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UPPER PINE CREEK
CHANNEL ANALYSIS

J·R ENGINEERING
A Subsidiary of Westrian

J·R ENGINEERING
A Westrian Company

UPPER PINE CREEK

CHANNEL ANALYSIS

March 2003
Revised December 2003

Prepared For:

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LA PLATA INVESTMENTS
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Job No. 8717.45

UPPER PINE CREEK

CHANNEL ANALYSIS

J·R ENGINEERING
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DRAINAGE REPORT STATEMENT

ENGINEER'S STATEMENT:
The attached drainage plan and report were prepared under my direction and supervision and are correct to the best of my knowledge and belief. Said drainage report has been prepared according to the criteria established by the City for drainage reports and said report is in conformity with the master plan of the drainage basin. I accept responsibility for any liability caused by any negligent acts, errors, or omissions on my part in preparing this report.

Mike A. Bramlett, Colorado P.E. #32314 — Date: 2.16.04
For and On Behalf of JR Engineering, LLC

DEVELOPER'S STATEMENT:

I, the developer, have read and will comply with all of the requirements specified in this drainage report and plan.

Business Name: LP47, LLC dba La Plata Investments

By: Thomas Gregor

Title: Director of Development Services

Address: 2315 Briargate Parkway, Suite 100

Colorado Springs, CO 80920

CITY OF COLORADO SPRINGS ONLY:
Filed in accordance with Section 15-3-906 of the Code of the City of Colorado Springs, 1980, as amended.

City Engineer — Date: Feb 20, 2004

Conditions:

4300 Kinross Drive, Colorado Springs, CO 80907
719-593-2593 • Fax: 719-528-6613 • www.jrengineering.com

UPPER PINE CREEK
CHANNEL ANALYSIS

TABLE OF CONTENTS

APPENDICES

APPENDICES (CONTINUED)

REACH NO. 2 - HYDRAULIC CALCULATIONS

- HEC-RAS EXISTING CONDITION MODEL
- HEC-RAS IMPROVED CONDITION MODEL DROPS MODELED AS VERTICAL SECTIONS
- HEC-RAS IMPROVED CONDITION MODEL DROPS MODELED AS WEIRS

REACH NO. 3

- HYDROGRAPHS
- HEC-RAS ANALYSIS
- FLOWMASTER CHANNEL ANALYSIS

APPENDIX

- VICINITY MAP
- SUGGESTED LOW FLOW CHANNEL DOCUMENTATION
- CHANNEL DOCUMENTATION

ROLLED PLANS (SEPARATE)

- UPPER PINE CREEK ANALYSIS - SHEETS 1 THROUGH 11

APPENDICES (CONTINUED)

REACH NO. 2 - HYDRAULIC CALCULATIONS

- HEC-RAS EXISTING CONDITION MODEL
- HEC-RAS IMPROVED CONDITION MODEL DROPS MODELED AS VERTICAL SECTIONS
- HEC-RAS IMPROVED CONDITION MODEL DROPS MODELED AS WEIRS

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UPPER PINE CREEK
CHANNEL ANALYSIS

INTRODUCTION/PURPOSE

The purpose of this report is to present the analysis of Upper Pine Creek Channel from Chapel Hills Drive east to a point in the Pine Creek Channel North Branch Channel approximately 2,600 L.F. east of proposed Detention Facility "F", or approximately 1,800 L.F. east of the centerline of proposed Powers Boulevard.

In addition, this report is intended to document the existing condition of the channel, analyze the channel in the developed basin condition as defined in the Pine Creek D.B.P.S. Amendment Number 3, and make recommendations to reduce the potential for degradation of the channel due to the proposed developed condition.

GENERAL DESCRIPTION

The study area lies within Sections 26, 27, and 28, Township 12 South, Range 66 West of the Sixth Principle Meridian in the City of Colorado Springs, County of El Paso, State of Colorado.

REGULATORY RESTRICTIONS

Pine Creek Channel to include the reaches in the study has been determined to be Preble's meadow jumping mouse habitat protected by the Endangered Species Act, thus minimizing the limits of disturbance and preservation of habitant is of utmost concern in the selection and construction of any proposed improvements.

METHOD OF STUDY

For the purposes of this study the channel was divided into three separate reaches. The first reach is from Chapel Hills Drive upstream to the 84" outfall; the second, is from existing Detention Facility "E" to the proposed outfall from proposed Detention Facility "F"; the third, from Detention Facility "F" upstream east for approximately 2,600 L.F. to a proposed storm drain outfall.

Each of the study reaches has distinct characteristics. In addition, the proposed method of application of the developed condition flows varies, as defined in the Pine Creeks D.B.P.S. Amendment Number 3 (as approved on March 18, 2003). For these reasons, each of the three reaches is discussed and analyzed in a separate section of this report.

This study included field observations of the channel as part of the preparation of this report in addition to various observations made over the past 4 years. Previous HEC-RAS Models of the portions of the study reaches were reviewed and compiled to reflect the field observations and the specific channel reaches. Adjustments were made to the "n" values to reflect the current channel condition and proposed condition as discussed in the analysis of reach section.

Suggested improvements in the channel were based on general field observations, hydraulic analysis, and experience on similar projects.

HYDROLOGIC DATA

The following runoff flow data for this study was derived from Pine Creek D.B.P.S. Amendment Number 3.

North Pine Creek Flow Data

Chapel Hills Drive To Headwaters East Of Proposed Powers Blvd.

2/20/2003

ANALYSIS POINT	Q_{100} cfs	Q_{50} cfs	Q_{25} cfs	Q_{10} cfs	Q_5 cfs	Q_2 cfs	Q_m[4] cfs
E4a[1]	370	304	249	162	90	0	51
3a[2]	437	361	294	185	110	8	64
DF "F" IN[3]	1178	1027	878	648	470	312	339
DF "F" OUT	224	208	194	170	157	124	109
4	309	274	241	194	166	130	119
DF "E" IN[3]	437	380	323	244	197	137	139
5A (84" OUTFALL)	531	470	413	354	313	248	222
12	899	771	650	479	372	255	266
13	1017	871	729	524	399	257	282

[1] E4a is flow diverted to the natural channel at the Blue Road.

[2] 3a is flow in the natural channel above DF "F", the Q_2 flow rate is flow from Basin PNE-10.

[3] DF "E" in and DF "F" in are flows in the rundown channel exclusive of storm drains entering at other locations.

[4] Dominant Discharge Calculation:

$$Q_m = .015Q_{100} + .0150Q_{50} + .04Q_{25} + .08Q_{10} + .2Q_5 + .4Q_2$$

Flow rates were adjusted between analysis points as deemed appropriate. The flow data for the each reach is included with the discussion and analysis of each individual reach.

HYDRAULIC ANALYSIS

The channel reaches were modeled using HEC-RAS and Haestads FlowMaster V5.15. "n" values were derived from the City Of Colorado Springs/County of El Paso Drainage Criteria Manual, latest addition, various Corps of Engineers Publications, Federal Highway Administration publications and other sources. A list of references is included in the appendix of this report.

A discussion of the analysis of each reach is included in the following sections of this report as are copies of all hydraulic models and data sheets.

In addition to 2, 5, 10, 25, 50 and 100-year peak the HEC-RAS analysis included a dominant flow rate. The dominant flow rate is considered to be the flow rate that shapes the channel. It is usually applied to natural channels and thus may not be conclusive in the study area because of the presence of storm drains and detention basins. The Formula for dominant flow is:

$$Q_m = .015Q_{100} + .0150Q_{50} + .04Q_{25} + .08Q_{10} + .2Q_5 + .4Q_2$$

The source of the formula is "Sediment and Erosion Design Guide" for Albuquerque Metropolitan Arroyo Flood Control Authority, by RCE, November 1994.

GEOTECHNICAL INVESTIGATIONS

No geotechnical investigations have been done been done for this project. Geotechnical investigations will be necessary for structural calculations and preparation of construction plans and documents.

EROSION CONTROL PLAN

Erosion control plans shall be prepared as part of the construction documents.

FLOODPLAIN STATEMENT

The study area of this analysis lies within the flood plain of Pine Creek and North Pine Creek a designated F.E.M.A. floodplain, as depicted on Flood Insurance Rate Map Community Panel Numbers 08041C-0506F, 08041C-0507F, and 08041C-0530F, effective March 17, 1997 and LOMR dated July 28, 2000. A Flood Plain Development Permit will be required for construction of the proposed improvements.

CONSTRUCTION COST OPINION

The cost of the proposed improvements is dependent on soil, bedrock, groundwater conditions and construction surveys of the proposed improvement locations. Thus, a more meaningful construction cost estimate can be done at the time of preparation of construction drawings.

The developer will bear the cost of the improvements.

SUMMARY AND RECOMMENDATIONS

Summary and recommendations are included in the analysis and discussion for each reach of channel in the following sections of this report.

A recommendation common to all study reaches is the implementation of a monitoring program. Monitoring and timely correction of erosion/degradation problems is the best insurance for channel stability. It is recommended that control points be set, particularly in the low flow channel, so that record measurements can be taken from the reference points to document changes in the channel depth or width. A sketch is included in the appendix of this report to show a possible configuration of control points and measurements to be taken.

A monitoring program and timely corrective action is needed to ensure the continued stability of the channel. Due to the dynamic nature of natural channels, monitoring should be done at a minimum on an annual basis and after runoff events that produce either long runoff durations or high peak flows. La Plata Investments proposes to monitor the stability of the channel on an annual basis and after significant rainfall events through the year 2006 and mitigate stability problems if needed. The monitoring will be done in conjunction with the annual monitoring of the habitat vegetation within the channel corridor as required by the "Final Environmental Assessment and Habitat Conservation Plan for the Briargate Development, Located Along Upper Pine Creek", dated February 2003 (Pine Creek HCP). La Plata expects that the Pine Creek HCP success criteria for the habitat vegetation will be met and the ownership of the channel corridor

will be transferred to a public entity in the year 2006. The perpetual monitoring and maintenance of the channel stability is then expected to become the obligation of the either the City or the new owner of the corridor.

Among the other recommendations for increasing the potential stability of the channel are: planting of vegetation in critical areas; installation of low flow channel check structures; installation of full channel width check structures; and diverting frequent flows to parallel storm drains while providing frequent trickle flows to the existing channel to promote the growth of vegetation. A drawing of the check and drop structure concepts is included in the appendix of this report. Also included with this report are photographs taken of the channel as part of the field investigations conducted in preparation of this report.

It should be noted that this report is based on aerial topography and field observations. There was no field survey done for this study. Actual locations for the proposed structures will be determined in final design based on field survey data, weighing impacts on existing vegetation and channel stability and consultation with the U.S. Army Corps of Engineers.

The conceptual check/drop structures shown on Sheet 7 of 11 of the accompanying plans are presented for comment.

This report is not intended to preclude the possible use of other types of structures, adjustment of proposed structure locations, or the reduction or increases in the total number of structures in a study reach. The areas designated for additional review are indicated on the accompanying plans, sheets 1 through 11.

PREPARED BY:

JR Engineering, LLC

John R Bessette

John R. Bessette, P.E.
Lead Project Engineer

/kd/8717.45/reports/upper pine creek analysis rpt December 2003

Reach #1

UPPER PINE CREEK REACH NO. 1, FROM CHAPEL HILLS BRIDGE UPSTREAM TO THE 84" DIAMETER OUTFALL

UPPER PINE CREEK REACH NO. 1, FROM CHAPEL HILLS BRIDGE UPSTREAM TO THE 84" DIAMETER OUTFALL

EXISTING CONDITION

This reach is heavily vegetated, primarily with willows, some cattails, brush and trees. This reach has benefited from the watering of the adjacent golf course, providing moisture to promote the growth of wetlands vegetation. This reach has been subjected to frequent runoff from limited adjacent development for several years. However, the majority of the watershed is still undeveloped, thus peak rates have not been as high as predicted for the fully developed basin condition. The fully developed condition peak flows will be attenuated by the existing and proposed upstream detention facilities proposed in the Pine Creek D.B.P.S. Amendment No. 3. The proposed storm water facilities are intended to keep peak 100 frequency peak flow rates at historic levels. However, the channel will be subjected to more frequent flows.

The existing channel is stable due to the well-rooted vegetation, relatively flat bottom except for the low flow channel and relatively straight alignment except for one bend at Station 31+00 to 32+50.

A section of irregular v-shaped channel exists between Stations 6+75 and 8+10 and that is of some concern. There is also a constriction of the channel between Stations 32+00 and 33+00.

The channel gradient increases in the upstream direction. The average slope of the channel between Stations 3+00 and 18+00 is 1.13%, between Stations 18+00 and 27+00, 2.89%, between Stations 27+00 and the 84" diameter outfall, 3.24%.

In some locations the channel bank slopes are 1.5:1+/- with some localized sloughing. In general these areas are small and surrounded by healthy vegetation. The areas are also relative high on

the channel banks. The combination of these factors would lead to the conclusion that the channel stability is not jeopardized by the condition of the channel banks.

A defined low flow channel exists over most of this reach. The low flow channel is generally between 0.5 and 1.5 feet in depth, and between 2 and 3 feet in width. It is the low flow channel that is of the most concern.

PROPOSED CONDITION

The proposed improvements are to include:

1. A channel check structure at Station 8+12 +/-, upstream of the steep irregular section, to impede any channel instability between Stations 6+75 and 8+10 from moving upstream.

2. Six low flow channel check structures at Stations: 14+00, 25+45, 27+85, 28+75, 30+60, and 31+20 to reduce the potential for degradation of the low flow channel. The recommendation for the use of low flow channel check structures is discussed in more detail in the next section of this report.

3. A second channel check structure at Station 32+50.

4. Limited channel bank grading between Stations 32+00 and 33+00 to remove the previously mentioned restriction.

5. Construction of a proposed R.C.B and buried riprap for the existing golf cart path crossing of Pine Creek, Station 20+00+/-. The proposed 2 cell, 6's x 3'r R.C.B will pass slightly less than a two-year frequency storm without over-topping the cart path,

while acting as a drop structure during more severe storms that over top the cart path. The proposed riprap will be toed in along the down stream limits to act as a check structure at that point in the channel.

HYDRAULIC ANALYSIS

A total of three HEC-RAS Models were developed, existing condition sections, proposed condition (improved) and improved condition high "n" values. The flow data used in all three models was the developed condition flow data as established in the Pine Creek D.B.P.S. Amendment No. 3. The full data for this reach is as follows:

Peak Flow Data (cfs)

Section	D.B.P.S.	Frequency (Years)						
No.	AP NO.	2	5	10	25	50	100	Dominant
640	5A	248	313	354	413	470	531	222
420	12	255	372	479	650	771	899	266
200	13	257	399	524	729	871	1017	282

The existing condition model analyzed the channel in the present condition. Channel condition "n" values are a result of field observation. The resulting areas of concern were Sections 433 and 430 the golf cart path area, and Section 250 in the irregular segment of channel previously discussed. Both of these areas have been addressed. The golf cart path area is addressed with the proposed R.C.B. and buried riprap, and a check structure is proposed upstream of Section No. 250.

The proposed condition model was developed from the existing condition model with sections added/revised to reflect the proposed improvements. The results were as expected. A slight velocity reduction is noted at Section 610, Station 32+14 where proposed channel bank grading removes a restrictive segment of the channel banks. It is proposed that proposed channel check structure No. 2 be located in the area of the channel back restriction. Final design of these improvements shall minimize the area of disturbance. The need for the golf cart path

improvements was confirmed by the velocities in Sections 433 and 430 in the area of proposed buried riprap.

The third model, improved condition high "n" values, was developed from the improved condition model by multiplying the "n" values by a factor of 1.5 in the naturally vegetated areas of the channel. The purpose of this model was to determine if the channel cross-section has adequate capacity should the density of vegetation continue to increase, increasing the resistance to flow. The existing channel had additional freeboard even with the higher "n" values.

Analysis of the low flow channel was done using FlowMaster v5.15. The analysis was based on a low flow channel with a depth of 1.5 feet and a bottom width of 2.5 feet. The analysis was run with channel slopes of 1 to 3.5%, "n" equal to 0.032, and water depth of 0.5 to 6.5 feet. A copy of the analysis data sheets is included as part of this report. Using 3.5 fps as a guideline for the maximum velocity in sand channels the following conclusions can be drawn:

- At a 0.5 foot depth of flow, a channel slope of 2.5%, velocity is 3.5 fps
- At a 1-foot depth of flow, a channel slope of 1.5%, velocity is 3.9 fps.
- At a 1.5-foot depth of flow, a channel slope of 1%, velocity is 4 fps.
- At a water depth of 2.5 feet, velocities range from 4.6 fps to 8.6 fps with channel slopes from 1 to 3.5 %. Velocities continue to increase with water depth.

These results correlate well with field observations and confirm that low flow channel velocities are the greatest potential cause of channel instability. If the low flow channel erodes, the water surface and adjacent groundwater elevation will drop taking the water supply from the vegetation. If consideration is given to the root structure of the wetland vegetation the allowable velocity maybe increased slightly. However, the same relationship between water depth, channel slope and water velocity still exists only the base level is raised slightly. The need for low flow channel check structures is evident.

RELATED PROJECTS

In addition to the proposed improvements listed previously it is proposed that the existing overflow structure for the irrigation pond, Pine Creek Station 24+40 +/- be reconstructed. The existing structure is in disrepair and needs to be replaced to ensure the integrity of the pond.

REACH NO. 1, SUMMARY AND RECOMMENDATION

Field observations and hydraulic analysis indicate that the channel reach from Chapel Hills Drive to the proposed 84" diameter storm drain outfall is relatively stable. However, some improvements are recommended to address areas of concern.

As previously stated, two check structures extending into the channel banks are recommend. A total of six low flow channel check structures are recommended to lessen the potential for head cutting and degradation of the low flow channel particularly in the upstream end of the channel reach where the average channel gradient is 3.5%. Removal of the previously discussed restrictive channel banks and installation of the golf cart path RCB and buried riprap complete the immediate recommended improvements.

A monitoring program and timely corrective action is needed to ensure the continued stability of the channel. Due to the dynamic nature of natural channels, monitoring should be done at a minimum on an annual basis and after runoff events that produce either long runoff durations or high peak flows. La Plata Investments proposes to monitor the stability of the channel on an annual basis and after significant rainfall events through the year 2006 and mitigate stability problems if needed. The monitoring will be done in conjunction with the annual monitoring of the habitat vegetation within the channel corridor as required by the "Final Environmental Assessment and Habitat Conservation Plan for the Briargate Development, Located Along Upper Pine Creek", dated February 2003 (Pine Creek HCP). La Plata expects that the Pine Creek HCP success criteria for the habitat vegetation will be met and the ownership of the channel corridor will be transferred to a public entity in the year 2006. The perpetual monitoring and

maintenance of the channel stability is then expected to become the obligation of the either the City or the new owner of the corridor.

An additional threat to the channel stability not previously discussed is the build up of dry organic matter in the form of dead Willows and other vegetation in some areas of the channel. Although there is a healthy Willow growth there is a potential for fire in the built-up dry organic material. Selective clearing of old growth during the winter months when the Preble's meadow jumping mouse is dormant maybe a possible solution.

Reach number 1 hydraulic models and data sheets follow:

REACH NO. 1

HYDRAULIC CALCULATIONS

HEC-RAS EXISTING CONDITION MODEL

HEC-RAS IMPROVED CONDITION MODEL

HEC-RAS IMPROVED CONDITION HIGH "n" VALUE MODEL

FLOWMASTER LOW FLOW

CHANNEL ANALYSIS DATA SHEETS

REACH NO. 1

HEC-RAS EXISTING CONDITION MODEL

PCCCTO.rep

HEC-RAS September 1998 Version 2.2
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

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

PROJECT DATA
Project Title: PINE CREEK CHANNEL - CHD TO OUTFALL
Project File : PCCCTO.prj
Run Date and Time: 2/17/2003 8:07:38 AM

Project in English units

PLAN DATA

Plan Title: Plan 14
Plan File : x:\2870000.all\2871611\HYDRO\HECRAS\PCCCTO.p14

Geometry Title: PCXSECT02EXIST
Geometry File : x:\2870000.all\2871611\HYDRO\HECRAS\PCCCTO.g04

Flow Title : FLOW DATA 2/2003
Flow File : x:\2870000.all\2871611\HYDRO\HECRAS\PCCCTO.f03

Plan Summary Information:
Number of: Cross Sections = 51 Mulitple Openings = 0
Culverts = 0 Inline Weirs = 0
Bridges = 0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculaton tolerance = 0.01
Maximum number of interations = 20
Maximum difference tolerance = 0.3
Flow tolerance factor = 0.001

Computation Options
Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Mixed Flow

FLOW DATA

Flow Title: FLOW DATA 2/2003
Flow File : x:\2870000.all\2871611\HYDRO\HECRAS\PCCCTO.f03

Flow Data (cfs)

River	Reach	RS	2-yr PF 1	5-yr PF 2	10-yr PF 3	25-yr PF 4	50-yr PF 5	100-yr PF 6	D.M. PF 7
PINE CRK	1	640	248	313	354	413	470	531	222
PINE CRK	1	420	255	372	479	650	771	899	266
PINE CRK	1	200	257	399	524	729	871	1017	282

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
PINE CREEK	1	PF 1	Normal S = .025	Critical
PINE CREEK	1	PF 2	Normal S = .025	Critical
PINE CREEK	1	PF 3	Normal S = .025	Critical
PINE CREEK	1	PF 4	Normal S = .025	Critical
PINE CREEK	1	PF 5	Normal S = .025	Critical
PINE CREEK	1	PF 6	Normal S = .025	Critical
PINE CREEK	1	PF 7	Normal S = .025	Critical

GEOMETRY DATA

Geometry Title: PCXSECT02EXIST
Geometry File : x:\2870000.all\2871611\HYDRO\HECRAS\PCCCTO.g04

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 640

INPUT
Description:
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
39	6732	57	6730	80	6728	100	6727.7	112	6728
116	6730	122	6732						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
39	.045	57	.06	112	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
39	122	40	66	85	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 630

INPUT
Description:
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
63	6732	78	6726	100	6725.8	113	6726	121	6726.2
125	6728	135	6732						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
63	.03	78	.06	125	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
78	121	67	67	63	.1 .3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 620

INPUT
Description: EXISTING CONDITION AT PROPOSED BANK GRADING
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
67	6730	78	6724	90	6723.2	100	6724	113	6730

Manning's n Values num= 2

Sta	n Val	Sta	n Val
67	.07	113	.032

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
67	113	12	25	30	.1 .3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 610

INPUT
Description: EXIST'G CONDITION
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
70	6730	85	6724	100	6723.6	118	6724	140	6726
146	6728	151	6730						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
70	.045	85	.08	151	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
70	151	50	50	55	.1 .3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 590

INPUT
Description:
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
63	6728	73	6724	84	6723	97	6722	100	6722
126	6722	143	6724	157	6726	179	6728		

Manning's n Values num= 2

Sta	n Val	Sta	n Val
63	.045	73	.08

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
73	143	15	23	35	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 580

INPUT
Description:
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
65	6728	85	6722	100	6721	137	6722	148	6724
165	6726	186	6728						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
65	.045	85	.08	186	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
85	137	88	98	120	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 570

INPUT
Description:
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
69	6724	75	6720	80	6718	96	6718	100	6718.1
146	6719	166	6720	173	6724				

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
69	.045	75	.08	166	.045	173	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
75	166	85	95	104	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 560

INPUT
Description:
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
62	6722	76	6716	91	6715	100	6715.2	133	6715.6
162	6716	173	6722						

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
62	.045	76	.08	133	.06	162	.08

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
76	162	96	100	102	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 550

INPUT
Description:
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
63	6718	69	6714	81	6712	100	6711.8	117	6712
127	6712.3	154	6713	166	6718				

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
63	.045	69	.08	117	.45	154	.08

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
69	154	65	54	50	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 540

INPUT
Description:
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
27	6714	37	6710	100	6710	108	6710	152	6711
158	6714								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
27	.03	37	.045	158	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
37	152	92	93	75	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 530

INPUT
Description:
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
55	6712	73	6708	100	6706.5	109	6706	125	6706
135	6708	148	6712						

Manning's n Values num= 2

Sta	n Val	Sta	n Val
55	.045	135	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
73	135	57	52	50	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 520

INPUT
Description:
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
56	6710	60	6708	68	6706	100	6705.4	130	6706
139	6710								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
56	.03	60	.08	130	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
60	139	70	67	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 510

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
154	6710	162	6705	200	6704	231	6704	241	6710

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
154	.03	162	.08	241	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
162	231	73	74	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 500

INPUT
Description:
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
44	6710	53	6703	88	6703	100	6703	129	6703
167	6710								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
44	.03	53	.08	167	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
53	129	65	66	70	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 490

INPUT
Description:
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
40	6708	52	6702	87	6702	100	6702.4	140	6703
145	6704	163	6708						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
40	.03	52	.07	145	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
52	145	55	65	74	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 480

INPUT
Description:
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
44	6706	50	6704	62	6702	80	6701	85	6700.7
100	6701	145	6702	152	6704	156	6706		

Manning's n Values num= 1

Sta	n Val
44	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
50	152	102	90	90	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 470

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4	6706	65	6699.2	100	6699.2	140	6699.3	150	6706

Manning's n Values num= 2

Sta	n Val	Sta	n Val
4	.03	65	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
65	140	90	90	90	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 460

INPUT
Description:
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-12	6704	43	6702	64	6697.4	100	6697.4	132	6697.4
151	6704								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-12	.3	64	.06	132	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
43	151	112	105	103	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 450

INPUT
Description:
Station Elevation Data num= 11

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
93	6702	97	6700	128	6700	154	6698	163	6696
183	6696	200	6696.1	234	6696.3	240	6698	247	6700
251	6702								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
93	.03	163	.08	240	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
154	240	132	114	90	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 445

INPUT
Description: EDGE OF WOODS AT GOLF CART CROSSING
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
107	6700	125	6698	172	6696	197	6694	204	6694
214	6696	258	6698	272	6700				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
107	.03	172	.035	214	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
125	258	5	5	5	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 439

INPUT
Description: GOLF CART CROSSING
Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
68	6700	87	6698	100	6697.3	140	6697.3	158	6697
175	6696.7	184	6696.7	192	6696.7	197	6698	200	6698.1
217	6699	236	6700						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
68	.025	100	.017	236	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
68	236	12	12	12	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 433

INPUT
Description:
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
80	6698	110	6696	170	6696	194	6694	200	6693.5
204	6694	213	6696	258	6698				

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
80	.03	110	.03	170	.035	204	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
80	258	18	17	17	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 430

INPUT
Description: EXISTING CONDITION
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
93	6698	118	6696	158	6694.6	183	6694.2	190	6695
197	6694	207	6694	229	6696	260	6698		

Manning's n Values num= 1

Sta	n Val
93	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
93	260	72	82	88	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 420

INPUT
Description: EDGE WOODS/GOLF COURSE
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
49	6696	65	6694	83	6692	97	6690	100	6689.6
103	6690	111	6691.3	132	6690	137	6690	160	6694

Manning's n Values num= 2

Sta	n Val	Sta	n Val
49	.03	83	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
65	160	92	100	107	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev
150	160	6696

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 410

INPUT
Description:
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
22	6698	45	6690	51	6688.3	80	6690	100	6690.1
106	6690	113	6689.6	120	6690	138	6696	142	6698

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
22	.045	45	.03	51	.07	120	.06	138	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
45	120	38	50	63	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 400

INPUT
Description:

Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
58	6696	70	6692	78	6688	89	6688	100	6688.2
116	6688	135	6696						

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
58	.045	78	.035	89	.045	116	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
70	116	37	37	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 390

INPUT
Description:
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
54	6696	65	6692	85	6687.4	100	6687.4	116	6687.4
120	6690	134	6696						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
54	.045	65	.08	120	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
85	116	58	64	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 380

INPUT
Description:
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
41	6694	49	6692	58	6690	75	6688	90	6687
100	6686.5	112	6686	115	6686	141	6694		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
41	.045	49	.08	112	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
49	141	68	68	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 370

INPUT
Description:
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
27	6694	36	6692	84	6685.2	100	6685.2	110	6685.2
138	6692	145	6694						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
27	.045	36	.08	110	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
36	138	75	75	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 360

INPUT
Description:
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
28	6692	68	6686	88	6684	100	6683.9	122	6684
147	6692								

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
28	.06	68	.08	122	.06	147	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
28	147	92	90	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 350

INPUT
Description:
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
38	6690	53	6688	70	6683	100	6683	115	6683
140	6690								

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
38	.03	53	.06	70	.08	115	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
70	115	122	115	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 340

INPUT
Description:
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
35	6688	63	6684	74	6682	88	6681	100	6681
130	6682	141	6684	153	6688				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
35	.03	74	.08	130	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
63	141	112	112	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 330

INPUT

Description:
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
38	6686	45	6684	60	6682	69	6680	81	6679
100	6679.4	131	6680	140	6682	160	6686		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
38	.03	60	.08	140	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
60	140	96	96	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 320

INPUT
Description:
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
33	6684	55	6680	73	6677.3	100	6677.8	125	6678
135	6680	150	6684						

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
33	.03	55	.08	125	.06	135	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
55	135	72	72	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 310

INPUT
Description:
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
50	6680	68	6678	77	6675.7	100	6675.7	136	6675.7
142	6678	149	6680						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
50	.08	77	.045	136	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
77	142	73	73	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 300

INPUT
Description:
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
50	6680	65	6678	78	6674	100	6674	135	6674.5
151	6680								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val

```
      50      .03       65     .045      135      .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
            78     135               75      75      75             .1      .3

CROSS SECTION          RIVER: PINE CREEK
REACH: PINE CREEK         RS: 290

INPUT
Description:
Station Elevation Data    num=       7
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
      35     6680       65     6674       74   6672.7      100   6672.7      115   6672.7
     120     6674      143     6680

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
      35      .03       65      .08      120      .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
            65     120               47      53      58             .1      .3

CROSS SECTION          RIVER: PINE CREEK
REACH: PINE CREEK         RS: 280

INPUT
Description:
Station Elevation Data    num=       7
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
      37     6680       54     6676       78     6672      100   6671.8      116     6672
     133     6676      141     6680

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
      37      .03       54      .08      116      .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
            78     116               48      50      50             .1      .3

CROSS SECTION          RIVER: PINE CREEK
REACH: PINE CREEK         RS: 270

INPUT
Description:
Station Elevation Data    num=       9
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
      45     6680       62     6676       71     6674      100   6672.2      104     6672
     116     6670      122     6672      133     6678      137     6680

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
      45      .03       62      .07      122      .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
            62     133               27      27      27             .1      .3

CROSS SECTION          RIVER: PINE CREEK
REACH: PINE CREEK         RS: 260
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INPUT
Description:
Station Elevation Data    num=       8
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
      54     6678       68     6674       90     6672      100     6671      109     6670
     117     6670      128     6676      133     6678

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
      54      .03       68      .06      117      .03

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.    Expan.
            68     117                25      25      25              .1       .3

CROSS SECTION          RIVER: PINE CREEK
REACH: PINE CREEK         RS: 250

INPUT
Description:
Station Elevation Data    num=       8
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
      58     6678       71     6674       86   6671.2       92     6670      100   6668.8
     110     6670      120     6672      135     6678

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
      58      .03       71      .06      110      .03

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.    Expan.
            58     135                28      32      31              .1       .3

CROSS SECTION          RIVER: PINE CREEK
REACH: PINE CREEK         RS: 240

INPUT
Description:
Station Elevation Data    num=       8
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
      61     6676       70     6674       80     6670       89     6668      100     6669
     105   6669.4      114     6670      134     6676

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
      61      .03       80      .06      105      .03

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.    Expan.
            80     114                84      80      76              .1       .3

CROSS SECTION          RIVER: PINE CREEK
REACH: PINE CREEK         RS: 230

INPUT
Description:
Station Elevation Data    num=       8
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
      46     6676       55     6674       66     6670       76     6666       87     6668
     100   6668.9      115     6670      134     6676

Manning's n Values        num=       3
```

Sta	n Val	Sta	n Val	Sta	n Val
46	.03	76	.045	100	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
66	115	80	79	77	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 220

INPUT
Description:
Station Elevation Data num= 11

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
20	6674	35	6673	45	6672	59	6670	63	6666
72	6665.1	75	6666	95	6668	100	6668.5	110	6670
123	6674								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
20	.03	59	.045	123	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
59	110	40	37	35	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 210

INPUT
Description:
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
118	6670.7	142	6670	162	6668	167	6666	177	6664.6
196	6666	200	6666.8	206	6668	221	6671		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
118	.03	162	.08	196	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
162	196	60	51	50	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 200

INPUT
Description:
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
106	6672	127	6668	140	6666	160	6665	175	6665
182	6664	200	6666.2	218	6668	233	6672		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
106	.025	140	.08	200	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
140	200	64	67	70	.1	.3

CROSS SECTION RIVER: PINE CREEK

REACH: PINE CREEK RS: 190

INPUT
Description:
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
54	6670	61	6668	77	6666	96	6664	112	6664
134	6666	139	6668	143	6670				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
54	.025	77	.06	134	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
77	134	83	47	63	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 185

INPUT
Description: CONC. CHANN.
Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
28	6669	28.1	6668	31.5	6666.7	39.5	6666.7	60	6666
93	6664	121	6664	136.5	6665.5	136.6	6668	145.6	6668
150.6	6668.5	150.7	6669						

Manning's n Values num= 7

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
28	.015	28.1	.035	31.5	.015	39.5	.06	136.5	.015
145.6	.035	150.6	.015						

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
39.5	136.5	17	37	24	.2	.4

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 181

INPUT
Description: CONC. CHANN.
Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
68	6669	68.1	6666	71.5	6665.1	80.5	6665.1	80.6	6664.2
83.6	6662.7	116	6662.7	119	6664.2	119.1	6666	128.1	6666
133.1	6667	133.2	6669						

Manning's n Values num= 9

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
68	.015	68.1	.35	71.5	.015	80.6	.035	83.6	.015
116	.035	119	.015	128.1	.035	133.1	.015		

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
80.5	119.1	1	1	1	.2	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 179

INPUT
Description: CONC. CHANN

Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-32	6669	-31.9	6666	-28.5	6665.1	-19.5	6665.1	-19.4	6663.2
-16.4	6661.7	16	6661.7	19	6663.2	19.1	6666	28.1	6666
33.1	6667	33.2	6669						

Manning's n Values num= 9

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-32	.015	-31.9	.035	-28.5	.015	-19.4	.035	-16.4	.015
16	.035	19	.015	28.1	.035	33.1	.015		

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-19.5	19.1	10	17	25	.3	.5

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 173

INPUT
Description: TOP OF DROP EXISTING CONC. DROP
Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
75	6669	75.1	6664.9	78.5	6664.1	87.5	6664.1	87.6	6662.8
90.6	6661.8	109.6	6661.8	112.6	6662.8	112.7	6664	121.7	6664
125.2	6664.9	125.3	6669						

Manning's n Values num= 9

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
75	.015	75.1	.035	78.5	.015	87.6	.035	90.6	.015
109.6	.035	112.6	.015	121.7	.035	125.2	.015		

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
87.5	112.7	1	1	1	.2	.4

SUMMARY OF MANNING'S N VALUES

River:PINE CREEK

Reach	River Sta.	n1	n2	n3	n4	n5	n6	n7	n8	n9
PINE CREEK	640	.045	.06	.03						
PINE CREEK	630	.03	.06	.03						
PINE CREEK	620	.07	.032							
PINE CREEK	610	.045	.08	.03						
PINE CREEK	590	.045	.08							
PINE CREEK	580	.045	.08	.045						
PINE CREEK	570	.045	.08	.045	.03					
PINE CREEK	560	.045	.08	.06	.08					

