.85	1	47	.94	3.33	2.88
6.14-18	2.31E+02	14.55	54.00	1.62E+02	1	47	14.44	2	13	.70	2.88	4.22
6.13-14	2.79E+02	17.55	54.00	1.66E+02	1	48	14.02	2	21	.59	4.22	4.64
6.12-13	2.41E+02	15.13	54.00	2.24E+02	1	48	14.80	2	12	.93	4.64	5.18
6.11-12	1.99E+02	12.50	54.00	2.24E+02	1	48	13.47	1	48	1.13	5.18	5.03
6.10-11	1.98E+02	12.46	54.00	2.24E+02	1	49	13.97	1	49	1.13	5.03	4.17
6.9-10	3.58E+02	22.48	54.00	2.47E+02	1	49	19.64	2	8	.69	2.88	4.51
6.7-9	7.51E+01	5.97	48.00	1.52E+02	1	50	13.56	1	50	2.03	4.51	2.66
6.6-7	1.93E+02	15.36	48.00	1.52E+02	1	50	15.98	1	53	.79	2.66	3.09
6.5-6	1.64E+02	13.07	48.00	1.52E+02	1	51	14.95	1	47	.93	3.09	3.01
6.4-5	1.74E+02	13.85	48.00	1.52E+02	1	52	15.23	2	8	.87	3.01	3.47
6.3-4	1.75E+02	13.94	48.00	1.52E+02	1	52	14.09	2	9	.87	3.47	4.37
6.2-3	1.45E+02	11.50	48.00	1.52E+02	1	53	12.92	2	13	1.05	4.37	4.26
6.1-2	1.60E+02	12.77	48.00	1.52E+02	1	54	11.64	1	54	.95	4.26	4.63
2.2-6.1	8.81E+01	7.01	48.00	1.52E+02	1	53	12.29	1	53	1.72	4.63	3.40
2.1-2	2.28E+02	18.12	48.00	2.01E+02	1	54	21.90	1	54	.88	3.40	2.04
6.31-32	8.93E+00	5.05	18.00	2.60E+01	2	10	15.26	2	17	2.92	4.53	1.75
6.29-30	1.87E+01	3.80	30.00	2.08E+01	1	41	5.43	1	41	1.11	3.61	1.42
6.27-28	8.40E+00	6.85	15.00	2.04E+00	0	3	5.65	0	3	.24	.48	.42
6.26-27	1.25E+01	7.08	18.00	1.94E+00	0	5	5.22	0	6	.16	.42	.37
6.25-26	1.44E+01	8.15	18.00	1.95E+00	0	5	4.75	0	5	.14	.37	.54
6.24-25	1.01E+01	5.70	18.00	1.96E+00	0	6	4.83	0	4	.19	.54	.34
6.21-22	4.22E+01	10.63	27.00	5.13E+01	2	15	12.82	2	15	1.22	7.23	4.51
6.20-21	4.41E+01	8.97	30.00	5.19E+01	2	12	10.55	2	12	1.18	4.51	4.00
6.19-20	5.37E+01	10.95	30.00	6.33E+01	2	3	12.60	2	3	1.18	4.00	3.33
6.23-24	3.07E+01	9.77	24.00	1.95E+00	0	7	2.84	0	7	.06	.34	2.44
6.13-15	7.66E+01	15.60	30.00	7.29E+01	1	38	14.55	1	38	.95	2.73	4.64
7.2-6.9	1.19E+02	12.34	42.00	1.17E+02	1	53	14.00	2	11	.99	4.16	2.50
7.1-2	1.66E+02	13.22	48.00	1.17E+02	1	54	13.58	1	43	.70	2.50	3.00
4.4-5	1.62E+01	9.19	18.00	0.00E+00	0	0	.00	0	0	.00	-3.83	.00
4.3-4	1.58E+01	8.95	18.00	0.00E+00	0	0	.00	0	0	.00	-1.72	.00
4.2-3	1.07E+01	6.07	18.00	0.00E+00	0	0	.00	0	0	.00	-1.59	.00
4.1-2	4.16E+01	13.25	24.00	0.00E+00	0	0	.00	0	0	.00	-17.85	.00
2.11-4.1	4.62E+01	14.71	24.00	0.00E+00	0	0	.00	0	0	.00	-11.04	1.65
4.2-7	6.53E+01	20.80	24.00	0.00E+00	0	0	.00	0	0	.00	-6.51	.00
2.18-19	1.84E+02	30.63	24.00	0.00E+00	0	0	.00	0	0	.00	-6.30	.00
2.16-18	2.92E+01	7.34	27.00	0.00E+00	0	0	.00	0	0	.00	-2.41	.00
2.15-16	6.17E+01	15.52	27.00	0.00E+00	0	0	.00	0	0	.00	-10.46	.00
2.14-15	4.03E+01	8.22	30.00	0.00E+00	0	0	.00	0	0	.00	-3.27	.00
2.13-14	1.67E+02	13.27	48.00	0.00E+00	0	0	.00	0	0	.00	-3.84	.00
2.12-13	1.41E+02	11.22	48.00	0.00E+00	0	0	.00	0	0	.00	-2.22	.00
2.11-12	3.30E+02	20.76	54.00	0.00E+00	0	0	.00	0	0	.00	-2.63	1.65
2.10-11	2.39E+02	15.01	54.00	6.69E+01	1	50	12.24	1	42	.28	1.65	2.13
3.1-2.10	3.17E+02	19.91	54.00	6.69E+01	1	51	10.38	2	9	.21	2.13	3.83
2.9-3.1	3.22E+02	20.23	54.00	1.07E+02	1	42	10.17	2	9	.33	3.83	4.30
2.16-17	7.96E+00	6.48	15.00	0.00E+00	0	0	.00	0	0	.00	-.88	.00

5 yr

Conduit Name	Design Flow (cfs)	Design Velocity (ft/s)	Conduit Vertical Depth (in)	Maximum Computed Flow (cfs)	Time of Occurence Hr.	Time of Occurence Min.	Maximum Computed Velocity (ft/s)	Time of Occurence Hr.	Time of Occurence Min.	Ratio of Max. to Design Flow	Maximum Depth at Pipe Upstream (ft)	Maximum Depth > Ends Dwnstrm (ft)
3.4-5	4.36E+01	10.96	27.00	0.00E+00	0	0	.00	0	0	.00	-5.15	.00
3.3-4	4.26E+01	10.72	27.00	0.00E+00	0	0	.00	0	0	.00	-5.14	.00
3.2-3	5.54E+01	9.33	33.00	0.00E+00	0	0	.00	0	0	.00	-2.68	.30
3.1-2	7.06E+01	11.89	33.00	1.38E+00	1	54	.73	2	42	.02	.30	2.83
2.8-9	1.12E+02	8.90	48.00	1.08E+02	1	42	9.95	1	40	.97	4.30	4.82
1.7-2.8	5.09E+01	7.20	36.00	7.29E+01	1	42	10.18	1	42	1.43	4.82	4.53
2.6-7	3.01E+01	6.13	30.00	3.73E+01	1	39	7.51	1	40	1.24	6.25	6.21
2.5-6	3.44E+01	7.00	30.00	4.00E+01	1	40	8.13	1	40	1.16	6.20	5.85
2.4-5	4.14E+01	8.43	30.00	4.31E+01	1	53	8.89	2	38	1.04	5.85	5.69
2.3-4	3.79E+01	7.71	30.00	4.52E+01	1	43	9.15	1	43	1.19	5.69	4.94
2.2-3	3.79E+01	7.73	30.00	5.00E+01	1	43	10.11	1	44	1.32	4.94	3.40
5.3-5	1.30E+01	7.36	18.00	0.00E+00	0	0	.00	0	0	.00	-.78	.00
5.1-3	1.16E+01	6.55	18.00	0.00E+00	0	0	.00	0	0	.00	-2.97	1.22
2.5-5.1	1.70E+01	9.64	18.00	3.48E+00	2	9	4.38	2	11	.20	1.22	2.17
1.5-6	6.55E+01	9.27	36.00	6.99E+01	1	43	9.73	1	43	1.07	4.51	3.93
1.4-5	5.79E+01	8.19	36.00	6.84E+01	1	44	9.51	1	44	1.18	3.93	3.42
1.3-4	5.55E+01	7.86	36.00	6.82E+01	1	53	11.55	1	45	1.23	3.42	1.80
1.2-3	9.59E+01	13.57	36.00	6.82E+01	1	53	13.52	1	57	.71	1.80	2.65
2.1-1.2	7.27E+01	10.29	36.00	6.85E+01	1	47	12.03	1	45	.94	2.65	2.04
Chan #1	6.30E+02	16.16	36.00	3.25E+02	1	55	10.73	1	46	.52	2.04	3.34
2 blk Culv #1	1.59E+02	8.85	36.00	1.85E+02	1	57	11.97	2	12	1.16	3.34	1.93
Chan #2	3.18E+03	31.82	60.00	5.09E+02	1	56	10.14	2	9	.16	1.93	4.34
Chan #8	2.90E+02	6.05	48.00	1.31E+02	1	53	4.91	1	53	.45	3.00	1.93
Culv #2	6.15E+02	15.38	60.00	5.19E+02	1	54	18.33	1	54	.84	4.34	2.87
Culv #2.2	6.75E+03	34.43	84.00	6.70E+02	1	54	10.61	2	36	.10	3.33	3.12
Culv #4	1.09E+03	15.62	84.00	6.39E+02	1	54	18.21	1	55	.58	4.57	3.04
Chan #5	1.54E+03	10.71	72.00	5.69E+02	2	0	7.71	1	59	.37	3.04	4.72
4 blk Culv #5	1.35E+02	6.90	60.00	1.67E+02	2	1	10.15	2	38	1.23	4.72	4.08
Chan #6	1.54E+03	9.15	84.00	6.77E+02	1	55	6.44	1	52	.44	4.08	8.64
2 blk Culv #6	3.06E+02	7.96	84.00	3.10E+02	2	8	7.81	2	9	1.01	8.64	7.81
Chan #7	9.70E+02	7.19	108.00	6.14E+02	2	10	6.89	2	13	.63	7.81	5.75
Bridge	6.38E+02	4.80	84.00	6.98E+02	2	10	6.56	2	18	1.09	5.75	5.70
Chan #7.	1.90E+03	10.30	96.00	7.02E+02	2	10	9.54	2	9	.37	5.70	3.05
Chan #9	3.24E+02	3.80	66.00	9.17E+01	3	0	2.81	3	0	.28	3.05	2.00
Chan #13	2.76E+02	18.40	36.00	1.05E+02	2	6	9.74	2	6	.38	1.87	3.14
Culv #10	3.30E+01	2.63	48.00	1.05E+02	2	6	12.30	1	57	3.17	3.14	2.19
Chan #12	1.68E+02	13.45	30.00	1.05E+02	2	6	9.29	2	7	.62	2.19	4.00
Culv #9	6.90E+01	14.07	30.00	5.24E+01	2	0	15.18	2	36	.76	4.00	.96
Chan #11	5.70E+02	23.76	48.00	5.31E+01	2	0	12.05	2	1	.09	.96	1.72
Culv #8	1.20E+02	16.91	36.00	5.31E+01	2	1	14.15	2	1	.44	1.72	1.40
Culv #3	1.70E+03	23.64	72.00	6.29E+02	1	54	15.69	1	55	.37	3.12	4.58
Short 1.6-7	3.60E+01	11.47	24.00	2.44E+01	1	42	7.71	1	42	.68	4.51	4.50
2.7-8	2.72E+01	15.37	18.00	1.61E+01	1	38	9.06	1	36	.59	4.82	6.25
8-23/22	7.68E+02	9.21	15.00	1.65E+01	1	41	2.60	1	40	.02	.31	.46
8-24/23	6.31E+02	7.56	15.00	3.10E+01	1	44	3.32	1	45	.05	.46	.43
8-25/24	4.15E+02	4.97	15.00	6.11E+01	1	51	2.64	1	48	.15	.43	.94
8-26/25	2.37E+02	2.84	15.00	9.09E+01	1	56	2.19	1	56	.38	.94	.82
8-28/26	4.59E+02	5.51	15.00	1.09E+02	2	2	3.58	2	3	.24	.82	.68
28th	6.09E+02	6.88	15.00	1.05E+02	2	5	4.19	2	6	.17	.68	.68
27th	2.74E+03	18.53	30.00	0.00E+00	0	0	.00	0	0	.00	-33.64	.36
27 to Ch	1.73E+03	17.09	18.00	1.96E+01	2	18	4.86	2	18	.01	.36	.36
To 27th	1.59E+03	13.83	24.00	0.00E+00	0	0	.00	0	0	.00	-1.00	.00
11-5	3.65E+01	2.96	8.40	3.65E+01	1	53	2.97	2	3	1.00	.70	.70
11-4	1.43E+01	1.16	8.40	1.43E+01	2	3	1.16	2	11	1.00	.70	.70
11-3	4.69E+01	3.81	8.40	3.16E+01	1	41	3.59	1	44	.67	.70	.44
11-2	8.06E+01	6.54	8.40	3.60E+01	1	44	5.14	1	43	.45	.44	.71
11-1	4.92E+01	3.99	8.40	2.63E+01	1	48	3.50	1	49	.54	.71	.36
CBC #2.1	8.93E+02	19.84	54.00	4.16E+02	1	54	24.18	2	15	.47	2.87	1.90
Pipe #2.	5.48E+02	19.39	72.00	1.66E+02	1	54	21.12	2	0	.30	2.87	2.05
Chan #10	6.05E+01	5.04	24.00	2.76E+01	2	1	4.38	2	1	.46	1.29	1.12
ORF # 1	4.10E+01	.63	27.75	2.70E+01	2	35	7.49	1	54	.66	3.51	1.80