PINE CREEK	550	.045	.08	.45	.08	
PINE CREEK	540	.03	.045	.03		
PINE CREEK	530	.045	.03			
PINE CREEK	520	.03	.08	.03		
PINE CREEK	510	.03	.08	.03		
PINE CREEK	500	.03	.08	.03		
PINE CREEK	490	.03	.07	.03		
PINE CREEK	480	.035				
PINE CREEK	470	.03	.045			
PINE CREEK	460	.3	.06	.045		
PINE CREEK	450	.03	.08	.045		
PINE CREEK	445	.03	.035	.035		
PINE CREEK	439	.025	.017	.025		
PINE CREEK	433	.03	.03	.035	.025	
PINE CREEK	430	.03				
PINE CREEK	420	.03	.045			
PINE CREEK	410	.045	.03	.07	.06	.03
PINE CREEK	400	.045	.035	.045	.06	
PINE CREEK	390	.045	.08	.06		
PINE CREEK	380	.045	.08	.06		
PINE CREEK	370	.045	.08	.06		
PINE CREEK	360	.06	.08	.06	.03	
PINE CREEK	350	.03	.06	.08	.03	
PINE CREEK	340	.03	.08	.03		
PINE CREEK	330	.03	.08	.03		
PINE CREEK	320	.03	.08	.06	.03	
PINE CREEK	310	.08	.045	.03		
PINE CREEK	300	.03	.045	.03		
PINE CREEK	290	.03	.08	.03		

PINE CREEK	280			.03	.08	.03		
PINE CREEK	270			.03	.07	.03		
PINE CREEK	260			.03	.06	.03		
PINE CREEK	250			.03	.06	.03		
PINE CREEK	240			.03	.06	.03		
PINE CREEK	230			.03	.045	.03		
PINE CREEK	220			.03	.045	.03		
PINE CREEK	210			.03	.08	.03		
PINE CREEK	200			.025	.08	.03		
PINE CREEK	190			.025	.06	.03		
PINE CREEK	185			.015	.035	.015	.06	.015
.035	.015							
PINE CREEK	181			.015	.35	.015	.035	.015
.035	.015	.035	.015					
PINE CREEK	179			.015	.035	.015	.035	.015
.035	.015	.035	.015					
PINE CREEK	173			.015	.035	.015	.035	.015
.035	.015	.035	.015					

SUMMARY OF REACH LENGTHS

River: PINE CREEK

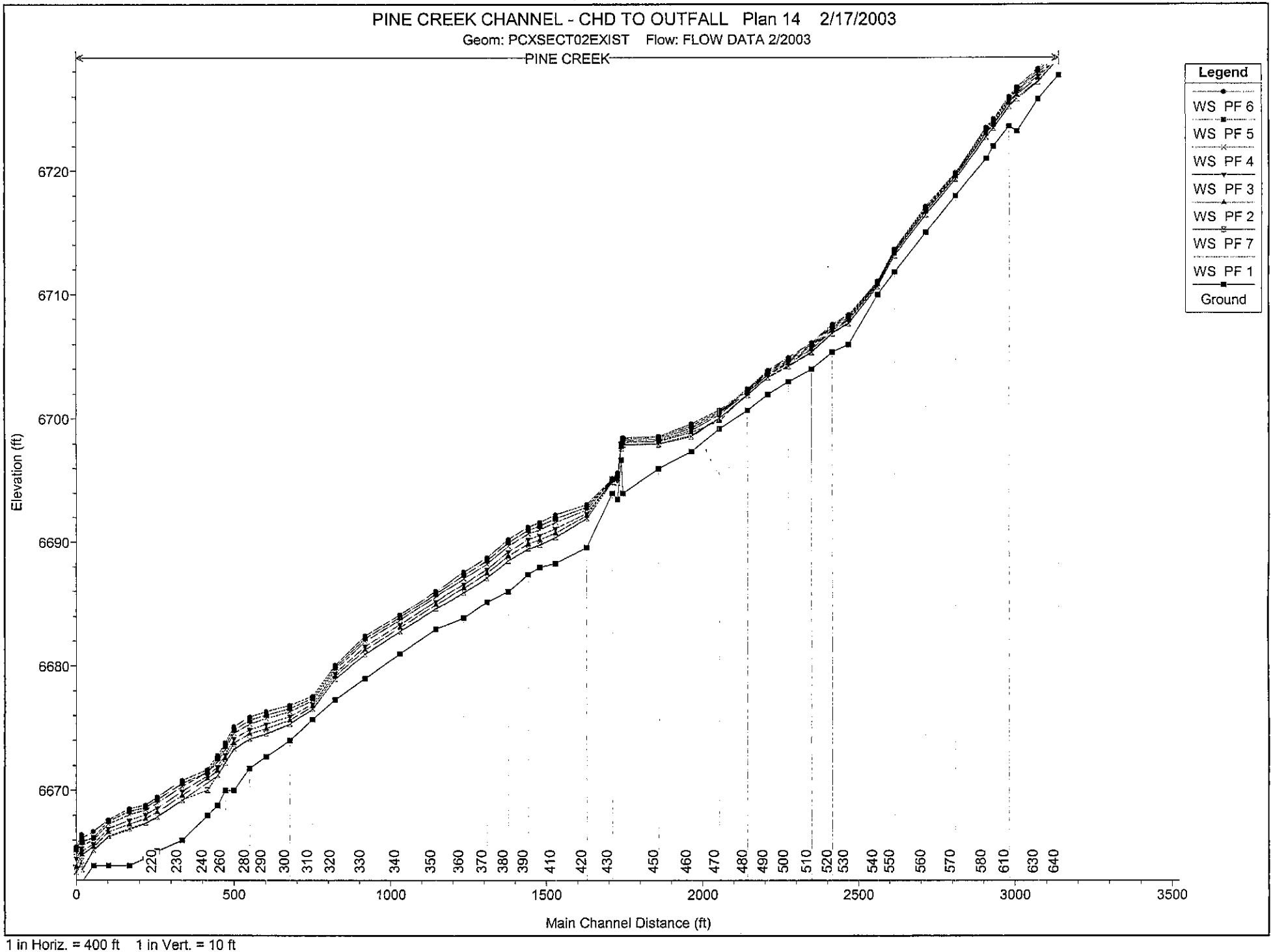
Reach	River Sta.	Left	Channel	Right
PINE CREEK	640	40	66	85
PINE CREEK	630	67	67	63
PINE CREEK	620	12	25	30
PINE CREEK	610	50	50	55
PINE CREEK	590	15	23	35
PINE CREEK	580	88	98	120
PINE CREEK	570	85	95	104
PINE CREEK	560	96	100	102
PINE CREEK	550	65	54	50
PINE CREEK	540	92	93	75
PINE CREEK	530	57	52	50
PINE CREEK	520	70	67	62
PINE CREEK	510	73	74	76
PINE CREEK	500	65	66	70
PINE CREEK	490	55	65	74
PINE CREEK	480	102	90	90
PINE CREEK	470	90	90	90
PINE CREEK	460	112	105	103
PINE CREEK	450	132	114	90
PINE CREEK	445	5	5	5

PINE CREEK	439	12	12	12
PINE CREEK	433	18	17	17
PINE CREEK	430	72	82	88
PINE CREEK	420	92	100	107
PINE CREEK	410	38	50	63
PINE CREEK	400	37	37	37
PINE CREEK	390	58	64	66
PINE CREEK	380	68	68	68
PINE CREEK	370	75	75	75
PINE CREEK	360	92	90	80
PINE CREEK	350	122	115	108
PINE CREEK	340	112	112	112
PINE CREEK	330	96	96	96
PINE CREEK	320	72	72	72
PINE CREEK	310	73	73	73
PINE CREEK	300	75	75	75
PINE CREEK	290	47	53	58
PINE CREEK	280	48	50	50
PINE CREEK	270	27	27	27
PINE CREEK	260	25	25	25
PINE CREEK	250	28	32	31
PINE CREEK	240	84	80	76
PINE CREEK	230	80	79	77
PINE CREEK	220	40	37	35
PINE CREEK	210	60	51	50
PINE CREEK	200	64	67	70
PINE CREEK	190	83	47	63
PINE CREEK	185	17	37	24
PINE CREEK	181	1	1	1
PINE CREEK	179	10	17	25
PINE CREEK	173	1	1	1

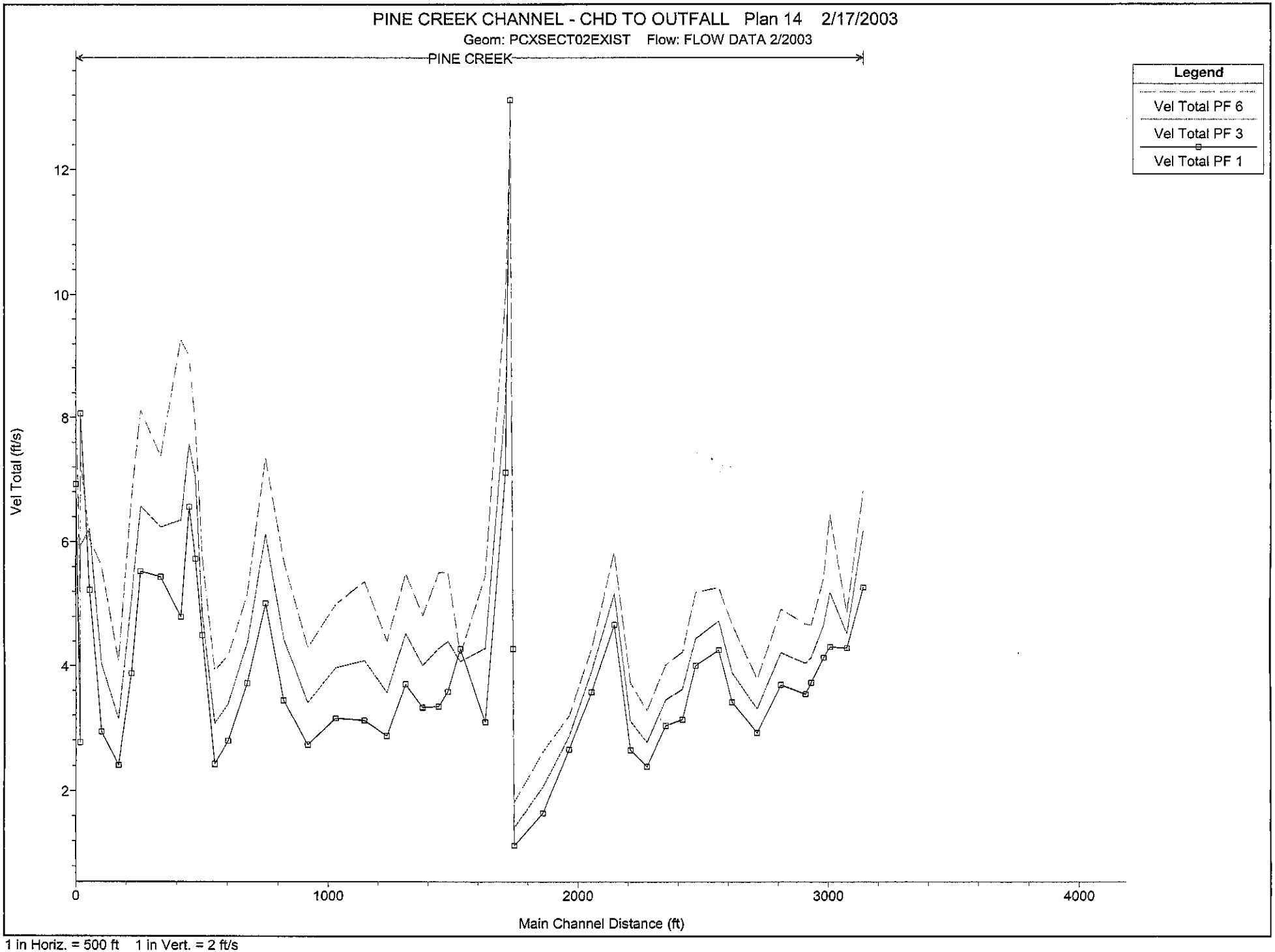
SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: PINE CREEK

Reach	River Sta.	Contr.	Expan.
PINE CREEK	640	.1	.3
PINE CREEK	630	.1	.3
PINE CREEK	620	.1	.3
PINE CREEK	610	.1	.3
PINE CREEK	590	.1	.3
PINE CREEK	580	.1	.3
PINE CREEK	570	.1	.3
PINE CREEK	560	.1	.3
PINE CREEK	550	.1	.3
PINE CREEK	540	.1	.3
PINE CREEK	530	.1	.3
PINE CREEK	520	.1	.3
PINE CREEK	510	.1	.3
PINE CREEK	500	.1	.3
PINE CREEK	490	.1	.3
PINE CREEK	480	.1	.3
PINE CREEK	470	.1	.3
PINE CREEK	460	.1	.3

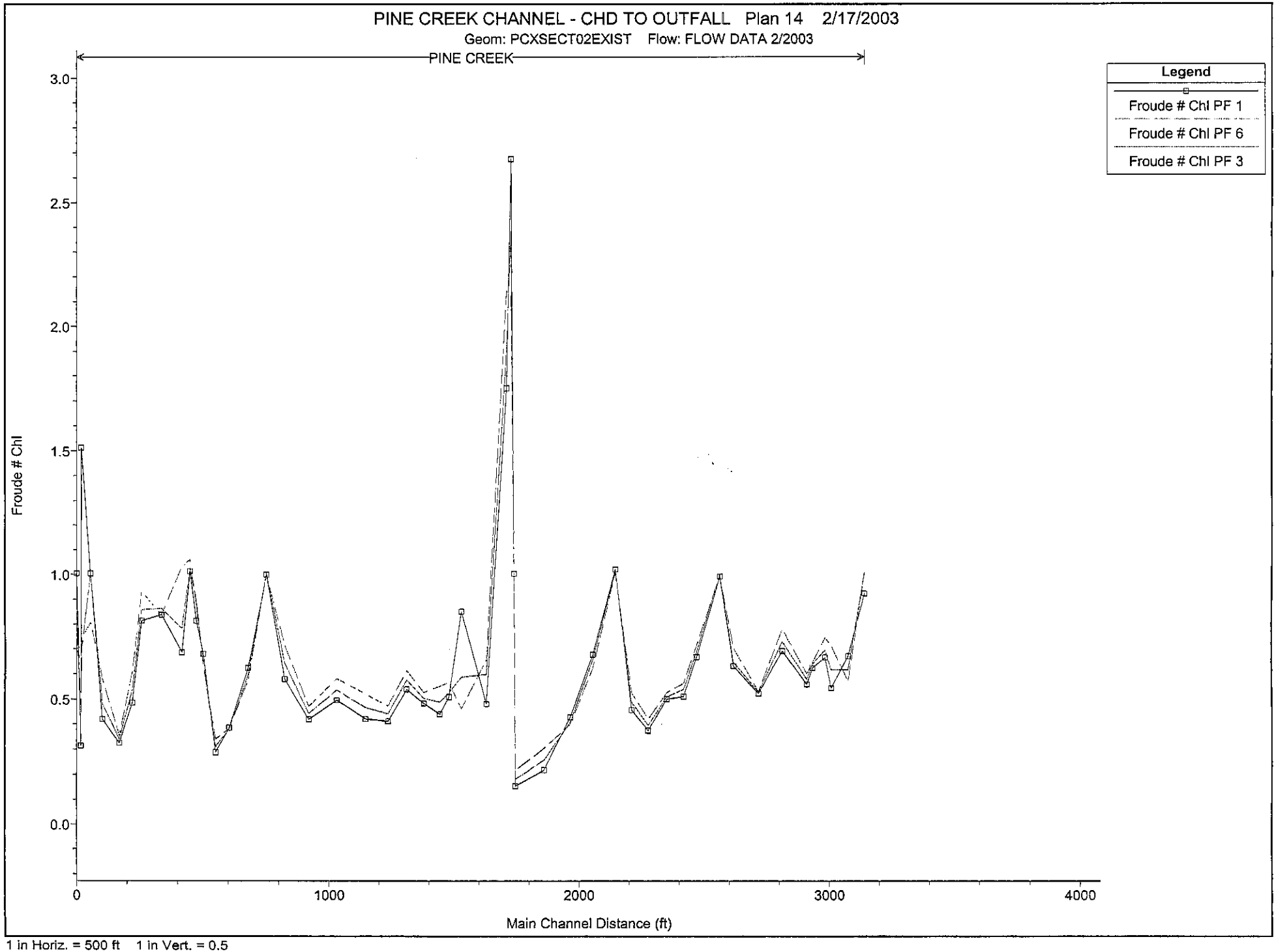
PINE CREEK	450	.1	.3
PINE CREEK	445	.1	.3
PINE CREEK	439	.1	.3
PINE CREEK	433	.1	.3
PINE CREEK	430	.1	.3
PINE CREEK	420	.1	.3
PINE CREEK	410	.1	.3
PINE CREEK	400	.1	.3
PINE CREEK	390	.1	.3
PINE CREEK	380	.1	.3
PINE CREEK	370	.1	.3
PINE CREEK	360	.1	.3
PINE CREEK	350	.1	.3
PINE CREEK	340	.1	.3
PINE CREEK	330	.1	.3
PINE CREEK	320	.1	.3
PINE CREEK	310	.1	.3
PINE CREEK	300	.1	.3
PINE CREEK	290	.1	.3
PINE CREEK	280	.1	.3
PINE CREEK	270	.1	.3
PINE CREEK	260	.1	.3
PINE CREEK	250	.1	.3
PINE CREEK	240	.1	.3
PINE CREEK	230	.1	.3
PINE CREEK	220	.1	.3
PINE CREEK	210	.1	.3
PINE CREEK	200	.1	.3
PINE CREEK	190	.1	.3
PINE CREEK	185	.2	.4
PINE CREEK	181	.2	.3
PINE CREEK	179	.3	.5
PINE CREEK	173	.2	.4



1 in Horiz. = 400 ft 1 in Vert. = 10 ft



1 in Horiz. = 500 ft 1 in Vert. = 2 ft/s



1 in Horiz. = 500 ft 1 in Vert. = 0.5

HEC-RAS Plan: Plan 08 River: PINE CREEK Reach: PINE CREEK

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
PINE CREEK	640	248.00	6727.70	6729.08	6729.01	6729.51	0.043159	5.28	47.01	46.52	0.92
PINE CREEK	640	313.00	6727.70	6729.19	6729.19	6729.74	0.049700	5.97	52.46	48.07	1.01
PINE CREEK	640	354.00	6727.70	6729.29	6729.29	6729.88	0.049118	6.18	57.26	49.40	1.01
PINE CREEK	640	413.00	6727.70	6729.43	6729.43	6730.07	0.047421	6.41	64.39	51.31	1.01
PINE CREEK	640	470.00	6727.70	6729.55	6729.55	6730.24	0.046482	6.63	70.86	52.99	1.01
PINE CREEK	640	531.00	6727.70	6729.68	6729.68	6730.41	0.045167	6.82	77.86	54.74	1.01
PINE CREEK	640	222.00	6727.70	6729.03	6728.93	6729.41	0.039784	4.95	44.84	45.88	0.88
PINE CREEK	630	248.00	6725.80	6727.21		6727.50	0.021989	4.31	57.74	48.27	0.67
PINE CREEK	630	313.00	6725.80	6727.47	6727.10	6727.78	0.018419	4.47	70.44	49.50	0.64
PINE CREEK	630	354.00	6725.80	6727.63	6727.20	6727.95	0.016839	4.56	78.18	50.23	0.62
PINE CREEK	630	413.00	6725.80	6727.84	6727.33	6728.18	0.015213	4.68	88.83	51.23	0.60
PINE CREEK	630	470.00	6725.80	6728.03	6727.45	6728.39	0.014039	4.80	98.75	52.14	0.58
PINE CREEK	630	531.00	6725.80	6728.22	6727.58	6728.60	0.013038	4.91	109.03	53.12	0.57
PINE CREEK	630	222.00	6725.80	6727.10		6727.38	0.024044	4.25	52.47	47.75	0.69
PINE CREEK	620	248.00	6723.20	6725.89		6726.18	0.017765	4.32	57.47	29.55	0.55
PINE CREEK	620	313.00	6723.20	6726.11		6726.48	0.020389	4.87	64.24	30.46	0.59
PINE CREEK	620	354.00	6723.20	6726.24		6726.66	0.021947	5.20	68.14	30.96	0.62
PINE CREEK	620	413.00	6723.20	6726.41		6726.90	0.024151	5.64	73.28	31.62	0.65
PINE CREEK	620	470.00	6723.20	6726.55		6727.12	0.026193	6.03	77.90	32.20	0.68
PINE CREEK	620	531.00	6723.20	6726.69		6727.33	0.028345	6.44	82.46	32.76	0.72
PINE CREEK	620	222.00	6723.20	6725.79		6726.04	0.016677	4.08	54.47	29.14	0.53
PINE CREEK	610	248.00	6723.60	6725.28		6725.55	0.037627	4.14	59.89	50.28	0.67
PINE CREEK	610	313.00	6723.60	6725.47		6725.78	0.038408	4.49	69.73	52.85	0.69
PINE CREEK	610	354.00	6723.60	6725.58		6725.92	0.038736	4.68	75.67	54.35	0.70
PINE CREEK	610	413.00	6723.60	6725.73		6726.11	0.039202	4.93	83.83	56.34	0.71
PINE CREEK	610	470.00	6723.60	6725.85		6726.27	0.040651	5.19	90.56	57.93	0.73
PINE CREEK	610	531.00	6723.60	6725.97		6726.43	0.041655	5.43	97.76	59.58	0.75
PINE CREEK	610	222.00	6723.60	6725.19		6725.44	0.037480	3.99	55.62	49.12	0.66
PINE CREEK	590	248.00	6722.00	6723.48		6723.70	0.035311	3.73	66.44	59.93	0.62
PINE CREEK	590	313.00	6722.00	6723.68		6723.92	0.035200	3.99	78.36	63.69	0.63
PINE CREEK	590	354.00	6722.00	6723.79		6724.05	0.035226	4.14	85.48	65.83	0.64
PINE CREEK	590	413.00	6722.00	6723.94		6724.23	0.035103	4.32	95.50	68.73	0.65
PINE CREEK	590	470.00	6722.00	6724.07		6724.38	0.034259	4.49	104.74	70.64	0.65
PINE CREEK	590	531.00	6722.00	6724.19		6724.53	0.033313	4.67	113.78	71.85	0.65
PINE CREEK	590	222.00	6722.00	6723.40		6723.60	0.034995	3.60	61.68	58.36	0.62
PINE CREEK	580	248.00	6721.00	6722.79		6722.99	0.026882	3.61	69.90	58.99	0.56
PINE CREEK	580	313.00	6721.00	6722.97		6723.21	0.027020	3.95	80.85	60.60	0.57
PINE CREEK	580	354.00	6721.00	6723.08		6723.34	0.026946	4.14	87.50	61.57	0.58
PINE CREEK	580	413.00	6721.00	6723.23		6723.52	0.026827	4.38	96.67	62.87	0.59
PINE CREEK	580	470.00	6721.00	6723.36		6723.68	0.027035	4.61	104.76	63.99	0.60
PINE CREEK	580	531.00	6721.00	6723.49		6723.84	0.026917	4.82	113.46	65.19	0.60
PINE CREEK	580	222.00	6721.00	6722.70		6722.89	0.027784	3.49	64.52	58.18	0.56
PINE CREEK	570	248.00	6718.00	6719.35		6719.56	0.047190	3.69	67.15	76.39	0.69
PINE CREEK	570	313.00	6718.00	6719.49		6719.74	0.048296	4.02	77.92	79.50	0.72
PINE CREEK	570	354.00	6718.00	6719.56		6719.84	0.049681	4.22	83.88	81.17	0.73
PINE CREEK	570	413.00	6718.00	6719.66		6719.97	0.051535	4.49	91.99	83.39	0.75
PINE CREEK	570	470.00	6718.00	6719.75		6720.10	0.052734	4.71	99.70	85.44	0.77
PINE CREEK	570	531.00	6718.00	6719.85		6720.22	0.053528	4.92	107.85	87.56	0.78
PINE CREEK	570	222.00	6718.00	6719.31		6719.49	0.044189	3.48	63.74	75.38	0.67
PINE CREEK	560	248.00	6715.00	6716.50		6716.63	0.021752	2.94	84.71	88.08	0.52
PINE CREEK	560	313.00	6715.00	6716.66		6716.81	0.021135	3.19	98.44	88.73	0.53
PINE CREEK	560	354.00	6715.00	6716.75		6716.92	0.020598	3.33	106.91	89.13	0.53
PINE CREEK	560	413.00	6715.00	6716.88		6717.07	0.019839	3.50	118.74	89.68	0.53
PINE CREEK	560	470.00	6715.00	6717.00		6717.21	0.019396	3.66	129.32	90.17	0.53
PINE CREEK	560	531.00	6715.00	6717.12		6717.35	0.018966	3.81	140.23	90.67	0.53
PINE CREEK	560	222.00	6715.00	6716.42		6716.55	0.023053	2.86	77.80	87.76	0.53
PINE CREEK	550	248.00	6711.80	6713.15	6712.89	6713.33	0.055786	3.42	72.53	80.26	0.63
PINE CREEK	550	313.00	6711.80	6713.29	6713.02	6713.51	0.060674	3.74	83.86	81.44	0.65
PINE CREEK	550	354.00	6711.80	6713.38	6713.09	6713.61	0.062259	3.89	91.05	82.18	0.65
PINE CREEK	550	413.00	6711.80	6713.47	6713.18	6713.74	0.068145	4.19	98.67	82.95	0.67

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
PINE CREEK	550	470.00	6711.80	6713.57	6713.26	6713.87	0.071387	4.42	106.61	83.75	0.69
PINE CREEK	550	531.00	6711.80	6713.65	6713.35	6713.99	0.076227	4.68	113.71	84.46	0.71
PINE CREEK	550	222.00	6711.80	6713.11	6712.83	6713.27	0.050605	3.21	69.13	79.91	0.61
PINE CREEK	540	248.00	6710.00	6710.67	6710.67	6710.95	0.035076	4.26	58.15	102.22	0.99
PINE CREEK	540	313.00	6710.00	6710.77	6710.77	6711.09	0.033891	4.55	68.77	106.94	1.00
PINE CREEK	540	354.00	6710.00	6710.83	6710.83	6711.18	0.033812	4.73	74.79	109.53	1.01
PINE CREEK	540	413.00	6710.00	6710.91	6710.91	6711.29	0.032588	4.91	84.10	113.41	1.00
PINE CREEK	540	470.00	6710.00	6710.98	6710.98	6711.39	0.031969	5.08	92.48	116.80	1.00
PINE CREEK	540	531.00	6710.00	6711.06	6711.06	6711.49	0.030953	5.27	100.74	117.75	1.00
PINE CREEK	540	222.00	6710.00	6710.62	6710.62	6710.89	0.038238	4.23	52.48	99.61	1.02
PINE CREEK	530	248.00	6706.00	6707.73	6707.40	6707.98	0.012855	4.01	61.91	55.71	0.67
PINE CREEK	530	313.00	6706.00	6707.92	6707.58	6708.20	0.013147	4.30	72.87	60.07	0.69
PINE CREEK	530	354.00	6706.00	6708.03	6707.68	6708.33	0.013084	4.45	79.58	62.20	0.69
PINE CREEK	530	413.00	6706.00	6708.15	6707.81	6708.50	0.013136	4.74	87.26	63.15	0.70
PINE CREEK	530	470.00	6706.00	6708.26	6707.94	6708.65	0.013057	4.98	94.62	64.04	0.71
PINE CREEK	530	531.00	6706.00	6708.38	6708.05	6708.80	0.012952	5.21	102.27	64.96	0.72
PINE CREEK	530	222.00	6706.00	6707.64	6707.32	6707.88	0.012693	3.87	57.34	53.79	0.66
PINE CREEK	520	248.00	6705.40	6706.93		6707.08	0.022575	3.14	79.08	67.82	0.51
PINE CREEK	520	313.00	6705.40	6707.10		6707.28	0.023277	3.46	90.52	68.87	0.53
PINE CREEK	520	354.00	6705.40	6707.20		6707.41	0.023349	3.63	97.65	69.51	0.54
PINE CREEK	520	413.00	6705.40	6707.34		6707.57	0.023427	3.84	107.42	70.39	0.55
PINE CREEK	520	470.00	6705.40	6707.47		6707.72	0.023527	4.04	116.34	71.17	0.56
PINE CREEK	520	531.00	6705.40	6707.60		6707.87	0.023578	4.23	125.53	71.98	0.56
PINE CREEK	520	222.00	6705.40	6706.86		6707.00	0.022446	3.00	73.96	67.35	0.50
PINE CREEK	510	248.00	6704.00	6705.43		6705.58	0.022384	3.06	81.64	72.08	0.50
PINE CREEK	510	313.00	6704.00	6705.61		6705.78	0.021813	3.33	94.79	72.67	0.51
PINE CREEK	510	354.00	6704.00	6705.72		6705.91	0.021571	3.48	102.50	73.02	0.51
PINE CREEK	510	413.00	6704.00	6705.86		6706.07	0.021372	3.69	112.91	73.48	0.52
PINE CREEK	510	470.00	6704.00	6705.99		6706.22	0.021215	3.88	122.45	73.90	0.52
PINE CREEK	510	531.00	6704.00	6706.12		6706.37	0.021111	4.06	132.11	74.33	0.53
PINE CREEK	510	222.00	6704.00	6705.36		6705.49	0.022314	2.93	76.41	71.84	0.50
PINE CREEK	500	248.00	6703.00	6704.29		6704.38	0.012140	2.42	103.55	84.66	0.38
PINE CREEK	500	313.00	6703.00	6704.47		6704.58	0.012441	2.67	118.66	85.85	0.39
PINE CREEK	500	354.00	6703.00	6704.57		6704.69	0.012605	2.82	127.54	86.54	0.40
PINE CREEK	500	413.00	6703.00	6704.71		6704.85	0.012733	3.00	139.90	87.49	0.40
PINE CREEK	500	470.00	6703.00	6704.83		6704.99	0.013027	3.17	150.55	88.30	0.41
PINE CREEK	500	531.00	6703.00	6704.96		6705.13	0.013284	3.35	161.46	89.13	0.42
PINE CREEK	500	222.00	6703.00	6704.21		6704.30	0.011945	2.31	97.20	84.15	0.37
PINE CREEK	490	248.00	6702.00	6703.38		6703.50	0.014832	2.62	93.50	92.69	0.46
PINE CREEK	490	313.00	6702.00	6703.52		6703.66	0.015440	2.90	106.61	93.67	0.48
PINE CREEK	490	354.00	6702.00	6703.60		6703.76	0.015963	3.07	113.86	94.21	0.49
PINE CREEK	490	413.00	6702.00	6703.71		6703.88	0.016665	3.29	123.60	94.94	0.51
PINE CREEK	490	470.00	6702.00	6703.80		6704.00	0.017118	3.49	132.81	95.61	0.52
PINE CREEK	490	531.00	6702.00	6703.90		6704.13	0.017360	3.67	142.65	96.33	0.53
PINE CREEK	490	222.00	6702.00	6703.32		6703.42	0.014895	2.51	87.23	92.21	0.45
PINE CREEK	480	248.00	6700.70	6701.98	6701.98	6702.32	0.021607	4.67	53.09	81.92	1.02
PINE CREEK	480	313.00	6700.70	6702.10	6702.10	6702.49	0.020692	5.01	62.44	83.90	1.02
PINE CREEK	480	354.00	6700.70	6702.17	6702.17	6702.58	0.019781	5.18	68.37	84.57	1.01
PINE CREEK	480	413.00	6700.70	6702.26	6702.26	6702.71	0.019010	5.42	76.21	85.45	1.01
PINE CREEK	480	470.00	6700.70	6702.34	6702.34	6702.83	0.018270	5.62	83.67	86.27	1.01
PINE CREEK	480	531.00	6700.70	6702.43	6702.43	6702.96	0.017908	5.84	90.91	87.07	1.01
PINE CREEK	480	222.00	6700.70	6701.93	6701.93	6702.25	0.021298	4.52	49.13	78.82	1.01
PINE CREEK	470	248.00	6699.20	6700.10	6699.91	6700.30	0.014286	3.60	69.32	84.23	0.68
PINE CREEK	470	313.00	6699.20	6699.82		6700.02	0.085486	6.80	46.21	81.31	1.56
PINE CREEK	470	354.00	6699.20	6700.34	6700.09	6700.58	0.012350	3.95	90.33	86.80	0.66
PINE CREEK	470	413.00	6699.20	6700.47	6700.18	6700.73	0.011503	4.10	101.60	88.15	0.65
PINE CREEK	470	470.00	6699.20	6700.59	6700.27	6700.87	0.010769	4.22	112.40	89.42	0.64
PINE CREEK	470	531.00	6699.20	6700.72	6700.36	6701.01	0.010075	4.33	123.83	90.75	0.62
PINE CREEK	470	222.00	6699.20	6700.04	6699.86	6700.22	0.014453	3.46	64.53	83.63	0.68

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
PINE CREEK	460	248.00	6697.40	6698.68		6698.79	0.019404	2.66	93.16	77.53	0.43
PINE CREEK	460	313.00	6697.40	6698.92	6698.26	6699.04	0.018755	2.79	112.27	79.34	0.41
PINE CREEK	460	354.00	6697.40	6699.06		6699.19	0.018662	2.87	123.46	80.39	0.41
PINE CREEK	460	413.00	6697.40	6699.25		6699.39	0.018755	2.98	138.63	81.78	0.40
PINE CREEK	460	470.00	6697.40	6699.42		6699.57	0.018974	3.08	152.47	83.03	0.40
PINE CREEK	460	531.00	6697.40	6699.59		6699.74	0.019310	3.19	166.48	84.28	0.40
PINE CREEK	460	222.00	6697.40	6698.57		6698.68	0.020068	2.62	84.80	76.72	0.44
PINE CREEK	450	248.00	6696.00	6698.02		6698.06	0.003377	1.65	150.18	86.33	0.22
PINE CREEK	450	313.00	6696.00	6698.17		6698.23	0.004070	1.92	163.48	88.84	0.25
PINE CREEK	450	354.00	6696.00	6698.26		6698.33	0.004467	2.07	171.39	90.29	0.26
PINE CREEK	450	413.00	6696.00	6698.38		6698.46	0.004984	2.27	182.31	92.27	0.28
PINE CREEK	450	470.00	6696.00	6698.49		6698.58	0.005442	2.46	192.32	94.04	0.29
PINE CREEK	450	531.00	6696.00	6698.60		6698.70	0.005886	2.64	202.61	95.83	0.30
PINE CREEK	450	222.00	6696.00	6697.95		6697.99	0.003065	1.54	144.51	85.63	0.21
PINE CREEK	445	248.00	6694.00	6697.97	6695.82	6697.99	0.000243	1.13	219.61	131.49	0.15
PINE CREEK	445	313.00	6694.00	6698.11	6696.05	6698.13	0.000310	1.31	238.18	134.70	0.17
PINE CREEK	445	354.00	6694.00	6698.19	6696.20	6698.22	0.000350	1.42	249.22	136.00	0.18
PINE CREEK	445	413.00	6694.00	6698.30	6696.37	6698.34	0.000403	1.57	264.32	137.77	0.20
PINE CREEK	445	470.00	6694.00	6698.40	6696.50	6698.44	0.000453	1.70	277.99	139.34	0.21
PINE CREEK	445	531.00	6694.00	6698.50	6696.63	6698.55	0.000502	1.83	292.09	140.95	0.22
PINE CREEK	445	222.00	6694.00	6697.91	6695.73	6697.92	0.000212	1.05	211.86	128.78	0.14
PINE CREEK	439	248.00	6696.70	6697.67	6697.67	6697.96	0.004993	4.28	57.92	102.66	1.00
PINE CREEK	439	313.00	6696.70	6697.77	6697.77	6698.10	0.004839	4.62	67.74	104.78	1.01
PINE CREEK	439	354.00	6696.70	6697.82	6697.82	6698.18	0.004722	4.80	73.82	106.07	1.01
PINE CREEK	439	413.00	6696.70	6697.90	6697.90	6698.29	0.004637	5.04	81.91	107.77	1.02
PINE CREEK	439	470.00	6696.70	6697.98	6697.98	6698.40	0.004465	5.22	90.08	109.45	1.01
PINE CREEK	439	531.00	6696.70	6698.05	6698.05	6698.50	0.004376	5.38	98.61	112.08	1.01
PINE CREEK	439	222.00	6696.70	6697.63	6697.63	6697.90	0.005160	4.15	53.48	101.68	1.01
PINE CREEK	433	248.00	6693.50	6694.93	6695.64	6697.60	0.129929	13.12	18.90	25.32	2.68
PINE CREEK	433	313.00	6693.50	6695.13	6696.12	6697.71	0.104940	12.89	24.29	28.62	2.47
PINE CREEK	433	354.00	6693.50	6695.24	6696.18	6697.81	0.095891	12.87	27.50	30.42	2.39
PINE CREEK	433	413.00	6693.50	6695.39	6696.26	6697.94	0.084972	12.81	32.23	32.88	2.28
PINE CREEK	433	470.00	6693.50	6695.52	6696.33	6698.06	0.077118	12.79	36.76	35.08	2.20
PINE CREEK	433	531.00	6693.50	6695.66	6696.41	6698.17	0.070045	12.74	41.69	37.33	2.12
PINE CREEK	433	222.00	6693.50	6694.85	6695.54	6697.51	0.139897	13.10	16.95	24.02	2.75
PINE CREEK	430	248.00	6694.00	6694.94	6695.18	6695.73	0.050530	7.11	34.86	68.08	1.75
PINE CREEK	430	313.00	6694.00	6695.02	6695.31	6695.94	0.052467	7.71	40.59	72.26	1.81
PINE CREEK	430	354.00	6694.00	6695.05	6695.37	6696.11	0.057226	8.26	42.87	73.49	1.91
PINE CREEK	430	413.00	6694.00	6695.11	6695.47	6696.30	0.058722	8.74	47.24	75.81	1.95
PINE CREEK	430	470.00	6694.00	6695.15	6695.57	6696.52	0.064923	9.42	49.89	77.18	2.06
PINE CREEK	430	531.00	6694.00	6695.19	6695.65	6696.74	0.069113	9.99	53.13	78.83	2.15
PINE CREEK	430	222.00	6694.00	6694.90	6695.13	6695.63	0.050028	6.87	32.30	65.97	1.73
PINE CREEK	420	255.00	6689.60	6691.92	6691.35	6692.07	0.006379	3.09	82.46	64.44	0.48
PINE CREEK	420	372.00	6689.60	6692.16	6691.61	6692.38	0.007778	3.77	98.76	67.91	0.55
PINE CREEK	420	479.00	6689.60	6692.35	6691.82	6692.64	0.008746	4.29	111.67	70.66	0.60
PINE CREEK	420	650.00	6689.60	6692.64	6692.11	6693.02	0.009260	4.90	132.68	75.00	0.64
PINE CREEK	420	771.00	6689.60	6692.85	6692.31	6693.27	0.009204	5.21	148.01	78.07	0.65
PINE CREEK	420	899.00	6689.60	6693.07	6692.51	6693.53	0.008971	5.47	164.49	81.28	0.66
PINE CREEK	420	266.00	6689.60	6691.94	6691.38	6692.10	0.006514	3.16	84.23	64.79	0.49
PINE CREEK	410	255.00	6688.30	6690.37	6690.30	6690.66	0.052077	4.30	59.56	77.19	0.85
PINE CREEK	410	372.00	6688.30	6690.76		6691.03	0.029094	4.18	89.62	79.44	0.68
PINE CREEK	410	479.00	6688.30	6691.10		6691.36	0.019950	4.12	117.59	81.48	0.59
PINE CREEK	410	650.00	6688.30	6691.61		6691.87	0.013815	4.15	159.23	84.43	0.51
PINE CREEK	410	771.00	6688.30	6691.93		6692.20	0.011646	4.20	186.83	86.33	0.48
PINE CREEK	410	899.00	6688.30	6692.24		6692.52	0.010209	4.28	214.40	88.19	0.46
PINE CREEK	410	266.00	6688.30	6690.41	6690.32	6690.69	0.048553	4.28	62.43	77.40	0.83
PINE CREEK	400	255.00	6688.00	6689.76		6689.97	0.005905	3.69	71.17	45.72	0.51
PINE CREEK	400	372.00	6688.00	6690.21		6690.48	0.005669	4.19	92.08	47.68	0.52
PINE CREEK	400	479.00	6688.00	6690.56		6690.88	0.005636	4.58	108.87	49.20	0.53
PINE CREEK	400	650.00	6688.00	6691.03		6691.43	0.005709	5.13	132.71	51.27	0.54

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
PINE CREEK	400	771.00	6688.00	6691.33		6691.78	0.005790	5.47	148.07	52.57	0.55
PINE CREEK	400	899.00	6688.00	6691.61		6692.12	0.005922	5.81	162.98	53.79	0.57
PINE CREEK	400	266.00	6688.00	6689.81		6690.02	0.005864	3.74	73.29	45.92	0.51
PINE CREEK	390	255.00	6687.40	6689.46		6689.64	0.014223	3.58	76.14	43.10	0.44
PINE CREEK	390	372.00	6687.40	6689.90		6690.15	0.015100	4.20	95.80	45.70	0.47
PINE CREEK	390	479.00	6687.40	6690.24		6690.55	0.015777	4.68	111.68	47.89	0.49
PINE CREEK	390	650.00	6687.40	6690.70		6691.09	0.016765	5.33	134.34	50.95	0.52
PINE CREEK	390	771.00	6687.40	6690.98		6691.43	0.017388	5.73	149.01	52.84	0.53
PINE CREEK	390	899.00	6687.40	6691.24		6691.76	0.018132	6.14	163.17	54.60	0.55
PINE CREEK	390	266.00	6687.40	6689.50		6689.69	0.014299	3.64	78.15	43.37	0.44
PINE CREEK	380	255.00	6686.00	6688.47		6688.64	0.017493	3.33	76.54	52.00	0.48
PINE CREEK	380	372.00	6686.00	6688.90		6689.11	0.017276	3.72	99.94	57.04	0.50
PINE CREEK	380	479.00	6686.00	6689.23		6689.48	0.017218	4.01	119.49	60.94	0.50
PINE CREEK	380	650.00	6686.00	6689.69		6689.98	0.017153	4.38	148.54	66.30	0.52
PINE CREEK	380	771.00	6686.00	6689.97		6690.30	0.017129	4.59	167.85	69.64	0.52
PINE CREEK	380	899.00	6686.00	6690.23		6690.59	0.017041	4.82	186.51	71.81	0.53
PINE CREEK	380	266.00	6686.00	6688.51		6688.69	0.017490	3.38	78.81	52.51	0.49
PINE CREEK	370	255.00	6685.20	6687.08		6687.30	0.022297	3.70	68.86	47.07	0.54
PINE CREEK	370	372.00	6685.20	6687.49		6687.76	0.022639	4.18	89.00	51.63	0.56
PINE CREEK	370	479.00	6685.20	6687.81		6688.12	0.022983	4.53	105.68	55.12	0.58
PINE CREEK	370	650.00	6685.20	6688.24		6688.62	0.023260	4.98	130.54	59.95	0.59
PINE CREEK	370	771.00	6685.20	6688.50		6688.93	0.023463	5.25	146.92	62.93	0.61
PINE CREEK	370	899.00	6685.20	6688.76		6689.23	0.023579	5.49	163.65	65.83	0.61
PINE CREEK	370	266.00	6685.20	6687.13		6687.35	0.022257	3.75	70.93	47.56	0.54
PINE CREEK	360	255.00	6683.90	6685.88		6686.01	0.013237	2.87	88.72	58.65	0.41
PINE CREEK	360	372.00	6683.90	6686.29		6686.45	0.013329	3.27	113.62	63.06	0.43
PINE CREEK	360	479.00	6683.90	6686.60		6686.80	0.013286	3.57	134.16	66.17	0.44
PINE CREEK	360	650.00	6683.90	6687.04		6687.29	0.013249	3.96	164.18	70.47	0.46
PINE CREEK	360	771.00	6683.90	6687.32		6687.59	0.013222	4.19	184.00	73.17	0.47
PINE CREEK	360	899.00	6683.90	6687.59		6687.89	0.013196	4.41	203.97	75.80	0.47
PINE CREEK	360	266.00	6683.90	6685.92		6686.05	0.013275	2.91	91.26	59.22	0.41
PINE CREEK	350	255.00	6683.00	6684.62		6684.78	0.014115	3.04	81.78	56.26	0.42
PINE CREEK	350	372.00	6683.00	6684.96		6685.19	0.014830	3.55	101.73	58.68	0.45
PINE CREEK	350	479.00	6683.00	6685.22		6685.51	0.015562	3.95	117.27	60.50	0.47
PINE CREEK	350	650.00	6683.00	6685.58		6685.96	0.016396	4.48	139.58	63.02	0.49
PINE CREEK	350	771.00	6683.00	6685.81		6686.25	0.016853	4.80	154.01	64.59	0.50
PINE CREEK	350	899.00	6683.00	6686.02		6686.52	0.017506	5.13	167.60	66.04	0.52
PINE CREEK	350	266.00	6683.00	6684.65		6684.82	0.014197	3.09	83.79	56.51	0.42
PINE CREEK	340	255.00	6681.00	6682.78		6682.93	0.018530	3.16	80.82	64.55	0.50
PINE CREEK	340	372.00	6681.00	6683.10		6683.31	0.018072	3.63	102.56	68.15	0.52
PINE CREEK	340	479.00	6681.00	6683.36		6683.61	0.017584	3.97	120.67	71.01	0.54
PINE CREEK	340	650.00	6681.00	6683.73		6684.03	0.016966	4.42	146.97	74.98	0.56
PINE CREEK	340	771.00	6681.00	6683.94		6684.29	0.016894	4.72	163.34	77.34	0.57
PINE CREEK	340	899.00	6681.00	6684.15		6684.54	0.016560	5.01	179.65	79.48	0.58
PINE CREEK	340	266.00	6681.00	6682.81		6682.97	0.018457	3.20	83.04	64.92	0.50
PINE CREEK	330	255.00	6679.00	6680.95		6681.06	0.014998	2.73	93.27	70.53	0.42
PINE CREEK	330	372.00	6679.00	6681.31		6681.46	0.014978	3.12	119.20	73.76	0.43
PINE CREEK	330	479.00	6679.00	6681.59		6681.77	0.015065	3.41	140.41	76.30	0.44
PINE CREEK	330	650.00	6679.00	6681.99		6682.21	0.015099	3.79	171.72	79.91	0.46
PINE CREEK	330	771.00	6679.00	6682.22		6682.48	0.015138	4.05	190.42	82.75	0.46
PINE CREEK	330	899.00	6679.00	6682.44		6682.73	0.015233	4.31	208.99	85.51	0.47
PINE CREEK	330	266.00	6679.00	6680.98		6681.10	0.015042	2.78	95.76	70.84	0.42
PINE CREEK	320	255.00	6677.30	6678.93	6678.56	6679.11	0.029337	3.45	74.02	67.51	0.58
PINE CREEK	320	372.00	6677.30	6679.20	6678.80	6679.45	0.031116	4.01	92.71	70.67	0.62
PINE CREEK	320	479.00	6677.30	6679.41	6678.99	6679.72	0.032299	4.43	108.02	73.15	0.64
PINE CREEK	320	650.00	6677.30	6679.69	6679.27	6680.09	0.034793	5.04	128.86	76.41	0.68
PINE CREEK	320	771.00	6677.30	6679.88	6679.44	6680.33	0.035613	5.38	143.20	78.56	0.70
PINE CREEK	320	899.00	6677.30	6680.06	6679.62	6680.56	0.035903	5.70	157.74	80.55	0.72
PINE CREEK	320	266.00	6677.30	6678.96	6678.58	6679.15	0.029365	3.50	76.03	67.86	0.58

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
PINE CREEK	310	255.00	6675.70	6676.52	6676.52	6676.93	0.031082	5.11	50.81	64.37	1.00
PINE CREEK	310	372.00	6675.70	6676.75	6676.75	6677.27	0.028889	5.79	65.66	65.86	1.01
PINE CREEK	310	479.00	6675.70	6676.94	6676.94	6677.55	0.027375	6.29	78.16	67.09	1.01
PINE CREEK	310	650.00	6675.70	6677.22	6677.22	6677.95	0.025156	6.90	97.18	68.91	1.00
PINE CREEK	310	771.00	6675.70	6677.40	6677.40	6678.21	0.024032	7.27	109.81	70.10	1.00
PINE CREEK	310	899.00	6675.70	6677.58	6677.58	6678.47	0.023257	7.63	122.30	71.25	1.00
PINE CREEK	310	266.00	6675.70	6676.54	6676.54	6676.96	0.031059	5.19	52.17	64.51	1.00
PINE CREEK	300	255.00	6674.00	6675.29	6674.99	6675.51	0.011028	3.78	68.58	63.51	0.62
PINE CREEK	300	372.00	6674.00	6675.63	6675.23	6675.90	0.009610	4.20	90.49	65.60	0.61
PINE CREEK	300	479.00	6674.00	6675.92	6675.42	6676.22	0.008672	4.49	109.44	67.36	0.60
PINE CREEK	300	650.00	6674.00	6676.32	6675.70	6676.68	0.007806	4.89	137.11	69.84	0.58
PINE CREEK	300	771.00	6674.00	6676.58	6675.89	6676.97	0.007395	5.13	155.43	71.44	0.58
PINE CREEK	300	899.00	6674.00	6676.83	6676.07	6677.26	0.007079	5.36	173.80	73.00	0.58
PINE CREEK	300	266.00	6674.00	6675.33	6675.02	6675.55	0.010864	3.83	70.72	63.72	0.62
PINE CREEK	290	255.00	6672.70	6674.50		6674.63	0.011860	2.80	91.26	59.46	0.39
PINE CREEK	290	372.00	6672.70	6674.96		6675.11	0.010683	3.13	118.98	63.44	0.38
PINE CREEK	290	479.00	6672.70	6675.30		6675.48	0.010141	3.37	141.31	66.48	0.38
PINE CREEK	290	650.00	6672.70	6675.77		6675.99	0.009639	3.70	173.23	70.59	0.38
PINE CREEK	290	771.00	6672.70	6676.06		6676.31	0.009357	3.88	194.19	73.17	0.38
PINE CREEK	290	899.00	6672.70	6676.34		6676.62	0.009117	4.05	215.15	75.66	0.38
PINE CREEK	290	266.00	6672.70	6674.55		6674.68	0.011701	2.84	94.05	59.87	0.39
PINE CREEK	280	255.00	6671.80	6674.08		6674.18	0.006038	2.42	104.82	59.29	0.29
PINE CREEK	280	372.00	6671.80	6674.54		6674.68	0.006113	2.77	133.36	64.03	0.30
PINE CREEK	280	479.00	6671.80	6674.88		6675.06	0.006284	3.05	155.91	67.54	0.31
PINE CREEK	280	650.00	6671.80	6675.33		6675.56	0.006617	3.44	187.39	72.16	0.33
PINE CREEK	280	771.00	6671.80	6675.62		6675.88	0.006762	3.66	208.31	75.08	0.33
PINE CREEK	280	899.00	6671.80	6675.89		6676.19	0.006880	3.88	229.38	77.90	0.34
PINE CREEK	280	266.00	6671.80	6674.13		6674.24	0.006036	2.46	107.73	59.79	0.29
PINE CREEK	270	255.00	6670.00	6673.28	6672.87	6673.59	0.028889	4.50	56.67	41.75	0.68
PINE CREEK	270	372.00	6670.00	6673.78	6673.27	6674.12	0.025423	4.68	79.54	50.64	0.66
PINE CREEK	270	479.00	6670.00	6674.14	6673.56	6674.50	0.022871	4.84	98.95	55.54	0.64
PINE CREEK	270	650.00	6670.00	6674.57	6673.96	6675.00	0.021125	5.25	123.74	58.30	0.64
PINE CREEK	270	771.00	6670.00	6674.85	6674.17	6675.32	0.020408	5.51	139.92	60.03	0.64
PINE CREEK	270	899.00	6670.00	6675.11	6674.38	6675.63	0.019894	5.76	156.09	61.71	0.64
PINE CREEK	270	266.00	6670.00	6673.34	6672.91	6673.65	0.028291	4.51	59.02	42.75	0.68
PINE CREEK	260	255.00	6670.00	6672.20		6672.76	0.031492	5.42	44.50	33.21	0.81
PINE CREEK	260	372.00	6670.00	6672.56		6673.28	0.034179	6.11	57.21	37.80	0.87
PINE CREEK	260	479.00	6670.00	6672.83	6672.83	6673.69	0.035558	6.58	68.06	41.33	0.89
PINE CREEK	260	650.00	6670.00	6673.27	6673.27	6674.24	0.033228	6.90	87.65	47.02	0.88
PINE CREEK	260	771.00	6670.00	6673.54	6673.54	6674.58	0.032119	7.10	100.81	50.48	0.88
PINE CREEK	260	899.00	6670.00	6673.80	6673.80	6674.90	0.031273	7.29	114.17	53.77	0.87
PINE CREEK	260	266.00	6670.00	6672.23		6672.81	0.032265	5.52	45.51	33.60	0.83
PINE CREEK	250	255.00	6668.80	6671.17	6671.17	6671.84	0.041693	6.56	38.85	29.75	1.01
PINE CREEK	250	372.00	6668.80	6671.60	6671.60	6672.38	0.037648	7.08	52.53	34.17	1.01
PINE CREEK	250	479.00	6668.80	6671.90	6671.92	6672.79	0.037049	7.58	63.21	37.27	1.03
PINE CREEK	250	650.00	6668.80	6672.29	6672.35	6673.36	0.036989	8.29	78.37	40.57	1.05
PINE CREEK	250	771.00	6668.80	6672.54	6672.63	6673.71	0.036585	8.69	88.72	42.52	1.06
PINE CREEK	250	899.00	6668.80	6672.79	6672.89	6674.05	0.035690	9.01	99.77	44.52	1.06
PINE CREEK	250	266.00	6668.80	6671.23	6671.23	6671.90	0.040552	6.58	40.40	30.27	1.00
PINE CREEK	240	255.00	6668.00	6670.59	6670.25	6670.95	0.016692	4.84	53.18	37.43	0.69
PINE CREEK	240	372.00	6668.00	6670.92	6670.62	6671.42	0.017655	5.72	65.85	39.35	0.74
PINE CREEK	240	479.00	6668.00	6671.16	6670.90	6671.79	0.018792	6.45	75.47	40.75	0.78
PINE CREEK	240	650.00	6668.00	6671.46	6671.31	6672.32	0.020958	7.51	88.16	42.53	0.85
PINE CREEK	240	771.00	6668.00	6671.46	6671.57	6672.67	0.029780	8.93	87.89	42.49	1.02
PINE CREEK	240	899.00	6668.00	6671.67	6671.82	6673.02	0.029489	9.45	97.03	43.73	1.03
PINE CREEK	240	266.00	6668.00	6670.00	6670.29	6671.06	0.093253	8.25	32.23	34.01	1.49
PINE CREEK	230	255.00	6666.00	6669.19		6669.65	0.015643	5.44	46.88	35.87	0.84
PINE CREEK	230	372.00	6666.00	6669.60		6670.14	0.014484	5.91	62.91	42.48	0.86
PINE CREEK	230	479.00	6666.00	6669.90		6670.51	0.013681	6.24	76.79	47.46	0.86
PINE CREEK	230	650.00	6666.00	6670.29		6671.01	0.012391	6.78	96.09	50.74	0.85

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
PINE CREEK	230	771.00	6666.00	6670.54	6670.32	6671.33	0.011683	7.13	108.80	52.20	0.85
PINE CREEK	230	899.00	6666.00	6670.79	6670.54	6671.65	0.011091	7.45	121.83	53.66	0.84
PINE CREEK	230	266.00	6666.00	6669.23	6669.04	6669.70	0.015599	5.50	48.35	36.53	0.84
PINE CREEK	220	255.00	6665.10	6667.84		6668.32	0.018138	5.53	46.13	32.25	0.81
PINE CREEK	220	372.00	6665.10	6668.26		6668.85	0.018498	6.13	60.73	36.90	0.84
PINE CREEK	220	479.00	6665.10	6668.58		6669.25	0.018694	6.57	72.86	40.10	0.86
PINE CREEK	220	650.00	6665.10	6668.98		6669.80	0.019102	7.25	89.64	43.18	0.89
PINE CREEK	220	771.00	6665.10	6669.22		6670.14	0.019572	7.69	100.30	45.04	0.91
PINE CREEK	220	899.00	6665.10	6669.45		6670.47	0.020169	8.12	110.70	46.77	0.93
PINE CREEK	220	266.00	6665.10	6667.89		6668.37	0.018028	5.57	47.71	32.79	0.81
PINE CREEK	210	255.00	6664.60	6667.34		6667.58	0.018030	3.79	85.83	39.04	0.48
PINE CREEK	210	372.00	6664.60	6667.75		6668.08	0.018999	4.34	82.45	42.11	0.51
PINE CREEK	210	479.00	6664.60	6668.04		6668.46	0.020301	4.81	94.86	44.53	0.54
PINE CREEK	210	650.00	6664.60	6668.41		6668.97	0.021580	5.44	112.68	50.17	0.57
PINE CREEK	210	771.00	6664.60	6668.63		6669.29	0.022606	5.85	123.89	53.42	0.59
PINE CREEK	210	899.00	6664.60	6668.82		6669.59	0.023867	6.26	134.47	56.31	0.61
PINE CREEK	210	266.00	6664.60	6667.41		6667.65	0.017131	3.77	68.75	39.59	0.48
PINE CREEK	200	257.00	6664.00	6666.84		6666.93	0.008287	2.41	106.53	71.88	0.32
PINE CREEK	200	399.00	6664.00	6667.29		6667.42	0.008171	2.79	140.33	79.26	0.34
PINE CREEK	200	524.00	6664.00	6667.61		6667.77	0.008069	3.04	166.53	84.54	0.34
PINE CREEK	200	729.00	6664.00	6668.04		6668.26	0.007916	3.36	204.90	91.40	0.35
PINE CREEK	200	871.00	6664.00	6668.30		6668.55	0.007807	3.53	228.49	93.69	0.35
PINE CREEK	200	1017.00	6664.00	6668.52		6668.81	0.007895	3.71	249.48	95.68	0.36
PINE CREEK	200	282.00	6664.00	6666.93		6667.03	0.008274	2.48	112.88	73.32	0.33
PINE CREEK	190	257.00	6664.00	6666.25	6665.47	6666.38	0.008047	2.94	87.52	59.61	0.42
PINE CREEK	190	399.00	6664.00	6666.64	6665.84	6666.84	0.008797	3.59	111.92	63.77	0.46
PINE CREEK	190	524.00	6664.00	6666.93	6666.09	6667.18	0.009359	4.05	130.24	66.72	0.48
PINE CREEK	190	729.00	6664.00	6667.31	6666.46	6667.65	0.010110	4.68	156.48	70.72	0.51
PINE CREEK	190	871.00	6664.00	6667.53	6666.68	6667.93	0.010555	5.06	172.70	73.09	0.53
PINE CREEK	190	1017.00	6664.00	6667.64		6668.14	0.012413	5.63	180.94	74.27	0.58
PINE CREEK	190	282.00	6664.00	6666.33	6665.53	6666.47	0.008183	3.07	92.21	60.44	0.43
PINE CREEK	185	257.00	6664.00	6665.14	6665.14	6665.56	0.056201	5.22	49.19	58.52	1.00
PINE CREEK	185	399.00	6664.00	6665.45	6665.45	6665.97	0.052977	5.80	68.79	66.90	1.01
PINE CREEK	185	524.00	6664.00	6665.67	6665.67	6666.27	0.050210	6.21	84.37	71.14	1.00
PINE CREEK	185	729.00	6664.00	6665.99	6665.99	6666.70	0.047280	6.77	107.75	76.38	1.00
PINE CREEK	185	871.00	6664.00	6666.20	6666.20	6666.96	0.046455	7.01	124.21	82.36	1.01
PINE CREEK	185	1017.00	6664.00	6666.69		6667.26	0.028466	6.04	168.44	96.83	0.81
PINE CREEK	185	282.00	6664.00	6665.20	6665.20	6665.64	0.055492	5.34	52.78	60.14	1.00
PINE CREEK	181	257.00	6662.70	6663.63	6663.91	6664.64	0.011197	8.06	31.87	36.12	1.51
PINE CREEK	181	399.00	6662.70	6664.84	6664.31	6665.25	0.001793	5.13	77.83	38.51	0.64
PINE CREEK	181	524.00	6662.70	6665.11	6664.60	6665.66	0.002069	5.95	88.21	47.59	0.69
PINE CREEK	181	729.00	6662.70	6665.54	6665.05	6666.26	0.002200	6.85	109.21	49.25	0.73
PINE CREEK	181	871.00	6662.70	6665.84	6665.43	6666.64	0.002180	7.28	123.87	50.38	0.74
PINE CREEK	181	1017.00	6662.70	6666.12		6667.00	0.002141	7.65	139.49	60.62	0.74
PINE CREEK	181	282.00	6662.70	6663.70	6663.99	6664.75	0.010844	8.21	34.33	36.39	1.49
PINE CREEK	179	257.00	6661.70	6664.23	6662.92	6664.35	0.000420	2.77	92.88	38.49	0.31
PINE CREEK	179	399.00	6661.70	6665.01		6665.18	0.000413	3.25	122.85	38.56	0.32
PINE CREEK	179	524.00	6661.70	6665.33		6665.56	0.000520	3.87	137.26	48.44	0.36
PINE CREEK	179	729.00	6661.70	6665.81		6666.14	0.000643	4.66	161.00	50.28	0.41
PINE CREEK	179	871.00	6661.70	6666.12		6666.52	0.000700	5.10	177.87	60.61	0.43
PINE CREEK	179	1017.00	6661.70	6666.42		6666.87	0.000738	5.48	196.11	62.11	0.45
PINE CREEK	179	282.00	6661.70	6664.38	6662.99	6664.51	0.000418	2.86	98.54	38.50	0.32
PINE CREEK	173	257.00	6661.80	6663.40	6663.40	6664.15	0.005905	6.93	37.10	25.10	1.00
PINE CREEK	173	399.00	6661.80	6663.90	6663.90	6664.90	0.005610	8.06	49.51	25.18	1.01
PINE CREEK	173	524.00	6661.80	6664.54	6664.54	6665.37	0.003342	7.48	75.53	47.17	0.82
PINE CREEK	173	729.00	6661.80	6665.00	6665.00	6665.94	0.003191	8.15	98.17	50.11	0.82
PINE CREEK	173	871.00	6661.80	6665.23	6665.23	6666.29	0.003310	8.71	109.74	50.12	0.84
PINE CREEK	173	1017.00	6661.80	6665.47	6665.47	6666.63	0.003331	9.15	121.61	50.13	0.86
PINE CREEK	173	282.00	6661.80	6663.49	6663.49	6664.29	0.005879	7.17	39.35	25.11	1.01

REACH NO. 1

HEC-RAS IMPROVED CONDITION MODEL

HEC-RRAS-PCCCTO-IMP

HEC-RAS September 1998 Version 2.2
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

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

PROJECT DATA
Project Title: PINE CREEK CHANNEL - CHD TO OUTFALL
Project File : PCCCTO.prj
Run Date and Time: 2/14/2003 4:28:55 PM

Project in English units

PLAN DATA

Plan Title: Plan 13
Plan File : x:\2870000.all\2871611\HYDRO\HECRAS\PCCCTO.p13

Geometry Title: PCXSECT02IMPROV
Geometry File : x:\2870000.all\2871611\HYDRO\HECRAS\PCCCTO.g03

Flow Title : FLOW DATA 2/2003
Flow File : x:\2870000.all\2871611\HYDRO\HECRAS\PCCCTO.f03

Plan Summary Information:
Number of: Cross Sections = 51 Mulitple Openings = 0
Culverts = 1 Inline Weirs = 0
Bridges = 0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculaton tolerance = 0.01
Maximum number of interations = 20
Maximum difference tolerance = 0.3
Flow tolerance factor = 0.001

Computation Options
Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Mixed Flow

FLOW DATA

Flow Title: FLOW DATA 2/2003
Flow File : x:\2870000.all\2871611\HYDRO\HECRAS\PCCCTO.f03

Flow Data (cfs)

River	Reach	RS	2-yr PF 1	5-yr PF 2	10-yr PF 3	25-yr PF 4	50-yr PF 5	100-yr PF 6	D.M. PF 7
PINE CREEK	1	640	248	313	354	413	470	531	222
PINE CREEK	1	420	255	372	479	650	771	899	266
PINE CREEK	1	200	257	399	524	729	871	1017	282

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
PINE CREEK	1	PF 1	Normal S = .025	Critical
PINE CREEK	1	PF 2	Normal S = .025	Critical
PINE CREEK	1	PF 3	Normal S = .025	Critical
PINE CREEK	1	PF 4	Normal S = .025	Critical
PINE CREEK	1	PF 5	Normal S = .025	Critical
PINE CREEK	1	PF 6	Normal S = .025	Critical
PINE CREEK	1	PF 7	Normal S = .025	Critical

GEOMETRY DATA

Geometry Title: PCXSECT02IMPROV
Geometry File : x:\2870000.all\2871611\HYDRO\HECRAS\PCCCTO.g03

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 640

INPUT
Description:
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
39	6732	57	6730	80	6728	100	6727.7	112	6728
116	6730	122	6732						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
39	.045	57	.06	112	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
39	122	40	66	85	.1 .3

CROSS SECTION RIVER: PINE CREEK

REACH: PINE CREEK RS: 630

INPUT
Description:
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
63	6732	78	6726	100	6725.8	113	6726	121	6726.2
125	6728	135	6732						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
63	.03	78	.06	125	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
78	121	67	67	63	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 620

INPUT
Description: PROPOSED BANK GRADING
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
54	6730	74	6724	90	6723.2	113	6724	125	6730

Manning's n Values num= 1

Sta	n Val
54	.07

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
54	125	12	25	35	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 610

INPUT
Description: PROPOSED GRADING LEFT BANK
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
52	6730	72	6724	100	6723.6	128	6724	140	6726
146	6728	151	6730						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
52	.045	72	.08	151	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
72	151	50	50	55	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 590

INPUT
Description:
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
63	6728	73	6724	84	6723	97	6722	100	6722
126	6722	143	6724	157	6726	179	6728		

Manning's n Values num= 2

Sta	n Val	Sta	n Val
63	.045	73	.08

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
73	143	15	23	35	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 580

INPUT
Description:
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
65	6728	85	6722	100	6721	137	6722	148	6724
165	6726	186	6728						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
65	.045	85	.08	186	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
85	137	88	98	120	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 570

INPUT
Description:
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
69	6724	75	6720	80	6718	96	6718	100	6718.1
146	6719	166	6720	173	6724				

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
69	.045	75	.08	166	.045	173	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
75	166	85	95	104	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 560

INPUT
Description:
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
62	6722	76	6716	91	6715	100	6715.2	133	6715.6
162	6716	173	6722						

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
62	.045	76	.08	133	.06	162	.08

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
76	162	96	100	102	.1	.3

CROSS SECTION RIVER: PINE CREEK

REACH: PINE CREEK RS: 550

INPUT
Description:

Station Elevation Data	num=	8							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
63	6718	69	6714	81	6712	100	6711.8	117	6712
127	6712.3	154	6713	166	6718				

Manning's n Values	num=	4					
Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
63	.045	69	.08	117	.45	154	.08

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
69	154	65	54	50	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 540

INPUT
Description:

Station Elevation Data	num=	6							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
27	6714	37	6710	100	6710	108	6710	152	6711
158	6714								

Manning's n Values	num=	3			
Sta	n Val	Sta	n Val	Sta	n Val
27	.03	37	.045	158	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
37	152	92	93	75	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 530

INPUT
Description:

Station Elevation Data	num=	7							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
55	6712	73	6708	100	6706.5	109	6706	125	6706
135	6708	148	6712						

Manning's n Values	num=	2	
Sta	n Val	Sta	n Val
55	.045	135	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
73	135	57	52	50	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 520

INPUT
Description:

Station Elevation Data	num=	6							
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
56	6710	60	6708	68	6706	100	6705.4	130	6706
139	6710								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
56	.03	60	.08	130	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
60	139	70	67	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 510

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
154	6710	162	6705	200	6704	231	6704	241	6710

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
154	.03	162	.08	241	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
162	231	73	74	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 500

INPUT
Description:
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
44	6710	53	6703	88	6703	100	6703	129	6703
167	6710								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
44	.03	53	.08	167	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
53	129	65	66	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 490

INPUT
Description:
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
40	6708	52	6702	87	6702	100	6702.4	140	6703
145	6704	163	6708						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
40	.03	52	.07	145	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
52	145	55	65	.1	.3

CROSS SECTION RIVER: PINE CREEK

REACH: PINE CREEK RS: 480

INPUT
Description:
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
44	6706	50	6704	62	6702	80	6701	85	6700.7
100	6701	145	6702	152	6704	156	6706		

Manning's n Values num= 1

Sta	n Val
44	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
50	152	102	90	90	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 470

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4	6706	65	6699.2	100	6699.2	140	6699.3	150	6706

Manning's n Values num= 2

Sta	n Val	Sta	n Val
4	.03	65	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
65	140	90	90	90	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 460

INPUT
Description:
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-12	6704	43	6702	64	6697.4	100	6697.4	132	6697.4
151	6704								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-12	.3	64	.06	132	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
43	151	112	105	103	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 450

INPUT
Description:
Station Elevation Data num= 11

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
93	6702	97	6700	128	6700	154	6698	163	6696
183	6696	200	6696.1	234	6696.3	240	6698	247	6700
251	6702								

```
Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
      93     .03     163     .08     240    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.    Expan.
           154     240               132     114      90             .1       .3

CROSS SECTION           RIVER: PINE CREEK
REACH: PINE CREEK          RS: 445

INPUT
Description: AT TOP OF PROPOSED RCB INLET
Station Elevation Data     num=        8
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
     107     6700      125     6698      189     6696      193     6694      207     6694
     210     6696      258     6698      272     6700

Manning's n Values          num=        4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
     107     .03     189    .035     193    .017     210    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.    Expan.
           125     258                 .1      .1       .1             .1       .3

CROSS SECTION           RIVER: PINE CREEK
REACH: PINE CREEK          RS: 444

INPUT
Description: AT BOTTOM OF PROPOSED RCB INLET
Station Elevation Data     num=        8
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
      66     6699       78     6698      189     6696      193  6692.97      207  6692.97
     210     6696      258     6698      272     6700

Manning's n Values          num=        4
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
      66     .03     189    .035     193    .017     207    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.    Expan.
           189     258                17      17       17             .1       .3

CULVERT                 RIVER: PINE CREEK
REACH: PINE CREEK          RS: 440

INPUT
Description: GOLF CART CROSSING
Distance from Upstream XS =        4
Deck/Roadway Width        =       11
Weir Coefficient          =      2.6
Bridge Deck/Roadway Skew  =
Upstream  Deck/Roadway Coordinates
    num=        7
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
      80     6698             176 6697.15            192.5  6696.9
     200   6696.9           207.5  6696.9              225 6697.15
     258     6698

Upstream Bridge Cross Section Data
```

Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
66	6699	78	6698	189	6696	193	6692.97	207	6692.97
210	6696	258	6698	272	6700				

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
66	.03	189	.035	193	.017	207	.035

Bank Sta: Left	Right	Coeff Contr.	Expan.
189	258	.1	.3

Downstream Deck/Roadway Coordinates

num= 7

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
80	6698		176	6697.1		192.5	6696.8	
200	6696.8		207.5	6696.8		225	6697.1	
258	6698							

Downstream Bridge Cross Section Data

Station Elevation Data num= 11

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
80	6698	176	6696	190	6696	192.5	6694	193	6692.4
200	6692.4	207	6692.4	208.5	6694	211	6696	229	6696.5
258	6698								

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
80	.03	176	.03	190	.035	208.5	.025

Bank Sta: Left	Right	Coeff Contr.	Expan.
176	229	.1	.3

Upstream Embankment side slope = 3 horiz. to 1.0 vertical
Downstream Embankment side slope = 4 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins = 6696.9
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Culverts = 1

Culvert Name	Shape	Rise	Span
Culvert #1	Box	3	6

FHWA Chart # 59- Rectangular concrete
FHWA Scale # 1 - Slope tapered; Less favorable edges
Solution Criteria = Highest U.S. EG

Culvert	Upstrm Dist	Length	n Value	Entrance Loss Coef	Exit Loss Coef
	4	11	.015	.5	1

Number of Barrels = 2
Upstream Elevation = 6692.97
Centerline Stations

Sta.	Sta.
196.7	203.3

Downstream Elevation = 6692.9
Centerline Stations

Sta.	Sta.
196.7	203.3

CULVERT OUTPUT Profile #PF 1
Culvert ID : Culvert #1

Culv Q (cfs)	243.97	Culv Vel In (ft/s)	8.68
# Barrels	2	Culv Vel Out (ft/s)	9.06
Q Barrel (cfs)	121.99	Culv Inv El Up (ft)	6692.97
E.G. US. (ft)	6697.07	Culv Inv El Dn (ft)	6692.90
W.S. US. (ft)	6696.97	Culv Frctn Ls (ft)	0.06
Delta EG (ft)	1.62	Culv Ext Lss (ft)	1.00
Delta WS (ft)	2.70	Culv Ent Lss (ft)	0.59
E.G. IC (ft)	6697.00	Q Weir (cfs)	4.03
E.G. OC (ft)	6697.07	Weir Sta Lft (ft)	181.58
Culvert Control	Outlet	Weir Sta Rgt (ft)	219.09
Culv WS In (ft)	6695.31	Weir Submerg	0.00
Culv WS Out (ft)	6695.14	Weir Max Depth (ft)	0.17
Culv Nml Depth (ft)	2.19	Weir Avg Depth (ft)	0.12
Culv Crt Depth (ft)	2.34	Wr Flw Area (sq ft)	4.35
Culv Ful Lngh (ft)		Min Top Rd (ft)	6696.90

Warning: The flow through the culvert is supercritical. However, since there is flow over the road
(weir flow), the program cannot determine if the downstream cross section should be
subcritical or supercritical. The program used the downstream subcritical answer, even
though it may not be valid.
Note: The flow in the culvert is entirely supercritical.