5yr

Conduit Name	Design Flow (cfs)	Design Velocity (ft/s)	Conduit Vertical Depth (in)	Maximum Computed Flow (cfs)	Time of Occurence Hr.	Time of Occurence Min.	Maximum Computed Velocity (ft/s)	Time of Occurence Hr.	Time of Occurence Min.	Ratio of Max. to Design Flow	Maximum Depth > at Pipe Ends Upstream (ft)	Maximum Depth > at Pipe Ends Dwnstrm (ft)
ORF # 2	9.93E+00	.56	6.00	6.30E+00	1	40	2.86	1	40	.63	.70	.53
ORF # 3	9.93E+00	.56	6.00	-8.23E+00	1	52	-3.28	1	52	-.83	.70	1.23
ORF # 4	9.93E+00	.56	6.00	6.15E+00	2	11	2.81	2	11	.62	.70	.36
ORF # 5	9.93E+00	.56	6.00	6.17E+00	1	41	2.82	1	41	.62	.70	.36
ORF # 6	9.93E+00	.56	6.00	3.51E+00	1	41	1.98	1	41	.35	.44	.25
ORF # 7	9.93E+00	.56	6.00	5.98E+00	1	47	2.75	1	47	.60	.71	.35

```
===> Your output file was named: C:\XPS\WORK\GRLCB\grlcb--5.out
   JIN for Block #     1 File #   20  C:\XPS\WORK\GRLCB\grl-5yr.rin
  JOUT for Block #     1 File #   21  C:\XPS\WORK\GRLCB\Grlcb.int
   JIN for Block #     2 File #   24  C:\XPS\WORK\GRLCB\grlcb.int
```

SWMM Simulation Date and Time Summary

```
  Starting Date... May       13, 1994
           TIME...         8:26: 2:63
    Ending Date... May       13, 1994
           Time...         8:42:22:56
  Elapsed time...            16.333 minutes
  Elapsed time...           980.000 seconds
```

APPENDIX TWO

CENTRAL BASIN DRAINAGE COMPONENTS

CENTRAL BASIN CHANNEL DATA

Chan #	Description	Length (ft)	Elev Up	Elev Dn	Slope	Bottom Width	Max Depth	Side "z":1	Mng's "n"
1	North Hwy 34 Bypass	1,272	4701.30	4690.44	0.85%	10'	3'	1	0.014
2	Hwy 34 to State Farm	120	4688.81	4677.80	9.20%	10'	5'	2	0.030
5	Hwy 85 to UPRR	731	4657.38	4649.26	1.11%	12'	6'	2	0.035
6	UPRR to 4th	1,035	4648.49	4641.08	0.72%	10'	7'	2	0.035
7	4th to Bridge	1340	4640.59	4633.40	0.54%	6'	9'	1	0.040
7.1	Bridge to Pond	464	4633.30	4629.00	0.93%	12'	9'	1	0.040
8	South Hwy 34 Bypass	1,293	4701.65	4688.81	0.99%	8'	4'	1	0.045
9	Pond to River	3,103	4628.90	4624.60	0.14%	10'	6'	1	0.040
10	Median #1	125	4669.76	4668.80	0.77%	1.25'	2'	1	0.020
11	Median #2	197	4675.81	4671.31	2.28%	1.25'	2'	1	0.014
12	Median #3	330	4688.71	4684.99	1.13%	2'	2.5'	1	0.014
13	Median #4	170	4691.91	4688.74	1.86%	2'	2.5'	1	0.014
14	No. Hwy 34 Bypass(W)	848	4806.00	4795.33	1.26%	2'	3'	1	0.014

CENTRAL BASIN CULVERT DATA

Culv #	Descr	Length (ft)	Elev Up	Elev Dn	Slope (%)	Size	Barrels #	Wing Cond	Mng's "n"
1	CBC	230	4690.44	4688.81	0.71%	6'W x 3'H	2	1	0.014
2	CBC	905	4677.80	4667.11	1.18%	8'W x 5'H	1	2	0.014
2.1	CBC & Pipe	50	4667.11	4666.48	1.26%	10'x 4.5'H & 72"Ø	2	3	0.014
2.2	CBC	45	4664.38	4663.22	2.58%	28'x 7' to 12'x 6'H	1	3	0.014
3	CBC	188	4663.22	4659.50	1.97%	12'x 6'H	1	3	0.014
4	CBC	254	4659.50	4657.38	0.75%	10'x 7'H	1	3	0.014
5	Pipe	80	4649.26	4648.49	0.96%	60"CMP	4	1	0.025
6	Pipe	60	4641.08	4640.59	0.82%	84"CMP	2	3	0.025
7	Bridge	21	4633.40	4633.00	2.00%	19'Wx 7'H	1	3	0.040
8	Pipe	60	4671.31	4669.93	2.30%	30"RCP	1	3	0.014
9	Pipe	453	4684.99	4675.81	2.03%	30"RCP	1	1	0.014
10	Pipe	80	4688.74	4688.71	0.04%	48"RCP	1	3	0.014

APPENDIX THREE

XP-SWMM: 5 YR STORM SIMULATION

Number	Description	Type	Survey ?	Pipe In	Pipe Out	Rim Elev	Inv Elev	North	East
'01.002'	'INLET TYPE R'	'5'L '	'Y'	'36"RCP'	'36"RCP'	4712.65	4705.82	387196.70	2223879.76
'01.003'	'INLET TYPE R'	'5'L '	'Y'	'36"RCP'	'36"RCP'	4717.73	4711.03	387551.76	2223876.89
'01.004'	'INLET TYPE R'	'5'L '	'Y'	'36"RCP'	'36"RCP'	4720.17	4712.46	387839.97	2223873.55
'01.005'	'MH'	'48"'	'Y'	'36"RCP'	'36"RCP'	4721.26	4714.16	388152.79	2223851.55
'01.006'	'JCT BOX (buried)'	10'X 5'X 5'H	'except elev'	'3-19"X30"RCP'	'36"RCP'	4722.20	4717.20	388591.81	2223843.61
'01.007'	'JCT BOX'	10'X 5'X 5'H	'Y'	'36"RCP'	'3-19"X30"RCP'	4722.30	4717.50	388591.81	2223827.16
'02.001'	'PIPE END'	"	'Y'	'48"RCP'	"	4705.68	4701.30	386718.22	2224007.96
'02.002'	'MH'	'72"'	'except inv'	'30"& 48"RCP'	'48"RCP'	4711.26	4705.60	386850.29	2223822.00
'02.003'	'INLET TYPE R'	'5'L '	'Y'	'30"RCP'	'30"RCP'	4713.34	4707.86	387221.06	2223816.27
'02.004'	'INLET TYPE R'	'5'L '	'Y'	'30"RCP'	'30"RCP'	4718.43	4709.91	387550.24	2223812.95
'02.005'	'MH?'	'60"?'	'Y'	'30"&18"RCP'	'30"RCP'	4720.37	4712.32	387879.53	2223808.89
'02.006'	'MH'	'60"?'	'Y'	'30"RCP'	'30"RCP'	4720.87	4714.40	388293.29	2223805.04
'02.007'	'MH'	'60"'	'Y'	'2-18"RCP & 12"RCP'	'30"RCP'	4721.87	4715.47	388571.21	2223802.78
'02.007.1'	'Inlet Type R'	'5'L '	'N'	"	'12"RCP'	4721.20	4719.00	388573.15	2223776.07
'02.008'	'JCT BOX (buried)'	'10'X5'X5'	'Except elev'	'38"X60"RCP & 12"RCP'	'2-18"RCP & 36"RCP'	4722.20	4717.60	388615.80	2223802.00
'02.008.1'	'Inlet Type R'	'5'L '	'N'	"	'12"RCP'	4721.80	4719.00	388629.14	2223774.91
'02.009'	'JCT BOX'	"	'Y'	'54"RCP'	'38"X60"RCP'	4727.03	4720.48	389278.85	2223789.60
'02.010'	'MH'	'72"'	'Y'	'54"RCP'	'54"RCP'	4729.82	4722.36	389374.59	2223761.14
'02.011'	'MH W/GRATE'	'72"'	'Y'	'24"&54"RCP'	'54"RCP'	4732.52	4723.72	389503.37	2223761.91
'02.012'	'MH'	'7'x 7' Box	'N'	'48"RCP'	'54"RCP'	4736.00	4728.00	389634.45	2223595.32
'02.013'	'MH'	'60"'	'Y'	'48"RCP'	'48"RCP'	4738.34	4730.22	389630.05	2223273.77
'02.014'	'INLET TYPE 13'	"	'Y'	'30"&36"RCP'	'48"RCP'	4742.21	4734.06	389625.15	2222877.00
'02.015'	'MH'	'60"'	'Y'	'27"RCP'	'30"RCP'	4749.69	4737.33	389860.87	2222467.66
'02.016'	'MH'	'60"'	'Y'	'15"&27"RCP'	'27"RCP'	4754.56	4747.79	390128.80	2222217.72
'02.017'	'INLET TYPE 13'	'2'X2'	'Y'	"	'15"RCP'	4754.02	4748.67	390075.06	2222156.83
'02.018'	'INLET TYPE 13'	"	'Y'	'12"&18"RCP'	'27"RCP'	4757.90	4750.20	390293.11	2221878.62
'02.019'	'INLET TYPE 13'	'DBL'	'Y'	"	'24"X36"CBC'	4760.85	4756.50	390320.95	2221822.70
'03.001'	'PIPE JCT'	'none'	'N'	'33"&54"RCP'	'54"RCP'	4725.43	4720.93	389301.50	2223782.87
'03.002'	'MH'	'60"'	'Y'	'33"RCP'	'33"RCP'	4728.87	4724.46	389300.13	2223586.42
'03.003'	'MH'	'60"'	'Y'	'27"RCP'	'33"RCP'	4732.85	4727.44	389302.49	2223208.28
'03.004'	'MH'	'60"'	'Y'	'27"RCP'	'27"RCP'	4737.63	4732.58	389302.32	2222831.63
'03.005'	'MH W/GRATE'	'60"'	'Y'	"	'27"RCP'	4743.45	4737.73	389303.00	2222469.53
'04.001'	'MH'	'60"'	'Y'	'24"RCP'	'24"RCP'	4743.21	4736.41	389927.69	2223754.64

Number	Description	Type	Survey ?	Pipe In	Pipe Out	Rim Elev	Inv Elev	North	East
'04.002'	'MH'	'60"'	'Y'	'18"&24"RCP'	'24"RCP'	4769.00	4754.26	390663.34	2223746.15
'04.003'	'MH'	'60"'	'Y'	'18"RCP'	'18"RCP'	4771.88	4755.85	390873.12	2223743.50
'04.004'	'MH'	'48"'	'Y'	'12"&18"RCP'	'18"RCP'	4770.70	4757.57	390920.59	2223648.73
'04.005'	'MH'	'48"'	'Y'	'15"VCP&15"RCP'	'18"RCP'	4765.94	4761.40	391017.66	2223447.03
'04.006'	'INLET TYPE13'	''	'Y'	''	'15"RCP'	4765.10	4762.02	391036.22	2223410.82
'04.007'	'MH'	'48"'	'Y'	'12"&24"RCP'	'24"RCP'	4771.58	4760.77	390664.79	2223854.99
'05.001'	'MH'	'48"?'	'Y'	'2-18"RCP'	'18"RCP'	4721.54	4716.93	387911.29	2223771.95
'05.002'	'INLET TYPE R'	'10'L '	'Y'	''	'18"RCP'	4720.67	4718.12	387923.97	2223769.67
'05.003'	'MH'	'48"?'	'Y'	'15"&18"RCP'	'18"RCP'	4724.04	4721.12	387910.76	2223291.39
'05.004'	'INLET TYPE R'	'5'L '	'N'	''	'15"RCP'	4723.63	4721.50	387920.82	2223285.86
'05.005'	'MH'	'48"?'	'Y'	'18"RCP'	'18"RCP'	4724.65	4721.90	387908.97	2223223.40
'05.006'	'INLET TYPE R'	'10'L '	'N'	''	'18"RCP'	4724.38	4722.00	387912.37	2223220.77
'06.001'	'MH'	'72"?'	'Y'	'48"RCP'	'48"RCP'	4713.16	4706.26	386852.76	2223578.22
'06.002'	'MH'	'72"?'	'Y'	'48"&12"RCP'	'48"RCP'	4715.54	4708.69	386851.63	2223307.15
'06.003'	'MH'	'72"?'	'Y'	'48"&12"RCP'	'48"RCP'	4718.02	4710.69	386830.70	2223032.48
'06.004'	'MH (NOT FND)'	'72"?'	'N'	'48"RCP'	'48"RCP'	4722.50	4713.77	386830.60	2222739.34
'06.005'	'MH'	'72"?'	'Y'	'48"&12"RCP'	'48"RCP'	4727.29	4716.49	386831.39	2222481.55
'06.006'	'MH'	'72"?'	'Y'	'48"&12"RCP'	'48"RCP'	4730.41	4719.55	386831.31	2222156.37
'06.007'	'MH'	'72"?'	'Y'	'48"&12"RCP'	'48"RCP'	4732.80	4723.30	386829.54	2221866.28
'06.008'	'MH (BURIED)'	'48" ACCESS'	'N'	'48"'	'48"RCP'	4738.00	4725.00	386682.63	2221814.00
'06.009'	'JCT BOX'	'10'X6'X7'H	'Y'	'54"RCP'	'48" & 42"RCP'	4746.49	4723.65	386672.22	2221806.21
'06.010'	'Open Box'	'10x10x7d'	'Y'	'54"RCP'	'24"RCP& 54"RCP'	4747.12	4740.03	386755.06	2221148.99
'06.011'	'MH'	'on pipe'	'Y'	'54"RCP'	'54"RCP'	4750.40	4745.03	386863.35	2220807.08
'06.012'	'Grate'	'on pipe'	'Y'	'54"RCP'	'54"RCP'	4751.05	4745.60	386923.77	2220759.68
'06.013'	'Inlet Type R'	'5'L '	'Y'	'54"RCP'	'54"RCP'	4755.03	4749.03	386949.23	2220441.22
'06.014'	'Inlet Type R'	'5'L '	''	'54"RCP'	'54"RCP'	4755.00	4749.65	386931.38	2220402.65
'06.015'	'MH'	''	'Y'	'18"RCP?'	'30"RCP'	4756.20	4753.47	387116.39	2220385.00
'06.016'	'Inlet-Curb'	'2.5' '	'N'	''	'18"RCP?'	4755.00	4753.80	387148.86	2220407.27
'06.017'	'Inlet-Curb'	'2.5' '	'N'	''	'18"RCP?'	4755.47	4753.80	387121.97	2220371.50
'06.018'	'MH?'	''	'N'	'48"RCP'	'54"RCP'	4760.00	4753.30	386822.14	2220053.86
'06.019'	'MH'	'?'	'Y'	'N-30"RCP S-42"RCP'	'E-48"RCP'	4777.37	4769.55	386963.84	2218535.55
'06.020'	''	'?'	'Y'	'30"RCP'	'30"RCP'	4776.72	4772.72	387220.85	2218534.85
'06.021'	'MH'	'?'	'Y'	'27"RCP'	'30"RCP'	4778.83	4773.10	387264.88	2218523.98