CULVERT OUTPUT Profile #PF 2
Culvert ID : Culvert #1

Culv Q (cfs)	265.50	Culv Vel In (ft/s)	8.93
# Barrels	2	Culv Vel Out (ft/s)	9.29
Q Barrel (cfs)	132.75	Culv Inv El Up (ft)	6692.97
E.G. US. (ft)	6697.46	Culv Inv El Dn (ft)	6692.90
W.S. US. (ft)	6697.38	Culv Frctn Ls (ft)	0.06
Delta EG (ft)	1.53	Culv Ext Lss (ft)	0.75
Delta WS (ft)	2.81	Culv Ent Lss (ft)	0.77
E.G. IC (ft)	6697.46	Q Weir (cfs)	47.50
E.G. OC (ft)	6697.31	Weir Sta Lft (ft)	141.98
Culvert Control	Inlet	Weir Sta Rgt (ft)	236.70
Culv WS In (ft)	6695.45	Weir Submerg	0.00
Culv WS Out (ft)	6695.28	Weir Max Depth (ft)	0.55
Culv Nml Depth (ft)	2.33	Weir Avg Depth (ft)	0.31
Culv Crt Depth (ft)	2.48	Wr Flw Area (sq ft)	29.64
Culv Ful Lngh (ft)		Min Top Rd (ft)	6696.90

Warning: The flow through the culvert is supercritical. However, since there is flow over the road
(weir flow), the program cannot determine if the downstream cross section should be
subcritical or supercritical. The program used the downstream subcritical answer, even
though it may not be valid.
Note: The flow in the culvert is entirely supercritical.

CULVERT OUTPUT Profile #PF 3
Culvert ID : Culvert #1

Culv Q (cfs)	272.87	Culv Vel In (ft/s)	7.58
# Barrels	2	Culv Vel Out (ft/s)	12.03
Q Barrel (cfs)	136.43	Culv Inv El Up (ft)	6692.97
E.G. US. (ft)	6697.60	Culv Inv El Dn (ft)	6692.90
W.S. US. (ft)	6697.52	Culv Frctn Ls (ft)	0.11
Delta EG (ft)	0.95	Culv Ext Lss (ft)	0.89
Delta WS (ft)	3.23	Culv Ent Lss (ft)	0.45
E.G. IC (ft)	6697.60	Q Weir (cfs)	81.13
E.G. OC (ft)	6697.39	Weir Sta Lft (ft)	124.83
Culvert Control	Inlet	Weir Sta Rgt (ft)	242.59
Culv WS In (ft)	6695.97	Weir Submerg	0.00
Culv WS Out (ft)	6694.79	Weir Max Depth (ft)	0.70
Culv Nml Depth (ft)	2.38	Weir Avg Depth (ft)	0.39
Culv Crt Depth (ft)	2.52	Wr Flw Area (sq ft)	45.78
Culv Ful Lngh (ft)		Min Top Rd (ft)	6696.90

Warning: The flow through the culvert is supercritical. However, since there is flow over the road
(weir flow), the program cannot determine if the downstream cross section should be
subcritical or supercritical. The program used the downstream subcritical answer, even
though it may not be valid.
Note: The flow in the culvert is entirely supercritical.

CULVERT OUTPUT Profile #PF 4
Culvert ID : Culvert #1

Culv Q (cfs)	281.58	Culv Vel In (ft/s)	7.82
# Barrels	2	Culv Vel Out (ft/s)	12.39
Q Barrel (cfs)	140.79	Culv Inv El Up (ft)	6692.97
E.G. US. (ft)	6697.77	Culv Inv El Dn (ft)	6692.90
W.S. US. (ft)	6697.69	Culv Frctn Ls (ft)	0.12
Delta EG (ft)	0.29	Culv Ext Lss (ft)	0.67
Delta WS (ft)	3.40	Culv Ent Lss (ft)	0.47
E.G. IC (ft)	6697.77	Q Weir (cfs)	131.42
E.G. OC (ft)	6697.48	Weir Sta Lft (ft)	105.75
Culvert Control	Inlet	Weir Sta Rgt (ft)	249.15
Culv WS In (ft)	6695.97	Weir Submerg	0.00
Culv WS Out (ft)	6694.79	Weir Max Depth (ft)	0.87
Culv Nml Depth (ft)	2.43	Weir Avg Depth (ft)	0.47
Culv Crt Depth (ft)	2.58	Wr Flw Area (sq ft)	67.84
Culv Ful Lngh (ft)		Min Top Rd (ft)	6696.90

Warning: The flow through the culvert is supercritical. However, since there is flow over the road
(weir flow), the program cannot determine if the downstream cross section should be
subcritical or supercritical. The program used the downstream subcritical answer, even
though it may not be valid.
Note: The flow in the culvert is entirely supercritical.

CULVERT OUTPUT Profile #PF 5

Culvert ID : Culvert #1

Culv Q (cfs)	287.88	Culv Vel In (ft/s)	8.00
# Barrels	2	Culv Vel Out (ft/s)	12.64
Q Barrel (cfs)	143.94	Culv Inv El Up (ft)	6692.97
E.G. US. (ft)	6697.90	Culv Inv El Dn (ft)	6692.90
W.S. US. (ft)	6697.82	Culv Frctn Ls (ft)	0.13
Delta EG (ft)	-0.51	Culv Ext Lss (ft)	0.45
Delta WS (ft)	3.52	Culv Ent Lss (ft)	0.50
E.G. IC (ft)	6697.90	Q Weir (cfs)	182.12
E.G. OC (ft)	6697.55	Weir Sta Lft (ft)	90.53
Culvert Control	Inlet	Weir Sta Rgt (ft)	254.38
Culv WS In (ft)	6695.97	Weir Submerg	0.00
Culv WS Out (ft)	6694.80	Weir Max Depth (ft)	1.01
Culv Nml Depth (ft)	2.47	Weir Avg Depth (ft)	0.54
Culv Crt Depth (ft)	2.61	Wr Flw Area (sq ft)	88.55
Culv Ful Lngh (ft)		Min Top Rd (ft)	6696.90

Warning: The flow through the culvert is supercritical. However, since there is flow over the road
(weir flow), the program cannot determine if the downstream cross section should be
subcritical or supercritical. The program used the downstream subcritical answer, even
though it may not be valid.
Note: The flow in the culvert is entirely supercritical.

CULVERT OUTPUT Profile #PF 6
Culvert ID : Culvert #1

Culv Q (cfs)	293.56	Culv Vel In (ft/s)	8.15
# Barrels	2	Culv Vel Out (ft/s)	8.15
Q Barrel (cfs)	146.78	Culv Inv El Up (ft)	6692.97
E.G. US. (ft)	6698.02	Culv Inv El Dn (ft)	6692.90
W.S. US. (ft)	6697.93	Culv Frctn Ls (ft)	0.35
Delta EG (ft)	0.86	Culv Ext Lss (ft)	
Delta WS (ft)	2.20	Culv Ent Lss (ft)	0.52
E.G. IC (ft)	6698.02	Q Weir (cfs)	237.44
E.G. OC (ft)	6697.95	Weir Sta Lft (ft)	77.67
Culvert Control	Inlet	Weir Sta Rgt (ft)	258.19
Culv WS In (ft)	6695.97	Weir Submerg	0.00
Culv WS Out (ft)	6696.12	Weir Max Depth (ft)	1.13
Culv Nml Depth (ft)	2.51	Weir Avg Depth (ft)	0.61
Culv Crt Depth (ft)	2.65	Wr Flw Area (sq ft)	109.42
Culv Ful Lngh (ft)	11.00	Min Top Rd (ft)	6696.90

Note: During the supercritical calculations a hydraulic jump occurred inside of the culvert.

CULVERT OUTPUT Profile #PF 7
Culvert ID : Culvert #1

Culv Q (cfs)	222.00	Culv Vel In (ft/s)	8.41
# Barrels	2	Culv Vel Out (ft/s)	8.81
Q Barrel (cfs)	111.00	Culv Inv El Up (ft)	6692.97
E.G. US. (ft)	6696.82	Culv Inv El Dn (ft)	6692.90
W.S. US. (ft)	6696.69	Culv Frctn Ls (ft)	0.06

Delta EG (ft)	1.57	Culv Ext Lss (ft)	0.99
Delta WS (ft)	2.55	Culv Ent Lss (ft)	0.55
E.G. IC (ft)	6696.50	Q Weir (cfs)	
E.G. OC (ft)	6696.82	Weir Sta Lft (ft)	
Culvert Control	Outlet	Weir Sta Rgt (ft)	
Culv WS In (ft)	6695.17	Weir Submerg	
Culv WS Out (ft)	6695.00	Weir Max Depth (ft)	
Culv Nml Depth (ft)	2.05	Weir Avg Depth (ft)	
Culv Crt Depth (ft)	2.20	Wr Flw Area (sq ft)	
Culv Ful Lngh (ft)		Min Top Rd (ft)	6696.90

Note: The flow in the culvert is entirely supercritical.

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 433

INPUT
Description: JUST DOWN STREAM OF PROPOSED RCB
Station Elevation Data num= 11

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
80	6698	176	6696	190	6696	192.5	6694	193	6692.4
200	6692.4	207	6692.4	208.5	6694	211	6696	229	6696.5
258	6698								

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
80	.03	176	.03	190	.035	208.5	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
176	229	18	17	17	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 430

INPUT
Description: GOLF COURSE
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
118	6696	176	6692.8	199	6692.7	200	6692.33	201	6692.7
227	6692.8	240	6696						

Manning's n Values num= 1

Sta	n Val
118	.025

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
118	240	72	82	88	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 420

INPUT
Description: EDGE OF WOODS/EDGE OF GOLF COURSE
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
49	6696	65	6694	83	6692	97	6690	100	6689.6
103	6690	111	6691.3	132	6690	137	6690	160	6694

Manning's n Values num= 2

Sta	n Val	Sta	n Val
49	.03	83	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
65	160	92	100	107	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev
150	160	6696

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 410

INPUT
Description:
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
22	6698	45	6690	51	6688.3	80	6690	100	6690.1
106	6690	113	6689.6	120	6690	138	6696	142	6698

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
22	.045	45	.03	51	.07	120	.06	138	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
45	120	38	50	63	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 400

INPUT
Description:
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
58	6696	70	6692	78	6688	89	6688	100	6688.2
116	6688	135	6696						

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
58	.045	78	.035	89	.045	116	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
70	116	37	37	37	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 390

INPUT
Description:
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
54	6696	65	6692	85	6687.4	100	6687.4	116	6687.4
120	6690	134	6696						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
54	.045	65	.08	120	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.

85	116		58	64	66	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 380

INPUT
Description:
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
41	6694	49	6692	58	6690	75	6688	90	6687
100	6686.5	112	6686	115	6686	141	6694		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
41	.045	49	.08	112	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
49	141	68	68	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 370

INPUT
Description:
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
27	6694	36	6692	84	6685.2	100	6685.2	110	6685.2
138	6692	145	6694						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
27	.045	36	.08	110	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
36	138	75	75	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 360

INPUT
Description:
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
28	6692	68	6686	88	6684	100	6683.9	122	6684
147	6692								

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
28	.06	68	.08	122	.06	147	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
28	147	92	90	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 350

INPUT
Description:
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
38	6690	53	6688	70	6683	100	6683	115	6683
140	6690								

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
38	.03	53	.06	70	.08	115	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
70	115	122	115	108	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 340

INPUT
Description:
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
35	6688	63	6684	74	6682	88	6681	100	6681
130	6682	141	6684	153	6688				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
35	.03	74	.08	130	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
63	141	112	112	112	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 330

INPUT
Description:
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
38	6686	45	6684	60	6682	69	6680	81	6679
100	6679.4	131	6680	140	6682	160	6686		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
38	.03	60	.08	140	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
60	140	96	96	96	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 320

INPUT
Description:
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
33	6684	55	6680	73	6677.3	100	6677.8	125	6678
135	6680	150	6684						

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
33	.03	55	.08	125	.06	135	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
55	135	72	72	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 310

INPUT
Description:
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
50	6680	68	6678	77	6675.7	100	6675.7	136	6675.7
142	6678	149	6680						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
50	.08	77	.045	136	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
77	142	73	73	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 300

INPUT
Description:
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
50	6680	65	6678	78	6674	100	6674	135	6674.5
151	6680								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
50	.03	65	.045	135	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
78	135	75	75	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 290

INPUT
Description:
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
35	6680	65	6674	74	6672.7	100	6672.7	115	6672.7
120	6674	143	6680						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
35	.03	65	.08	120	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
65	120	47	53	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 280

INPUT
Description:

Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
37	6680	54	6676	78	6672	100	6671.8	116	6672
133	6676	141	6680						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
37	.03	54	.08	116	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
78	116	48	50	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 270

INPUT
Description:
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
45	6680	62	6676	71	6674	100	6672.2	104	6672
116	6670	122	6672	133	6678	137	6680		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
45	.03	62	.07	122	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
62	133	27	27	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 260

INPUT
Description:
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
54	6678	68	6674	90	6672	100	6671	109	6670
117	6670	128	6676	133	6678				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
54	.03	68	.06	117	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
68	117	25	25	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 250

INPUT
Description:
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
58	6678	71	6674	86	6671.2	92	6670	100	6668.8
110	6670	120	6672	135	6678				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
58	.03	71	.06	110	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
58	135	28	32	31	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 240

INPUT
Description:
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
61	6676	70	6674	80	6670	89	6668	100	6669
105	6669.4	114	6670	134	6676				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
61	.03	80	.06	105	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
80	114	84	80	76	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 230

INPUT
Description:
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
46	6676	55	6674	66	6670	76	6666	87	6668
100	6668.9	115	6670	134	6676				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
46	.03	76	.045	100	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
66	115	80	79	77	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 220

INPUT
Description:
Station Elevation Data num= 11

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
20	6674	35	6673	45	6672	59	6670	63	6666
72	6665.1	75	6666	95	6668	100	6668.5	110	6670
123	6674								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
20	.03	59	.045	123	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
59	110	40	37	35	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 210

INPUT
Description:
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
118	6670.7	142	6670	162	6668	167	6666	177	6664.6
196	6666	200	6666.8	206	6668	221	6671		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
118	.03	162	.08	196	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
162	196	60	51	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 200

INPUT
Description:
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
106	6672	127	6668	140	6666	160	6665	175	6665
182	6664	200	6666.2	218	6668	233	6672		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
106	.025	140	.08	200	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
140	200	64	67	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 190

INPUT
Description:
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
54	6670	61	6668	77	6666	96	6664	112	6664
134	6666	139	6668	143	6670				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
54	.025	77	.06	134	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
77	134	83	47	.1	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 185

INPUT
Description: CONC. CHANN.
Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
28	6669	28.1	6668	31.5	6666.7	39.5	6666.7	60	6666
93	6664	121	6664	136.5	6665.5	136.6	6668	145.6	6668
150.6	6668.5	150.7	6669						

Manning's n Values num= 7

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
28	.015	28.1	.035	31.5	.015	39.5	.06	136.5	.015
145.6	.035	150.6	.015						

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
39.5	136.5	17	37	24	.2	.4

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 181

INPUT
Description: CONC. CHANN.
Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
68	6669	68.1	6666	71.5	6665.1	80.5	6665.1	80.6	6664.2
83.6	6662.7	116	6662.7	119	6664.2	119.1	6666	128.1	6666
133.1	6667	133.2	6669						

Manning's n Values num= 9

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
68	.015	68.1	.35	71.5	.015	80.6	.035	83.6	.015
116	.035	119	.015	128.1	.035	133.1	.015		

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
80.5	119.1	1	1	1	.2	.3

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 179

INPUT
Description: CONC. CHANN
Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-32	6669	-31.9	6666	-28.5	6665.1	-19.5	6665.1	-19.4	6663.2
-16.4	6661.7	16	6661.7	19	6663.2	19.1	6666	28.1	6666
33.1	6667	33.2	6669						

Manning's n Values num= 9

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
-32	.015	-31.9	.035	-28.5	.015	-19.4	.035	-16.4	.015
16	.035	19	.015	28.1	.035	33.1	.015		

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-19.5	19.1	10	17	25	.3	.5

CROSS SECTION RIVER: PINE CREEK
REACH: PINE CREEK RS: 173

INPUT
Description: TOP OF DROP EXISTING CONC. DROP
Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
75	6669	75.1	6664.9	78.5	6664.1	87.5	6664.1	87.6	6662.8
90.6	6661.8	109.6	6661.8	112.6	6662.8	112.7	6664	121.7	6664
125.2	6664.9	125.3	6669						

Manning's n Values num= 9

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val

75	.015	75.1	.035	78.5	.015	87.6	.035	90.6	.015
109.6	.035	112.6	.015	121.7	.035	125.2	.015		

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
87.5	112.7	1	1	.2	.4

SUMMARY OF MANNING'S N VALUES

River:PINE CREEK

Reach	River Sta.	n1	n2	n3	n4	n5	n6	n7	n8	n9
PINE CREEK	640	.045	.06	.03						
PINE CREEK	630	.03	.06	.03						
PINE CREEK	620	.07								
PINE CREEK	610	.045	.08	.03						
PINE CREEK	590	.045	.08							
PINE CREEK	580	.045	.08	.045						
PINE CREEK	570	.045	.08	.045	.03					
PINE CREEK	560	.045	.08	.06	.08					
PINE CREEK	550	.045	.08	.45	.08					
PINE CREEK	540	.03	.045	.03						
PINE CREEK	530	.045	.03							
PINE CREEK	520	.03	.08	.03						
PINE CREEK	510	.03	.08	.03						
PINE CREEK	500	.03	.08	.03						
PINE CREEK	490	.03	.07	.03						
PINE CREEK	480	.035								
PINE CREEK	470	.03	.045							
PINE CREEK	460	.3	.06	.045						
PINE CREEK	450	.03	.08	.045						
PINE CREEK	445	.03	.035	.017	.035					
PINE CREEK	444	.03	.035	.017	.035					

PINE CREEK	440	Culvert					
PINE CREEK	433	.03	.03	.035	.025		
PINE CREEK	430	.025					
PINE CREEK	420	.03	.045				
PINE CREEK	410	.045	.03	.07	.06	.03	
PINE CREEK	400	.045	.035	.045	.06		
PINE CREEK	390	.045	.08	.06			
PINE CREEK	380	.045	.08	.06			
PINE CREEK	370	.045	.08	.06			
PINE CREEK	360	.06	.08	.06	.03		
PINE CREEK	350	.03	.06	.08	.03		
PINE CREEK	340	.03	.08	.03			
PINE CREEK	330	.03	.08	.03			
PINE CREEK	320	.03	.08	.06	.03		
PINE CREEK	310	.08	.045	.03			
PINE CREEK	300	.03	.045	.03			
PINE CREEK	290	.03	.08	.03			
PINE CREEK	280	.03	.08	.03			
PINE CREEK	270	.03	.07	.03			
PINE CREEK	260	.03	.06	.03			
PINE CREEK	250	.03	.06	.03			
PINE CREEK	240	.03	.06	.03			
PINE CREEK	230	.03	.045	.03			
PINE CREEK	220	.03	.045	.03			
PINE CREEK	210	.03	.08	.03			
PINE CREEK	200	.025	.08	.03			
PINE CREEK	190	.025	.06	.03			
PINE CREEK	185	.015	.035	.015	.06	.015	.035 .015
PINE CREEK	181	.015	.35	.015	.035	.015	.035 .015
PINE CREEK	179	.015	.035	.015	.035	.015	

.035 .015 .035 .015

PINE CREEK 173 .015 .035 .015 .035 .015

.035 .015 .035 .015

SUMMARY OF REACH LENGTHS

River: PINE CREEK

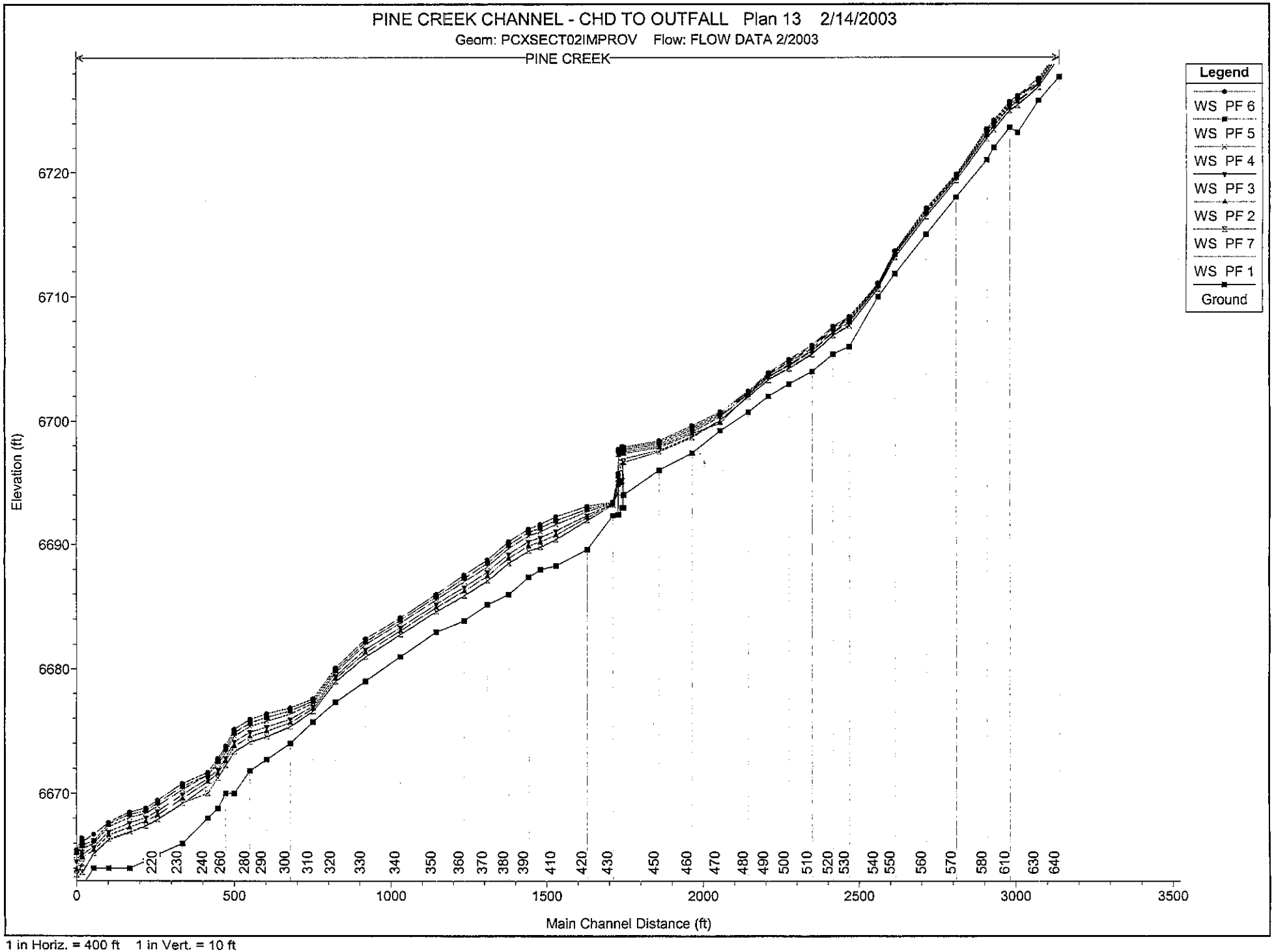
Reach	River Sta.	Left	Channel	Right
PINE CREEK	640	40	66	85
PINE CREEK	630	67	67	63
PINE CREEK	620	12	25	35
PINE CREEK	610	50	50	55
PINE CREEK	590	15	23	35
PINE CREEK	580	88	98	120
PINE CREEK	570	85	95	104
PINE CREEK	560	96	100	102
PINE CREEK	550	65	54	50
PINE CREEK	540	92	93	75
PINE CREEK	530	57	52	50
PINE CREEK	520	70	67	62
PINE CREEK	510	73	74	76
PINE CREEK	500	65	66	70
PINE CREEK	490	55	65	74
PINE CREEK	480	102	90	90
PINE CREEK	470	90	90	90
PINE CREEK	460	112	105	103
PINE CREEK	450	132	114	90
PINE CREEK	445	.1	.1	.1
PINE CREEK	444	17	17	17
PINE CREEK	440	Culvert		
PINE CREEK	433	18	17	17
PINE CREEK	430	72	82	88
PINE CREEK	420	92	100	107
PINE CREEK	410	38	50	63
PINE CREEK	400	37	37	37
PINE CREEK	390	58	64	66
PINE CREEK	380	68	68	68
PINE CREEK	370	75	75	75
PINE CREEK	360	92	90	80
PINE CREEK	350	122	115	108
PINE CREEK	340	112	112	112
PINE CREEK	330	96	96	96
PINE CREEK	320	72	72	72
PINE CREEK	310	73	73	73
PINE CREEK	300	75	75	75
PINE CREEK	290	47	53	58
PINE CREEK	280	48	50	50
PINE CREEK	270	27	27	27
PINE CREEK	260	25	25	25
PINE CREEK	250	28	32	31
PINE CREEK	240	84	80	76
PINE CREEK	230	80	79	77
PINE CREEK	220	40	37	35

PINE CREEK	210	60	51	50
PINE CREEK	200	64	67	70
PINE CREEK	190	83	47	63
PINE CREEK	185	17	37	24
PINE CREEK	181	1	1	1
PINE CREEK	179	10	17	25
PINE CREEK	173	1	1	1

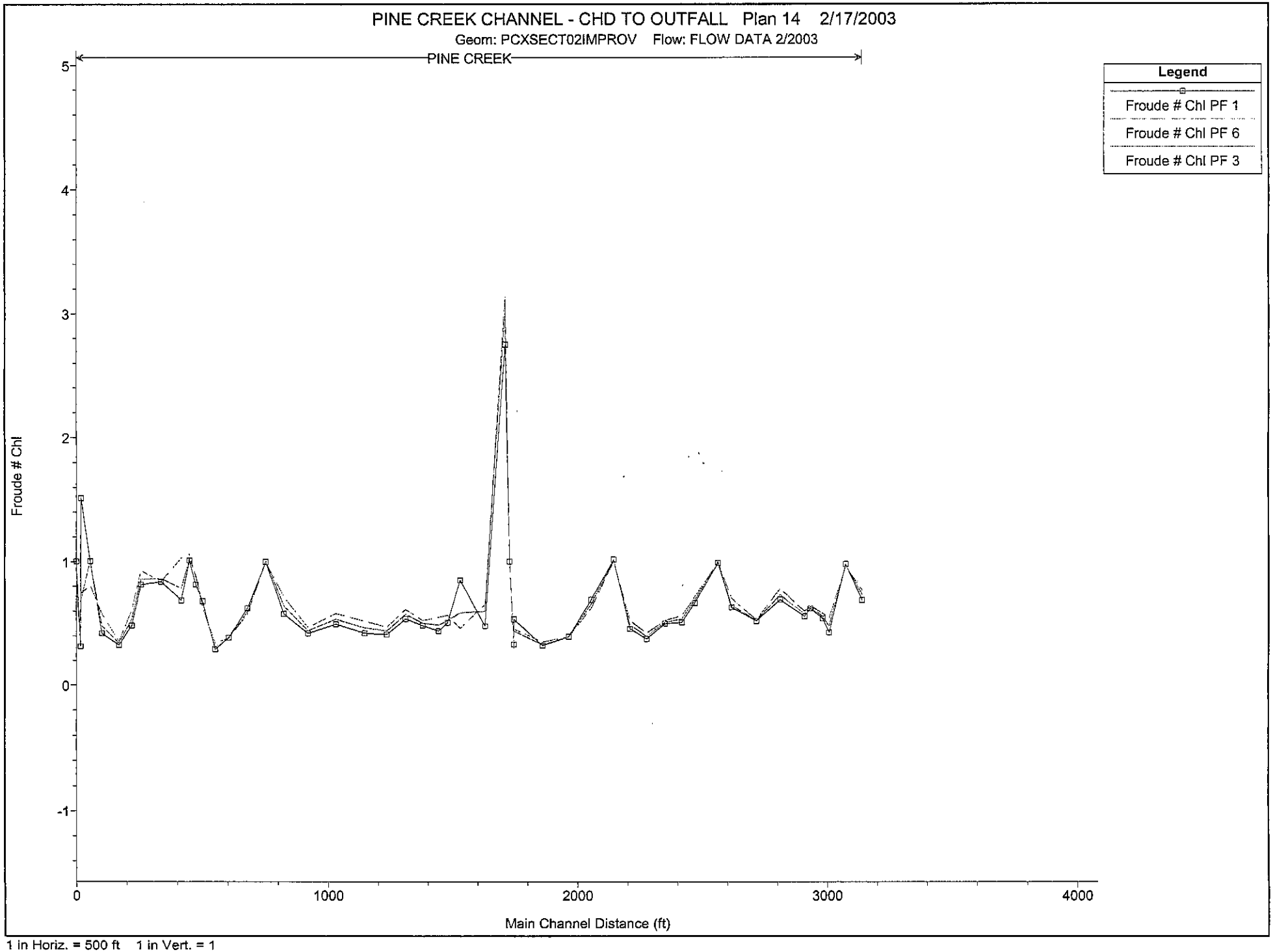
SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: PINE CREEK

Reach	River Sta.	Contr.	Expan.
PINE CREEK	640	.1	.3
PINE CREEK	630	.1	.3
PINE CREEK	620	.1	.3
PINE CREEK	610	.1	.3
PINE CREEK	590	.1	.3
PINE CREEK	580	.1	.3
PINE CREEK	570	.1	.3
PINE CREEK	560	.1	.3
PINE CREEK	550	.1	.3
PINE CREEK	540	.1	.3
PINE CREEK	530	.1	.3
PINE CREEK	520	.1	.3
PINE CREEK	510	.1	.3
PINE CREEK	500	.1	.3
PINE CREEK	490	.1	.3
PINE CREEK	480	.1	.3
PINE CREEK	470	.1	.3
PINE CREEK	460	.1	.3
PINE CREEK	450	.1	.3
PINE CREEK	445	.1	.3
PINE CREEK	444	.1	.3
PINE CREEK	440	Culvert	
PINE CREEK	433	.1	.3
PINE CREEK	430	.1	.3
PINE CREEK	420	.1	.3
PINE CREEK	410	.1	.3
PINE CREEK	400	.1	.3
PINE CREEK	390	.1	.3
PINE CREEK	380	.1	.3
PINE CREEK	370	.1	.3
PINE CREEK	360	.1	.3
PINE CREEK	350	.1	.3
PINE CREEK	340	.1	.3
PINE CREEK	330	.1	.3
PINE CREEK	320	.1	.3
PINE CREEK	310	.1	.3
PINE CREEK	300	.1	.3
PINE CREEK	290	.1	.3
PINE CREEK	280	.1	.3
PINE CREEK	270	.1	.3
PINE CREEK	260	.1	.3
PINE CREEK	250	.1	.3

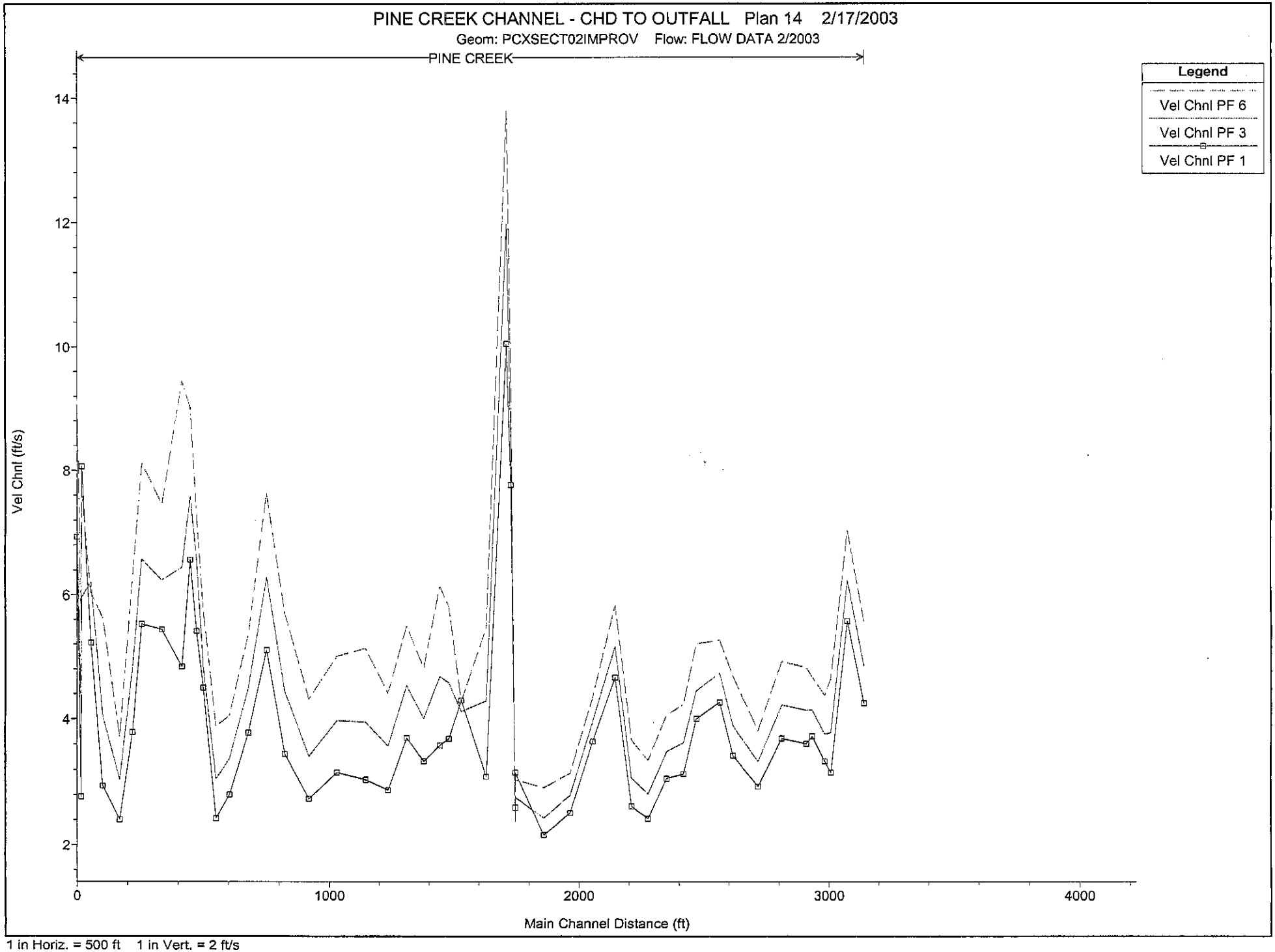
		HEC-RRAS-PCCCTO-IMP	
PINE CREEK	240	.1	.3
PINE CREEK	230	.1	.3
PINE CREEK	220	.1	.3
PINE CREEK	210	.1	.3
PINE CREEK	200	.1	.3
PINE CREEK	190	.1	.3
PINE CREEK	185	.2	.4
PINE CREEK	181	.2	.3
PINE CREEK	179	.3	.5
PINE CREEK	173	.2	.4