Number	Description	Type	Survey ?	Pipe In	Pipe Out	Rim Elev	Inv Elev	North	East
'06.022'	'Pipe End'	''	'Y'	''	'27"RCP'	4780.00	4777.47	387591.97	2218519.07
'06.023'	'MH'	'?'	'Y'	'W-42"RCP S-24"RCP SE'	'N-42"RCP'	4779.01	4772.58	386724.91	2218538.63
'06.024'	'Inlet Type R'	'5'L '	'Y'	'SW-18"RCP SE-18"RCP'	'N-24"RCP'	4779.96	4774.73	386563.61	2218533.56
'06.025'	'Inlet Type C'	''	'Y'	'SW-18"RCP'	'NE-18"RCP'	4778.38	4775.29	386486.98	2218496.32
'06.026'	'Inlet Type C'	''	'Y'	'SE-18"RCP'	'NW-18"RCP'	4778.12	4776.07	386435.73	2218471.88
'06.027'	'Inlet Spec'	''	'Y'	'S-15"RCP & SE-15"RCP'	'NW-18"RCP'	4781.68	4776.76	386384.84	2218517.45
'06.028'	'Inlet Type 3'	''	'N'	'12"RCP from Pond'	'15"RCP'	4786.60	4784.62	385736.57	2218556.34
'06.029'	'MH (BURIED)'	'not fnd'	'N'	'S-42"CMP W-36"RCP'	'42"RCP'	4790.00	4779.50	386711.09	2218123.55
'06.030'	'Inlet Type C'	''	'Y'	'18"RCP from Pond'	'42"CMP'	4785.74	4781.34	386486.81	2218043.60
'06.031'	'Inlet Type C'	''	'Y'	'NW-18"RCP W-36"ECP'	'36"RCP'	4790.61	4784.09	386735.35	2217848.10
'06.032'	'Inlet Type C'	''	'Y'	''	'18"RCP'	4786.74	4784.54	386795.60	2217787.40
'06.033'	'MH'	'?'	'Y'	W-36"RCP S-24"RCP'	'36"RCP'	4791.49	4786.14	386715.21	2217607.93
'06.034'	'Pipe End'	''	'Y'	''	'36"RCP'	4798.60	4795.33	386721.22	2216941.15
'06.035'	'Pipe End'	''	'N'	'30"CMP'	'chan'	4812.00	4806.00	386722.66	2216092.75
'06.036'	'Inlet Type C'	''	'N'	''	'30"CMP'	4810.80	4806.80	386606.26	2216025.26
'07.001'	'PIPE END'	''	'Y'	'48"'	''	4707.00	4701.65	386556.84	2224008.02
'07.002'	'MH (BURIED)'	'72"?'	'N'	'42"RCP'	'48"RCP'	4713.00	4704.20	386696.80	2223788.00

APPENDIX FOUR

XP-SWMM: 10 YR STORM SIMULATION

GREELEY CENTRAL BASIN

10 YEAR, 24 HR STORM - 3 HR SIMULATION

SUMMARY STATISTICS FOR SUBCATCHMENTS

SUBCATCHMENT NO.	GUTTER OR INLET NO.	AREA (AC)	PERCENT IMPER.	TOTAL SIMULATED RAINFALL (IN)	PERVIOUS AREA TOTAL RUNOFF DEPTH (IN)	PERVIOUS AREA TOTAL LOSSES (IN)	PERVIOUS AREA PEAK RUNOFF RATE (CFS)	IMPERVIOUS AREA RUNOFF DEPTH (IN)	IMPERVIOUS AREA PEAK RUNOFF RATE (CFS)	TOTAL SUBCATCHMENT AREA RUNOFF DEPTH (IN)	TOTAL SUBCATCHMENT AREA PEAK RUNOFF RATE (CFS)	TOTAL SUBCATCHMENT AREA PEAK UNIT RUNOFF (IN/HR)
06.037#1	06.037	21.01	85.0	1.72	.608	1.112	6.89	1.146	41.79	1.065	48.68	2.317
06.035#1	06.035	19.58	70.0	1.72	.588	1.132	9.77	1.159	33.98	.987	43.75	2.234
06.032#1	06.032	60.62	60.0	1.72	.538	1.182	23.59	1.131	79.47	.894	103.06	1.700
Pnd-GG-1	Pnd-GG-1	56.35	85.0	1.72	.594	1.126	15.25	1.102	91.64	1.026	106.89	1.897
06.030#1	06.030	5.77	85.0	1.72	.622	1.098	2.21	1.194	13.87	1.108	16.08	2.787
Pnd-WM#1	Pnd-WM	8.41	85.0	1.72	.623	1.097	3.25	1.200	20.53	1.114	23.78	2.828
06.023#1	06.023	17.18	85.0	1.72	.618	1.102	6.32	1.177	39.00	1.093	45.32	2.638
06.022#1	06.022	70.30	60.0	1.72	.539	1.181	27.44	1.131	92.29	.894	119.72	1.703
06.020#1	06.020	21.44	70.0	1.72	.567	1.153	8.31	1.128	32.38	.960	40.69	1.898
Pnd-Mall	Pnd-Mall	28.08	95.0	1.72	.617	1.103	3.41	1.078	45.92	1.055	49.33	1.757
06.015#1	06.015	126.30	40.0	1.72	.462	1.258	41.51	1.139	114.33	.732	155.84	1.234
06.010#1	06.010	26.11	45.0	1.72	.537	1.183	13.79	1.169	30.41	.821	44.21	1.693
11/25#1	11/25	71.88	40.0	1.72	.433	1.287	20.81	1.122	60.35	.709	81.16	1.129
02.011#1	02.011	92.05	50.0	1.72	.459	1.261	24.83	1.100	87.46	.779	112.29	1.220
03.001#1	03.001	62.92	35.0	1.72	.445	1.275	20.83	1.146	51.45	.691	72.28	1.149
11/26#1	11/26	54.65	45.0	1.72	.475	1.245	17.94	1.131	53.61	.770	71.56	1.309
06.009#1	06.009	19.15	85.0	1.72	.606	1.114	6.09	1.139	36.82	1.059	42.91	2.241
07.001#1	07.001	15.66	50.0	1.72	.541	1.179	7.82	1.161	19.59	.851	27.41	1.750
Culv1-Up	Culv1-Up	33.92	95.0	1.72	.616	1.104	4.10	1.073	54.49	1.051	58.58	1.727
Culv1-Up	Culv1-Up	14.96	75.0	1.72	.570	1.150	5.00	1.111	22.33	.975	27.33	1.827
Culv1-Dn	Culv1-Dn	10.64	70.0	1.72	.574	1.146	4.47	1.139	16.85	.969	21.32	2.004
8/22#1	8/22	12.46	50.0	1.72	.590	1.130	10.64	1.197	17.76	.893	28.39	2.279
UC3-22nd	UC3-22nd	33.13	50.0	1.72	.519	1.201	13.67	1.145	38.63	.832	52.30	1.579
UC3-26th	UC3-26th	131.71	78.0	1.72	.535	1.185	27.31	1.022	141.70	.915	169.01	1.283
8/23#1	8/23	14.03	50.0	1.72	.584	1.136	11.20	1.193	19.78	.889	30.98	2.208
8/24#1	8/24	16.32	52.0	1.72	.577	1.143	11.44	1.184	23.29	.893	34.72	2.128
8/25#1	8/25	49.87	50.0	1.72	.484	1.236	15.83	1.120	51.69	.802	67.52	1.354
8/26#1	8/26	25.80	60.0	1.72	.539	1.181	10.06	1.131	33.86	.894	43.92	1.702
Culv5-Up	Culv5-Up	145.49	85.0	1.72	.557	1.163	25.30	.989	151.32	.924	176.61	1.214
Brdge-Up	Brdge-Up	155.54	85.0	1.72	.525	1.195	20.17	.899	120.69	.843	140.86	.906
Pond#1	Pond	77.07	85.0	1.72	.592	1.128	20.44	1.097	122.72	1.021	143.16	1.857
River#1	River	159.76	85.0	1.72	.526	1.194	21.01	.904	125.69	.847	146.70	.918
02.001#1	02.001	65.95	45.0	1.72	.463	1.257	20.04	1.123	62.46	.760	82.50	1.251

*** NOTE *** IMPERVIOUS AREA STATISTICS AGGREGATE IMPERVIOUS AREAS WITH AND WITHOUT DEPRESSION STORAGE

SUMMARY STATISTICS FOR CHANNEL/PIPES

CHANNEL NUMBER	FULL FLOW (CFS)	FULL VELOCITY (FPS)	FULL DEPTH (FT)	MAXIMUM COMPUTED INFLOW (CFS)	MAXIMUM COMPUTED OUTFLOW (CFS)	MAXIMUM COMPUTED DEPTH (FT)	MAXIMUM COMPUTED VELOCITY (FPS)	TIME OF OCCURRENCE DAY	TIME OF OCCURRENCE HR.	LENGTH OF SURCHARGE (HOUR)	MAXIMUM SURCHARGE VOLUME (AC-FT)	RATIO OF MAX. TO FULL FLOW	RATIO OF MAX. DEPTH TO FULL DEPTH
02.001				82.5				6/ 1/94	1.67				
River				146.7				6/ 1/94	1.67				
Pond				143.2				6/ 1/94	1.67				
Brdge-Up				140.9				6/ 1/94	1.67				
Culv5-Up				176.6				6/ 1/94	1.67				
8/26				43.9				6/ 1/94	1.67				
8/25				67.5				6/ 1/94	1.67				
8/24				34.7				6/ 1/94	1.67				
8/23				31.0				6/ 1/94	1.67				
UC3-26th				169.0				6/ 1/94	1.67				
UC3-22nd				52.3				6/ 1/94	1.67				
8/22				28.4				6/ 1/94	1.67				
Culv1-Dn				21.3				6/ 1/94	1.67				
Culv1-Up				85.9				6/ 1/94	1.67				
07.001				27.4				6/ 1/94	1.67				
06.009				42.9				6/ 1/94	1.67				
11/26				71.6				6/ 1/94	1.67				
03.001				71.7				6/ 1/94	1.67				
02.011				112.2				6/ 1/94	1.67				
11/25				80.2				6/ 1/94	1.67				
06.010				44.2				6/ 1/94	1.67				
06.015				155.8				6/ 1/94	1.67				
Pnd-Hall				49.3				6/ 1/94	1.67				
06.020				40.7				6/ 1/94	1.67				
06.022				119.7				6/ 1/94	1.67				
06.023				45.3				6/ 1/94	1.67				
Pnd-WM				23.8				6/ 1/94	1.67				
06.030				16.1				6/ 1/94	1.67				
Pnd-GG-1/2				106.9				6/ 1/94	1.67				
06.032				103.1				6/ 1/94	1.67				
06.035				43.8				6/ 1/94	1.67				
06.037				48.7				6/ 1/94	1.67				

TOTAL NUMBER OF CHANNELS/PIPES = 32

Integration cycles	720	
Length of integration step is	15.00	seconds
Simulation length	3.00	hours
Do not create equiv. pipes(NEQUAL)	0	
Use U.S. customary units for I/O	0	
Printing starts in cycle	1000	
Intermediate printout intervals of	2500	cycles
Intermediate printout intervals of	625.00	minutes
Summary printout intervals of	1440	cycles
Summary printout time interval of	360.00	minutes
Hot start file parameter (REDO)	0	
Initial time	.00	hours
Iteration variables: SURTOL	.0100	
SURJUN	.1200	mm or inch
QREF	1.0000	
Minimum depth (m or ft)	.0030	
Underrelaxation parameter	.6500	
Time weighting parameter	.6500	
Default Expansion/Contraction K	.0100	
Default Entrance/Exit K	.0100	
Default surface area of junctions	12.60	square feet.