1 in Horiz. = 400 ft 1 in Vert. = 10 ft



1 in Horiz. = 500 ft 1 in Vert. = 1


PINE CREEK CHANNEL - CHD TO OUTFALL Plan 14 2/17/2003
Geom: PCXSECT02IMPROV Flow: FLOW DATA 2/2003
PINE CREEK
Legend
Vel Chnl PF 6
Vel Chnl PF 3
Vel Chnl PF 1
Vel Chnl (ft/s)
14
12
10
8
6
4
2
0
1000
2000
3000
4000
Main Channel Distance (ft)
1 in Horiz. = 500 ft 1 in Vert. = 2 ft/s

HEC-RAS Plan: Plan 08 River: PINE CREEK Reach: PINE CREEK

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
PINE CREEK	640	248.00	6727.70	6729.31	6729.02	6729.59	0.022839	4.25	58.33	49.69	0.69
PINE CREEK	640	313.00	6727.70	6729.49	6729.19	6729.82	0.023717	4.64	67.53	52.13	0.72
PINE CREEK	640	354.00	6727.70	6729.59	6729.30	6729.96	0.024296	4.86	72.89	53.50	0.73
PINE CREEK	640	413.00	6727.70	6729.74	6729.44	6730.14	0.024556	5.11	80.79	55.46	0.75
PINE CREEK	640	470.00	6727.70	6729.87	6729.56	6730.31	0.024845	5.34	88.02	57.19	0.76
PINE CREEK	640	531.00	6727.70	6729.99	6729.69	6730.47	0.025203	5.57	95.37	58.90	0.77
PINE CREEK	640	222.00	6727.70	6729.23	6728.93	6729.49	0.022587	4.09	54.30	48.58	0.68
PINE CREEK	630	248.00	6725.80	6726.94	6726.94	6727.42	0.050892	5.58	44.60	46.97	0.98
PINE CREEK	630	313.00	6725.80	6727.10	6727.10	6727.66	0.047795	5.99	52.47	47.75	0.98
PINE CREEK	630	354.00	6725.80	6727.20	6727.20	6727.80	0.046690	6.24	57.01	48.20	0.98
PINE CREEK	630	413.00	6725.80	6727.33	6727.33	6728.00	0.044659	6.53	63.57	48.84	0.97
PINE CREEK	630	470.00	6725.80	6727.45	6727.45	6728.17	0.043228	6.79	69.57	49.42	0.97
PINE CREEK	630	531.00	6725.80	6727.58	6727.58	6728.36	0.041623	7.04	75.93	50.02	0.97
PINE CREEK	630	222.00	6725.80	6726.86	6726.86	6727.32	0.052743	5.40	41.22	46.63	0.99
PINE CREEK	620	248.00	6723.20	6725.47	6724.67	6725.62	0.011282	3.16	78.56	46.83	0.43
PINE CREEK	620	313.00	6723.20	6725.67	6724.85	6725.86	0.012720	3.56	87.97	47.89	0.46
PINE CREEK	620	354.00	6723.20	6725.78	6724.95	6726.00	0.013528	3.79	93.48	48.49	0.48
PINE CREEK	620	413.00	6723.20	6725.93	6725.10	6726.19	0.014609	4.09	100.90	49.30	0.50
PINE CREEK	620	470.00	6723.20	6726.07	6725.23	6726.36	0.015598	4.37	107.57	50.02	0.53
PINE CREEK	620	531.00	6723.20	6726.20	6725.36	6726.53	0.016618	4.65	114.24	50.73	0.55
PINE CREEK	620	222.00	6723.20	6725.38	6724.60	6725.52	0.010664	2.98	74.44	46.35	0.41
PINE CREEK	610	248.00	6723.60	6725.04		6725.21	0.026204	3.33	74.46	65.70	0.54
PINE CREEK	610	313.00	6723.60	6725.22		6725.43	0.025880	3.61	86.68	67.42	0.55
PINE CREEK	610	354.00	6723.60	6725.33		6725.55	0.025762	3.76	93.90	68.41	0.56
PINE CREEK	610	413.00	6723.60	6725.47		6725.72	0.025666	3.97	103.79	69.74	0.56
PINE CREEK	610	470.00	6723.60	6725.60		6725.87	0.025945	4.17	112.40	70.89	0.57
PINE CREEK	610	531.00	6723.60	6725.71		6726.01	0.026396	4.38	120.95	72.01	0.58
PINE CREEK	610	222.00	6723.60	6724.96		6725.12	0.026586	3.21	69.10	64.94	0.54
PINE CREEK	590	248.00	6722.00	6723.48		6723.70	0.035311	3.73	66.44	59.93	0.62
PINE CREEK	590	313.00	6722.00	6723.68		6723.92	0.035200	3.99	78.36	63.69	0.63
PINE CREEK	590	354.00	6722.00	6723.79		6724.05	0.035226	4.14	85.48	65.83	0.64
PINE CREEK	590	413.00	6722.00	6723.94		6724.23	0.035103	4.32	95.50	68.73	0.65
PINE CREEK	590	470.00	6722.00	6724.07		6724.38	0.034259	4.49	104.74	70.64	0.65
PINE CREEK	590	531.00	6722.00	6724.19		6724.53	0.033313	4.67	113.78	71.85	0.65
PINE CREEK	590	222.00	6722.00	6723.40		6723.60	0.034995	3.60	61.68	58.36	0.62
PINE CREEK	580	248.00	6721.00	6722.79		6722.99	0.026882	3.61	69.90	58.99	0.56
PINE CREEK	580	313.00	6721.00	6722.97		6723.21	0.027020	3.95	80.85	60.60	0.57
PINE CREEK	580	354.00	6721.00	6723.08		6723.34	0.026946	4.14	87.50	61.57	0.58
PINE CREEK	580	413.00	6721.00	6723.23		6723.52	0.026827	4.38	96.67	62.87	0.59
PINE CREEK	580	470.00	6721.00	6723.36		6723.68	0.027035	4.61	104.76	63.99	0.60
PINE CREEK	580	531.00	6721.00	6723.49		6723.84	0.026917	4.82	113.46	65.19	0.60
PINE CREEK	580	222.00	6721.00	6722.70		6722.89	0.027784	3.49	64.52	58.18	0.56
PINE CREEK	570	248.00	6718.00	6719.35		6719.56	0.047190	3.69	67.15	76.39	0.69
PINE CREEK	570	313.00	6718.00	6719.49		6719.74	0.048296	4.02	77.92	79.50	0.72
PINE CREEK	570	354.00	6718.00	6719.56		6719.84	0.049681	4.22	83.88	81.17	0.73
PINE CREEK	570	413.00	6718.00	6719.66		6719.97	0.051535	4.49	91.99	83.39	0.75
PINE CREEK	570	470.00	6718.00	6719.75		6720.10	0.052734	4.71	99.70	85.44	0.77
PINE CREEK	570	531.00	6718.00	6719.85		6720.22	0.053528	4.92	107.85	87.56	0.78
PINE CREEK	570	222.00	6718.00	6719.31		6719.49	0.044189	3.48	63.74	75.38	0.67
PINE CREEK	560	248.00	6715.00	6716.50		6716.63	0.021752	2.94	84.71	88.08	0.52
PINE CREEK	560	313.00	6715.00	6716.66		6716.81	0.021135	3.19	98.44	88.73	0.53
PINE CREEK	560	354.00	6715.00	6716.75		6716.92	0.020598	3.33	106.91	89.13	0.53
PINE CREEK	560	413.00	6715.00	6716.88		6717.07	0.019839	3.50	118.74	89.68	0.53
PINE CREEK	560	470.00	6715.00	6717.00		6717.21	0.019396	3.66	129.32	90.17	0.53
PINE CREEK	560	531.00	6715.00	6717.12		6717.35	0.018966	3.81	140.23	90.67	0.53
PINE CREEK	560	222.00	6715.00	6716.42		6716.55	0.023053	2.86	77.80	87.76	0.53
PINE CREEK	550	248.00	6711.80	6713.15	6712.89	6713.33	0.055786	3.42	72.53	80.26	0.63
PINE CREEK	550	313.00	6711.80	6713.29	6713.02	6713.51	0.060674	3.74	83.86	81.44	0.65
PINE CREEK	550	354.00	6711.80	6713.38	6713.09	6713.61	0.062259	3.89	91.05	82.18	0.65
PINE CREEK	550	413.00	6711.80	6713.47	6713.18	6713.74	0.068145	4.19	98.67	82.95	0.67

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
PINE CREEK	550	470.00	6711.80	6713.57	6713.26	6713.87	0.071387	4.42	106.61	83.75	0.69
PINE CREEK	550	531.00	6711.80	6713.65	6713.35	6713.99	0.076227	4.68	113.71	84.46	0.71
PINE CREEK	550	222.00	6711.80	6713.11	6712.83	6713.27	0.050605	3.21	69.13	79.91	0.61
PINE CREEK	540	248.00	6710.00	6710.67	6710.67	6710.95	0.035076	4.26	58.15	102.22	0.99
PINE CREEK	540	313.00	6710.00	6710.77	6710.77	6711.09	0.033891	4.55	68.77	106.94	1.00
PINE CREEK	540	354.00	6710.00	6710.83	6710.83	6711.18	0.033812	4.73	74.79	109.53	1.01
PINE CREEK	540	413.00	6710.00	6710.91	6710.91	6711.29	0.032588	4.91	84.10	113.41	1.00
PINE CREEK	540	470.00	6710.00	6710.98	6710.98	6711.39	0.031969	5.08	92.48	116.80	1.00
PINE CREEK	540	531.00	6710.00	6711.06	6711.06	6711.49	0.030953	5.27	100.74	117.75	1.00
PINE CREEK	540	222.00	6710.00	6710.62	6710.62	6710.89	0.038238	4.23	52.48	99.61	1.02
PINE CREEK	530	248.00	6706.00	6707.73	6707.40	6707.98	0.012855	4.01	61.91	55.71	0.67
PINE CREEK	530	313.00	6706.00	6707.92	6707.58	6708.20	0.013147	4.30	72.87	60.07	0.69
PINE CREEK	530	354.00	6706.00	6708.03	6707.68	6708.33	0.013084	4.45	79.58	62.20	0.69
PINE CREEK	530	413.00	6706.00	6708.15	6707.81	6708.50	0.013106	4.73	87.32	63.15	0.70
PINE CREEK	530	470.00	6706.00	6708.26	6707.94	6708.65	0.013057	4.98	94.62	64.04	0.71
PINE CREEK	530	531.00	6706.00	6708.38	6708.05	6708.80	0.012952	5.21	102.27	64.96	0.72
PINE CREEK	530	222.00	6706.00	6707.64	6707.32	6707.88	0.012693	3.87	57.34	53.79	0.66
PINE CREEK	520	248.00	6705.40	6706.93		6707.08	0.022575	3.14	79.08	67.82	0.51
PINE CREEK	520	313.00	6705.40	6707.10		6707.28	0.023333	3.46	90.46	68.86	0.53
PINE CREEK	520	354.00	6705.40	6707.20		6707.41	0.023349	3.63	97.65	69.51	0.54
PINE CREEK	520	413.00	6705.40	6707.34		6707.57	0.023451	3.85	107.39	70.38	0.55
PINE CREEK	520	470.00	6705.40	6707.47		6707.72	0.023527	4.04	116.34	71.17	0.56
PINE CREEK	520	531.00	6705.40	6707.60		6707.87	0.023578	4.23	125.53	71.98	0.56
PINE CREEK	520	222.00	6705.40	6706.86		6707.00	0.022446	3.00	73.96	67.35	0.50
PINE CREEK	510	248.00	6704.00	6705.43		6705.58	0.022384	3.06	81.64	72.08	0.50
PINE CREEK	510	313.00	6704.00	6705.61		6705.78	0.021786	3.33	94.82	72.67	0.51
PINE CREEK	510	354.00	6704.00	6705.72		6705.91	0.021571	3.48	102.50	73.02	0.51
PINE CREEK	510	413.00	6704.00	6705.86		6706.07	0.021350	3.69	112.95	73.48	0.52
PINE CREEK	510	470.00	6704.00	6705.99		6706.22	0.021215	3.88	122.45	73.90	0.52
PINE CREEK	510	531.00	6704.00	6706.12		6706.37	0.021111	4.06	132.11	74.33	0.53
PINE CREEK	510	222.00	6704.00	6705.36		6705.49	0.022314	2.93	76.41	71.84	0.50
PINE CREEK	500	248.00	6703.00	6704.29		6704.38	0.012124	2.42	103.59	84.66	0.38
PINE CREEK	500	313.00	6703.00	6704.47		6704.58	0.012426	2.67	118.70	85.85	0.39
PINE CREEK	500	354.00	6703.00	6704.57		6704.69	0.012578	2.81	127.62	86.54	0.40
PINE CREEK	500	413.00	6703.00	6704.71		6704.85	0.012808	3.00	139.65	87.47	0.41
PINE CREEK	500	470.00	6703.00	6704.83		6704.99	0.013027	3.17	150.55	88.30	0.41
PINE CREEK	500	531.00	6703.00	6704.96		6705.13	0.013284	3.35	161.46	89.13	0.42
PINE CREEK	500	222.00	6703.00	6704.21		6704.30	0.011912	2.31	97.28	84.16	0.37
PINE CREEK	490	248.00	6702.00	6703.38		6703.50	0.014879	2.62	93.41	92.68	0.46
PINE CREEK	490	313.00	6702.00	6703.53		6703.66	0.015419	2.89	106.65	93.68	0.48
PINE CREEK	490	354.00	6702.00	6703.60		6703.76	0.016026	3.07	113.72	94.20	0.49
PINE CREEK	490	413.00	6702.00	6703.71		6703.89	0.016307	3.27	124.43	95.00	0.50
PINE CREEK	490	470.00	6702.00	6703.80		6704.00	0.017118	3.49	132.81	95.61	0.52
PINE CREEK	490	531.00	6702.00	6703.90		6704.13	0.017396	3.67	142.56	96.32	0.53
PINE CREEK	490	222.00	6702.00	6703.31		6703.42	0.015071	2.52	86.91	92.19	0.46
PINE CREEK	480	248.00	6700.70	6701.98	6701.98	6702.32	0.021478	4.66	53.21	82.02	1.02
PINE CREEK	480	313.00	6700.70	6702.10	6702.10	6702.49	0.020649	5.01	62.48	83.91	1.02
PINE CREEK	480	354.00	6700.70	6702.17	6702.17	6702.58	0.019628	5.17	68.53	84.59	1.01
PINE CREEK	480	413.00	6700.70	6702.25	6702.25	6702.71	0.019278	5.44	75.88	85.41	1.02
PINE CREEK	480	470.00	6700.70	6702.35	6702.35	6702.83	0.018240	5.61	83.72	86.28	1.00
PINE CREEK	480	531.00	6700.70	6702.43	6702.43	6702.96	0.017855	5.84	91.00	87.08	1.01
PINE CREEK	480	222.00	6700.70	6701.94	6701.94	6702.25	0.020989	4.49	49.39	79.03	1.00
PINE CREEK	470	248.00	6699.20	6700.09	6699.91	6700.29	0.014938	3.65	68.38	84.11	0.69
PINE CREEK	470	313.00	6699.20	6699.82	6700.02	6700.53	0.085486	6.80	46.21	81.31	1.56
PINE CREEK	470	354.00	6699.20	6700.34	6700.09	6700.58	0.012425	3.95	90.16	86.78	0.66
PINE CREEK	470	413.00	6699.20	6700.47	6700.18	6700.73	0.011488	4.10	101.65	88.16	0.65
PINE CREEK	470	470.00	6699.20	6700.59	6700.27	6700.87	0.010728	4.21	112.53	89.44	0.64
PINE CREEK	470	531.00	6699.20	6700.72	6700.36	6701.01	0.010145	4.34	123.57	90.72	0.63
PINE CREEK	470	222.00	6699.20	6700.02	6699.86	6700.21	0.015943	3.56	62.61	83.39	0.71

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
PINE CREEK	460	248.00	6697.40	6698.75		6698.85	0.016657	2.52	98.59	78.05	0.39
PINE CREEK	460	313.00	6697.40	6698.97	6698.26	6699.08	0.017199	2.70	116.00	79.69	0.39
PINE CREEK	460	354.00	6697.40	6699.10		6699.23	0.017439	2.79	126.69	80.69	0.39
PINE CREEK	460	413.00	6697.40	6699.28		6699.42	0.017830	2.92	141.35	82.03	0.39
PINE CREEK	460	470.00	6697.40	6699.45		6699.59	0.018250	3.04	154.78	83.24	0.39
PINE CREEK	460	531.00	6697.40	6699.61		6699.77	0.018663	3.15	168.70	84.47	0.39
PINE CREEK	460	222.00	6697.40	6698.65		6698.75	0.016509	2.44	91.12	77.33	0.40
PINE CREEK	450	248.00	6696.00	6697.60		6697.67	0.008020	2.16	114.74	82.79	0.32
PINE CREEK	450	313.00	6696.00	6697.84		6697.92	0.007601	2.32	134.86	84.72	0.32
PINE CREEK	450	354.00	6696.00	6697.97		6698.06	0.007615	2.43	145.56	85.73	0.33
PINE CREEK	450	413.00	6696.00	6698.12		6698.23	0.007713	2.59	159.29	88.05	0.34
PINE CREEK	450	470.00	6696.00	6698.26		6698.38	0.007886	2.75	171.30	90.28	0.34
PINE CREEK	450	531.00	6696.00	6698.38		6698.52	0.008181	2.92	182.72	92.34	0.35
PINE CREEK	450	222.00	6696.00	6697.50		6697.57	0.008114	2.08	106.74	82.01	0.32
PINE CREEK	445	248.00	6694.00	6696.93		6697.08	0.003548	3.16	78.51	72.90	0.54
PINE CREEK	445	313.00	6694.00	6697.35		6697.46	0.002469	2.74	114.15	96.47	0.44
PINE CREEK	445	354.00	6694.00	6697.49		6697.61	0.002407	2.76	128.17	104.29	0.44
PINE CREEK	445	413.00	6694.00	6697.65		6697.78	0.002383	2.82	146.42	113.67	0.44
PINE CREEK	445	470.00	6694.00	6697.79		6697.92	0.002425	2.91	161.72	120.97	0.44
PINE CREEK	445	531.00	6694.00	6697.89		6698.03	0.002565	3.04	174.60	126.79	0.46
PINE CREEK	445	222.00	6694.00	6696.62		6696.84	0.004884	3.77	58.95	55.89	0.65
PINE CREEK	444	248.00	6692.97	6696.97	6694.98	6697.06	0.001256	2.60	110.62	97.98	0.33
PINE CREEK	444	313.00	6692.97	6697.38	6695.29	6697.45	0.001061	2.36	157.43	130.55	0.30
PINE CREEK	444	354.00	6692.97	6697.52	6695.47	6697.59	0.001075	2.38	176.64	141.76	0.30
PINE CREEK	444	413.00	6692.97	6697.69	6695.74	6697.76	0.001102	2.42	201.88	155.27	0.30
PINE CREEK	444	470.00	6692.97	6697.82	6695.94	6697.90	0.001143	2.48	223.28	165.87	0.31
PINE CREEK	444	531.00	6692.97	6697.93	6696.77	6698.01	0.001220	2.58	241.73	174.49	0.32
PINE CREEK	444	222.00	6692.97	6696.69	6694.85	6696.81	0.001421	2.86	86.54	75.97	0.36
PINE CREEK	440	Culvert									
PINE CREEK	433	248.00	6692.40	6694.48	6694.48	6695.41	0.016539	7.77	31.92	17.19	1.00
PINE CREEK	433	313.00	6692.40	6694.81	6694.81	6695.88	0.015742	8.27	37.85	18.03	1.01
PINE CREEK	433	354.00	6692.40	6695.01	6695.01	6696.14	0.015397	8.55	41.41	18.52	1.01
PINE CREEK	433	413.00	6692.40	6695.28	6695.28	6696.50	0.014904	8.89	46.47	19.19	1.01
PINE CREEK	433	470.00	6692.40	6695.52	6695.52	6696.83	0.014432	9.16	51.31	19.81	1.00
PINE CREEK	433	531.00	6692.40	6695.73	6695.73	6697.16	0.014646	9.57	55.50	20.33	1.02
PINE CREEK	433	222.00	6692.40	6694.14	6694.33	6695.25	0.024209	8.46	26.24	16.35	0.36
PINE CREEK	430	248.00	6692.33	6693.19	6693.59	6694.76	0.093152	10.05	24.68	59.69	2.75
PINE CREEK	430	313.00	6692.33	6693.24	6693.73	6695.25	0.105495	11.37	27.53	60.74	2.98
PINE CREEK	430	354.00	6692.33	6693.27	6693.81	6695.50	0.108200	11.97	29.56	61.48	3.04
PINE CREEK	430	413.00	6692.33	6693.32	6693.91	6695.82	0.109234	12.68	32.56	62.55	3.10
PINE CREEK	430	470.00	6692.33	6693.36	6694.01	6696.11	0.110012	13.30	35.33	63.52	3.14
PINE CREEK	430	531.00	6692.33	6693.41	6694.10	6696.37	0.107983	13.80	38.49	64.62	3.15
PINE CREEK	430	222.00	6692.33	6693.18	6693.53	6694.53	0.084180	9.35	23.75	59.34	2.60
PINE CREEK	420	255.00	6689.60	6691.92	6691.38	6692.07	0.006379	3.09	82.46	64.44	0.48
PINE CREEK	420	372.00	6689.60	6692.16	6691.61	6692.38	0.007778	3.77	98.76	67.91	0.55
PINE CREEK	420	479.00	6689.60	6692.35	6691.78	6692.64	0.008746	4.29	111.67	70.66	0.60
PINE CREEK	420	650.00	6689.60	6692.64	6692.11	6693.02	0.009260	4.90	132.68	75.00	0.64
PINE CREEK	420	771.00	6689.60	6692.85	6692.31	6693.27	0.009204	5.21	148.01	78.07	0.65
PINE CREEK	420	899.00	6689.60	6693.07	6692.51	6693.53	0.008971	5.47	164.49	81.28	0.66
PINE CREEK	420	266.00	6689.60	6691.94	6691.40	6692.10	0.006514	3.16	84.23	64.79	0.49
PINE CREEK	410	255.00	6688.30	6690.37	6690.30	6690.66	0.052077	4.30	59.56	77.19	0.85
PINE CREEK	410	372.00	6688.30	6690.76		6691.03	0.029094	4.18	89.62	79.44	0.68
PINE CREEK	410	479.00	6688.30	6691.10		6691.36	0.019950	4.12	117.59	81.48	0.59
PINE CREEK	410	650.00	6688.30	6691.61		6691.87	0.013815	4.15	159.23	84.43	0.51
PINE CREEK	410	771.00	6688.30	6691.93		6692.20	0.011646	4.20	186.83	86.33	0.48
PINE CREEK	410	899.00	6688.30	6692.24		6692.52	0.010209	4.28	214.40	88.19	0.46
PINE CREEK	410	266.00	6688.30	6690.41	6690.32	6690.69	0.048553	4.28	62.43	77.40	0.83
PINE CREEK	400	255.00	6688.00	6689.76		6689.97	0.005905	3.69	71.17	45.72	0.51
PINE CREEK	400	372.00	6688.00	6690.21		6690.48	0.005669	4.19	92.08	47.68	0.52

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
PINE CREEK	400	479.00	6688.00	6690.56		6690.88	0.005636	4.58	108.87	49.20	0.53
PINE CREEK	400	650.00	6688.00	6691.03		6691.43	0.005709	5.13	132.71	51.27	0.54
PINE CREEK	400	771.00	6688.00	6691.33		6691.78	0.005790	5.47	148.07	52.57	0.55
PINE CREEK	400	899.00	6688.00	6691.61		6692.12	0.005922	5.81	162.98	53.79	0.57
PINE CREEK	400	266.00	6688.00	6689.81		6690.02	0.005864	3.74	73.29	45.92	0.51
PINE CREEK	390	255.00	6687.40	6689.46		6689.64	0.014223	3.58	76.14	43.10	0.44
PINE CREEK	390	372.00	6687.40	6689.90		6690.15	0.015100	4.20	95.80	45.70	0.47
PINE CREEK	390	479.00	6687.40	6690.24		6690.55	0.015777	4.68	111.68	47.89	0.49
PINE CREEK	390	650.00	6687.40	6690.70		6691.09	0.016765	5.33	134.34	50.95	0.52
PINE CREEK	390	771.00	6687.40	6690.98		6691.43	0.017388	5.73	149.01	52.84	0.53
PINE CREEK	390	899.00	6687.40	6691.24		6691.76	0.018132	6.14	163.17	54.60	0.55
PINE CREEK	390	266.00	6687.40	6689.50		6689.69	0.014299	3.64	78.15	43.37	0.44
PINE CREEK	380	255.00	6686.00	6688.47		6688.64	0.017493	3.33	76.54	52.00	0.48
PINE CREEK	380	372.00	6686.00	6688.90		6689.11	0.017276	3.72	99.94	57.04	0.50
PINE CREEK	380	479.00	6686.00	6689.23		6689.48	0.017218	4.01	119.49	60.94	0.50
PINE CREEK	380	650.00	6686.00	6689.69		6689.98	0.017153	4.38	148.54	66.30	0.52
PINE CREEK	380	771.00	6686.00	6689.97		6690.30	0.017129	4.59	167.85	69.64	0.52
PINE CREEK	380	899.00	6686.00	6690.23		6690.59	0.017041	4.82	186.51	71.81	0.53
PINE CREEK	380	266.00	6686.00	6688.51		6688.69	0.017490	3.38	78.81	52.51	0.49
PINE CREEK	370	255.00	6685.20	6687.08		6687.30	0.022297	3.70	68.86	47.07	0.54
PINE CREEK	370	372.00	6685.20	6687.49		6687.76	0.022639	4.18	89.00	51.63	0.56
PINE CREEK	370	479.00	6685.20	6687.81		6688.12	0.022983	4.53	105.68	55.12	0.58
PINE CREEK	370	650.00	6685.20	6688.24		6688.62	0.023260	4.98	130.54	59.95	0.59
PINE CREEK	370	771.00	6685.20	6688.50		6688.93	0.023463	5.25	146.92	62.93	0.61
PINE CREEK	370	899.00	6685.20	6688.76		6689.23	0.023579	5.49	163.65	65.83	0.61
PINE CREEK	370	266.00	6685.20	6687.13		6687.35	0.022257	3.75	70.93	47.56	0.54
PINE CREEK	360	255.00	6683.90	6685.88		6686.01	0.013237	2.87	88.72	58.65	0.41
PINE CREEK	360	372.00	6683.90	6686.29		6686.45	0.013329	3.27	113.62	63.06	0.43
PINE CREEK	360	479.00	6683.90	6686.60		6686.80	0.013286	3.57	134.16	66.17	0.44
PINE CREEK	360	650.00	6683.90	6687.04		6687.29	0.013249	3.96	164.18	70.47	0.46
PINE CREEK	360	771.00	6683.90	6687.32		6687.59	0.013222	4.19	184.00	73.17	0.47
PINE CREEK	360	899.00	6683.90	6687.59		6687.89	0.013196	4.41	203.97	75.80	0.47
PINE CREEK	360	266.00	6683.90	6685.92		6686.05	0.013275	2.91	91.26	59.22	0.41
PINE CREEK	350	255.00	6683.00	6684.62		6684.78	0.014115	3.04	81.78	56.26	0.42
PINE CREEK	350	372.00	6683.00	6684.96		6685.19	0.014830	3.55	101.73	58.68	0.45
PINE CREEK	350	479.00	6683.00	6685.22		6685.51	0.015562	3.95	117.27	60.50	0.47
PINE CREEK	350	650.00	6683.00	6685.58		6685.96	0.016396	4.48	139.58	63.02	0.49
PINE CREEK	350	771.00	6683.00	6685.81		6686.25	0.016853	4.80	154.01	64.59	0.50
PINE CREEK	350	899.00	6683.00	6686.02		6686.52	0.017506	5.13	167.60	66.04	0.52
PINE CREEK	350	266.00	6683.00	6684.65		6684.82	0.014197	3.09	83.79	56.51	0.42
PINE CREEK	340	255.00	6681.00	6682.78		6682.93	0.018530	3.16	80.82	64.55	0.50
PINE CREEK	340	372.00	6681.00	6683.10		6683.31	0.018072	3.63	102.56	68.15	0.52
PINE CREEK	340	479.00	6681.00	6683.36		6683.61	0.017584	3.97	120.67	71.01	0.54
PINE CREEK	340	650.00	6681.00	6683.73		6684.03	0.016966	4.42	146.97	74.98	0.56
PINE CREEK	340	771.00	6681.00	6683.94		6684.29	0.016894	4.72	163.34	77.34	0.57
PINE CREEK	340	899.00	6681.00	6684.15		6684.54	0.016560	5.01	179.65	79.48	0.58
PINE CREEK	340	266.00	6681.00	6682.81		6682.97	0.018457	3.20	83.04	64.92	0.50
PINE CREEK	330	255.00	6679.00	6680.95		6681.06	0.014998	2.73	93.27	70.53	0.42
PINE CREEK	330	372.00	6679.00	6681.31		6681.46	0.014978	3.12	119.20	73.76	0.43
PINE CREEK	330	479.00	6679.00	6681.59		6681.77	0.015065	3.41	140.41	76.30	0.44
PINE CREEK	330	650.00	6679.00	6681.99		6682.21	0.015099	3.79	171.72	79.91	0.46
PINE CREEK	330	771.00	6679.00	6682.22		6682.48	0.015138	4.05	190.42	82.75	0.46
PINE CREEK	330	899.00	6679.00	6682.44		6682.73	0.015233	4.31	208.99	85.51	0.47
PINE CREEK	330	266.00	6679.00	6680.98		6681.10	0.015042	2.78	95.76	70.84	0.42
PINE CREEK	320	255.00	6677.30	6678.93	6678.56	6679.11	0.029337	3.45	74.02	67.51	0.58
PINE CREEK	320	372.00	6677.30	6679.20	6678.80	6679.45	0.031116	4.01	92.71	70.67	0.62
PINE CREEK	320	479.00	6677.30	6679.41	6678.99	6679.72	0.032299	4.43	108.02	73.15	0.64
PINE CREEK	320	650.00	6677.30	6679.69	6679.27	6680.09	0.034793	5.04	128.86	76.41	0.68
PINE CREEK	320	771.00	6677.30	6679.88	6679.44	6680.33	0.035613	5.38	143.20	78.56	0.70
PINE CREEK	320	899.00	6677.30	6680.06	6679.62	6680.56	0.035903	5.70	157.74	80.55	0.72

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
PINE CREEK	320	266.00	6677.30	6678.96	6678.58	6679.15	0.029365	3.50	76.03	67.86	0.58
PINE CREEK	310	255.00	6675.70	6676.52	6676.52	6676.93	0.031082	5.11	50.81	64.37	1.00
PINE CREEK	310	372.00	6675.70	6676.75	6676.75	6677.27	0.028889	5.79	65.66	65.86	1.01
PINE CREEK	310	479.00	6675.70	6676.94	6676.94	6677.55	0.027375	6.29	78.16	67.09	1.01
PINE CREEK	310	650.00	6675.70	6677.22	6677.22	6677.95	0.025156	6.90	97.18	68.91	1.00
PINE CREEK	310	771.00	6675.70	6677.40	6677.40	6678.21	0.024032	7.27	109.81	70.10	1.00
PINE CREEK	310	899.00	6675.70	6677.58	6677.58	6678.47	0.023257	7.63	122.30	71.25	1.00
PINE CREEK	310	266.00	6675.70	6676.54	6676.54	6676.96	0.031059	5.19	52.17	64.51	1.00
PINE CREEK	300	255.00	6674.00	6675.29	6674.99	6675.51	0.011028	3.78	68.58	63.51	0.62
PINE CREEK	300	372.00	6674.00	6675.63	6675.23	6675.90	0.009610	4.20	90.49	65.60	0.61
PINE CREEK	300	479.00	6674.00	6675.92	6675.42	6676.22	0.008672	4.49	109.44	67.36	0.60
PINE CREEK	300	650.00	6674.00	6676.32	6675.70	6676.68	0.007806	4.89	137.11	69.84	0.58
PINE CREEK	300	771.00	6674.00	6676.58	6675.89	6676.97	0.007395	5.13	155.43	71.44	0.58
PINE CREEK	300	899.00	6674.00	6676.83	6676.07	6677.26	0.007079	5.36	173.80	73.00	0.58
PINE CREEK	300	266.00	6674.00	6675.33	6675.02	6675.55	0.010864	3.83	70.72	63.72	0.62
PINE CREEK	290	255.00	6672.70	6674.50		6674.63	0.011860	2.80	91.26	59.46	0.39
PINE CREEK	290	372.00	6672.70	6674.96		6675.11	0.010683	3.13	118.98	63.44	0.38
PINE CREEK	290	479.00	6672.70	6675.30		6675.48	0.010141	3.37	141.31	66.48	0.38
PINE CREEK	290	650.00	6672.70	6675.77		6675.99	0.009639	3.70	173.23	70.59	0.38
PINE CREEK	290	771.00	6672.70	6676.06		6676.31	0.009357	3.88	194.19	73.17	0.38
PINE CREEK	290	899.00	6672.70	6676.34		6676.62	0.009117	4.05	215.15	75.66	0.38
PINE CREEK	290	266.00	6672.70	6674.55		6674.68	0.011701	2.84	94.05	59.87	0.39
PINE CREEK	280	255.00	6671.80	6674.08		6674.18	0.006038	2.42	104.82	59.29	0.29
PINE CREEK	280	372.00	6671.80	6674.54		6674.68	0.006113	2.77	133.36	64.03	0.30
PINE CREEK	280	479.00	6671.80	6674.88		6675.06	0.006284	3.05	155.91	67.54	0.31
PINE CREEK	280	650.00	6671.80	6675.33		6675.56	0.006617	3.44	187.39	72.16	0.33
PINE CREEK	280	771.00	6671.80	6675.62		6675.88	0.006762	3.66	208.31	75.08	0.33
PINE CREEK	280	899.00	6671.80	6675.89		6676.19	0.006880	3.88	229.38	77.90	0.34
PINE CREEK	280	266.00	6671.80	6674.13		6674.24	0.006036	2.46	107.73	59.79	0.29
PINE CREEK	270	255.00	6670.00	6673.28	6672.87	6673.59	0.028889	4.50	56.67	41.75	0.68
PINE CREEK	270	372.00	6670.00	6673.78	6673.27	6674.12	0.025423	4.68	79.54	50.64	0.66
PINE CREEK	270	479.00	6670.00	6674.14	6673.56	6674.50	0.022871	4.84	98.95	55.54	0.64
PINE CREEK	270	650.00	6670.00	6674.57	6673.96	6675.00	0.021125	5.25	123.74	58.30	0.64
PINE CREEK	270	771.00	6670.00	6674.85	6674.17	6675.32	0.020408	5.51	139.92	60.03	0.64
PINE CREEK	270	899.00	6670.00	6675.11	6674.38	6675.63	0.019894	5.76	156.09	61.71	0.64
PINE CREEK	270	266.00	6670.00	6673.34	6672.91	6673.65	0.028291	4.51	59.02	42.75	0.68
PINE CREEK	260	255.00	6670.00	6672.20		6672.76	0.031492	5.42	44.50	33.21	0.81
PINE CREEK	260	372.00	6670.00	6672.56		6673.28	0.034179	6.11	57.21	37.80	0.87
PINE CREEK	260	479.00	6670.00	6672.83	6672.83	6673.69	0.035558	6.58	68.06	41.33	0.89
PINE CREEK	260	650.00	6670.00	6673.27	6673.27	6674.24	0.033228	6.90	87.65	47.02	0.88
PINE CREEK	260	771.00	6670.00	6673.54	6673.54	6674.58	0.032119	7.10	100.81	50.48	0.88
PINE CREEK	260	899.00	6670.00	6673.80	6673.80	6674.90	0.031273	7.29	114.17	53.77	0.87
PINE CREEK	260	266.00	6670.00	6672.23		6672.81	0.032265	5.52	45.51	33.60	0.83
PINE CREEK	250	255.00	6668.80	6671.17	6671.17	6671.84	0.041693	6.56	38.85	29.75	1.01
PINE CREEK	250	372.00	6668.80	6671.60	6671.60	6672.38	0.037648	7.08	52.53	34.17	1.01
PINE CREEK	250	479.00	6668.80	6671.90	6671.92	6672.79	0.037049	7.58	63.21	37.27	1.03
PINE CREEK	250	650.00	6668.80	6672.29	6672.35	6673.36	0.036989	8.29	78.37	40.57	1.05
PINE CREEK	250	771.00	6668.80	6672.54	6672.63	6673.71	0.036585	8.69	88.72	42.52	1.06
PINE CREEK	250	899.00	6668.80	6672.79	6672.89	6674.05	0.035690	9.01	99.77	44.52	1.06
PINE CREEK	250	266.00	6668.80	6671.23	6671.23	6671.90	0.040552	6.58	40.40	30.27	1.00
PINE CREEK	240	255.00	6668.00	6670.59	6670.25	6670.95	0.016692	4.84	53.18	37.43	0.69
PINE CREEK	240	372.00	6668.00	6670.92	6670.62	6671.42	0.017655	5.72	65.85	39.35	0.74
PINE CREEK	240	479.00	6668.00	6671.16	6670.90	6671.79	0.018792	6.45	75.47	40.75	0.78
PINE CREEK	240	650.00	6668.00	6671.46	6671.31	6672.32	0.020958	7.51	88.16	42.53	0.85
PINE CREEK	240	771.00	6668.00	6671.46	6671.57	6672.67	0.029780	8.93	87.89	42.49	1.02
PINE CREEK	240	899.00	6668.00	6671.67	6671.82	6673.02	0.029489	9.45	97.03	43.73	1.03
PINE CREEK	240	266.00	6668.00	6670.00	6670.29	6671.06	0.093253	8.25	32.23	34.01	1.49
PINE CREEK	230	255.00	6666.00	6669.19		6669.65	0.015643	5.44	46.88	35.87	0.84
PINE CREEK	230	372.00	6666.00	6669.60		6670.14	0.014484	5.91	62.91	42.48	0.86