Junction Summary Statistics

GREELEY CENTRAL BASIN
10 YR, 24 HR STORM - 3 HR SIMULATION

Junction Name	Ground Elevation (ft)	Uppermost Pipe Crown Elevation (ft)	Mean Junction Elevation (ft)	Junction Average % Change	Maximum Junction Elev. (ft)	Time of Occurence Hr.	Time of Occurence Min.	Feet of Surcharge at Max Elevation	Feet Max. Depth is Below Ground Elevation	Maximum Junction Area ft^2
01.002	4712.65	4708.82	4706.62	.0613	4708.90	1	41	.08	3.75	12.6
01.003	4717.70	4714.03	4711.67	.0456	4713.17	1	39	.00	4.53	12.6
01.004	4720.17	4715.46	4713.59	.0797	4716.16	1	39	.70	4.01	12.6
01.005	4721.26	4717.16	4715.38	.1521	4718.44	1	39	1.28	2.82	12.6
01.006	5000.00	4720.20	4718.52	.9175	4722.12	1	49	1.92	277.88	12.6
01.007	4722.30	4720.50	4718.72	.6028	4722.30	1	38	1.80	.00	12.6
02.001	4704.30	4705.30	4702.25	.0584	4703.46	1	45	.00	.84	12.6
02.002	4711.26	4709.60	4707.34	.2193	4709.26	1	47	.00	2.00	12.6
02.003	4713.90	4710.36	4709.83	.2114	4713.01	1	57	2.65	.89	12.6
02.004	4718.95	4712.41	4712.10	.1882	4715.84	1	57	3.43	3.11	12.6
02.005	4721.37	4717.50	4714.44	.1752	4718.38	1	57	.88	2.99	12.6
02.006	4720.87	4716.90	4716.58	.1649	4720.74	1	59	3.84	.13	12.6
02.007	4721.87	4717.97	4717.67	.1583	4721.87	1	38	3.90	.00	12.6
02.008	5000.00	4721.60	4719.05	.3129	4723.05	1	42	1.45	276.95	12.6
02.009	4727.03	4724.98	4722.26	1.0170	4727.03	1	43	2.05	.00	12.6
02.010	4729.82	4726.86	4723.35	.1859	4727.76	1	39	.90	2.06	12.6
02.011	4732.52	4728.22	4724.65	.0856	4727.76	1	40	.00	4.76	12.6
02.012	4736.00	4732.50	4728.00	.0003	4728.00	0	0	.00	8.00	12.6
02.013	4738.34	4734.22	4730.22	.0003	4730.22	0	0	.00	8.12	12.6
02.014	4742.21	4738.06	4734.06	.0003	4734.06	0	0	.00	8.15	12.6
02.015	4749.69	4739.83	4737.33	.0003	4737.33	0	0	.00	12.36	12.6
02.016	4754.56	4750.04	4747.79	.0003	4747.79	0	0	.00	6.77	12.6
02.017	4754.02	4749.92	4748.67	.0003	4748.67	0	0	.00	5.35	12.6
02.018	4757.90	4752.45	4750.20	.0003	4750.20	0	0	.00	7.70	12.6
02.019	4760.85	4758.50	4756.50	.0003	4756.50	0	0	.00	4.35	12.6
03.001	4727.00	4725.43	4722.44	.2959	4727.00	1	39	1.57	.00	12.6
03.002	4728.87	4727.21	4724.74	.0875	4728.14	1	43	.93	.73	12.6
03.003	4732.85	4730.19	4727.45	.0013	4727.50	1	44	.00	5.35	12.6
03.004	4737.63	4734.83	4732.58	.0004	4732.58	0	0	.00	5.05	12.6
03.005	4743.45	4739.98	4737.73	.0004	4737.73	0	0	.00	5.72	12.6
04.001	4743.21	4738.41	4736.41	.0003	4736.41	0	0	.00	6.80	12.6
04.002	4769.00	4756.26	4754.26	.0003	4754.26	0	0	.00	14.74	12.6
04.003	4771.88	4757.35	4755.85	.0003	4755.85	0	0	.00	16.03	12.6
04.004	4770.70	4759.07	4757.57	.0003	4757.57	0	0	.00	13.13	12.6
04.005	4765.94	4762.90	4761.40	.0003	4761.40	0	0	.00	4.54	12.6
04.007	4771.58	4762.77	4760.77	.0003	4760.77	0	0	.00	10.81	12.6
05.001	4721.54	4718.43	4717.16	.0253	4718.38	1	58	.00	3.17	12.6
05.003	4724.04	4722.62	4721.12	.0003	4721.12	0	0	.00	2.92	12.6
05.005	4724.65	4723.40	4721.90	.0003	4721.90	0	0	.00	2.75	12.6
06.001	4713.16	4710.26	4708.42	.3860	4711.59	1	46	1.33	1.57	12.6
06.002	4715.54	4712.69	4710.44	.4853	4714.40	1	44	1.71	1.14	12.6
06.003	4718.02	4714.69	4712.60	.5374	4716.99	1	46	2.30	1.03	12.6
06.004	4722.50	4717.80	4715.47	.5358	4719.86	1	47	2.06	2.64	12.6
06.005	4727.29	4720.49	4718.16	.3855	4722.48	1	43	1.99	4.81	12.6
06.006	4730.41	4723.55	4721.24	.2663	4725.59	1	47	2.04	4.82	12.6
06.007	4732.80	4727.30	4724.72	.1609	4728.26	1	46	.96	4.54	12.6
06.009	4746.49	4728.15	4725.94	.1622	4730.46	1	46	2.31	16.03	12.6
06.010	4747.12	4747.00	4741.55	.1011	4743.48	1	47	.00	3.64	12.6
06.011	4750.40	4749.53	4747.40	.1362	4750.27	1	45	.74	.13	12.6
06.012	4751.05	4750.10	4747.99	.1518	4751.05	1	44	.95	.00	12.6
06.013	4755.03	4753.53	4751.08	.1456	4754.29	1	48	.76	.74	12.6
06.014	4755.00	4754.15	4751.51	.1428	4754.59	1	48	.44	.41	12.6
06.015	4756.20	4755.97	4754.36	.0758	4756.20	1	34	.23	.00	12.6
06.018	4760.00	4757.80	4754.89	.0950	4756.92	1	48	.00	3.08	12.6

Junction Name	Ground Elevation (ft)	Uppermost Pipe Crown Elevation (ft)	Mean Junction Elevation (ft)	Junction Average % Change	Maximum Junction Elev. (ft)	Time of Occurence Hr.	Time of Occurence Min.	Feet of Surcharge at Max Elevation	Feet Max. Depth is Below Ground Elevation	Maximum Junction Area ft^2
06.019	4777.37	4773.55	4771.34	.1278	4773.82	1	43	.27	3.55	12.6
06.020	4776.72	4775.22	4774.29	.2761	4776.72	1	33	1.50	.00	12.6
06.021	4778.83	4775.60	4774.72	.7623	4777.35	1	33	1.75	1.48	12.6
06.022	4783.00	4779.72	4780.31	.1642	4785.28	2	1	5.56	.00	44005.9
06.023	4779.01	4776.08	4774.00	.1192	4776.58	1	43	.51	2.42	12.6
06.024	4779.96	4776.73	4775.10	.0735	4776.89	1	42	.16	3.07	12.6
06.025	4778.38	4776.79	4775.76	.0773	4777.28	1	42	.49	1.10	12.6
06.026	4778.12	4777.57	4776.40	.0341	4776.89	1	42	.00	1.23	12.6
06.027	4781.68	4778.26	4777.15	.0268	4777.18	1	50	.00	4.50	12.6
06.028	4786.60	4785.87	4784.99	.0534	4785.10	0	2	.00	1.50	12.6
06.029	4790.00	4783.00	4780.65	.0860	4781.48	1	42	.00	8.52	12.6
06.030	4785.77	4783.84	4782.93	.2427	4785.08	1	40	1.24	.69	12.6
06.031	4790.61	4787.09	4785.06	.0559	4785.95	1	43	.00	4.66	12.6
06.032	4786.74	4786.04	4787.01	.0961	4789.41	2	11	3.37	.00	67532.0
06.033	4791.49	4789.14	4786.92	.0665	4787.98	1	42	.00	3.51	12.6
06.034	4800.00	4798.33	4796.08	.0522	4796.79	1	41	.00	3.21	12.6
06.035	4809.00	4809.00	4806.62	.0733	4807.39	1	40	.00	1.61	12.6
06.036	4810.80	4809.30	4808.10	.1938	4808.26	0	1	.00	2.54	12.6
07.001	4705.70	4705.70	4703.28	.0669	4704.79	1	49	.00	.91	12.6
07.002	4713.00	4708.20	4705.54	.0834	4706.80	1	48	.00	6.20	12.6
Culv1-Up	4695.10	4693.40	4691.84	.0881	4694.84	1	53	1.44	.26	12.6
Culv1-Dn	4693.80	4693.80	4689.71	.0408	4690.81	1	52	.00	2.99	12.6
Culv2-Up	4690.80	4682.80	4679.78	.1038	4683.22	1	56	.42	7.58	12.6
Culv2-Dn	4674.00	4673.10	4668.21	.0850	4670.01	1	46	.00	3.99	12.6
Culv2.1D	4674.00	4672.50	4665.33	1.6025	4667.87	1	46	.00	6.13	12.6
Culv3-Up	4674.00	4670.20	4664.26	.8848	4666.23	1	46	.00	7.77	12.6
Culv4-Up	4668.40	4666.50	4661.16	.1703	4663.94	1	47	.00	4.46	12.6
Culv4-Dn	4663.40	4664.40	4658.72	.0758	4660.33	1	47	.00	3.07	12.6
Culv5-Up	4660.00	4655.30	4651.47	.1140	4654.71	2	2	.00	5.29	12.6
Culv5-Dn	4655.50	4655.50	4650.22	.1302	4653.19	2	5	.00	2.31	12.6
Culv6-Up	4651.00	4648.10	4644.93	.1426	4650.36	2	9	2.26	.64	12.6
Culv6-Dn	4649.59	4649.59	4644.20	.1244	4648.76	2	12	.00	.83	12.6
Brdge-Up	4643.40	4642.40	4635.84	.1090	4639.42	2	1	.00	3.98	12.6
Brdge-Dn	4643.40	4641.30	4635.71	.1107	4639.26	2	1	.00	4.14	12.6
Pond	4637.10	4637.00	4630.00	.0381	4632.87	3	0	.00	4.23	479164.6
River	4630.00	4629.50	4626.00	.2778	4626.00	0	0	.00	4.00	12.6
Chan13-U	4694.91	4696.25	4692.46	.0394	4694.21	1	59	.00	.70	12.6
Culv10-U	4696.00	4692.74	4689.89	.0654	4692.64	1	59	.00	3.36	12.6
Culv10-D	4691.21	4692.71	4689.34	.0513	4691.21	1	55	.00	.00	12.6
Culv9-Up	4689.00	4687.50	4686.42	.0679	4689.00	1	52	1.50	.00	12.6
Culv9-Dn	4679.81	4679.81	4676.20	.0311	4676.79	1	52	.00	3.02	12.6
Culv8-Up	4676.00	4675.31	4672.02	.0438	4673.05	1	53	.00	2.95	12.6
Culv8-Dn	4675.00	4672.93	4669.22	.0676	4671.31	1	57	.00	3.69	12.6
8/22	4716.98	4716.98	4715.82	.0125	4716.00	1	38	.00	.98	12.6
8/23	4710.29	4710.29	4709.20	.0162	4709.56	1	43	.00	.73	12.6
8/24	4704.98	4704.98	4703.92	.0179	4704.22	1	42	.00	.76	12.6
8/25	4702.64	4702.64	4701.80	.0218	4702.47	1	50	.00	.17	12.6
8/26	4701.93	4701.93	4701.02	.0174	4701.62	1	54	.00	.31	12.6
8/28	4697.20	4696.95	4695.98	.0129	4696.48	1	58	.00	.72	12.6
11/27	4712.50	4713.50	4711.15	.0045	4711.36	2	26	.00	1.14	12.6
27th/17	4748.50	4747.50	4744.00	.0004	4744.00	0	0	.00	4.50	12.6
11/25	4721.90	4721.90	4721.52	.0179	4721.90	1	34	.00	.00	12.6
11-Orf4	4721.00	4721.00	4720.62	.0142	4721.00	1	37	.00	.00	12.6
11/26	4720.80	4720.80	4720.47	.0169	4720.80	1	36	.00	.00	12.6
11-Orf6	4719.10	4719.10	4718.57	.0128	4718.83	1	37	.00	.27	12.6
11-Orf7	4714.20	4714.00	4713.58	.0143	4714.01	1	42	.01	.19	12.6