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
PINE CREEK	230	479.00	6666.00	6669.90		6670.51	0.013681	6.24	76.79	47.46	0.86
PINE CREEK	230	650.00	6666.00	6670.29		6671.01	0.012391	6.78	96.09	50.74	0.85
PINE CREEK	230	771.00	6666.00	6670.54	6670.32	6671.33	0.011683	7.13	108.80	52.20	0.85
PINE CREEK	230	899.00	6666.00	6670.79	6670.54	6671.65	0.011091	7.45	121.83	53.66	0.84
PINE CREEK	230	266.00	6666.00	6669.23	6669.04	6669.70	0.015599	5.50	48.35	36.53	0.84
PINE CREEK	220	255.00	6665.10	6667.84		6668.32	0.018138	5.53	46.13	32.25	0.81
PINE CREEK	220	372.00	6665.10	6668.26		6668.85	0.018498	6.13	60.73	36.90	0.84
PINE CREEK	220	479.00	6665.10	6668.58		6669.25	0.018694	6.57	72.86	40.10	0.86
PINE CREEK	220	650.00	6665.10	6668.98		6669.80	0.019102	7.25	89.64	43.18	0.89
PINE CREEK	220	771.00	6665.10	6669.22		6670.14	0.019572	7.69	100.30	45.04	0.91
PINE CREEK	220	899.00	6665.10	6669.45		6670.47	0.020169	8.12	110.70	46.77	0.93
PINE CREEK	220	266.00	6665.10	6667.89		6668.37	0.018028	5.57	47.71	32.79	0.81
PINE CREEK	210	255.00	6664.60	6667.34		6667.58	0.018030	3.79	65.83	39.04	0.48
PINE CREEK	210	372.00	6664.60	6667.75		6668.08	0.018999	4.34	82.45	42.11	0.51
PINE CREEK	210	479.00	6664.60	6668.04		6668.46	0.020301	4.81	94.86	44.53	0.54
PINE CREEK	210	650.00	6664.60	6668.41		6668.97	0.021580	5.44	112.68	50.17	0.57
PINE CREEK	210	771.00	6664.60	6668.63		6669.29	0.022606	5.85	123.89	53.42	0.59
PINE CREEK	210	899.00	6664.60	6668.82		6669.59	0.023867	6.26	134.47	56.31	0.61
PINE CREEK	210	266.00	6664.60	6667.41		6667.65	0.017131	3.77	68.75	39.59	0.48
PINE CREEK	200	257.00	6664.00	6666.84		6666.93	0.008287	2.41	106.53	71.88	0.32
PINE CREEK	200	399.00	6664.00	6667.29		6667.42	0.008171	2.79	140.33	79.26	0.34
PINE CREEK	200	524.00	6664.00	6667.61		6667.77	0.008069	3.04	166.53	84.54	0.34
PINE CREEK	200	729.00	6664.00	6668.04		6668.26	0.007916	3.36	204.90	91.40	0.35
PINE CREEK	200	871.00	6664.00	6668.30		6668.55	0.007807	3.53	228.49	93.69	0.35
PINE CREEK	200	1017.00	6664.00	6668.52		6668.81	0.007895	3.71	249.48	95.68	0.36
PINE CREEK	200	282.00	6664.00	6666.93		6667.03	0.008274	2.48	112.88	73.32	0.33
PINE CREEK	190	257.00	6664.00	6666.25	6665.47	6666.38	0.008047	2.94	87.52	59.61	0.42
PINE CREEK	190	399.00	6664.00	6666.64	6665.84	6666.84	0.008797	3.59	111.92	63.77	0.46
PINE CREEK	190	524.00	6664.00	6666.93	6666.09	6667.18	0.009359	4.05	130.24	66.72	0.48
PINE CREEK	190	729.00	6664.00	6667.31	6666.46	6667.65	0.010110	4.68	156.48	70.72	0.51
PINE CREEK	190	871.00	6664.00	6667.53	6666.68	6667.93	0.010555	5.06	172.70	73.09	0.53
PINE CREEK	190	1017.00	6664.00	6667.64		6668.14	0.012413	5.63	180.94	74.27	0.58
PINE CREEK	190	282.00	6664.00	6666.33	6665.53	6666.47	0.008183	3.07	92.21	60.44	0.43
PINE CREEK	185	257.00	6664.00	6665.14	6665.14	6665.56	0.056201	5.22	49.19	58.52	1.00
PINE CREEK	185	399.00	6664.00	6665.45	6665.45	6665.97	0.052977	5.80	68.79	66.90	1.01
PINE CREEK	185	524.00	6664.00	6665.67	6665.67	6666.27	0.050210	6.21	84.37	71.14	1.00
PINE CREEK	185	729.00	6664.00	6665.99	6665.99	6666.70	0.047280	6.77	107.75	76.38	1.00
PINE CREEK	185	871.00	6664.00	6666.20	6666.20	6666.96	0.046455	7.01	124.21	82.36	1.01
PINE CREEK	185	1017.00	6664.00	6666.69		6667.26	0.028466	6.04	168.44	96.83	0.81
PINE CREEK	185	282.00	6664.00	6665.20	6665.20	6665.64	0.055492	5.34	52.78	60.14	1.00
PINE CREEK	181	257.00	6662.70	6663.63	6663.91	6664.64	0.011197	8.06	31.87	36.12	1.51
PINE CREEK	181	399.00	6662.70	6664.84	6664.31	6665.25	0.001793	5.13	77.83	38.51	0.64
PINE CREEK	181	524.00	6662.70	6665.11	6664.60	6665.66	0.002069	5.95	88.21	47.59	0.69
PINE CREEK	181	729.00	6662.70	6665.54	6665.05	6666.26	0.002200	6.85	109.21	49.25	0.73
PINE CREEK	181	871.00	6662.70	6665.84	6665.43	6666.64	0.002180	7.28	123.87	50.38	0.74
PINE CREEK	181	1017.00	6662.70	6666.12		6667.00	0.002141	7.65	139.49	60.62	0.74
PINE CREEK	181	282.00	6662.70	6663.70	6663.99	6664.75	0.010844	8.21	34.33	36.39	1.49
PINE CREEK	179	257.00	6661.70	6664.23	6662.92	6664.35	0.000420	2.77	92.88	38.49	0.31
PINE CREEK	179	399.00	6661.70	6665.01		6665.18	0.000413	3.25	122.85	38.56	0.32
PINE CREEK	179	524.00	6661.70	6665.33		6665.56	0.000520	3.87	137.26	48.44	0.36
PINE CREEK	179	729.00	6661.70	6665.81		6666.14	0.000643	4.66	161.00	50.28	0.41
PINE CREEK	179	871.00	6661.70	6666.12		6666.52	0.000700	5.10	177.87	60.61	0.43
PINE CREEK	179	1017.00	6661.70	6666.42		6666.87	0.000738	5.48	196.11	62.11	0.45
PINE CREEK	179	282.00	6661.70	6664.38	6662.99	6664.51	0.000418	2.86	98.54	38.50	0.32
PINE CREEK	173	257.00	6661.80	6663.40	6663.40	6664.15	0.005905	6.93	37.10	25.10	1.00
PINE CREEK	173	399.00	6661.80	6663.90	6663.90	6664.90	0.005610	8.06	49.51	25.18	1.01
PINE CREEK	173	524.00	6661.80	6664.54	6664.54	6665.37	0.003342	7.48	75.53	47.17	0.82
PINE CREEK	173	729.00	6661.80	6665.00	6665.00	6665.94	0.003191	8.15	98.17	50.11	0.82
PINE CREEK	173	871.00	6661.80	6665.23	6665.23	6666.29	0.003310	8.71	109.74	50.12	0.84
PINE CREEK	173	1017.00	6661.80	6665.47	6665.47	6666.63	0.003331	9.15	121.61	50.13	0.86

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
PINE CREEK	173	282.00	6661.80	6663.49	6663.49	6664.29	0.005879	7.17	39.35	25.11	1.01

REACH NO. 1

HEC-RAS IMPROVED CONDITION MODEL

HIGH "n" MODEL

PCCCTO.rep

HEC-RAS September 1998 Version 2.2
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

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

PROJECT DATA
Project Title: PINE CREEK CHANNEL - CHD TO OUTFALL
Project File : PCCCTO.prj
Run Date and Time: 2/14/2003 4:50:50 PM

Project in English units

PLAN DATA

Plan Title: Plan 14
Plan File : x:\2870000.all\2871611\HYDRO\HECRAS\PCCCTO.p14

Geometry Title: PCXSECT02IMPROVHN
Geometry File : x:\2870000.all\2871611\HYDRO\HECRAS\PCCCTO.g05

Flow Title : FLOW DATA 2/2003
Flow File : x:\2870000.all\2871611\HYDRO\HECRAS\PCCCTO.f03

Plan Summary Information:

Number of:	Cross Sections	= 51	Mulitple Openings	=	0
	Culverts	= 1	Inline Weirs	=	0
	Bridges	= 0			

Computational Information

Water surface calculation tolerance	= 0.01
Critical depth calculaton tolerance	= 0.01
Maximum number of interations	= 20
Maximum difference tolerance	= 0.3
Flow tolerance factor	= 0.001

Computation Options
Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Mixed Flow

CULVERT RIVER: PINE CREEK
REACH: PINE CREEK RS: 440

CULVERT OUTPUT Profile #PF 1
Culvert ID : Culvert #1

Culv Q (cfs)	243.97	Culv Vel In (ft/s)	8.68
# Barrels	2	Culv Vel Out (ft/s)	9.06
Q Barrel (cfs)	121.99	Culv Inv El Up (ft)	6692.97
E.G. US. (ft)	6697.07	Culv Inv El Dn (ft)	6692.90
W.S. US. (ft)	6696.97	Culv Frctn Ls (ft)	0.06
Delta EG (ft)	1.61	Culv Ext Lss (ft)	1.00
Delta WS (ft)	2.70	Culv Ent Lss (ft)	0.59
E.G. IC (ft)	6697.00	Q Weir (cfs)	4.03
E.G. OC (ft)	6697.07	Weir Sta Lft (ft)	181.58
Culvert Control	Outlet	Weir Sta Rgt (ft)	219.09
Culv WS In (ft)	6695.31	Weir Submerg	0.00
Culv WS Out (ft)	6695.14	Weir Max Depth (ft)	0.17
Culv Nml Depth (ft)	2.19	Weir Avg Depth (ft)	0.12
Culv Crt Depth (ft)	2.34	Wr Flw Area (sq ft)	4.35
Culv Ful Lngh (ft)		Min Top Rd (ft)	6696.90

Warning: The flow through the culvert is supercritical. However, since there is flow over the road
(weir flow), the program cannot determine if the downstream cross section should be
subcritical or supercritical. The program used the downstream subcritical answer, even
though it may not be valid.
Note: The flow in the culvert is entirely supercritical.

CULVERT OUTPUT Profile #PF 2
Culvert ID : Culvert #1

Culv Q (cfs)	265.50	Culv Vel In (ft/s)	8.93
# Barrels	2	Culv Vel Out (ft/s)	9.29
Q Barrel (cfs)	132.75	Culv Inv El Up (ft)	6692.97
E.G. US. (ft)	6697.46	Culv Inv El Dn (ft)	6692.90
W.S. US. (ft)	6697.38	Culv Frctn Ls (ft)	0.06
Delta EG (ft)	1.53	Culv Ext Lss (ft)	0.75
Delta WS (ft)	2.81	Culv Ent Lss (ft)	0.77
E.G. IC (ft)	6697.46	Q Weir (cfs)	47.50
E.G. OC (ft)	6697.31	Weir Sta Lft (ft)	141.98
Culvert Control	Inlet	Weir Sta Rgt (ft)	236.70
Culv WS In (ft)	6695.45	Weir Submerg	0.00
Culv WS Out (ft)	6695.28	Weir Max Depth (ft)	0.55
Culv Nml Depth (ft)	2.33	Weir Avg Depth (ft)	0.31
Culv Crt Depth (ft)	2.48	Wr Flw Area (sq ft)	29.64
Culv Ful Lngh (ft)		Min Top Rd (ft)	6696.90

Warning: The flow through the culvert is supercritical. However, since there is flow over the road
(weir flow), the program cannot determine if the downstream cross section should be
subcritical or supercritical. The program used the downstream subcritical answer, even

though it may not be valid.
Note: The flow in the culvert is entirely supercritical.

CULVERT OUTPUT Profile #PF 3
Culvert ID : Culvert #1

Culv Q (cfs)	272.87	Culv Vel In (ft/s)	7.58
# Barrels	2	Culv Vel Out (ft/s)	12.03
Q Barrel (cfs)	136.43	Culv Inv El Up (ft)	6692.97
E.G. US. (ft)	6697.60	Culv Inv El Dn (ft)	6692.90
W.S. US. (ft)	6697.52	Culv Frctn Ls (ft)	0.11
Delta EG (ft)	0.95	Culv Ext Lss (ft)	0.89
Delta WS (ft)	3.23	Culv Ent Lss (ft)	0.45
E.G. IC (ft)	6697.60	Q Weir (cfs)	81.13
E.G. OC (ft)	6697.39	Weir Sta Lft (ft)	124.83
Culvert Control	Inlet	Weir Sta Rgt (ft)	242.59
Culv WS In (ft)	6695.97	Weir Submerg	0.00
Culv WS Out (ft)	6694.79	Weir Max Depth (ft)	0.70
Culv Nml Depth (ft)	2.38	Weir Avg Depth (ft)	0.39
Culv Crt Depth (ft)	2.52	Wr Flw Area (sq ft)	45.78
Culv Ful Lngh (ft)		Min Top Rd (ft)	6696.90

Warning: The flow through the culvert is supercritical. However, since there is flow over the road
(weir flow), the program cannot determine if the downstream cross section should be
subcritical or supercritical. The program used the downstream subcritical answer, even
though it may not be valid.
Note: The flow in the culvert is entirely supercritical.

CULVERT OUTPUT Profile #PF 4
Culvert ID : Culvert #1

Culv Q (cfs)	281.58	Culv Vel In (ft/s)	7.82
# Barrels	2	Culv Vel Out (ft/s)	12.39
Q Barrel (cfs)	140.79	Culv Inv El Up (ft)	6692.97
E.G. US. (ft)	6697.77	Culv Inv El Dn (ft)	6692.90
W.S. US. (ft)	6697.69	Culv Frctn Ls (ft)	0.12
Delta EG (ft)	0.29	Culv Ext Lss (ft)	0.67
Delta WS (ft)	3.40	Culv Ent Lss (ft)	0.47
E.G. IC (ft)	6697.77	Q Weir (cfs)	131.42
E.G. OC (ft)	6697.48	Weir Sta Lft (ft)	105.75
Culvert Control	Inlet	Weir Sta Rgt (ft)	249.15
Culv WS In (ft)	6695.97	Weir Submerg	0.00
Culv WS Out (ft)	6694.79	Weir Max Depth (ft)	0.87
Culv Nml Depth (ft)	2.43	Weir Avg Depth (ft)	0.47
Culv Crt Depth (ft)	2.58	Wr Flw Area (sq ft)	67.84
Culv Ful Lngh (ft)		Min Top Rd (ft)	6696.90

Warning: The flow through the culvert is supercritical. However, since there is flow over the road
(weir flow), the program cannot determine if the downstream cross section should be
subcritical or supercritical. The program used the downstream subcritical answer, even
though it may not be valid.

Note: The flow in the culvert is entirely supercritical.

CULVERT OUTPUT Profile #PF 5
Culvert ID : Culvert #1

Culv Q (cfs)	287.88	Culv Vel In (ft/s)	8.00
# Barrels	2	Culv Vel Out (ft/s)	12.64
Q Barrel (cfs)	143.94	Culv Inv El Up (ft)	6692.97
E.G. US. (ft)	6697.90	Culv Inv El Dn (ft)	6692.90
W.S. US. (ft)	6697.82	Culv Frctn Ls (ft)	0.13
Delta EG (ft)	-0.51	Culv Ext Lss (ft)	0.45
Delta WS (ft)	3.52	Culv Ent Lss (ft)	0.50
E.G. IC (ft)	6697.90	Q Weir (cfs)	182.12
E.G. OC (ft)	6697.55	Weir Sta Lft (ft)	90.53
Culvert Control	Inlet	Weir Sta Rgt (ft)	254.38
Culv WS In (ft)	6695.97	Weir Submerg	0.00
Culv WS Out (ft)	6694.80	Weir Max Depth (ft)	1.01
Culv Nml Depth (ft)	2.47	Weir Avg Depth (ft)	0.54
Culv Crt Depth (ft)	2.61	Wr Flw Area (sq ft)	88.55
Culv Ful Lngh (ft)		Min Top Rd (ft)	6696.90

Warning: The flow through the culvert is supercritical. However, since there is flow over the road
(weir flow), the program cannot determine if the downstream cross section should be
subcritical or supercritical. The program used the downstream subcritical answer, even
though it may not be valid.
Note: The flow in the culvert is entirely supercritical.

CULVERT OUTPUT Profile #PF 6
Culvert ID : Culvert #1

Culv Q (cfs)	293.56	Culv Vel In (ft/s)	8.15
# Barrels	2	Culv Vel Out (ft/s)	8.15
Q Barrel (cfs)	146.78	Culv Inv El Up (ft)	6692.97
E.G. US. (ft)	6698.02	Culv Inv El Dn (ft)	6692.90
W.S. US. (ft)	6697.93	Culv Frctn Ls (ft)	0.35
Delta EG (ft)	0.86	Culv Ext Lss (ft)	
Delta WS (ft)	2.23	Culv Ent Lss (ft)	0.52
E.G. IC (ft)	6698.02	Q Weir (cfs)	237.44
E.G. OC (ft)	6697.94	Weir Sta Lft (ft)	77.67
Culvert Control	Inlet	Weir Sta Rgt (ft)	258.19
Culv WS In (ft)	6695.97	Weir Submerg	0.00
Culv WS Out (ft)	6696.12	Weir Max Depth (ft)	1.13
Culv Nml Depth (ft)	2.51	Weir Avg Depth (ft)	0.61
Culv Crt Depth (ft)	2.65	Wr Flw Area (sq ft)	109.42
Culv Ful Lngh (ft)	11.00	Min Top Rd (ft)	6696.90

Note: During the supercritical calculations a hydraulic jump occurred inside of the culvert.

CULVERT OUTPUT Profile #PF 7
Culvert ID : Culvert #1

Culv Q (cfs)	222.00	Culv Vel In (ft/s)	8.41
# Barrels	2	Culv Vel Out (ft/s)	8.81

Q Barrel (cfs)	111.00	Culv Inv El Up (ft)	6692.97
E.G. US. (ft)	6696.82	Culv Inv El Dn (ft)	6692.90
W.S. US. (ft)	6696.69	Culv Frctn Ls (ft)	0.06
Delta EG (ft)	1.57	Culv Ext Lss (ft)	0.99
Delta WS (ft)	2.55	Culv Ent Lss (ft)	0.55
E.G. IC (ft)	6696.50	Q Weir (cfs)	
E.G. OC (ft)	6696.82	Weir Sta Lft (ft)	
Culvert Control	Outlet	Weir Sta Rgt (ft)	
Culv WS In (ft)	6695.17	Weir Submerg	
Culv WS Out (ft)	6695.00	Weir Max Depth (ft)	
Culv Nml Depth (ft)	2.05	Weir Avg Depth (ft)	
Culv Crt Depth (ft)	2.20	Wr Flw Area (sq ft)	
Culv Ful Lngh (ft)		Min Top Rd (ft)	6696.90

Note: The flow in the culvert is entirely supercritical.

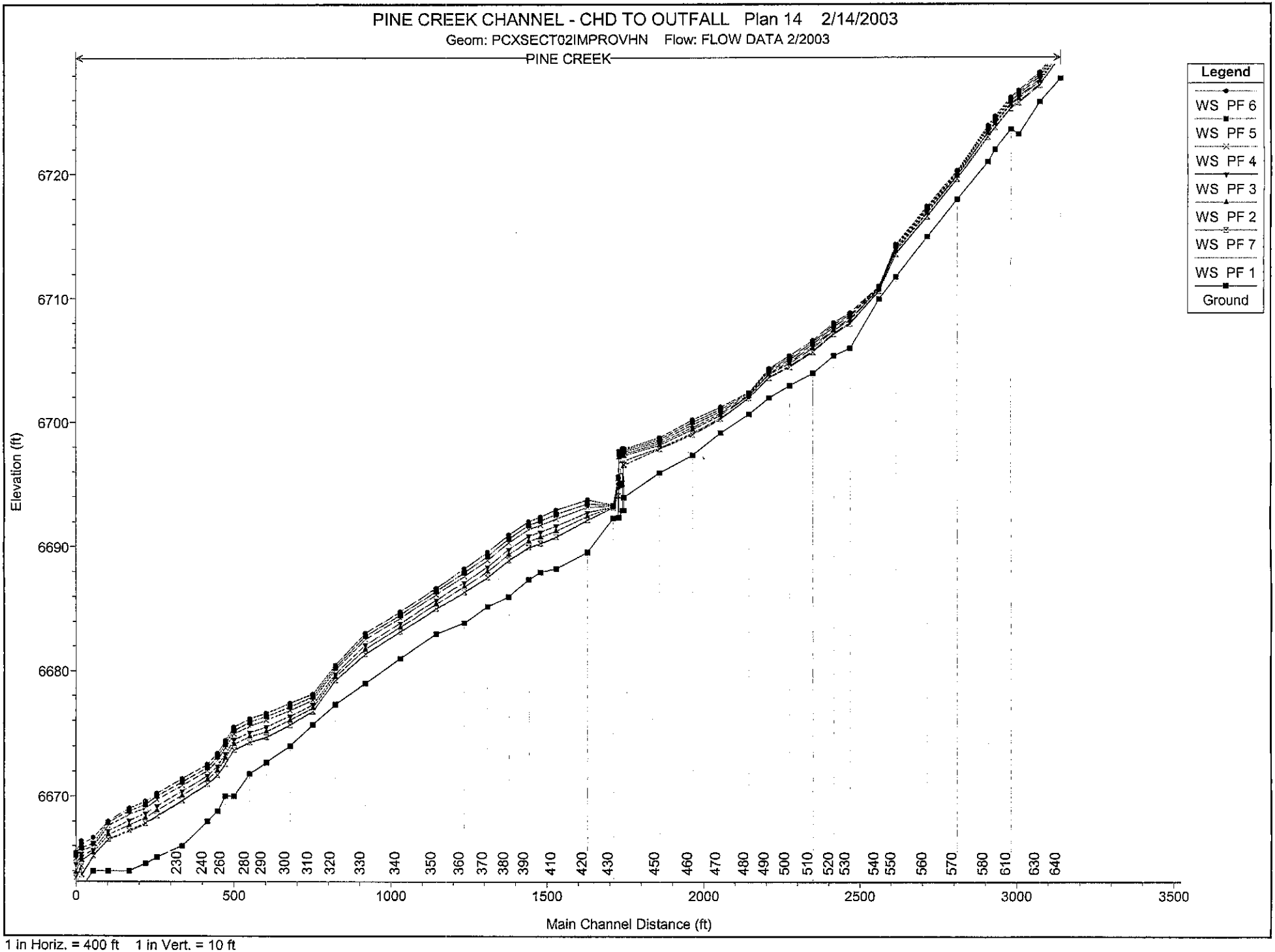
SUMMARY OF MANNING'S N VALUES

River:PINE CREEK

Reach	River Sta.	n1	n2	n3	n4	n5	n6	n7	n8	n9
PINE CREEK	640	.0675	.09	.045						
PINE CREEK	630	.045	.09	.045						
PINE CREEK	620	.105								
PINE CREEK	610	.0675	.12	.045						
PINE CREEK	590	.0675	.12							
PINE CREEK	580	.0675	.12	.0675						
PINE CREEK	570	.0675	.12	.0675	.045					
PINE CREEK	560	.0675	.12	.09	.12					
PINE CREEK	550	.0675	.12	.675	.12					
PINE CREEK	540	.045	.0675	.045						
PINE CREEK	530	.0675	.045							
PINE CREEK	520	.045	.12	.045						
PINE CREEK	510	.045	.12	.045						
PINE CREEK	500	.045	.12	.045						
PINE CREEK	490	.045	.105	.045						
PINE CREEK	480	.0525								

PINE CREEK	470	.045	.0675			
PINE CREEK	460	.45	.09	.0675		
PINE CREEK	450	.045	.12	.0675		
PINE CREEK	445	.045	.0525	.0255	.0525	
PINE CREEK	444	.03	.035	.017	.035	
PINE CREEK	440	Culvert				
PINE CREEK	433	.03	.03	.035	.025	
PINE CREEK	430	.025				
PINE CREEK	420	.045	.0675			
PINE CREEK	410	.0675	.045	.105	.09	.045
PINE CREEK	400	.0675	.0525	.0675	.09	
PINE CREEK	390	.0675	.12	.09		
PINE CREEK	380	.0675	.12	.09		
PINE CREEK	370	.0675	.12	.09		
PINE CREEK	360	.09	.12	.09	.045	
PINE CREEK	350	.045	.09	.12	.045	
PINE CREEK	340	.045	.12	.045		
PINE CREEK	330	.045	.12	.045		
PINE CREEK	320	.045	.12	.09	.045	
PINE CREEK	310	.12	.0675	.045		
PINE CREEK	300	.045	.0675	.045		
PINE CREEK	290	.045	.12	.045		
PINE CREEK	280	.03	.08	.03		
PINE CREEK	270	.045	.105	.045		
PINE CREEK	260	.045	.09	.045		
PINE CREEK	250	.045	.09	.045		
PINE CREEK	240	.045	.09	.045		
PINE CREEK	230	.045	.0675	.045		
PINE CREEK	220	.045	.0675	.045		

PINE CREEK	210		.045	.12	.045				
PINE CREEK	200		.0375	.12	.045				
PINE CREEK	190		.0375	.09	.045				
PINE CREEK	185		.015	.035	.015	.06	.015	.035	.015
PINE CREEK	181		.015	.35	.015	.035	.015	.035	.015
PINE CREEK	179		.015	.035	.015	.035	.015	.035	.015
PINE CREEK	173		.015	.035	.015	.035	.015	.035	.015



1 in Horiz. = 400 ft 1 in Vert. = 10 ft

HEC-RAS Plan: Plan 08 River: PINE CREEK Reach: PINE CREEK

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
PINE CREEK	640	248.00	6727.70	6729.59	6729.01	6729.77	0.026830	3.40	72.89	53.50	0.51
PINE CREEK	640	313.00	6727.70	6729.78	6729.19	6730.00	0.029309	3.77	83.05	56.01	0.55
PINE CREEK	640	354.00	6727.70	6729.89	6729.29	6730.14	0.030198	3.95	89.54	57.55	0.56
PINE CREEK	640	413.00	6727.70	6730.04	6729.43	6730.31	0.031533	4.21	98.05	59.46	0.58
PINE CREEK	640	470.00	6727.70	6730.17	6729.55	6730.47	0.032237	4.44	105.94	61.03	0.59
PINE CREEK	640	531.00	6727.70	6730.30	6729.68	6730.64	0.032745	4.65	114.18	62.63	0.61
PINE CREEK	640	222.00	6727.70	6729.51	6728.93	6729.67	0.025615	3.24	68.62	52.41	0.50
PINE CREEK	630	248.00	6725.80	6727.25		6727.52	0.045035	4.19	59.44	48.44	0.65
PINE CREEK	630	313.00	6725.80	6727.50		6727.80	0.038510	4.37	72.06	49.65	0.62
PINE CREEK	630	354.00	6725.80	6727.65		6727.97	0.035823	4.48	79.56	50.36	0.60
PINE CREEK	630	413.00	6725.80	6727.85		6728.19	0.033110	4.64	89.76	51.31	0.59
PINE CREEK	630	470.00	6725.80	6728.03		6728.39	0.031224	4.78	99.11	52.17	0.58
PINE CREEK	630	531.00	6725.80	6728.21		6728.60	0.029742	4.93	108.56	53.07	0.58
PINE CREEK	630	222.00	6725.80	6727.13		6727.40	0.049174	4.13	54.03	47.91	0.66
PINE CREEK	620	248.00	6723.20	6725.82		6725.93	0.013960	2.59	95.59	48.73	0.33
PINE CREEK	620	313.00	6723.20	6726.07		6726.20	0.015480	2.90	107.77	50.04	0.35
PINE CREEK	620	354.00	6723.20	6726.21		6726.36	0.016404	3.09	114.73	50.78	0.36
PINE CREEK	620	413.00	6723.20	6726.39		6726.56	0.017633	3.33	124.15	51.76	0.38
PINE CREEK	620	470.00	6723.20	6726.56		6726.75	0.018708	3.54	132.74	52.64	0.39
PINE CREEK	620	531.00	6723.20	6726.72		6726.94	0.019828	3.76	141.31	53.50	0.41
PINE CREEK	620	222.00	6723.20	6725.72		6725.81	0.013237	2.45	90.43	48.16	0.32
PINE CREEK	610	248.00	6723.60	6725.36		6725.47	0.026427	2.58	96.15	68.71	0.38
PINE CREEK	610	313.00	6723.60	6725.58		6725.71	0.026416	2.80	111.68	70.79	0.38
PINE CREEK	610	354.00	6723.60	6725.71		6725.84	0.026827	2.93	120.32	71.92	0.39
PINE CREEK	610	413.00	6723.60	6725.87		6726.02	0.027260	3.11	132.28	73.46	0.40
PINE CREEK	610	470.00	6723.60	6726.02		6726.19	0.027501	3.26	143.43	74.80	0.41
PINE CREEK	610	531.00	6723.60	6726.17		6726.35	0.027727	3.42	154.53	75.73	0.41
PINE CREEK	610	222.00	6723.60	6725.26		6725.36	0.026572	2.48	89.41	67.79	0.37
PINE CREEK	590	248.00	6722.00	6723.83		6723.96	0.035068	2.80	88.68	66.77	0.43
PINE CREEK	590	313.00	6722.00	6724.06		6724.20	0.034826	3.01	104.15	70.56	0.43
PINE CREEK	590	354.00	6722.00	6724.18		6724.34	0.034027	3.14	113.05	71.75	0.44
PINE CREEK	590	413.00	6722.00	6724.35		6724.52	0.033194	3.31	125.27	73.35	0.44
PINE CREEK	590	470.00	6722.00	6724.50		6724.69	0.032825	3.47	136.26	74.76	0.44
PINE CREEK	590	531.00	6722.00	6724.66		6724.86	0.032130	3.62	148.13	76.25	0.44
PINE CREEK	590	222.00	6722.00	6723.73		6723.85	0.034930	2.70	82.09	64.82	0.42
PINE CREEK	580	248.00	6721.00	6723.06		6723.19	0.031145	2.94	86.24	61.39	0.41
PINE CREEK	580	313.00	6721.00	6723.29		6723.45	0.030593	3.19	100.62	63.42	0.42
PINE CREEK	580	354.00	6721.00	6723.42		6723.59	0.030443	3.34	109.06	64.59	0.42
PINE CREEK	580	413.00	6721.00	6723.60		6723.79	0.030589	3.55	120.25	66.10	0.43
PINE CREEK	580	470.00	6721.00	6723.74		6723.95	0.031328	3.75	129.74	67.35	0.44
PINE CREEK	580	531.00	6721.00	6723.89		6724.12	0.031556	3.93	140.10	68.70	0.45
PINE CREEK	580	222.00	6721.00	6722.96		6723.08	0.031667	2.83	79.96	60.48	0.41
PINE CREEK	570	248.00	6718.00	6719.69		6719.80	0.039003	2.63	94.20	83.98	0.44
PINE CREEK	570	313.00	6718.00	6719.85		6719.98	0.041463	2.89	108.19	87.65	0.46
PINE CREEK	570	354.00	6718.00	6719.95		6720.09	0.042407	3.03	116.86	89.85	0.47
PINE CREEK	570	413.00	6718.00	6720.07		6720.23	0.043364	3.23	127.99	91.23	0.48
PINE CREEK	570	470.00	6718.00	6720.19		6720.37	0.042955	3.39	138.75	91.61	0.48
PINE CREEK	570	531.00	6718.00	6720.30		6720.50	0.043500	3.57	148.79	91.97	0.49
PINE CREEK	570	222.00	6718.00	6719.62		6719.72	0.037474	2.51	88.55	82.45	0.43
PINE CREEK	560	248.00	6715.00	6716.70		6716.79	0.026080	2.43	102.56	88.92	0.39
PINE CREEK	560	313.00	6715.00	6716.90		6717.01	0.024548	2.62	120.32	89.75	0.39
PINE CREEK	560	354.00	6715.00	6717.02		6717.13	0.023862	2.72	130.77	90.24	0.39
PINE CREEK	560	413.00	6715.00	6717.17		6717.30	0.023164	2.87	144.92	90.89	0.39
PINE CREEK	560	470.00	6715.00	6717.31		6717.45	0.022982	3.02	157.17	91.45	0.40
PINE CREEK	560	531.00	6715.00	6717.46		6717.61	0.022315	3.14	170.83	92.07	0.40
PINE CREEK	560	222.00	6715.00	6716.61		6716.70	0.027201	2.35	94.68	88.55	0.40
PINE CREEK	550	248.00	6711.80	6713.67	6712.89	6713.74	0.035728	2.15	115.61	84.65	0.32
PINE CREEK	550	313.00	6711.80	6713.87	6713.02	6713.96	0.038756	2.37	132.60	86.32	0.33
PINE CREEK	550	354.00	6711.80	6714.00	6713.09	6714.09	0.039604	2.47	143.54	87.38	0.34
PINE CREEK	550	413.00	6711.80	6714.13	6713.18	6714.24	0.042032	2.66	155.57	87.93	0.35