10yr

Conduit Summary Statistics

GREELEY CENTRAL BASIN
10 YR, 24 HR STORM - 3 HR SIMULATION

Conduit Name	Design Flow (cfs)	Design Velocity (ft/s)	Conduit Vertical Depth (in)	Maximum Computed Flow (cfs)	Time of Occurence Hr.	Time of Occurence Min.	Maximum Computed Velocity (ft/s)	Time of Occurence Hr.	Time of Occurence Min.	Ratio of Max. to Design Flow	Maximum Depth > at Pipe Ends Upstream (ft)	Maximum Depth > at Pipe Ends Dwnstrm (ft)
6.35-36	1.64E+01	3.34	30.00	7.70E+00	0	1	4.21	0	1	.47	1.45	1.39
Chan #14	2.27E+02	15.12	36.00	4.97E+01	1	41	10.30	1	42	.22	1.39	1.46
6.33-34	9.27E+01	13.11	36.00	4.97E+01	1	42	12.77	1	43	.54	1.46	1.84
6.31-33	7.29E+01	10.31	36.00	4.98E+01	1	43	10.94	1	44	.68	1.84	1.86
6.29-31	1.01E+02	14.35	36.00	7.26E+01	1	43	15.35	1	45	.72	1.86	1.98
6.23-29	1.53E+02	15.92	42.00	9.38E+01	1	42	13.53	1	49	.61	1.98	4.00
6.19-23	1.33E+02	13.80	42.00	1.31E+02	1	41	13.36	1	48	.98	4.00	4.27
6.18-19	1.75E+02	13.89	48.00	1.86E+02	1	47	15.86	1	49	1.07	4.27	3.62
6.14-18	2.31E+02	14.55	54.00	1.84E+02	1	48	14.32	2	37	.80	3.62	4.94
6.13-14	2.79E+02	17.55	54.00	1.88E+02	1	48	13.88	2	36	.68	4.94	5.26
6.12-13	2.41E+02	15.13	54.00	2.40E+02	1	48	14.81	2	15	1.00	5.26	5.45
6.11-12	1.99E+02	12.50	54.00	2.34E+02	1	47	14.15	1	47	1.18	5.45	5.24
6.10-11	1.98E+02	12.46	54.00	2.34E+02	1	47	14.50	1	47	1.18	5.24	4.20
6.9-10	3.58E+02	22.48	54.00	2.66E+02	1	42	19.71	2	11	.74	3.45	6.81
6.7-9	7.51E+01	5.97	48.00	1.85E+02	1	42	15.43	1	42	2.47	6.81	4.96
6.6-7	1.93E+02	15.36	48.00	1.84E+02	1	41	15.87	2	2	.95	4.96	6.04
6.5-6	1.64E+02	13.07	48.00	1.79E+02	1	42	14.77	1	41	1.09	6.04	6.01
6.4-5	1.74E+02	13.85	48.00	1.71E+02	1	42	15.22	2	7	.98	5.99	6.06
6.3-4	1.75E+02	13.94	48.00	1.66E+02	1	48	14.07	2	8	.95	6.06	6.30
6.2-3	1.45E+02	11.50	48.00	1.67E+02	1	46	13.23	1	46	1.15	6.31	5.72
6.1-2	1.60E+02	12.77	48.00	1.67E+02	1	47	13.24	1	47	1.04	5.71	5.33
2.2-6.1	8.81E+01	7.01	48.00	1.67E+02	1	47	13.51	1	47	1.89	5.33	3.66
2.1-2	2.28E+02	18.12	48.00	2.15E+02	1	47	22.10	1	48	.94	3.66	2.16
6.31-32	8.93E+00	5.05	18.00	2.73E+01	2	12	15.86	2	22	3.05	4.87	1.86
6.29-30	1.87E+01	3.80	30.00	2.52E+01	1	40	5.57	1	40	1.35	3.74	1.98
6.27-28	8.40E+00	6.85	15.00	2.04E+00	0	3	5.65	0	3	.24	.48	.42
6.26-27	1.25E+01	7.08	18.00	2.15E+00	1	42	5.32	1	51	.17	.42	.82
6.25-26	1.44E+01	8.15	18.00	4.11E+00	1	43	5.46	1	47	.29	.82	1.99
6.24-25	1.01E+01	5.70	18.00	4.65E+00	1	43	4.90	1	52	.46	2.00	2.16
6.21-22	4.22E+01	10.63	27.00	5.26E+01	2	27	13.12	2	27	1.25	7.81	4.25
6.20-21	4.41E+01	8.97	30.00	5.34E+01	2	19	10.86	2	19	1.21	4.25	4.00
6.19-20	5.37E+01	10.95	30.00	6.41E+01	1	53	12.78	1	53	1.19	4.00	4.27
6.23-24	3.07E+01	9.77	24.00	4.95E+00	1	46	2.85	0	7	.16	2.16	4.00
6.13-15	7.66E+01	15.60	30.00	7.55E+01	1	34	14.89	1	34	.99	2.73	5.26
7.2-6.9	1.19E+02	12.34	42.00	1.23E+02	1	47	14.00	1	47	1.03	6.46	2.60
7.1-2	1.66E+02	13.22	48.00	1.23E+02	1	48	13.33	1	38	.74	2.60	3.09
4.4-5	1.62E+01	9.19	18.00	0.00E+00	0	0	.00	0	0	.00	-3.83	.00
4.3-4	1.58E+01	8.95	18.00	0.00E+00	0	0	.00	0	0	.00	-1.72	.00
4.2-3	1.07E+01	6.07	18.00	0.00E+00	0	0	.00	0	0	.00	-1.59	.00
4.1-2	4.16E+01	13.25	24.00	0.00E+00	0	0	.00	0	0	.00	-17.85	.00
2.11-4.1	4.62E+01	14.71	24.00	0.00E+00	0	0	.00	0	0	.00	-8.65	4.04
4.2-7	6.53E+01	20.80	24.00	0.00E+00	0	0	.00	0	0	.00	-6.51	.00
2.18-19	1.84E+02	30.63	24.00	0.00E+00	0	0	.00	0	0	.00	-6.30	.00
2.16-18	2.92E+01	7.34	27.00	0.00E+00	0	0	.00	0	0	.00	-2.41	.00
2.15-16	6.17E+01	15.52	27.00	0.00E+00	0	0	.00	0	0	.00	-10.46	.00
2.14-15	4.03E+01	8.22	30.00	0.00E+00	0	0	.00	0	0	.00	-3.27	.00
2.13-14	1.67E+02	13.27	48.00	0.00E+00	0	0	.00	0	0	.00	-3.84	.00
2.12-13	1.41E+02	11.22	48.00	0.00E+00	0	0	.00	0	0	.00	-2.22	.00
2.11-12	3.30E+02	20.76	54.00	0.00E+00	0	0	.00	0	0	.00	-.24	4.04
2.10-11	2.39E+02	15.01	54.00	1.28E+02	1	41	12.16	2	11	.54	4.05	5.40
3.1-2.10	3.17E+02	19.91	54.00	1.33E+02	1	40	10.09	2	14	.42	5.40	6.07
2.9-3.1	3.22E+02	20.23	54.00	1.33E+02	1	42	10.12	2	13	.41	6.07	6.55
2.16-17	7.96E+00	6.48	15.00	0.00E+00	0	0	.00	0	0	.00	-.88	.00

10yr

Conduit Name	Design Flow (cfs)	Design Velocity (ft/s)	Conduit Vertical Depth (in)	Maximum Computed Flow (cfs)	Time of Occurence Hr.	Time of Occurence Min.	Maximum Computed Velocity (ft/s)	Time of Occurence Hr.	Time of Occurence Min.	Ratio of Max. to Design Flow	Maximum Depth > at Pipe Ends Upstream (ft)	Maximum Depth > at Pipe Ends Dwnstrm (ft)
3.4-5	4.36E+01	10.96	27.00	0.00E+00	0	0	.00	0	0	.00	-5.15	.00
3.3-4	4.26E+01	10.72	27.00	0.00E+00	0	0	.00	0	0	.00	-5.08	.06
3.2-3	5.54E+01	9.33	33.00	-1.05E+00	1	44	.50	2	28	-.02	.06	3.68
3.1-2	7.06E+01	11.89	33.00	-2.53E+01	1	42	-5.01	1	41	-.36	3.68	5.07
2.8-9	1.12E+02	8.90	48.00	1.30E+02	1	44	10.30	1	43	1.16	6.55	5.46
1.7-2.8	5.09E+01	7.20	36.00	8.34E+01	1	41	11.75	1	49	1.64	5.46	4.80
2.6-7	3.01E+01	6.13	30.00	3.82E+01	1	36	7.70	1	36	1.27	6.40	6.34
2.5-6	3.44E+01	7.00	30.00	4.12E+01	1	36	8.38	1	36	1.20	6.34	6.06
2.4-5	4.14E+01	8.43	30.00	4.35E+01	1	38	8.94	3	0	1.05	6.06	5.93
2.3-4	3.79E+01	7.71	30.00	4.63E+01	1	39	9.36	1	39	1.22	5.93	5.15
2.2-3	3.79E+01	7.73	30.00	5.12E+01	1	39	10.17	1	39	1.35	5.15	3.66
5.3-5	1.30E+01	7.36	18.00	0.00E+00	0	0	.00	0	0	.00	-.78	.00
5.1-3	1.16E+01	6.55	18.00	0.00E+00	0	0	.00	0	0	.00	-2.75	1.44
2.5-5.1	1.70E+01	9.64	18.00	3.20E+00	2	14	3.72	2	15	.19	1.44	2.38
1.5-6	6.55E+01	9.27	36.00	7.29E+01	1	38	10.28	1	38	1.11	4.92	4.28
1.4-5	5.79E+01	8.19	36.00	7.21E+01	1	38	9.97	1	38	1.24	4.28	3.70
1.3-4	5.55E+01	7.86	36.00	7.26E+01	1	39	11.72	1	44	1.31	3.70	2.14
1.2-3	9.59E+01	13.57	36.00	8.01E+01	1	40	13.99	1	40	.84	2.14	3.08
2.1-1.2	7.27E+01	10.29	36.00	7.41E+01	1	42	12.12	1	43	1.02	3.08	2.16
Chan #1	6.30E+02	16.16	36.00	3.57E+02	1	45	11.17	1	45	.57	2.16	4.44
2 bbl Culv #1	1.59E+02	8.85	36.00	2.00E+02	1	53	13.05	1	53	1.26	4.44	2.01
Chan #2	3.18E+03	31.82	60.00	5.49E+02	1	52	10.15	2	16	.17	2.01	5.42
Chan #8	2.90E+02	6.05	48.00	1.39E+02	1	50	5.00	1	49	.48	3.09	2.01
Culv #2	6.15E+02	15.38	60.00	5.46E+02	1	46	18.56	1	46	.89	5.42	2.91
Culv #2.	6.75E+03	34.43	84.00	7.06E+02	1	49	10.71	2	48	.10	3.47	3.02
Culv #4	1.09E+03	15.62	84.00	6.33E+02	1	47	17.79	1	47	.58	4.44	2.93
Chan #5	1.54E+03	10.71	72.00	6.03E+02	1	59	7.59	1	48	.39	2.93	5.41
4 bbl Culv #5	1.35E+02	6.90	60.00	1.81E+02	1	50	10.27	2	48	1.33	5.41	4.69
Chan #6	1.54E+03	9.15	84.00	7.39E+02	1	49	6.60	1	47	.48	4.69	9.26
2 bbl Culv #6	3.06E+02	7.96	84.00	3.39E+02	2	6	8.60	2	6	1.11	9.26	8.17
Chan #7	9.70E+02	7.19	108.00	6.72E+02	2	9	7.09	2	17	.69	8.17	6.02
Bridge	6.38E+02	4.80	84.00	7.82E+02	2	7	7.14	2	21	1.23	6.02	5.96
Chan #7.	1.90E+03	10.30	96.00	7.85E+02	2	7	9.92	2	4	.41	5.96	3.87
Chan #9	3.24E+02	3.80	66.00	1.29E+02	3	0	3.21	3	0	.40	3.87	2.00
Chan #13	2.76E+02	18.40	36.00	1.46E+02	1	59	12.02	2	0	.53	2.30	3.90
Culv #10	3.30E+01	2.63	48.00	1.46E+02	2	0	13.84	2	0	4.43	3.90	2.50
Chan #12	1.68E+02	13.45	30.00	1.30E+02	1	59	10.41	2	5	.77	2.50	4.00
Culv #9	6.90E+01	14.07	30.00	5.28E+01	1	53	15.18	2	45	.76	4.00	.98
Chan #11	5.70E+02	23.76	48.00	5.42E+01	1	53	12.10	1	53	.10	.98	1.74
Culv #8	1.20E+02	16.91	36.00	5.41E+01	1	53	14.23	1	54	.45	1.74	1.42
Culv #3	1.70E+03	23.64	72.00	6.40E+02	1	46	15.86	1	48	.38	3.03	4.43
1.6-7	3.60E+01	11.47	24.00	2.54E+01	1	37	8.05	1	37	.71	4.80	4.92
2.7-8	2.72E+01	15.37	18.00	1.75E+01	1	41	9.71	1	41	.64	5.46	6.40
8-23/22	7.68E+02	9.21	15.00	3.02E+01	1	41	3.66	1	41	.04	.27	.52
8-24/23	6.31E+02	7.56	15.00	5.18E+01	1	43	3.77	1	43	.08	.52	.49
8-25/24	4.15E+02	4.97	15.00	9.37E+01	1	46	2.99	1	46	.23	.49	1.08
8-26/25	2.37E+02	2.84	15.00	1.34E+02	1	51	2.49	1	50	.56	1.08	.94
8-28/26	4.59E+02	5.51	15.00	1.54E+02	1	56	3.94	1	56	.34	.94	.78
28th	6.09E+02	6.88	15.00	1.46E+02	1	59	4.56	1	59	.24	.78	.78
27th	2.74E+03	18.53	30.00	0.00E+00	0	0	.00	0	0	.00	-33.64	.36
27 to Ch	1.73E+03	17.50	18.00	2.05E+01	2	25	4.93	2	27	.01	.36	.36
To 27th	1.59E+03	13.83	24.00	0.00E+00	0	0	.00	0	0	.00	-1.00	.00
11-5	3.65E+01	2.96	8.40	3.65E+01	1	43	2.97	2	7	1.00	.70	.70
11-4	1.43E+01	1.16	8.40	1.43E+01	2	12	1.16	2	20	1.00	.70	.70
11-3	4.69E+01	3.81	8.40	3.12E+01	1	37	3.58	1	40	.67	.70	.43
11-2	8.06E+01	6.54	8.40	3.53E+01	1	40	5.11	1	39	.44	.43	.71
11-1	4.92E+01	3.99	8.40	2.63E+01	1	44	3.50	1	44	.53	.71	.36
CBC #2.1	8.93E+02	19.84	54.00	4.28E+02	1	46	23.28	1	46	.48	2.91	1.95
Pipe #2.	5.48E+02	19.39	72.00	1.71E+02	1	46	21.66	1	46	.31	2.91	2.12
Chan #10	6.05E+01	5.04	24.00	3.10E+01	1	57	4.55	1	57	.51	1.38	1.20
ORF # 1	4.10E+01	.63	27.75	2.70E+01	2	43	10.18	1	49	.66	3.60	1.80