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
PINE CREEK	550	470.00	6711.80	6714.27	6713.26	6714.39	0.043593	2.82	167.11	88.44	0.36
PINE CREEK	550	531.00	6711.80	6714.39	6713.35	6714.53	0.045603	3.00	178.15	88.92	0.37
PINE CREEK	550	222.00	6711.80	6713.60	6712.83	6713.66	0.033547	2.04	109.19	84.01	0.31
PINE CREEK	540	248.00	6710.00	6710.67	6710.67	6710.95	0.078922	4.26	58.15	102.22	0.99
PINE CREEK	540	313.00	6710.00	6710.77	6710.77	6711.09	0.076256	4.55	68.77	106.94	1.00
PINE CREEK	540	354.00	6710.00	6710.83	6710.83	6711.18	0.076078	4.73	74.79	109.53	1.01
PINE CREEK	540	413.00	6710.00	6710.91	6710.91	6711.29	0.073324	4.91	84.10	113.41	1.00
PINE CREEK	540	470.00	6710.00	6710.98	6710.98	6711.39	0.071930	5.08	92.48	116.80	1.00
PINE CREEK	540	531.00	6710.00	6711.06	6711.06	6711.49	0.069644	5.27	100.74	117.75	1.00
PINE CREEK	540	222.00	6710.00	6710.62	6710.62	6710.89	0.086035	4.23	52.48	99.61	1.02
PINE CREEK	530	248.00	6706.00	6708.08	6707.40	6708.22	0.012633	2.99	82.87	62.61	0.46
PINE CREEK	530	313.00	6706.00	6708.29	6707.58	6708.46	0.012261	3.26	96.40	64.26	0.46
PINE CREEK	530	354.00	6706.00	6708.41	6707.68	6708.59	0.012263	3.42	104.02	65.17	0.47
PINE CREEK	530	413.00	6706.00	6708.58	6707.81	6708.78	0.012060	3.61	115.11	66.48	0.47
PINE CREEK	530	470.00	6706.00	6708.73	6707.94	6708.95	0.011925	3.79	125.29	67.65	0.47
PINE CREEK	530	531.00	6706.00	6708.88	6708.05	6709.12	0.011839	3.97	135.65	68.83	0.48
PINE CREEK	530	222.00	6706.00	6707.99	6707.32	6708.12	0.012599	2.87	77.49	61.81	0.45
PINE CREEK	520	248.00	6705.40	6707.24		6707.34	0.023510	2.47	100.51	69.77	0.36
PINE CREEK	520	313.00	6705.40	6707.47		6707.58	0.023521	2.69	116.27	71.17	0.37
PINE CREEK	520	354.00	6705.40	6707.60		6707.72	0.023578	2.82	125.53	71.98	0.38
PINE CREEK	520	413.00	6705.40	6707.77		6707.91	0.023577	2.99	138.35	73.08	0.38
PINE CREEK	520	470.00	6705.40	6707.93		6708.08	0.023601	3.13	150.10	74.08	0.39
PINE CREEK	520	531.00	6705.40	6708.09		6708.26	0.023508	3.28	162.03	74.89	0.39
PINE CREEK	520	222.00	6705.40	6707.15		6707.23	0.023457	2.37	93.86	69.17	0.36
PINE CREEK	510	248.00	6704.00	6705.78		6705.87	0.020618	2.34	107.11	73.22	0.34
PINE CREEK	510	313.00	6704.00	6706.01		6706.11	0.020547	2.56	123.57	73.95	0.34
PINE CREEK	510	354.00	6704.00	6706.14		6706.25	0.020441	2.68	133.42	74.39	0.35
PINE CREEK	510	413.00	6704.00	6706.32		6706.44	0.020364	2.84	146.76	74.97	0.35
PINE CREEK	510	470.00	6704.00	6706.48		6706.62	0.020330	2.99	158.92	75.50	0.35
PINE CREEK	510	531.00	6704.00	6706.64		6706.79	0.020335	3.14	171.24	76.03	0.36
PINE CREEK	510	222.00	6704.00	6705.68		6705.76	0.020721	2.24	99.98	72.90	0.33
PINE CREEK	500	248.00	6703.00	6704.59		6704.65	0.013200	1.94	129.65	86.70	0.27
PINE CREEK	500	313.00	6703.00	6704.81		6704.88	0.013615	2.14	148.39	88.14	0.28
PINE CREEK	500	354.00	6703.00	6704.93		6705.01	0.013837	2.26	159.42	88.98	0.29
PINE CREEK	500	413.00	6703.00	6705.10		6705.19	0.014181	2.42	174.19	90.08	0.29
PINE CREEK	500	470.00	6703.00	6705.25		6705.35	0.014462	2.55	187.73	91.09	0.30
PINE CREEK	500	531.00	6703.00	6705.39		6705.51	0.014817	2.70	201.14	92.07	0.31
PINE CREEK	500	222.00	6703.00	6704.50		6704.55	0.013011	1.85	121.60	86.07	0.27
PINE CREEK	490	248.00	6702.00	6703.70		6703.76	0.013736	1.99	123.00	94.89	0.31
PINE CREEK	490	313.00	6702.00	6703.90		6703.98	0.013745	2.17	142.09	96.29	0.31
PINE CREEK	490	354.00	6702.00	6704.01		6704.09	0.013925	2.28	152.76	97.06	0.32
PINE CREEK	490	413.00	6702.00	6704.15		6704.25	0.014329	2.45	166.23	97.96	0.33
PINE CREEK	490	470.00	6702.00	6704.26		6704.38	0.014904	2.60	177.66	98.71	0.34
PINE CREEK	490	531.00	6702.00	6704.38		6704.51	0.015370	2.76	189.56	99.49	0.35
PINE CREEK	490	222.00	6702.00	6703.61		6703.67	0.013816	1.91	114.64	94.27	0.30
PINE CREEK	480	248.00	6700.70	6702.03		6702.32	0.040099	4.38	56.61	83.24	0.94
PINE CREEK	480	313.00	6700.70	6702.11	6702.10	6702.48	0.043726	4.92	63.67	84.04	1.00
PINE CREEK	480	354.00	6700.70	6702.17	6702.17	6702.58	0.044163	5.17	68.53	84.59	1.01
PINE CREEK	480	413.00	6700.70	6702.25	6702.25	6702.71	0.043376	5.44	75.88	85.41	1.02
PINE CREEK	480	470.00	6700.70	6702.35	6702.35	6702.83	0.041041	5.61	83.72	86.28	1.00
PINE CREEK	480	531.00	6700.70	6702.43	6702.43	6702.96	0.040174	5.84	91.00	87.08	1.01
PINE CREEK	480	222.00	6700.70	6701.99		6702.26	0.038107	4.15	53.53	82.26	0.91
PINE CREEK	470	248.00	6699.20	6700.40		6700.50	0.011520	2.63	95.17	87.38	0.43
PINE CREEK	470	313.00	6699.20	6700.61		6700.73	0.010176	2.76	114.32	89.65	0.41
PINE CREEK	470	354.00	6699.20	6700.74	6700.09	6700.87	0.009508	2.84	126.10	91.01	0.41
PINE CREEK	470	413.00	6699.20	6700.92	6700.18	6701.05	0.008798	2.93	142.30	92.86	0.40
PINE CREEK	470	470.00	6699.20	6701.09	6700.27	6701.23	0.008160	3.01	158.05	94.61	0.39
PINE CREEK	470	531.00	6699.20	6701.26	6700.36	6701.41	0.007622	3.08	174.42	96.41	0.38
PINE CREEK	470	222.00	6699.20	6700.31		6700.41	0.012151	2.56	87.41	86.45	0.43

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
PINE CREEK	460	248.00	6697.40	6699.18		6699.23	0.017123	1.87	132.50	81.22	0.26
PINE CREEK	460	313.00	6697.40	6699.46		6699.52	0.017833	2.01	156.04	83.35	0.26
PINE CREEK	460	354.00	6697.40	6699.63		6699.69	0.018328	2.08	169.90	84.58	0.26
PINE CREEK	460	413.00	6697.40	6699.85		6699.92	0.019057	2.19	188.79	86.22	0.26
PINE CREEK	460	470.00	6697.40	6700.04		6700.13	0.019824	2.28	205.81	87.68	0.26
PINE CREEK	460	531.00	6697.40	6700.24		6700.33	0.020557	2.38	223.47	89.17	0.26
PINE CREEK	460	222.00	6697.40	6699.05		6699.10	0.016978	1.82	122.17	80.27	0.26
PINE CREEK	450	248.00	6696.00	6697.97		6698.02	0.008279	1.70	146.27	85.80	0.23
PINE CREEK	450	313.00	6696.00	6698.20		6698.26	0.008684	1.89	166.17	89.34	0.24
PINE CREEK	450	354.00	6696.00	6698.33		6698.40	0.008889	1.99	178.05	91.50	0.24
PINE CREEK	450	413.00	6696.00	6698.50		6698.57	0.009214	2.14	193.88	94.31	0.25
PINE CREEK	450	470.00	6696.00	6698.65		6698.73	0.009537	2.27	208.06	96.76	0.26
PINE CREEK	450	531.00	6696.00	6698.80		6698.89	0.009873	2.41	222.32	99.16	0.27
PINE CREEK	450	222.00	6696.00	6697.88		6697.92	0.007982	1.61	138.05	85.02	0.22
PINE CREEK	445	248.00	6694.00	6696.93		6697.08	0.007983	3.16	78.51	72.90	0.54
PINE CREEK	445	313.00	6694.00	6697.35		6697.46	0.005556	2.74	114.15	96.47	0.44
PINE CREEK	445	354.00	6694.00	6697.49		6697.61	0.005416	2.76	128.17	104.29	0.44
PINE CREEK	445	413.00	6694.00	6697.65		6697.78	0.005362	2.82	146.42	113.67	0.44
PINE CREEK	445	470.00	6694.00	6697.79		6697.92	0.005456	2.91	161.72	120.97	0.44
PINE CREEK	445	531.00	6694.00	6697.89		6698.03	0.005772	3.04	174.60	126.79	0.46
PINE CREEK	445	222.00	6694.00	6696.62		6696.84	0.010980	3.76	58.98	55.92	0.65
PINE CREEK	444	248.00	6692.97	6696.97	6694.98	6697.06	0.001256	2.60	110.62	97.98	0.33
PINE CREEK	444	313.00	6692.97	6697.38	6695.30	6697.45	0.001061	2.36	157.43	130.55	0.30
PINE CREEK	444	354.00	6692.97	6697.52	6695.47	6697.59	0.001075	2.38	176.64	141.76	0.30
PINE CREEK	444	413.00	6692.97	6697.69	6695.74	6697.76	0.001102	2.42	201.88	155.27	0.30
PINE CREEK	444	470.00	6692.97	6697.82	6695.94	6697.90	0.001143	2.48	223.28	165.87	0.31
PINE CREEK	444	531.00	6692.97	6697.93	6696.77	6698.01	0.001220	2.58	241.73	174.49	0.32
PINE CREEK	444	222.00	6692.97	6696.69	6694.84	6696.81	0.001421	2.86	86.54	75.97	0.36
PINE CREEK	440	Culvert									
PINE CREEK	433	248.00	6692.40	6694.48	6694.48	6695.41	0.016565	7.77	31.90	17.19	1.01
PINE CREEK	433	313.00	6692.40	6694.81	6694.81	6695.88	0.015731	8.27	37.86	18.04	1.01
PINE CREEK	433	354.00	6692.40	6695.01	6695.01	6696.14	0.015397	8.55	41.41	18.52	1.01
PINE CREEK	433	413.00	6692.40	6695.28	6695.28	6696.50	0.014851	8.88	46.53	19.20	1.00
PINE CREEK	433	470.00	6692.40	6695.53	6695.53	6696.83	0.014400	9.15	51.35	19.82	1.00
PINE CREEK	433	531.00	6692.40	6695.70	6695.70	6697.16	0.015208	9.69	54.79	20.25	1.04
PINE CREEK	433	222.00	6692.40	6694.14	6694.33	6695.25	0.024072	8.44	26.29	16.35	0.36
PINE CREEK	430	248.00	6692.33	6693.19	6693.59	6694.77	0.094542	10.10	24.57	59.64	2.77
PINE CREEK	430	313.00	6692.33	6693.24	6693.73	6695.25	0.105495	11.37	27.53	60.74	2.98
PINE CREEK	430	354.00	6692.33	6693.27	6693.81	6695.50	0.108200	11.97	29.56	61.48	3.04
PINE CREEK	430	413.00	6692.33	6693.32	6693.91	6695.82	0.109234	12.68	32.56	62.55	3.10
PINE CREEK	430	470.00	6692.33	6693.36	6694.00	6696.11	0.110012	13.30	35.33	63.52	3.14
PINE CREEK	430	531.00	6692.33	6693.40	6694.11	6696.48	0.114741	14.07	37.74	64.36	3.24
PINE CREEK	430	222.00	6692.33	6693.18	6693.53	6694.53	0.083539	9.32	23.81	59.36	2.59
PINE CREEK	420	255.00	6689.60	6692.17	6691.38	6692.27	0.008164	2.58	99.00	67.96	0.38
PINE CREEK	420	372.00	6689.60	6692.50	6691.61	6692.64	0.008858	3.04	122.28	72.88	0.41
PINE CREEK	420	479.00	6689.60	6692.78	6691.78	6692.96	0.008936	3.35	142.89	77.05	0.43
PINE CREEK	420	650.00	6689.60	6693.22	6692.11	6693.43	0.008551	3.70	175.88	83.45	0.43
PINE CREEK	420	771.00	6689.60	6693.51	6692.31	6693.74	0.008208	3.88	198.79	87.72	0.44
PINE CREEK	420	899.00	6689.60	6693.80	6692.51	6694.05	0.007832	4.03	222.82	92.05	0.43
PINE CREEK	420	266.00	6689.60	6692.20	6691.40	6692.31	0.008231	2.62	101.46	68.50	0.38
PINE CREEK	410	255.00	6688.30	6690.79		6690.91	0.027752	2.78	92.49	79.65	0.45
PINE CREEK	410	372.00	6688.30	6691.30		6691.42	0.017910	2.82	133.62	82.63	0.38
PINE CREEK	410	479.00	6688.30	6691.71		6691.84	0.014155	2.89	168.21	85.05	0.35
PINE CREEK	410	650.00	6688.30	6692.29		6692.43	0.011307	3.04	218.50	88.46	0.33
PINE CREEK	410	771.00	6688.30	6692.65		6692.80	0.010251	3.14	250.98	90.59	0.32
PINE CREEK	410	899.00	6688.30	6693.00		6693.16	0.009550	3.26	282.92	92.64	0.31
PINE CREEK	410	266.00	6688.30	6690.84		6690.96	0.026297	2.78	96.51	79.95	0.44
PINE CREEK	400	255.00	6688.00	6690.26		6690.38	0.005589	2.81	94.20	47.87	0.34
PINE CREEK	400	372.00	6688.00	6690.80		6690.96	0.005580	3.21	120.81	50.25	0.35

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
PINE CREEK	400	479.00	6688.00	6691.22		6691.41	0.005664	3.53	142.27	52.08	0.36
PINE CREEK	400	650.00	6688.00	6691.78		6692.02	0.005899	3.98	172.42	54.56	0.38
PINE CREEK	400	771.00	6688.00	6692.13		6692.40	0.006043	4.27	191.58	56.20	0.39
PINE CREEK	400	899.00	6688.00	6692.46		6692.77	0.006159	4.56	210.28	57.96	0.40
PINE CREEK	400	266.00	6688.00	6690.31		6690.44	0.005578	2.85	96.89	48.12	0.34
PINE CREEK	390	255.00	6687.40	6689.94		6690.05	0.015028	2.83	97.75	45.95	0.31
PINE CREEK	390	372.00	6687.40	6690.47		6690.63	0.015956	3.31	123.23	49.48	0.33
PINE CREEK	390	479.00	6687.40	6690.88		6691.07	0.016683	3.68	144.03	52.21	0.35
PINE CREEK	390	650.00	6687.40	6691.43		6691.67	0.017851	4.19	173.47	55.85	0.37
PINE CREEK	390	771.00	6687.40	6691.76		6692.04	0.018580	4.51	192.53	58.08	0.38
PINE CREEK	390	899.00	6687.40	6692.08		6692.40	0.019192	4.80	211.56	60.10	0.39
PINE CREEK	390	266.00	6687.40	6690.00		6690.11	0.015128	2.88	100.32	46.28	0.31
PINE CREEK	380	255.00	6686.00	6688.91		6689.01	0.017792	2.53	100.86	57.23	0.34
PINE CREEK	380	372.00	6686.00	6689.42		6689.55	0.017797	2.83	131.56	63.22	0.35
PINE CREEK	380	479.00	6686.00	6689.82		6689.96	0.017808	3.04	157.41	67.85	0.35
PINE CREEK	380	650.00	6686.00	6690.35		6690.52	0.017649	3.34	194.66	72.68	0.36
PINE CREEK	380	771.00	6686.00	6690.67		6690.86	0.017569	3.52	218.78	75.21	0.36
PINE CREEK	380	899.00	6686.00	6690.99		6691.20	0.017590	3.70	242.74	77.64	0.37
PINE CREEK	380	266.00	6686.00	6688.97		6689.07	0.017803	2.56	103.86	57.84	0.34
PINE CREEK	370	255.00	6685.20	6687.55		6687.67	0.021754	2.77	92.02	52.28	0.37
PINE CREEK	370	372.00	6685.20	6688.05		6688.20	0.022139	3.12	119.24	57.81	0.38
PINE CREEK	370	479.00	6685.20	6688.43		6688.61	0.022313	3.37	142.25	62.10	0.39
PINE CREEK	370	650.00	6685.20	6688.95		6689.16	0.022611	3.69	176.05	67.91	0.40
PINE CREEK	370	771.00	6685.20	6689.27		6689.51	0.022765	3.88	198.52	71.51	0.41
PINE CREEK	370	899.00	6685.20	6689.59		6689.84	0.022797	4.06	221.63	75.03	0.42
PINE CREEK	370	266.00	6685.20	6687.60		6687.73	0.021796	2.81	94.71	52.85	0.37
PINE CREEK	360	255.00	6683.90	6686.30		6686.38	0.013745	2.23	114.55	63.20	0.29
PINE CREEK	360	372.00	6683.90	6686.78		6686.88	0.013953	2.55	145.94	67.89	0.31
PINE CREEK	360	479.00	6683.90	6687.15		6687.27	0.014124	2.79	171.78	71.52	0.32
PINE CREEK	360	650.00	6683.90	6687.66		6687.81	0.014333	3.10	209.47	76.51	0.33
PINE CREEK	360	771.00	6683.90	6687.98		6688.14	0.014471	3.29	234.13	79.60	0.34
PINE CREEK	360	899.00	6683.90	6688.28		6688.47	0.014587	3.47	258.96	82.60	0.35
PINE CREEK	360	266.00	6683.90	6686.35		6686.43	0.013758	2.26	117.71	63.69	0.29
PINE CREEK	350	255.00	6683.00	6684.99		6685.09	0.014947	2.39	103.25	58.86	0.30
PINE CREEK	350	372.00	6683.00	6685.40		6685.55	0.015881	2.80	128.16	61.74	0.32
PINE CREEK	350	479.00	6683.00	6685.72		6685.91	0.016456	3.10	148.45	63.99	0.33
PINE CREEK	350	650.00	6683.00	6686.15		6686.39	0.017480	3.52	176.46	66.97	0.35
PINE CREEK	350	771.00	6683.00	6686.42		6686.69	0.018116	3.78	194.33	68.81	0.36
PINE CREEK	350	899.00	6683.00	6686.67		6686.99	0.018740	4.03	211.89	70.56	0.37
PINE CREEK	350	266.00	6683.00	6685.03		6685.14	0.015015	2.43	105.85	59.17	0.30
PINE CREEK	340	255.00	6681.00	6683.14		6683.24	0.017526	2.42	105.30	68.59	0.34
PINE CREEK	340	372.00	6681.00	6683.55		6683.67	0.016837	2.77	134.21	73.08	0.36
PINE CREEK	340	479.00	6681.00	6683.87		6684.01	0.016497	3.04	157.59	76.52	0.37
PINE CREEK	340	650.00	6681.00	6684.28		6684.47	0.015866	3.42	190.57	80.84	0.39
PINE CREEK	340	771.00	6681.00	6684.54		6684.74	0.015670	3.66	211.17	83.35	0.39
PINE CREEK	340	899.00	6681.00	6684.78		6685.02	0.015408	3.89	232.20	85.84	0.40
PINE CREEK	340	266.00	6681.00	6683.19		6683.28	0.017469	2.46	108.15	69.05	0.35
PINE CREEK	330	255.00	6679.00	6681.32		6681.39	0.015418	2.12	120.24	73.89	0.29
PINE CREEK	330	372.00	6679.00	6681.76		6681.85	0.015649	2.43	153.35	77.82	0.30
PINE CREEK	330	479.00	6679.00	6682.09		6682.20	0.015813	2.66	179.98	81.16	0.31
PINE CREEK	330	650.00	6679.00	6682.53		6682.67	0.015975	3.01	216.60	86.62	0.32
PINE CREEK	330	771.00	6679.00	6682.80		6682.96	0.016166	3.23	240.13	89.95	0.33
PINE CREEK	330	899.00	6679.00	6683.05		6683.23	0.016309	3.43	263.74	93.17	0.34
PINE CREEK	330	266.00	6679.00	6681.37		6681.44	0.015417	2.15	123.61	74.30	0.29
PINE CREEK	320	255.00	6677.30	6679.20	6678.56	6679.32	0.032785	2.75	92.81	70.69	0.42
PINE CREEK	320	372.00	6677.30	6679.52		6679.68	0.035700	3.22	115.54	74.34	0.46
PINE CREEK	320	479.00	6677.30	6679.75		6679.95	0.038492	3.60	133.17	77.06	0.48
PINE CREEK	320	650.00	6677.30	6680.07		6680.33	0.041479	4.10	158.61	80.65	0.51
PINE CREEK	320	771.00	6677.30	6680.26		6680.56	0.043288	4.44	173.81	82.38	0.53
PINE CREEK	320	899.00	6677.30	6680.44		6680.79	0.044569	4.76	189.38	84.11	0.55

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
PINE CREEK	320	266.00	6677.30	6679.23	6678.58	6679.36	0.033105	2.80	95.09	71.06	0.43
PINE CREEK	310	255.00	6675.70	6676.74		6676.99	0.031627	4.01	64.95	65.79	0.70
PINE CREEK	310	372.00	6675.70	6677.03		6677.35	0.029081	4.53	84.38	67.69	0.70
PINE CREEK	310	479.00	6675.70	6677.28		6677.65	0.026689	4.87	101.60	69.33	0.69
PINE CREEK	310	650.00	6675.70	6677.65		6678.08	0.023873	5.29	127.71	71.74	0.68
PINE CREEK	310	771.00	6675.70	6677.90		6678.36	0.022362	5.54	145.42	73.33	0.67
PINE CREEK	310	899.00	6675.70	6678.14		6678.65	0.021101	5.78	163.47	75.76	0.67
PINE CREEK	310	266.00	6675.70	6676.77		6677.02	0.031318	4.07	66.88	65.98	0.70
PINE CREEK	300	255.00	6674.00	6675.65		6675.77	0.009799	2.85	91.51	65.70	0.41
PINE CREEK	300	372.00	6674.00	6676.05		6676.21	0.009142	3.23	118.48	68.18	0.41
PINE CREEK	300	479.00	6674.00	6676.37		6676.56	0.008790	3.51	140.70	70.16	0.42
PINE CREEK	300	650.00	6674.00	6676.83		6677.06	0.008364	3.88	173.55	72.98	0.42
PINE CREEK	300	771.00	6674.00	6677.12		6677.37	0.008189	4.11	194.90	74.76	0.42
PINE CREEK	300	899.00	6674.00	6677.40		6677.68	0.008098	4.34	215.91	76.47	0.42
PINE CREEK	300	266.00	6674.00	6675.69		6675.81	0.009714	2.89	94.21	65.95	0.41
PINE CREEK	290	255.00	6672.70	6674.67		6674.77	0.018908	2.52	101.49	60.96	0.33
PINE CREEK	290	372.00	6672.70	6675.16		6675.28	0.017227	2.81	131.86	65.21	0.33
PINE CREEK	290	479.00	6672.70	6675.52		6675.67	0.016416	3.03	156.40	68.45	0.33
PINE CREEK	290	650.00	6672.70	6676.03		6676.21	0.015532	3.31	191.98	72.90	0.33
PINE CREEK	290	771.00	6672.70	6676.33		6676.54	0.015155	3.48	214.86	75.62	0.33
PINE CREEK	290	899.00	6672.70	6676.62		6676.85	0.014947	3.65	237.16	78.18	0.33
PINE CREEK	290	266.00	6672.70	6674.72		6674.82	0.018694	2.55	104.53	61.40	0.33
PINE CREEK	280	255.00	6671.80	6674.24		6674.33	0.004542	2.21	114.92	61.01	0.25
PINE CREEK	280	372.00	6671.80	6674.73		6674.85	0.004670	2.54	145.61	65.96	0.27
PINE CREEK	280	479.00	6671.80	6675.09		6675.24	0.004842	2.80	169.84	69.63	0.28
PINE CREEK	280	650.00	6671.80	6675.58		6675.77	0.005018	3.13	205.35	74.67	0.29
PINE CREEK	280	771.00	6671.80	6675.88		6676.10	0.005145	3.34	228.12	77.73	0.30
PINE CREEK	280	899.00	6671.80	6676.16		6676.41	0.005239	3.53	250.22	79.98	0.30
PINE CREEK	280	266.00	6671.80	6674.30		6674.39	0.004544	2.24	118.09	61.54	0.26
PINE CREEK	270	255.00	6670.00	6673.66		6673.84	0.032805	3.46	73.70	48.52	0.49
PINE CREEK	270	372.00	6670.00	6674.14		6674.36	0.031116	3.76	98.87	55.53	0.50
PINE CREEK	270	479.00	6670.00	6674.48		6674.74	0.029440	4.04	118.56	57.73	0.50
PINE CREEK	270	650.00	6670.00	6674.96		6675.27	0.028149	4.43	146.88	60.76	0.50
PINE CREEK	270	771.00	6670.00	6675.24		6675.58	0.028276	4.70	164.13	62.53	0.51
PINE CREEK	270	899.00	6670.00	6675.50		6675.89	0.028781	4.98	180.65	64.18	0.52
PINE CREEK	270	266.00	6670.00	6673.71		6673.90	0.032703	3.49	76.21	49.44	0.50
PINE CREEK	260	255.00	6670.00	6672.56		6672.90	0.035949	4.18	57.32	37.84	0.59
PINE CREEK	260	372.00	6670.00	6673.02		6673.44	0.035741	4.56	76.12	43.76	0.60
PINE CREEK	260	479.00	6670.00	6673.37		6673.85	0.035389	4.83	92.25	48.26	0.61
PINE CREEK	260	650.00	6670.00	6673.85		6674.40	0.034490	5.14	116.95	54.43	0.61
PINE CREEK	260	771.00	6670.00	6674.14		6674.74	0.032983	5.36	133.36	57.10	0.61
PINE CREEK	260	899.00	6670.00	6674.42		6675.05	0.031211	5.61	149.41	58.58	0.60
PINE CREEK	260	266.00	6670.00	6672.61		6672.96	0.035932	4.22	59.16	38.46	0.59
PINE CREEK	250	255.00	6668.80	6671.65		6671.99	0.036478	4.71	54.18	34.67	0.66
PINE CREEK	250	372.00	6668.80	6672.08		6672.52	0.037778	5.32	69.91	38.89	0.70
PINE CREEK	250	479.00	6668.80	6672.40		6672.92	0.038363	5.77	83.02	41.46	0.72
PINE CREEK	250	650.00	6668.80	6672.85		6673.48	0.039043	6.35	102.37	44.98	0.74
PINE CREEK	250	771.00	6668.80	6673.13		6673.83	0.039443	6.69	115.16	47.16	0.75
PINE CREEK	250	899.00	6668.80	6673.40		6674.16	0.039711	7.01	128.21	49.28	0.77
PINE CREEK	250	266.00	6668.80	6671.70		6672.05	0.036653	4.77	55.73	35.13	0.67
PINE CREEK	240	255.00	6668.00	6670.94		6671.17	0.017921	3.87	66.68	39.47	0.50
PINE CREEK	240	372.00	6668.00	6671.34		6671.66	0.018746	4.56	83.01	41.82	0.53
PINE CREEK	240	479.00	6668.00	6671.63		6672.02	0.019977	5.13	95.26	43.49	0.56
PINE CREEK	240	650.00	6668.00	6672.04		6672.55	0.021058	5.85	113.50	45.87	0.60
PINE CREEK	240	771.00	6668.00	6672.29		6672.88	0.021633	6.29	125.38	47.36	0.62
PINE CREEK	240	899.00	6668.00	6672.54		6673.21	0.021953	6.69	137.62	48.85	0.63
PINE CREEK	240	266.00	6668.00	6670.98		6671.22	0.017998	3.95	68.34	39.72	0.50
PINE CREEK	230	255.00	6666.00	6669.61		6669.86	0.015017	4.03	63.35	42.64	0.58
PINE CREEK	230	372.00	6666.00	6670.06		6670.36	0.014057	4.42	84.23	49.34	0.59

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
PINE CREEK	230	479.00	6666.00	6670.39		6670.74	0.012907	4.76	100.94	51.31	0.59
PINE CREEK	230	650.00	6666.00	6670.85		6671.28	0.011971	5.25	125.19	54.03	0.58
PINE CREEK	230	771.00	6666.00	6671.14		6671.62	0.011548	5.55	141.22	55.76	0.58
PINE CREEK	230	899.00	6666.00	6671.41		6671.94	0.011469	5.87	156.27	57.33	0.59
PINE CREEK	230	266.00	6666.00	6669.65		6669.91	0.014915	4.07	65.43	43.42	0.58
PINE CREEK	220	255.00	6665.10	6668.37		6668.61	0.016422	3.93	64.83	38.10	0.53
PINE CREEK	220	372.00	6665.10	6668.86		6669.16	0.016602	4.40	84.57	42.27	0.55
PINE CREEK	220	479.00	6665.10	6669.22		6669.57	0.017050	4.78	100.19	45.02	0.56
PINE CREEK	220	650.00	6665.10	6669.69		6670.13	0.017921	5.31	122.37	48.65	0.59
PINE CREEK	220	771.00	6665.10	6669.98		6670.47	0.018612	5.65	136.46	50.82	0.61
PINE CREEK	220	899.00	6665.10	6670.22		6670.79	0.018933	6.03	149.31	53.29	0.62
PINE CREEK	220	266.00	6665.10	6668.44		6668.68	0.016201	3.96	67.25	38.79	0.53
PINE CREEK	210	255.00	6664.60	6667.78		6667.93	0.019058	2.92	83.85	42.36	0.34
PINE CREEK	210	372.00	6664.60	6668.26		6668.47	0.019684	3.34	105.31	47.92	0.36
PINE CREEK	210	479.00	6664.60	6668.60		6668.86	0.020378	3.68	122.40	53.00	0.37
PINE CREEK	210	650.00	6664.60	6669.06		6669.39	0.020879	4.09	148.08	59.83	0.38
PINE CREEK	210	771.00	6664.60	6669.33		6669.71	0.021095	4.32	165.00	63.93	0.39
PINE CREEK	210	899.00	6664.60	6669.57		6670.00	0.021596	4.56	181.05	67.59	0.40
PINE CREEK	210	266.00	6664.60	6667.86		6668.02	0.018216	2.92	87.42	42.99	0.34
PINE CREEK	200	257.00	6664.00	6667.20		6667.26	0.009020	1.90	133.28	77.78	0.23
PINE CREEK	200	399.00	6664.00	6667.69		6667.78	0.009140	2.21	173.89	85.96	0.24
PINE CREEK	200	524.00	6664.00	6668.04		6668.15	0.009189	2.41	204.99	91.40	0.25
PINE CREEK	200	729.00	6664.00	6668.51		6668.66	0.009204	2.67	248.87	95.63	0.26
PINE CREEK	200	871.00	6664.00	6668.80		6668.97	0.009229	2.82	276.17	98.16	0.26
PINE CREEK	200	1017.00	6664.00	6669.03		6669.24	0.009558	2.99	299.53	100.28	0.27
PINE CREEK	200	282.00	6664.00	6667.30		6667.36	0.009036	1.96	141.03	79.41	0.24
PINE CREEK	190	257.00	6664.00	6666.49	6665.47	6666.59	0.011013	2.53	102.11	62.13	0.34
PINE CREEK	190	399.00	6664.00	6666.92	6665.84	6667.07	0.012259	3.09	130.07	66.69	0.37
PINE CREEK	190	524.00	6664.00	6667.23	6666.09	6667.42	0.013193	3.49	150.88	69.89	0.39
PINE CREEK	190	729.00	6664.00	6667.65	6666.46	6667.90	0.014278	4.03	181.23	74.31	0.41
PINE CREEK	190	871.00	6664.00	6667.90	6666.68	6668.19	0.014937	4.35	199.91	76.90	0.43
PINE CREEK	190	1017.00	6664.00	6667.99		6668.37	0.018116	4.89	207.43	77.92	0.48
PINE CREEK	190	282.00	6664.00	6666.58	6665.53	6666.68	0.011239	2.64	107.52	63.04	0.34
PINE CREEK	185	257.00	6664.00	6665.14	6665.14	6665.56	0.056201	5.22	49.19	58.52	1.00
PINE CREEK	185	399.00	6664.00	6665.45	6665.45	6665.97	0.052977	5.80	68.79	66.90	1.01
PINE CREEK	185	524.00	6664.00	6665.67	6665.67	6666.27	0.050210	6.21	84.37	71.14	1.00
PINE CREEK	185	729.00	6664.00	6665.99	6665.99	6666.70	0.047280	6.77	107.75	76.38	1.00
PINE CREEK	185	871.00	6664.00	6666.20	6666.20	6666.96	0.046455	7.01	124.21	82.36	1.01
PINE CREEK	185	1017.00	6664.00	6666.69		6667.26	0.028466	6.04	168.44	96.83	0.81
PINE CREEK	185	282.00	6664.00	6665.20	6665.20	6665.64	0.055492	5.34	52.78	60.14	1.00
PINE CREEK	181	257.00	6662.70	6663.63	6663.91	6664.64	0.011197	8.06	31.87	36.12	1.51
PINE CREEK	181	399.00	6662.70	6664.84	6664.31	6665.25	0.001793	5.13	77.83	38.51	0.64
PINE CREEK	181	524.00	6662.70	6665.11	6664.60	6665.66	0.002069	5.95	88.21	47.59	0.69
PINE CREEK	181	729.00	6662.70	6665.54	6665.05	6666.26	0.002200	6.85	109.21	49.25	0.73
PINE CREEK	181	871.00	6662.70	6665.84	6665.43	6666.64	0.002180	7.28	123.87	50.38	0.74
PINE CREEK	181	1017.00	6662.70	6666.12		6667.00	0.002141	7.65	139.49	60.62	0.74
PINE CREEK	181	282.00	6662.70	6663.70	6663.99	6664.75	0.010844	8.21	34.33	36.39	1.49
PINE CREEK	179	257.00	6661.70	6664.23	6662.92	6664.35	0.000420	2.77	92.88	38.49	0.31
PINE CREEK	179	399.00	6661.70	6665.01		6665.18	0.000413	3.25	122.85	38.56	0.32
PINE CREEK	179	524.00	6661.70	6665.33		6665.56	0.000520	3.87	137.26	48.44	0.36
PINE CREEK	179	729.00	6661.70	6665.81		6666.14	0.000643	4.66	161.00	50.28	0.41
PINE CREEK	179	871.00	6661.70	6666.12		6666.52	0.000700	5.10	177.87	60.61	0.43
PINE CREEK	179	1017.00	6661.70	6666.42		6666.87	0.000738	5.48	196.11	62.11	0.45
PINE CREEK	179	282.00	6661.70	6664.38	6662.99	6664.51	0.000418	2.86	98.54	38.50	0.32
PINE CREEK	173	257.00	6661.80	6663.40	6663.40	6664.15	0.005905	6.93	37.10	25.10	1.00
PINE CREEK	173	399.00	6661.80	6663.90	6663.90	6664.90	0.005610	8.06	49.51	25.18	1.01
PINE CREEK	173	524.00	6661.80	6664.54	6664.54	6665.37	0.003342	7.48	75.53	47.17	0.82
PINE CREEK	173	729.00	6661.80	6665.00	6665.00	6665.94	0.003191	8.15	98.17	50.11	0.82
PINE CREEK	173	871.00	6661.80	6665.23	6665.23	6666.29	0.003310	8.71	109.74	50.12	0.84
PINE CREEK	173	1017.00	6661.80	6665.47	6665.47	6666.63	0.003331	9.15	121.61	50.13	0.86

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
PINE CREEK	173	282.00	6661.80	6663.49	6663.49	6664.29	0.005879	7.17	39.35	25.11	1.01

REACH NO. 1

FLOWMASTER LOW FLOW CHANNEL ANALYSIS

DATA SHEETS

Pine Creek
Worksheet for Irregular Channel

Project Description	
Project File	h:\fmw\project9.fm2
Worksheet	PINE CREEK CHAPEL HILLS DRIVE TO 84"
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Discharge

Input Data		
Channel Slope	0.010000	ft/ft
Water Surface Elevation	6.00	ft

Elevation range: 5.50 ft to 12.00 ft.