10 yr

Conduit Name	Design Flow (cfs)	Design Velocity (ft/s)	Conduit Vertical Depth (in)	Maximum Computed Flow (cfs)	Time of Occurence Hr.	Time of Occurence Min.	Maximum Computed Velocity (ft/s)	Time of Occurence Hr.	Time of Occurence Min.	Ratio of Max. to Design Flow	Maximum Depth > at Pipe Ends Upstream (ft)	Maximum Depth > at Pipe Ends Dwnstrm (ft)
ORF # 2	9.93E+00	.56	6.00	6.31E+00	1	35	2.86	1	35	.64	.70	.68
ORF # 3	9.93E+00	.56	6.00	-1.23E+01	1	43	-4.89	1	42	-1.24	.70	1.87
ORF # 4	9.93E+00	.56	6.00	6.15E+00	2	15	2.81	2	15	.62	.70	.45
ORF # 5	9.93E+00	.56	6.00	6.18E+00	1	36	2.82	1	36	.62	.70	.36
ORF # 6	9.93E+00	.56	6.00	3.32E+00	1	37	1.92	1	37	.33	.43	.24
ORF # 7	9.93E+00	.56	6.00	5.87E+00	1	43	2.71	1	43	.59	.71	.35

```
   JIN for Block #     1 File #   20  C:\XPS\WORK\GRLCB\grl-10yr.rin
  JOUT for Block #     1 File #   21  C:\XPS\WORK\GRLCB\Grlcb.int
   JIN for Block #     2 File #   24  C:\XPS\WORK\GRLCB\grlcb.int
  JOUT for Block #     2 File #    0  JOT.US

===> Your input file was named : C:\XPS\WORK\GRLCB\grlcb-10.dat
===> Your output file was named: C:\XPS\WORK\GRLCB\grlcb-10.out

        SWMM Simulation Date and Time Summary

  Starting Date... May        13, 1994
           TIME...          8:49:26:64
    Ending Date... May        13, 1994
           Time...          9: 7:27:20
   Elapsed time...             18.017 minutes
   Elapsed time...           1081.000 seconds
```

APPENDIX FIVE

XP-SWMM: 100 YR STORM SIMULATION

GREELEY CENTRAL BASIN

100 YEAR, 24 HR STORM - 3 HR SIMULATION

SUMMARY STATISTICS FOR SUBCATCHMENTS

SUBCATCHMENT NO.	GUTTER OR INLET NO.	AREA (AC)	PERCENT IMPER.	TOTAL SIMULATED RAINFALL (IN)	PERVIOUS AREA TOTAL RUNOFF DEPTH (IN)	PERVIOUS AREA TOTAL LOSSES (IN)	PERVIOUS AREA PEAK RUNOFF RATE (CFS)	IMPERVIOUS AREA RUNOFF DEPTH (IN)	IMPERVIOUS AREA PEAK RUNOFF RATE (CFS)	TOTAL SUBCATCHMENT AREA RUNOFF DEPTH (IN)	TOTAL SUBCATCHMENT AREA PEAK RUNOFF RATE (CFS)	TOTAL SUBCATCHMENT AREA PEAK UNIT RUNOFF (IN/HR)
06.037#1	06.037	21.01	85.0	2.75	1.498	1.252	17.41	2.024	93.97	1.945	111.38	5.301
06.035#1	06.035	19.58	70.0	2.75	1.474	1.276	28.86	2.039	75.01	1.869	103.87	5.305
06.032#1	06.032	60.62	60.0	2.75	1.403	1.347	84.96	2.006	182.30	1.765	267.26	4.409
Pnd-GG-1	Pnd-GG-1	56.35	85.0	2.75	1.482	1.268	43.23	1.970	217.43	1.897	260.67	4.626
06.030#1	06.030	5.77	85.0	2.75	1.504	1.246	4.96	2.079	29.09	1.993	34.05	5.901
Pnd-WM#1	Pnd-WM	8.41	85.0	2.75	1.503	1.247	7.24	2.086	42.72	1.998	49.96	5.940
06.023#1	06.023	17.18	85.0	2.75	1.504	1.246	14.68	2.060	83.81	1.976	98.49	5.733
06.022#1	06.022	70.30	60.0	2.75	1.404	1.346	98.73	2.006	211.62	1.765	310.35	4.415
06.020#1	06.020	21.44	70.0	2.75	1.445	1.305	27.32	2.003	74.54	1.835	101.86	4.751
Pnd-Mall	Pnd-Mall	28.08	95.0	2.75	1.504	1.246	7.98	1.940	111.52	1.918	119.50	4.256
06.015#1	06.015	126.30	40.0	2.75	1.277	1.473	168.61	2.015	259.66	1.572	428.26	3.391
06.010#1	06.010	26.11	45.0	2.75	1.401	1.349	49.85	2.051	66.13	1.693	115.98	4.442
11/25#1	11/25	71.88	40.0	2.75	1.225	1.525	85.80	1.995	139.94	1.533	225.75	3.141
02.011#1	02.011	92.05	50.0	2.75	1.272	1.478	100.76	1.969	207.86	1.620	308.62	3.353
03.001#1	03.001	62.92	35.0	2.75	1.248	1.502	84.37	2.023	115.75	1.519	200.12	3.181
11/26#1	11/26	54.65	45.0	2.75	1.300	1.450	71.88	2.005	123.06	1.617	194.93	3.567
06.009#1	06.009	19.15	85.0	2.75	1.496	1.254	15.70	2.015	83.64	1.937	99.34	5.188
07.001#1	07.001	15.66	50.0	2.75	1.408	1.342	27.95	2.041	43.12	1.724	71.07	4.538
Culv1-Up	Culv1-Up	33.92	95.0	2.75	1.504	1.246	9.63	1.935	132.81	1.913	142.44	4.199
Culv1-Up	Culv1-Up	14.96	75.0	2.75	1.450	1.300	16.24	1.981	52.49	1.848	68.73	4.594
Culv1-Dn	Culv1-Dn	10.64	70.0	2.75	1.455	1.295	14.25	2.015	38.27	1.847	52.52	4.936
8/22#1	8/22	12.46	50.0	2.75	1.477	1.273	31.02	2.082	37.09	1.780	68.11	5.466
UC3-22nd	UC3-22nd	33.13	50.0	2.75	1.373	1.377	51.33	2.023	86.96	1.698	138.28	4.174
UC3-26th	UC3-26th	131.71	78.0	2.75	1.398	1.352	99.21	1.868	358.31	1.765	457.52	3.474
8/23#1	8/23	14.03	50.0	2.75	1.470	1.280	33.74	2.078	41.53	1.774	75.27	5.365
8/24#1	8/24	16.32	52.0	2.75	1.460	1.290	35.84	2.068	49.49	1.776	85.33	5.229
8/25#1	8/25	49.87	50.0	2.75	1.315	1.435	62.73	1.992	120.25	1.654	182.98	3.669
8/26#1	8/26	25.80	60.0	2.75	1.404	1.346	36.21	2.006	77.64	1.765	113.85	4.413
Culv5-Up	Culv5-Up	145.49	85.0	2.75	1.430	1.320	86.40	1.824	389.59	1.765	475.98	3.272
Brdge-Up	Brdge-Up	155.54	85.0	2.75	1.382	1.368	74.91	1.699	321.93	1.651	396.84	2.551
Pond#1	Pond	77.07	85.0	2.75	1.480	1.270	58.55	1.965	292.61	1.892	351.16	4.556
River#1	River	159.76	85.0	2.75	1.385	1.365	77.75	1.705	334.79	1.657	412.54	2.582
02.001#1	02.001	65.95	45.0	2.75	1.279	1.471	81.30	1.996	144.74	1.602	226.03	3.427

*** NOTE *** IMPERVIOUS AREA STATISTICS AGGREGATE IMPERVIOUS AREAS WITH AND WITHOUT DEPRESSION STORAGE

SUMMARY STATISTICS FOR CHANNEL/PIPES

CHANNEL NUMBER	FULL FLOW (CFS)	FULL VELOCITY (FPS)	FULL DEPTH (FT)	MAXIMUM COMPUTED INFLOW (CFS)	MAXIMUM COMPUTED OUTFLOW (CFS)	MAXIMUM COMPUTED DEPTH (FT)	MAXIMUM COMPUTED VELOCITY (FPS)	TIME OF OCCURRENCE DAY	TIME OF OCCURRENCE HR.	LENGTH OF SURCHARGE (HOUR)	MAXIMUM SURCHARGE VOLUME (AC-FT)	RATIO OF MAX. TO FULL FLOW	RATIO OF MAX. DEPTH TO FULL DEPTH
02.001				226.0				6/ 1/94	1.83				
River				412.5				6/ 1/94	1.83				
Pond				351.2				6/ 1/94	1.83				
Brdge-Up				396.8				6/ 1/94	1.83				
Culv5-Up				476.0				6/ 1/94	1.83				
8/26				113.8				6/ 1/94	1.83				
8/25				183.0				6/ 1/94	1.83				
8/24				85.3				6/ 1/94	1.83				
8/23				75.3				6/ 1/94	1.83				
UC3-26th				457.5				6/ 1/94	1.83				
UC3-22nd				138.3				6/ 1/94	1.83				
8/22				68.1				6/ 1/94	1.83				
Culv1-Dn				52.5				6/ 1/94	1.83				
Culv1-Up				211.2				6/ 1/94	1.83				
07.001				71.1				6/ 1/94	1.83				
06.009				99.3				6/ 1/94	1.83				
11/26				194.9				6/ 1/94	1.83				
03.001				199.2				6/ 1/94	1.83				
02.011				308.6				6/ 1/94	1.83				
11/25				222.5				6/ 1/94	1.83				
06.010				116.0				6/ 1/94	1.83				
06.015				428.3				6/ 1/94	1.83				
Pnd-Mall				119.5				6/ 1/94	1.83				
06.020				101.9				6/ 1/94	1.83				
06.022				310.3				6/ 1/94	1.83				
06.023				98.5				6/ 1/94	1.83				
Pnd-WM				50.0				6/ 1/94	1.83				
06.030				34.1				6/ 1/94	1.83				
Pnd-GG-1/2				260.7				6/ 1/94	1.83				
06.032				267.3				6/ 1/94	1.83				
06.035				103.9				6/ 1/94	1.83				
06.037				111.4				6/ 1/94	1.83				

TOTAL NUMBER OF CHANNELS/PIPES = 32

Integration cycles	720	
Length of integration step is	15.00	seconds
Simulation length	3.00	hours
Do not create equiv. pipes(NEQUAL)	0	
Use U.S. customary units for I/O	0	
Printing starts in cycle	1000	
Intermediate printout intervals of	2500	cycles
Intermediate printout intervals of	625.00	minutes
Summary printout intervals of	1440	cycles
Summary printout time interval of	360.00	minutes
Hot start file parameter (REDO)	0	
Initial time	.00	hours
Iteration variables: SURTOL	.0100	
SURJUN	.1200	mm or inch
QREF	1.0000	
Minimum depth (m or ft)	.0030	
Underrelaxation parameter	.6500	
Time weighting parameter	.6500	
Default Expansion/Contraction K	.0100	
Default Entrance/Exit K	.0100	
Default surface area of junctions	12.60	square feet.
NJSW input hydrograph junctions	0	

Junction Summary Statistics

GREELEY CENTRAL BASIN
100 YR, 24 HR STORM - 3 HR SIMULATION

Junction Name	Ground Elevation (ft)	Uppermost Pipe Crown Elevation (ft)	Mean Junction Elevation (ft)	Junction Average % Change	Maximum Junction Elev. (ft)	Time of Occurence Hr.	Time of Occurence Min.	Feet of Surcharge at Max Elevation	Feet Max. Depth is Below Ground Elevation	Maximum Junction Area ft^2
01.002	4712.65	4708.82	4706.83	.0487	4708.49	1	46	.00	4.16	12.6
01.003	4717.70	4714.03	4711.71	.0410	4712.96	1	45	.00	4.74	12.6
01.004	4720.17	4715.46	4713.82	.0722	4716.39	1	44	.93	3.78	12.6
01.005	4721.26	4717.16	4715.67	.1564	4718.78	1	44	1.62	2.48	12.6
01.006	5000.00	4720.20	4718.88	1.5796	4722.45	1	43	2.25	277.55	12.6
01.007	4722.30	4720.50	4719.13	.5016	4722.30	1	43	1.80	.00	12.6
02.001	4704.30	4705.30	4702.37	.0769	4704.30	1	51	.00	.00	12.6
02.002	4711.26	4709.60	4707.39	.2230	4709.96	1	47	.36	1.30	12.6
02.003	4713.90	4710.36	4709.94	.2598	4713.60	1	47	3.24	.30	12.6
02.004	4718.95	4712.41	4712.30	.2500	4716.01	1	47	3.60	2.94	12.6
02.005	4721.37	4717.50	4714.72	.2211	4718.36	2	2	.86	3.01	12.6
02.006	4720.87	4716.90	4716.90	.2086	4720.73	2	3	3.83	.14	12.6
02.007	4721.87	4717.97	4718.01	.1709	4721.87	1	43	3.90	.00	12.6
02.008	5000.00	4721.60	4719.47	.5220	4723.40	1	43	1.80	276.60	12.6
02.009	4727.03	4724.98	4722.65	1.7236	4727.03	1	43	2.05	.00	12.6
02.010	4729.82	4726.86	4723.86	.5519	4728.62	1	52	1.76	1.20	12.6
02.011	4732.52	4728.22	4725.14	.1626	4730.88	1	52	2.66	1.64	12.6
02.012	4736.00	4732.50	4728.16	.0471	4730.96	1	51	.00	5.04	12.6
02.013	4738.34	4734.22	4730.24	.0029	4730.39	1	53	.00	7.95	12.6
02.014	4742.21	4738.06	4734.06	.0003	4734.06	0	0	.00	8.15	12.6
02.015	4749.69	4739.83	4737.33	.0003	4737.33	0	0	.00	12.36	12.6
02.016	4754.56	4750.04	4747.79	.0003	4747.79	0	0	.00	6.77	12.6
02.017	4754.02	4749.92	4748.67	.0003	4748.67	0	0	.00	5.35	12.6
02.018	4757.90	4752.45	4750.20	.0003	4750.20	0	0	.00	7.70	12.6
02.019	4760.85	4758.50	4756.50	.0003	4756.50	0	0	.00	4.35	12.6
03.001	4727.00	4725.43	4722.89	.2326	4727.00	1	43	1.57	.00	12.6
03.002	4728.87	4727.21	4725.03	.1352	4728.23	1	47	1.02	.64	12.6
03.003	4732.85	4730.19	4727.45	.0016	4727.52	1	52	.00	5.33	12.6
03.004	4737.63	4734.83	4732.58	.0004	4732.58	0	0	.00	5.05	12.6
03.005	4743.45	4739.98	4737.73	.0004	4737.73	0	0	.00	5.72	12.6
04.001	4743.21	4738.41	4736.41	.0003	4736.41	0	0	.00	6.80	12.6
04.002	4769.00	4756.26	4754.26	.0003	4754.26	0	0	.00	14.74	12.6
04.003	4771.88	4757.35	4755.85	.0003	4755.85	0	0	.00	16.03	12.6
04.004	4770.70	4759.07	4757.57	.0003	4757.57	0	0	.00	13.13	12.6
04.005	4765.94	4762.90	4761.40	.0003	4761.40	0	0	.00	4.54	12.6
04.007	4771.58	4762.77	4760.77	.0003	4760.77	0	0	.00	10.81	12.6
05.001	4721.54	4718.43	4717.28	.0247	4718.35	2	3	.00	3.19	12.6
05.003	4724.04	4722.62	4721.12	.0003	4721.12	0	0	.00	2.92	12.6
05.005	4724.65	4723.40	4721.90	.0003	4721.90	0	0	.00	2.75	12.6
06.001	4713.16	4710.26	4708.64	.3622	4713.16	1	46	2.90	.00	12.6
06.002	4715.54	4712.69	4710.79	.5746	4715.54	1	46	2.85	.00	12.6
06,003	4718.02	4714.69	4713.05	.5377	4718.02	1	46	3.33	.00	12.6
06.004	4722.50	4717.80	4716.04	.7273	4721.99	1	46	4.19	.51	12.6
06.005	4727.29	4720.49	4718.78	.5664	4726.69	1	46	6.20	.60	12.6
06.006	4730.41	4723.55	4721.98	.4738	4729.77	1	46	6.22	.64	12.6
06.007	4732.80	4727.30	4725.50	.3968	4732.80	1	45	5.50	.00	12.6
06.009	4746.49	4728.15	4726.85	.3525	4736.13	1	50	7.98	10.36	12.6
06.010	4747.12	4747.00	4742.03	.1439	4745.79	2	1	.00	1.33	12.6
06.011	4750.40	4749.53	4747.61	.1259	4750.26	2	14	.73	.14	12.6
06.012	4751.05	4750.10	4748.22	.1419	4751.05	1	49	.95	.00	12.6
06.013	4755.03	4753.53	4751.35	.1749	4754.48	2	5	.95	.55	12.6
06.014	4755.00	4754.15	4751.81	.1537	4754.83	1	51	.68	.17	12.6
06.015	4756.20	4755.97	4754.53	.0613	4756.20	1	40	.23	.00	12.6

Junction Name	Ground Elevation (ft)	Uppermost Pipe Crown Elevation (ft)	Mean Junction Elevation (ft)	Junction Average % Change	Maximum Junction Elev. (ft)	Time of Occurence Hr.	Time of Occurence Min.	Feet of Surcharge at Max Elevation	Feet Max. Depth is Below Ground Elevation	Maximum Junction Area ft^2
06.018	4760.00	4757.80	4755.06	.0928	4757.18	1	51	.00	2.82	12.6
06.019	4777.37	4773.55	4771.78	.1593	4775.79	1	54	2.24	1.58	12.6
06.020	4776.72	4775.22	4774.60	.3484	4776.72	1	38	1.50	.00	12.6
06.021	4778.83	4775.60	4775.09	.9040	4777.43	2	16	1.83	1.40	12.6
06.022	4783.00	4779.72	4781.55	.1102	4786.59	2	15	6.87	.00	176479.4
06.023	4779.01	4776.08	4774.60	.2343	4780.43	1	54	4.35	.00	15608.0
06.024	4779.96	4776.73	4775.65	.2609	4779.84	1	54	3.11	.12	12.6
06.025	4778.38	4776.79	4776.10	.1482	4778.38	1	45	1.59	.00	12.6
06.026	4778.12	4777.57	4776.65	.0606	4778.12	1	45	.55	.00	12.6
06.027	4781.68	4778.26	4777.28	.0682	4778.83	1	47	.57	2.85	12.6
06.028	4786.60	4785.87	4785.00	.0522	4785.10	0	2	.00	1.50	12.6
06.029	4790.00	4783.00	4780.98	.1796	4784.60	1	54	1.60	5.40	12.6
06.030	4785.77	4783.84	4783.58	.2893	4787.08	2	1	3.24	.00	13510.0
06.031	4790.61	4787.09	4785.36	.1385	4788.85	1	59	1.76	1.76	12.6
06.032	4786.74	4786.04	4787.26	.1524	4790.44	2	24	4.40	.00	196773.7
06.033	4791.49	4789.14	4787.31	.1474	4791.49	1	53	2.35	.00	12.6
06.034	4800.00	4798.33	4796.31	.1071	4799.49	1	55	1.16	.51	12.6
06.035	4809.00	4809.00	4806.63	.1007	4807.89	1	46	.00	1.11	12.6
06.036	4810.80	4809.30	4808.11	.2031	4808.32	2	3	.00	2.48	12.6
07.001	4705.70	4705.70	4702.94	.0916	4705.53	1	51	.00	.17	12.6
07.002	4713.00	4708.20	4705.79	.0861	4707.44	1	52	.00	5.56	12.6
Culv1-Up	4695.10	4693.40	4693.47	.1459	4698.46	2	15	5.06	.00	139196.7
Culv1-Dn	4693.80	4693.80	4690.71	.0838	4693.61	2	15	.00	.19	12.6
Culv2-Up	4690.80	4682.80	4684.06	.1992	4693.27	2	17	10.47	.00	53863.7
Culv2-Dn	4674.00	4673.10	4668.40	.0882	4669.89	1	49	.00	4.11	12.6
Culv2.1D	4674.00	4672.50	4665.77	1.5533	4667.84	2	13	.00	6.16	12.6
Culv3-Up	4674.00	4670.20	4664.55	1.0168	4666.38	2	19	.00	7.62	12.6
Culv4-Up	4668.40	4666.50	4661.46	.1303	4663.92	1	50	.00	4.48	12.6
Culv4-Dn	4663.40	4664.40	4658.75	.0741	4660.74	2	5	.00	2.66	12.6
Culv5-Up	4660.00	4655.30	4652.50	.1339	4657.61	2	3	2.31	2.39	12.6
Culv5-Dn	4655.50	4655.50	4651.12	.1176	4654.94	2	9	.00	.56	12.6
Culv6-Up	4651.00	4648.10	4645.62	.1309	4652.24	2	14	4.14	.00	12260.1
Culv6-Dn	4649.59	4649.59	4644.46	.1098	4649.59	2	19	.00	.00	12.6
Brdge-Up	4643.40	4642.40	4636.19	.1107	4640.89	2	1	.00	2.51	12.6
Brdge-Dn	4643.40	4641.30	4636.02	.1090	4640.50	2	1	.00	2.90	12.6
Pond	4637.10	4637.00	4630.31	.0466	4634.39	3	0	.00	2.71	524873.9
River	4630.00	4629.50	4626.04	.2840	4626.62	3	0	.00	3.38	12.6
Chan13-U	4694.91	4696.25	4692.67	.0456	4694.91	1	56	.00	.00	12.6
Culv10-U	4696.00	4692.74	4690.11	.0680	4693.49	1	56	.75	2.51	12.6
Culv10-D	4691.21	4692.71	4689.49	.0401	4691.21	1	54	.00	.00	12.6
Culv9-Up	4689.00	4687.50	4686.52	.0470	4689.00	1	54	1.50	.00	12.6
Culv9-Dn	4679.81	4679.81	4676.19	.0188	4676.83	1	52	.00	2.98	12.6
Culv8-Up	4676.00	4675.31	4671.98	.0259	4673.07	1	56	.00	2.93	12.6
Culv8-Dn	4675.00	4672.93	4669.11	.0708	4671.48	2	18	.00	3.52	12.6
8/22	4716.98	4716.98	4715.86	.0126	4716.24	1	50	.00	.74	12.6
8/23	4710.29	4710.29	4709.22	.0184	4709.76	1	52	.00	.53	12.6
8/24	4704.98	4704.98	4703.93	.0209	4704.43	1	53	.00	.55	12.6
8/25	4702.64	4702.64	4701.82	.0232	4702.64	1	49	.00	.00	12.6
8/26	4701.93	4701.93	4701.05	.0205	4701.89	1	57	.00	.04	12.6
8/28	4697.20	4696.95	4696.01	.0149	4696.72	2	2	.00	.48	12.6
11/27	4712.50	4713.50	4711.16	.0049	4711.42	2	16	.00	1.08	12.6
27th/17	4748.50	4747.50	4744.53	.0192	4745.66	2	0	.00	2.84	12.6
11/25	4721.90	4721.90	4721.53	.0163	4721.90	1	41	.00	.00	12.6
11-Orf4	4721.00	4721.00	4720.63	.0121	4721.00	1	43	.00	.00	12.6
11/26	4720.80	4720.80	4720.46	.0148	4720.80	1	41	.00	.00	12.6
11-Orf6	4719.10	4719.10	4718.56	.0118	4718.81	1	43	.00	.29	12.6
11-Orf7	4714.20	4714.00	4713.57	.0122	4714.00	1	47	.00	.21	12.6

100 yr

Conduit Summary Statistics

GREELEY CENTRAL BASIN
100 YR, 24 HR STORM - 3 HR SIMULATION

Conduit Name	Design Flow (cfs)	Design Velocity (ft/s)	Conduit Vertical Depth (in)	Maximum Computed Flow (cfs)	Time of Occurence Hr.	Time of Occurence Min.	Maximum Computed Velocity (ft/s)	Time of Occurence Hr.	Time of Occurence Min.	Ratio of Max. to Design Flow	Maximum Depth > at Pipe Ends Upstream (ft)	Maximum Depth > at Pipe Ends Dwnstrm (ft)
6.35-36	1.64E+01	3.34	30.00	7.70E+00	0	1	4.22	2	4	.47	1.52	1.89
Chan #14	2.27E+02	15.12	36.00	1.21E+02	1	50	12.11	1	50	.53	1.89	4.16
6.33-34	9.27E+01	13.11	36.00	8.61E+01	1	48	13.41	1	47	.93	4.16	5.35
6.31-33	7.29E+01	10.31	36.00	8.33E+01	1	51	11.73	1	51	1.14	5.35	4.76
6.29-31	1.01E+02	14.35	36.00	9.79E+01	2	0	15.38	2	8	.96	4.76	5.10
6.23-29	1.53E+02	15.92	42.00	1.30E+02	2	7	15.06	2	15	.85	5.10	7.85
6.19-23	1.33E+02	13.80	42.00	1.63E+02	1	54	16.87	1	54	1.23	7.85	6.24
6.18-19	1.75E+02	13.89	48.00	1.93E+02	1	50	15.96	2	12	1.10	6.24	3.88
6.14-18	2.31E+02	14.55	54.00	1.92E+02	1	52	14.39	3	0	.83	3.88	5.18
6.13-14	2.79E+02	17.55	54.00	1.97E+02	2	6	13.94	3	0	.70	5.18	5.45
6.12-13	2.41E+02	15.13	54.00	2.44E+02	1	52	14.89	1	52	1.02	5.45	5.45
6.11-12	1.99E+02	12.50	54.00	2.39E+02	1	51	14.47	1	51	1.20	5.45	5.23
6.10-11	1.98E+02	12.46	54.00	2.39E+02	1	51	14.80	1	51	1.21	5.23	4.22
6.9-10	3.58E+02	22.48	54.00	2.86E+02	2	8	19.90	2	28	.80	5.76	12.48
6.7-9	7.51E+01	5.97	48.00	2.16E+02	1	44	16.78	1	45	2.88	12.48	9.50
6.6-7	1.93E+02	15.36	48.00	2.12E+02	1	45	16.80	1	45	1.10	9.50	10.22
6.5-6	1.64E+02	13.07	48.00	2.16E+02	1	45	16.82	1	45	1.32	10.26	10.20
6.4-5	1.74E+02	13.85	48.00	2.11E+02	1	45	16.67	1	45	1.21	10.13	8.19
6.3-4	1.75E+02	13.94	48.00	1.93E+02	1	46	15.30	1	46	1.10	8.19	7.33
6.2-3	1.45E+02	11.50	48.00	1.87E+02	1	46	14.82	1	46	1.29	7.33	6.85
6.1-2	1.60E+02	12.77	48.00	1.80E+02	1	55	14.30	1	54	1.12	6.85	6.90
2.2-6.1	8.81E+01	7.01	48.00	1.80E+02	1	52	14.87	1	52	2.04	6.90	4.37
2.1-2	2.28E+02	18.12	48.00	2.29E+02	2	2	21.85	1	48	1.01	4.36	3.00
6.31-32	8.93E+00	5.05	18.00	3.07E+01	2	20	18.04	2	9	3.43	5.90	4.76
6.29-30	1.87E+01	3.80	30.00	3.17E+01	2	9	6.84	2	9	1.70	5.74	5.10
6.27-28	8.40E+00	6.85	15.00	2.04E+00	0	3	5.65	0	3	.24	.48	2.07
6.26-27	1.25E+01	7.08	18.00	7.61E+00	2	9	6.80	2	10	.61	2.07	2.05
6.25-26	1.44E+01	8.15	18.00	8.91E+00	2	10	6.07	2	10	.62	2.05	3.09
6.24-25	1.01E+01	5.70	18.00	-1.63E+01	1	54	-9.12	1	54	-1.62	3.09	5.11
6.21-22	4.22E+01	10.63	27.00	5.63E+01	2	50	13.98	2	50	1.33	9.12	4.33
6.20-21	4.41E+01	8.97	30.00	5.70E+01	2	49	11.58	2	49	1.29	4.33	4.00
6.19-20	5.37E+01	10.95	30.00	6.46E+01	2	21	12.97	2	20	1.20	4.00	6.24
6.23-24	3.07E+01	9.77	24.00	-1.63E+01	1	54	5.80	2	10	-.53	5.11	7.85
6.13-15	7.66E+01	15.60	30.00	7.19E+01	1	41	14.40	2	28	.94	2.73	5.45
7.2-6.9	1.19E+02	12.34	42.00	1.47E+02	1	51	15.52	1	48	1.24	12.13	3.24
7.1-2	1.66E+02	13.22	48.00	1.48E+02	1	53	16.39	2	26	.89	3.24	3.83
4.4-5	1.62E+01	9.19	18.00	0.00E+00	0	0	.00	0	0	.00	-3.83	.00
4.3-4	1.58E+01	8.95	18.00	0.00E+00	0	0	.00	0	0	.00	-1.72	.00
4.2-3	1.07E+01	6.07	18.00	0.00E+00	0	0	.00	0	0	.00	-1.59	.00
4.1-2	4.16E+01	13.25	24.00	0.00E+00	0	0	.00	0	0	.00	-17.85	.00
2.11-4.1	4.62E+01	14.71	24.00	0.00E+00	0	0	.00	0	0	.00	-5.54	7.15
4.2-7	6.53E+01	20.80	24.00	0.00E+00	0	0	.00	0	0	.00	-6.51	.00
2.18-19	1.84E+02	30.63	24.00	0.00E+00	0	0	.00	0	0	.00	-6.30	.00
2.16-18	2.92E+01	7.34	27.00	0.00E+00	0	0	.00	0	0	.00	-2.41	.00
2.15-16	6.17E+01	15.52	27.00	0.00E+00	0	0	.00	0	0	.00	-10.46	.00
2.14-15	4.03E+01	8.22	30.00	0.00E+00	0	0	.00	0	0	.00	-3.27	.00
2.13-14	1.67E+02	13.27	48.00	0.00E+00	0	0	.00	0	0	.00	-3.67	.17
2.12-13	1.41E+02	11.22	48.00	-2.50E+00	1	52	1.16	2	10	-.02	.17	2.96
2.11-12	3.30E+02	20.76	54.00	-2.91E+01	1	50	-2.60	1	50	-.09	2.96	7.15
2.10-11	2.39E+02	15.01	54.00	3.00E+02	1	52	18.84	1	52	1.26	7.16	6.25
3.1-2.10	3.17E+02	19.91	54.00	2.99E+02	1	52	18.79	1	52	.95	6.25	6.07
2.9-3.1	3.22E+02	20.23	54.00	1.44E+02	1	42	10.13	2	37	.45	6.07	6.55
2.16-17	7.96E+00	6.48	15.00	0.00E+00	0	0	.00	0	0	.00	-.88	.00

100 yr

Conduit Name	Design Flow (cfs)	Design Velocity (ft/s)	Conduit Vertical Depth (in)	Maximum Computed Flow (cfs)	Time of Occurence Hr.	Time of Occurence Min.	Maximum Computed Velocity (ft/s)	Time of Occurence Hr.	Time of Occurence Min.	Ratio of Max. to Design Flow	Maximum Depth > at Pipe Ends Upstream (ft)	Maximum Depth > at Pipe Ends Dwnstrm (ft)
3.4-5	4.36E+01	10.96	27.00	0.00E+00	0	0	.00	0	0	.00	-5.15	.00
3.3-4	4.26E+01	10.72	27.00	0.00E+00	0	0	.00	0	0	.00	-5.06	.08
3.2-3	5.54E+01	9.33	33.00	-1.20E+00	1	48	-.44	1	48	-.02	.08	3.78
3.1-2	7.06E+01	11.89	33.00	-2.58E+01	1	46	-5.05	1	46	-.36	3.77	5.07
2.8-9	1.12E+02	8.90	48.00	1.33E+02	1	43	10.58	1	43	1.19	6.55	5.82
1.7-2.8	5.09E+01	7.20	36.00	1.02E+02	1	43	14.39	1	43	2.01	5.80	4.80
2.6-7	3.01E+01	6.13	30.00	3.63E+01	1	41	7.26	1	41	1.21	6.40	6.33
2.5-6	3.44E+01	7.00	30.00	3.94E+01	1	46	8.13	1	39	1.15	6.33	6.04
2.4-5	4.14E+01	8.43	30.00	4.42E+01	2	30	8.94	2	30	1.07	6.04	6.10
2.3-4	3.79E+01	7.71	30.00	4.65E+01	1	44	9.42	1	44	1.23	6.10	5.74
2.2-3	3.79E+01	7.73	30.00	5.15E+01	1	44	10.32	2	30	1.36	5.74	4.37
5.3-5	1.30E+01	7.36	18.00	0.00E+00	0	0	.00	0	0	.00	-.78	.00
5.1-3	1.16E+01	6.55	18.00	0.00E+00	0	0	.00	0	0	.00	-2.77	1.42
2.5-5.1	1.70E+01	9.64	18.00	-3.91E+00	1	47	-3.61	1	47	-.23	1.42	2.36
1.5-6	6.55E+01	9.27	36.00	7.69E+01	1	43	10.83	1	43	1.17	5.25	4.62
1.4-5	5.79E+01	8.19	36.00	7.50E+01	1	44	10.59	1	44	1.29	4.62	3.91
1.3-4	5.55E+01	7.86	36.00	7.14E+01	1	45	11.79	1	44	1.29	3.93	1.94
1.2-3	9.59E+01	13.57	36.00	7.49E+01	1	46	13.89	1	46	.78	1.94	2.67
2.1-1.2	7.27E+01	10.29	36.00	7.40E+01	1	47	12.26	2	43	1.02	2.67	3.00
Chan #1	6.30E+02	16.16	36.00	5.16E+02	1	52	13.26	1	48	.82	3.00	8.06
Culv #1	1.59E+02	8.85	36.00	2.59E+02	1	52	15.17	1	51	1.62	8.06	4.81
Chan #2	3.18E+03	31.82	60.00	7.26E+02	1	51	11.37	1	51	.23	4.81	15.47
Chan #8	2.90E+02	6.05	48.00	2.42E+02	1	54	5.74	1	54	.83	3.83	4.81
Culv #2	6.15E+02	15.38	60.00	5.77E+02	2	18	18.02	2	19	.94	15.47	2.79
Culv #2.	6.75E+03	34.43	84.00	7.33E+02	2	12	9.00	1	45	.11	3.44	3.18
Culv #4	1.09E+03	15.62	84.00	6.41E+02	2	19	18.70	1	51	.59	4.42	3.34
Chan #5	1.54E+03	10.71	72.00	6.38E+02	2	20	7.29	3	0	.41	3.34	8.31
Culv #5	1.35E+02	6.90	60.00	2.42E+02	1	56	12.14	1	54	1.79	8.31	6.44
Chan #6	1.54E+03	9.15	84.00	9.50E+02	1	52	7.32	1	52	.62	6.44	11.14
Culv #6	3.06E+02	7.96	84.00	4.24E+02	2	10	11.00	2	10	1.39	11.14	9.00
Chan #7	9.70E+02	7.19	108.00	8.39E+02	2	12	7.52	2	21	.86	9.00	7.49
Bridge	6.38E+02	4.80	84.00	1.15E+03	2	2	8.46	2	20	1.80	7.49	7.20
Chan #7.	1.90E+03	10.30	96.00	1.15E+03	2	3	11.51	2	2	.61	7.20	5.39
Chan #9	3.24E+02	3.80	66.00	2.39E+02	3	0	3.95	3	0	.74	5.39	2.62
Chan #13	2.76E+02	18.40	36.00	1.88E+02	1	56	12.52	2	18	.68	3.00	4.75
Culv #10	3.30E+01	2.63	48.00	1.87E+02	1	57	17.14	1	57	5.67	4.75	2.50
Chan #12	1.68E+02	13.45	30.00	1.30E+02	2	23	10.42	2	24	.77	2.50	4.00
Culv #9	6.90E+01	14.07	30.00	5.31E+01	1	56	15.10	1	56	.77	4.00	1.02
Chan #11	5.70E+02	23.76	48.00	5.49E+01	1	56	12.15	1	53	.10	1.02	1.76
Culv #8	1.20E+02	16.91	36.00	5.48E+01	1	57	14.29	1	54	.46	1.76	1.55
Culv #3	1.70E+03	23.64	72.00	6.42E+02	2	19	15.60	2	12	.38	3.17	4.42
1.6-7	3.60E+01	11.47	24.00	2.84E+01	1	43	8.96	1	43	.79	4.80	5.25
2.7-8	2.72E+01	15.37	18.00	1.86E+01	1	43	10.35	1	43	.69	5.80	6.40
8-23/22	7.68E+02	9.21	15.00	6.49E+01	1	50	3.45	1	46	.08	.51	.72
8-24/23	6.31E+02	7.56	15.00	1.25E+02	1	52	4.71	1	53	.20	.72	.70
8-25/24	4.15E+02	4.97	15.00	1.86E+02	1	54	3.72	1	55	.45	.70	1.25
8-26/25	2.37E+02	2.84	15.00	2.20E+02	1	57	2.90	2	6	.93	1.25	1.21
8-28/26	4.59E+02	5.51	15.00	3.18E+02	2	0	4.97	2	0	.69	1.21	1.02
28th	6.09E+02	6.88	15.00	3.11E+02	2	2	5.70	2	3	.51	1.02	1.02
27th	2.74E+03	16.47	30.00	4.56E+01	2	0	4.25	2	0	.02	.66	.42
27 to Ch	1.73E+03	17.91	18.00	5.94E+01	2	3	6.29	2	3	.03	.42	.60
To 27th	1.59E+03	12.58	24.00	1.03E+02	1	50	3.80	1	46	.07	.79	1.66
11-5	3.65E+01	2.96	8.40	3.65E+01	2	23	2.96	2	23	1.00	.70	.70
11-4	1.43E+01	1.16	8.40	1.43E+01	2	23	1.16	2	49	1.00	.70	.70
11-3	4.69E+01	3.81	8.40	3.03E+01	1	43	3.58	1	45	.65	.70	.41
11-2	8.06E+01	6.54	8.40	3.38E+01	1	46	5.04	1	45	.42	.41	.70
11-1	4.92E+01	3.99	8.40	2.65E+01	1	49	3.51	1	49	.54	.70	.42
CBC #2.1	8.93E+02	19.84	54.00	4.18E+02	2	12	22.53	1	49	.47	2.79	1.95
Pipe #2.	5.48E+02	19.39	72.00	1.68E+02	2	12	20.99	2	9	.31	2.79	2.12
Chan #10	6.05E+01	5.04	24.00	3.74E+01	2	18	4.84	2	18	.62	1.55	1.33
ORF # 1	4.10E+01	.63	27.75	2.64E+01	3	0	10.43	2	10	.64	3.77	1.78

100 yr

Conduit Name	Design Flow (cfs)	Design Velocity (ft/s)	Conduit Vertical Depth (in)	Maximum Computed Flow (cfs)	Time of Occurence Hr.	Time of Occurence Min.	Maximum Computed Velocity (ft/s)	Time of Occurence Hr.	Time of Occurence Min.	Ratio of Max. to Design Flow	Maximum Depth > at Pipe Ends Upstream (ft)	Maximum Depth > at Pipe Ends Dwnstrm (ft)
ORF # 2	9.93E+00	.56	6.00	6.31E+00	1	43	2.84	1	42	.64	.70	.68
ORF # 3	9.93E+00	.56	6.00	-1.23E+01	1	45	-4.89	2	8	-1.24	.70	2.23
ORF # 4	9.93E+00	.56	6.00	6.06E+00	2	48	2.78	2	48	.61	.70	.44
ORF # 5	9.93E+00	.56	6.00	6.21E+00	1	42	2.83	1	42	.63	.70	.36
ORF # 6	9.93E+00	.56	6.00	3.06E+00	1	42	1.87	1	42	.31	.41	.23
ORF # 7	9.93E+00	.56	6.00	5.72E+00	1	48	2.66	1	48	.58	.70	.34

```
   JIN for Block #     1 File #   20  C:\XPS\WORK\GRLCB\grl100yr.rin
  JOUT for Block #     1 File #   21  C:\XPS\WORK\GRLCB\Grlcb.int
   JIN for Block #     2 File #   24  C:\XPS\WORK\GRLCB\grlcb.int
  JOUT for Block #     2 File #    0  JOT.US

===> Your input file was named : C:\XPS\WORK\GRLCB\grlcb100.dat
===> Your output file was named: C:\XPS\WORK\GRLCB\grlcb100.out

       SWMM Simulation Date and Time Summary

  Starting Date... May       13, 1994
           TIME...         9:19:26:45
    Ending Date... May       13, 1994
           Time...         9:39:14:99
   Elapsed time...            19.800 minutes
   Elapsed time...          1188.000 seconds
```