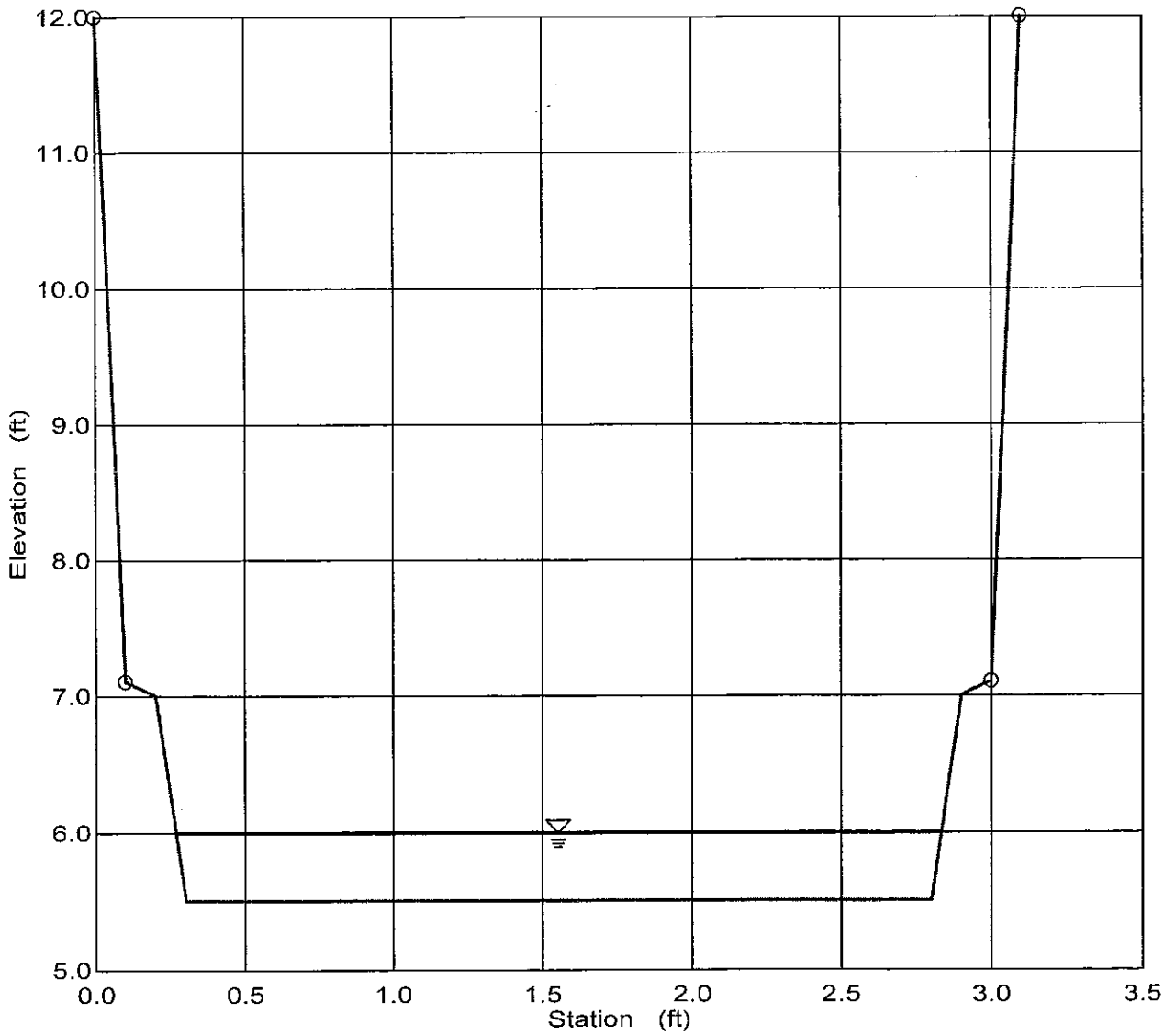
Station (ft)	Elevation (ft)	Start Station	End Station	Roughness
0.00	12.00	0.00	0.10	0.009
0.10	7.10	0.10	3.00	0.032
0.20	7.00	3.00	3.10	0.009
0.30	5.50			
2.80	5.50			
2.90	7.00			
3.00	7.10			
3.10	12.00			

Results		
Wtd. Mannings Coefficient	0.032	
Discharge	2.99	cfs
Flow Area	1.27	ft²
Wetted Perimeter	3.50	ft
Top Width	2.57	ft
Height	0.50	ft
Critical Depth	5.85	ft
Critical Slope	0.028802	ft/ft
Velocity	2.36	ft/s
Velocity Head	0.09	ft
Specific Energy	6.09	ft
Froude Number	0.59	
Flow is subcritical.		

Cross Section Low Flow Channel
Cross Section for Irregular Channel

Project Description	
Project File	h:\fmw\project9.fm2
Worksheet	PINE CREEK CHAPEL HILLS DRIVE TO 84"
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Discharge

Section Data		
Wtd. Mannings Coefficient	0.032	
Channel Slope	0.010000	ft/ft
Water Surface Elevation	6.00	ft
Discharge	2.99	cfs



LOW FLOW CHANNEL
Rating Table for Irregular Channel

Project Description	
Project File	h:\fmw\project9.fm2
Worksheet	PINE CREEK CHAPEL HILLS DRIVE TO 84"
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Discharge

Constant Data

Input Data	Minimum	Maximum	Increment	
Channel Slope	0.010000	0.035000	0.005000	ft/ft
Water Surface Elevation	6.00	10.50	0.50	ft

Rating Table

Water Surface Elevation (ft)	Channel Slope (ft/ft)	Wtd. Mannings Coefficient	Discharge (cfs)	Velocity (ft/s)
6.00	0.010000	0.032	2.99	2.36
6.00	0.015000	0.032	3.66	2.89
6.00	0.020000	0.032	4.22	3.33
6.00	0.025000	0.032	4.72	3.73
6.00	0.030000	0.032	5.17	4.08
6.00	0.035000	0.032	5.59	4.41
6.50	0.010000	0.032	8.19	3.19
6.50	0.015000	0.032	10.03	3.91
6.50	0.020000	0.032	11.58	4.51
6.50	0.025000	0.032	12.95	5.05
6.50	0.030000	0.032	14.19	5.53
6.50	0.035000	0.032	15.33	5.97
7.00	0.010000	0.032	14.39	3.69
7.00	0.015000	0.032	17.62	4.52
7.00	0.020000	0.032	20.35	5.22
7.00	0.025000	0.032	22.75	5.83
7.00	0.030000	0.032	24.92	6.39
7.00	0.035000	0.032	26.92	6.90
7.50	0.010000	0.030	23.20	4.34
7.50	0.015000	0.030	28.42	5.32
7.50	0.020000	0.030	32.81	6.14
7.50	0.025000	0.030	36.69	6.87
7.50	0.030000	0.030	40.19	7.52
7.50	0.035000	0.030	43.41	8.12
8.00	0.010000	0.028	34.16	5.02
8.00	0.015000	0.028	41.84	6.15
8.00	0.020000	0.028	48.31	7.10

LOW FLOW CHANNEL
Rating Table for Irregular Channel

Rating Table				
Water Surface Elevation (ft)	Channel Slope (ft/ft)	Wtd. Mannings Coefficient	Discharge (cfs)	Velocity (ft/s)
8.00	0.025000	0.028	54.01	7.93
8.00	0.030000	0.028	59.16	8.69
8.00	0.035000	0.028	63.90	9.39
8.50	0.010000	0.026	46.59	5.63
8.50	0.015000	0.026	57.06	6.89
8.50	0.020000	0.026	65.89	7.96
8.50	0.025000	0.026	73.67	8.90
8.50	0.030000	0.026	80.70	9.75
8.50	0.035000	0.026	87.16	10.53
9.00	0.010000	0.024	60.36	6.18
9.00	0.015000	0.024	73.92	7.57
9.00	0.020000	0.024	85.36	8.74
9.00	0.025000	0.024	95.43	9.77
9.00	0.030000	0.024	104.54	10.71
9.00	0.035000	0.024	112.92	11.57
9.50	0.010000	0.023	75.35	6.69
9.50	0.015000	0.023	92.28	8.20
9.50	0.020000	0.023	106.56	9.47
9.50	0.025000	0.023	119.13	10.58
9.50	0.030000	0.023	130.50	11.59
9.50	0.035000	0.023	140.96	12.52
10.00	0.010000	0.022	91.47	7.17
10.00	0.015000	0.022	112.02	8.78
10.00	0.020000	0.022	129.35	10.14
10.00	0.025000	0.022	144.62	11.33
10.00	0.030000	0.022	158.43	12.41
10.00	0.035000	0.022	171.12	13.41
10.50	0.010000	0.021	108.65	7.61
10.50	0.015000	0.021	133.06	9.32
10.50	0.020000	0.021	153.65	10.76
10.50	0.025000	0.021	171.78	12.03
10.50	0.030000	0.021	188.18	13.18
10.50	0.035000	0.021	203.26	14.24

Reach #2

UPPER PINE CREEK NORTH BRANCH, REACH NO. 2, FROM EXISTING DETENTION FACILITY "E" TO THE OUTFALL OF PROPOSED DETENTION FACILITY "F"

UPPER PINE CREEK NORTH BRANCH, REACH NO. 2, FROM EXISTING DETENTION FACILITY "E" TO THE OUTFALL OF PROPOSED DETENTION FACILITY "F"

EXISTING CONDITION

In its present condition this study reach has a sinuous alignment with two sharp changes in direction. The average channel slope from Station 4+18 to 30+33 is 2.56%, from Station 32+ 50 east to Station 37+00, 2.9%. The majority of the channel lies at a slope of 2.6% with short reaches at 1% and 5%.

This study reach includes two in-line ponds. The first Station 4+50 to 6+00+/- was previously stabilized with a concrete cutoff wall and a riprap rundown constructed with Detention Facility "E". It should be noted that there is little to no vegetation between the above mentioned riprap rundown and the top of the riprap rundown to existing Detention Facility "E".

The second existing in-line pond lies between Stations 31+30 and 33+50. The pond was built in the SCS configuration with an overland overflow on the south end of the containment berm. Any overflow would travel overland several hundred feet before reentering the channel. The containment berm blocks the historic main channel with an embankment with a vertical height of 18 feet. The down stream face of the embankment is vegetated with trees.

The channel bottom width and side slopes vary continuously over the reach. With the exception noted above this reach of channel is vegetated with a variety of wetland vegetation, native grass and weeds, trees and brush. Except for some minor incision and limited areas of sloughing side slopes the channel appears to be stable. This observation has to take into consideration that this reach of channel has only been subject to infrequent historic flows.

PROPOSED CONDITION

As stated in the reach description this reach lies between existing Detention Facility "E" and proposed Detention Facility "F". This reach will be subjected to frequent peak flows from developed areas, although somewhat buffered by proposed Detention Facility "F" and the previously discussed existing inline ponds. The purpose of proposed Detention Facility "F" is to reduce peak 100-year frequency flows to historic levels. However, the frequency of lesser flows will increase, and with it the potential of the unraveling of the channel. Some portions of the existing and proposed subdivisions will discharge storm water directly to the channel further subjecting the channel to direct peak frequent flows. Due to the sinuosity and slope of the channel it is the contention that frequent peak flows will destabilize the channel.

Based on the above evaluation, it is deemed prudent to anchor both the channel and the low flow channel invert with combination check/drop structures. As noted in the beginning of this report limiting disturbance is a factor in the selection of proposed improvements. Thus, analysis was made using a steel piling or reinforced concrete cutoff walls with limited riprap on the down stream face to prevent excessive splash pools from developing. A drawing, sheet 7 of 11, showing the proposed structural concepts is included as part of this report.

Tentative structure locations were set based the channel section changes, velocities and a one percent analysis grade line. An iterative process was used to locate the cutoff walls in the channel profile such that a one percent slope projected from the top of one structure to the next upstream structure would not result in a remaining vertical projection of more than 3.5 feet. As laid out in profile the tops of the cutoff walls maybe either flush with the channel bottom or project above the existing channel to a maximum of 3.5 feet. Where the cutoff walls are projecting above the channel granular material shall be placed to the angle of repose on the upstream side, the remaining depression shall be left creating a temporary pond eventually infiltrating or draining through weep holes in the cutoff walls. Where the proposed cutoff walls project above the existing channel a low flow notch shall be provided to encourage flow in the center of the channel, allow tickle flows to continue down the channel, and minimize the temporary upstream ponding depth. The proposed structures will have the following functions: reduce the effective slope of the channel, reducing velocities; pin the location of the channel

down; encourage the growth of vegetation by retaining water (both surface and groundwater) in the channel and by maintaining a flatter cross section spreading the flow out over more of the channel bottom width.

It is proposed that a concrete or steel sheet piling cutoff wall, and a riprap rundown and splash pool be constructed between channel reach Stations 30+00 and 31+50 to convey the overflow from the unimproved in-line pond into the existing Pine Creek channel. The following analysis of the proposed pond outfall shall be done in final design. Field survey shall be done to obtain the normal historic W.S.E. of the pond and the overflow elevation of the existing spillway area. The proposed rundown spillway cutoff wall elevation shall be set to maintain the obtained pond W.S.E. Based on hydraulic analysis of the proposed spillway section, the 100-year peak pond W.S.E. shall be determined. If necessary, the existing pond spillway shall be raised to prevent overland discharge and the resulting potential erosion.

A preliminary plan/profile of the structure layout sheets 4 & 5 of 11 and sheet 7 of 11 conceptual details of the structures are included as part of this report.

In addition to the proposed hard point improvements outlined herein, it is recommended that a wetland biologist be consulted to recommend types of vegetation to be planted in critical areas, for example between the existing improved in-line pond rundown and existing Detention Facility "E".

HYDRAULIC ANALYSIS

This reach of Pine Creek channel was analyzed using HEC-RAS and the following flow data from the Pine Creek D.B.P.S. Amendment No. 3.

Peak Flow Data (cfs)

Section	DBPS	Frequency (Years)						
No.	AP No.	2	5	10	25	50	100	Dominant
290	DF "F" out	124	157	170	194	208	224	109
100	4	130	166	194	241	274	309	119
20	DF"E" in	137	197	244	323	380	437	139

Using the above flow data, "n" values determined from field observation, and channel cross sections at the locations shown on the channel reach plan/profile sheets included with this report, a HEC-RAS model was developed with three sets of geometric data, one simulating the existing condition, one in the proposed improved condition modeling the check/drop structures as vertical drops, one in the proposed improved condition modeling the proposed check/drop structures as weirs. Copies of these models and resulting data are included in this report.

The model of the existing condition indicated velocities greater than 8 fps at in-line pond rundown Sections 250, 9.1, and 9; and Section 5 to the existing Detention Facility E riprap rundown. Section 250 is in the proposed riprap rundown for the unimproved in-line pond. It is suggested that vegetation be added down stream of existing riprap Sections numbered 9.1 and 9. Section 213 also indicated velocities over 8 fps. A check/drop structure is proposed at that location.

The HEC-RAS model with the proposed check/drop structure input as consecutive sections 0.1 foot apart (indicating a vertical drop). Predicted velocities that were high at the bottom section. When an additional section was inserted 5 feet down stream of the bottom section, the predicted velocities were back down to 8 fps.

When the same check/drop structures were modeled as weirs in the third model velocities were lower at the proposed structures. In all only seven sections had 100-year frequency velocities between 6 and 7 fps with the exception of the previously discussed rundown areas. The weir analysis is more applicable to low flows with low velocities approaching the structures.

In order to determine the allowable slope of the analysis grade line for this reach, a typical channel section was analyzed using Haestad Methods, Inc. FlowMaster v5.15. Hydraulic Analysis program. Using a trapezoidal channel section with a bottom width of 24 feet, 3:1 side slopes, Manning's coefficients of 0.035 to 0.050, it was determined that velocities of 8 fps+/- maximum could be expected. 8 fps is assumed to be an acceptable velocity for peak flows in a well-vegetated channel. Analysis data sheets are included in this report.

REACH NO. 2, SUMMARY AND CONCLUSION

In order to decrease the potential of channel degradation due to channel conditions and the introduction of increased frequent flows a total of 18 additional grade control structures are recommended, 17 check/drop structures plus a cutoff wall and riprap rundown at the unimproved in-line pond site.

In addition it is recommended that supplemental plantings be added to the channel vegetation in critical areas.

The computed channel water surfaces do not impact any existing subdivisions and are well within the Preble's meadow jumping mouse habitat setback limits for future development.

Two alternatives are proposed for the check/drop structure cutoff walls, steel sheet piling and reinforced concrete walls. Steel sheet piling has the advantage of shortening the time of disturbance of the channel and reducing the amount of dewatering required. Reinforced concrete provides a more predictable service life. The final selection should take into account the geotechnical conditions, not available at this time.

Reach number 2 HEC-HAS models are included on the following pages:

REACH NO. 2

HYDRAULIC CALCULATIONS

HEC-RAS EXISTING CONDITION MODEL

HEC-RAS IMPROVED CONDITION MODEL

DROPS MODELED AS VERTICAL SECTION

HEC-RAS IMPROVED CONDITION MODEL

DROPS MODELED AS WEIRS

FLOWMASTER CHANNEL ANALYSIS

REACH NO. 2

HEC-RAS EXISTING CONDITION MODEL

HEC-RAS September 1998 Version 2.2
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

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

PROJECT DATA
Project Title: PINE CREEK CHANNEL 2003
Project File : PCCSV.prj
Run Date and Time: 2/25/2003 12:15:47 PM

Project in English units

PLAN DATA

Plan Title: Plan 16
Plan File : x:\2870000.all\2871611\HYDRO\HECRAS\PCCSV.p16

Geometry Title: JB XSECTIONS 2/11/98-2002
Geometry File : x:\2870000.all\2871611\HYDRO\HECRAS\PCCSV.g01

Flow Title : 2003 FLOW DATA
Flow File : x:\2870000.all\2871611\HYDRO\HECRAS\PCCSV.f01

Plan Summary Information:

Number of:	Cross Sections	= 52	Mulitple Openings	=	0
	Culverts	= 0	Inline Weirs	=	0
	Bridges	= 0			

Computational Information

Water surface calculation tolerance	= 0.01
Critical depth calculaton tolerance	= 0.01
Maximum number of interations	= 20
Maximum difference tolerance	= 0.3
Flow tolerance factor	= 0.001

Computation Options
Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Mixed Flow

FLOW DATA

Flow Title: 2003 FLOW DATA
Flow File : x:\2870000.all\2871611\HYDRO\HECRAS\PCCSV.f01

Flow Data (cfs)

River	Reach	RS	2-yr PF 1	5-yr PF 2	10-yr PF 3	25-yr PF 4	50-yr PF 5	100-yr PF 6	DOM. PF 7
PINE CREEK N	2	290	124	157	170	194	208	224	109
PINE CREEK N	2	100	130	166	194	241	274	309	119
PINE CREEK N	2	20	137	197	244	323	380	437	139

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
PINE CREEK N	2	PF 1	Normal S = .02	Normal S = .005

GEOMETRY DATA

Geometry Title: JB XSECTIONS 2/11/98-2002
Geometry File : x:\2870000.all\2871611\HYDRO\HECRAS\PCCSV.g01

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 290

INPUT
Description: JUST DOWN STREAM OF DF "F" OUTFALL
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
53	6910	79	6904	86	6903	114	6903	123	6904
143	6910								

Manning's n Values num= 1

Sta	n Val
53	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
53	143	30	40	54	.1	.3

CROSS SECTION RIVER: PINE CREEK N

REACH: 2 RS: 280

INPUT
Description:
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
30	6908.5	47	6908	57	6906	64	6904	73	6902.2
117	6908								

Manning's n Values num= 1

Sta	n Val
30	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
30	117	30	45	55	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 275

INPUT
Description:
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
55	6906	66	6904	73	6902	82	6900	100	6900
117	6900.2	122	6902	126	6904	132	6906		

Manning's n Values num= 1

Sta	n Val
55	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
55	132	100	125	145	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 270

INPUT
Description:
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
46	6906	70	6898	73	6896	108	6896	125	6898
140	6900	146	6901.5	175	6902	196	6904	215	6906

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
46	.06	73	.03	108	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
46	215	280	225	180	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 260

INPUT
Description: EXIST'G POND SPILLWAY
Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6900	147	6898	150	6897.6	153	6898	165	6900
170	6901	265	6901.7	293	6900	300	6899	359	6899

364	6900	399	6902

Manning's n Values num= 1

Sta	n Val
0	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
265	364	37	53	68	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 250

INPUT
Description:
Station Elevation Data num= 13

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
86	6898	143	6897	247	6896	312	6895	358	6894
372	6888	385	6886	400	6884	412	6884	428	6886
439	6890	446	6896	491	6898				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
86	.03	312	.07	446	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
358	446	48	48	50	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 240

INPUT
Description:
Station Elevation Data num= 13

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
7	6896	160	6894	195	6893.7	222	6894	243	6895
267	6894	277	6886	285	6884	300	6882	315	6882
331	6884	345	6894	435	6896				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
7	.032	222	.07	345	.032

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
267	345	25	25	25	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 235

INPUT
Description:
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
72	6888	75	6886	80	6884	87	6882	100	6881.2
112	6882	128	6884	132	6886	135	6888		

Manning's n Values num= 1

Sta	n Val
72	.07

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
72	135	107	105	102	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 230

INPUT
Description:
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
60	6888	73	6884	78	6880	86	6878	100	6877.2
104	6878	120	6880	138	6888				

Manning's n Values num= 1

Sta	n Val
60	.07

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
86	104	220	225	240	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 220

INPUT
Description:
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
95	6880	170	6880	183	6874	190	6872	200	6870.9
220	6872	231	6876	235	6876.9	252	6876	281	6880

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
95	.032	170	.05	235	.032

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
183	252	58	56	58	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 215

INPUT
Description: SECTION D
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
70	6874	74	6872	78	6870	100	6868.7	107	6870
120	6872	138	6874						

Manning's n Values num= 1

Sta	n Val
70	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
70	120	60	50	45	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 213

INPUT
Description:

Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
68	6874	70	6872	74	6870	79	6868	93	6866
100	6865.8	105	6866	118	6870	125	6872	139	6874

Manning's n Values num= 1

Sta	n Val
68	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
68	139	73	70	70	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 212

INPUT
Description:
Station Elevation Data num= 11

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
68	6872	73	6870	76	6868	82	6866	87	6864
100	6862.7	114	6864	119	6866	127	6868	134	6870
143	6872								

Manning's n Values num= 1

Sta	n Val
68	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
68	143	32	32	32	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 210

INPUT
Description:
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
70	6870	75	6868	80	6866	85	6864	110	6862
120	6864	126	6866	132	6868	137	6870		

Manning's n Values num= 1

Sta	n Val
70	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
75	132	127	129	135	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 200

INPUT
Description:
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
103	6862	109	6860.2	123	6860.2	126	6860	135	6857.8
142	6858	156	6860	183	6862				

Manning's n Values num= 1

Sta	n Val

```
     103     .045

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
           103     183               66      80      86              .1       .3

CROSS SECTION          RIVER: PINE CREEK N
REACH: 2                  RS: 190

INPUT
Description:
Station Elevation Data    num=       10
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
     113     6860     116     6858     140   6857.6     150     6858     156     6858
     164     6856     172   6855.5     179     6856     187     6858     210     6860

Manning's n Values        num=       1
     Sta   n Val
     113    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
           113     187               52      62      70              .1       .3

CROSS SECTION          RIVER: PINE CREEK N
REACH: 2                  RS: 180

INPUT
Description:
Station Elevation Data    num=       9
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
     125     6860     133     6858     155     6856     170     6855     187     6855
     212   6854.3     218     6856     243     6858     253     6860

Manning's n Values        num=       1
     Sta   n Val
     125    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
           133     243               50      64      78              .1       .3

CROSS SECTION          RIVER: PINE CREEK N
REACH: 2                  RS: 170

INPUT
Description:
Station Elevation Data    num=       8
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
     100     6858     106     6856     113     6854     117     6852     140   6851.8
     166     6852     173     6854     200     6856

Manning's n Values        num=       2
     Sta   n Val     Sta   n Val
     100    .045     173     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
           100     200               88     100     112              .1       .3

CROSS SECTION          RIVER: PINE CREEK N
REACH: 2                  RS: 160
```

```
INPUT
Description:
Station Elevation Data    num=       9
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
      34     6858       40     6856       62     6852       80     6851      110     6851
     135     6852      170     6854      179     6856      184     6858

Manning's n Values        num=       1
     Sta    n Val
      34     .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
            40     179               48      50      60             .1      .3

CROSS SECTION          RIVER: PINE CREEK N
REACH: 2                  RS: 150

INPUT
Description:
Station Elevation Data    num=       9
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
      56     6856       68     6854       76   6851.5       90     6850      100   6849.9
     117     6850      124   6850.8      130     6852      149     6856

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
      56      .04       90      .04      124      .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
            56     149              105      95      80             .1      .3

CROSS SECTION          RIVER: PINE CREEK N
REACH: 2                  RS: 140.1

INPUT
Description:  (N CHANGE BNDY)
Station Elevation Data    num=       7
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
      63     6852       71     6850       73   6849.7      100   6848.6      126   6848.6
     141     6850      156     6852

Manning's n Values        num=       2
     Sta    n Val      Sta    n Val
      63     .035       73      .04

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
            63     156               .1       .1      .1             .1      .3

CROSS SECTION          RIVER: PINE CREEK N
REACH: 2                  RS: 140

INPUT
Description:
Station Elevation Data    num=       7
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
      63     6852       71     6850       73   6849.7      100   6848.6      126   6848.6
     141     6850      156     6852

Manning's n Values        num=       3
```

Sta	n Val	Sta	n Val	Sta	n Val
63	.035	71	.07	126	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
63	156	138	124	105	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 130.1

INPUT
Description: (N CHANGE BNDY)
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
63	6850	68	6848	81	6844	100	6845	119	6845.4
134	6846	150	6848	180	6850				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
63	.035	81	.06	134	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
68	150	.1	.1	.1	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 130

INPUT
Description:
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
63	6850	68	6848	81	6844	100	6845	119	6845.4
134	6846	150	6848	180	6850				

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
63	.035	81	.05	119	.055	150	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
68	150	94	110	126	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 120.1

INPUT
Description: (N CHANGE BNDY)
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
30	6845	67	6844	82	6842	85	6841.8	100	6841
115	6841.6	117	6842	130	6844	135	6845		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
30	.35	67	.055	82	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
67	130	.1	.1	.1	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 120

INPUT
Description:
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
30	6845	67	6844	82	6842	85	6841.8	100	6841
115	6841.6	117	6842	130	6844	135	6845		

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
30	.035	67	.035	82	.045	117	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
67	130	100	145	160	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 110

INPUT
Description:
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
67	6842	80	6838	88	6837	100	6836.7	112	6836.9
121	6838	130	6840	162	6842				

Manning's n Values num= 2

Sta	n Val	Sta	n Val
67	.045	88	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
67	162	110	102	80	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 100

INPUT
Description:
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
65	6842	77	6836	84	6834.2	100	6834.2	116	6834.2
127	6836	140	6838	165	6840	187	6842		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
65	.35	84	.045	116	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
77	127	107	102	97	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 90

INPUT
Description:
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
63	6840	69	6836	84	6832	100	6831.7	116	6832
131	6834	147	6836	157	6838	170	6840		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
63	.035	84	.045	116	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
69	147	87	89	95	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 80.1

INPUT
Description: (N CHANGE BNDY)
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
68	6836	74	6834	80	6832	93	6830	100	6829.4
115	6828	119	6828	138	6832	144	6834	148	6836

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
68	.035	80	.045	119	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
74	144	.1	.1	.1	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 80

INPUT
Description:
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
68	6836	74	6834	80	6832	93	6830	100	6829.4
115	6828	119	6828	138	6832	144	6834	148	6836

Manning's n Values num= 2

Sta	n Val	Sta	n Val
68	.035	80	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
74	144	58	70	70	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 70.1

INPUT
Description: (N CHANGE BNDY)
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
32	6834	70	6830	80	6828	90	6828	107	6826
110	6826	115	6828	130	6830	153	6834		

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
32	.035	80	.04	130	.035	153	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
70	130	.1	.1	.1	.1	.3

CROSS SECTION RIVER: PINE CREEK N

REACH: 2 RS: 70

INPUT
Description:
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
32	6834	70	6830	80	6828	90	6828	107	6826
110	6826	115	6828	130	6830	153	6834		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
32	.035	70	.04	110	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
70	130	55	55	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 65

INPUT
Description:
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
67	6832	75	6830	80	6828	90	6826	100	6824.3
115	6826	141	6828	154	6830	165	6832		

Manning's n Values num= 1

Sta	n Val
67	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
80	141	85	83	60	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 60.1

INPUT
Description: (N CHANGE BNDY)
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
72	6830	84	6824	88	6822.5	100	6822	112	6822.1
116	6824	154	6830						

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
72	.035	88	.035	112	.035	154	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
84	116	.1	.1	.1	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 60

INPUT
Description:
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
72	6830	84	6824	88	6822.5	100	6822	112	6822.1
116	6824	154	6830						

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
72	.035	84	.05	112	.035	154	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
84	116	123	120	121	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 50.1

INPUT
Description: (N CHANGE BNDY)
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
57	6826	76	6822	83	6820.9	100	6820.8	116	6820.9
117	6822	126	6824	134	6826				

Manning's n Values num= 2

Sta	n Val	Sta	n Val
57	.035	116	.055

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
57	126	.1	.1	.1	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 50

INPUT
Description:
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
57	6826	76	6822	83	6820.9	100	6820.8	116	6820.9
117	6822	126	6824	134	6826				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
57	.035	83	.04	116	.055

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
57	126	112	116	121	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 40.1

INPUT
Description: (N CHANGE BNDY)
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
26	6826	54	6822	68	6820	71	6819.3	100	6819.3
129	6819.5	137	6820	151	6824	157	6826		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
26	.035	71	.04	129	.055

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
54	151	.1	.1	.1	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 40

INPUT
Description:
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
26	6826	54	6822	60	6821	68	6820	71	6819.3
100	6819.3	129	6819.5	137	6820	151	6824	157	6826

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
26	.06	54	.045	60	.032	129	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
54	151	42	47	52	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 35

INPUT
Description: SECTION C
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
50	6822	68	6820	100	6818.7	141	6820	153	6822

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
50	.05	68	.035	141	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
50	153	91	86	77	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 30.1

INPUT
Description: (N CHANGE BNDY)
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
51	6822	60	6820	70	6818	75	6817.1	100	6816.8
125	6817.3	130	6818	137	6820	147	6822		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
51	.035	60	.055	70	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
60	137	.1	.1	.1	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 30

INPUT
Description:
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
51	6822	60	6820	70	6818	75	6817.1	100	6816.8
125	6817.3	130	6818	137	6820	147	6822		

Manning's n Values num= 2

Sta	n Val	Sta	n Val
51	.035	60	.055

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
51	137	72	72	73	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 20

INPUT
Description:
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
49	6820	71	6816	79	6814.6	100	6814.9	121	6814.5
131	6816	154	6820						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
49	.035	71	.045	131	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
49	154	67	61	50	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 15

INPUT
Description: EXISTING SMALL POND
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6818	26	6816	40	6814	44	6812	100	6812
140	6814	157	6818						

Manning's n Values num= 2

Sta	n Val	Sta	n Val
0	.032	26	.032

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
40	140	48	44	40	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 11

INPUT
Description: AT CONCRETE GRADE CONTROL STRUCTURE 25.5
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
42	6820	50	6818	77	6816	80	6815	120	6815
125	6816	139	6820						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
42	.035	42	.035	139	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
42	139	30	30	30	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 9.1

INPUT
Description: END OF RIPRAP RUNDOWN 25.4
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
28	6820	37	6818	45	6816	65	6812	131	6812
185	6814	200	6816	205	6818	210	6820		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
28	.045	45	.045	185	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
45	185	.1	.1	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 9

INPUT
Description: END OF RIPRAP RUNDOWN 25.4
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
28	6820	37	6818	45	6816	65	6812	131	6812
185	6814	200	6816	210	6820				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
28	.03	45	.03	185	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
45	185	120	155	195	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 7

INPUT
Description: RUNDOWN 25.3
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
60	6816	90	6809	110	6809	140	6816

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
60	.035	60	.035	140	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
60	140	62	62	62	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 5

INPUT
Description: RUNDOWN 25.2
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
75	6801	90	6798	110	6798	125	6801

```
Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
      75    .035       75    .045      125    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
            75     125                  60       60       60             .1      .3

CROSS SECTION           RIVER: PINE CREEK N
REACH: 2                   RS: 3

INPUT
Description: DF "E" BOTTOM OF RUNDOWN
Station Elevation Data     num=        4
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
      60     6791       90     6786      110     6786      140     6791

Manning's n Values          num=        1
     Sta   n Val
      60    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
            60     140                  40       40       40             .1      .3

CROSS SECTION           RIVER: PINE CREEK N
REACH: 2                   RS: 1

INPUT
Description: BOTTOM OF DF "E"
Station Elevation Data     num=        4
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
      30     6792       48     6788      184     6788      230     6792

Manning's n Values          num=        1
     Sta   n Val
      30     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
            30     230              .1      .3


SUMMARY OF MANNING'S N VALUES

River:PINE CREEK N

      Reach          River Sta.       n1         n2         n3         n4

 2                    290              .06
 2                    280              .06
 2                    275              .06
 2                    270              .06        .03        .06
 2                    260              .03
 2                    250              .03        .07        .03
 2                    240             .032        .07       .032
 2                    235              .07
 2                    230              .07
 2                    220             .032        .05       .032
 2                    215             .045
 2                    213             .045
```

2	212	.045			
2	210	.045			
2	200	.045			
2	190	.045			
2	180	.045			
2	170	.045	.03		
2	160	.045			
2	150	.04	.04	.04	
2	140.1	.035	.04		
2	140	.035	.07	.035	
2	130.1	.035	.06	.035	
2	130	.035	.05	.055	.035
2	120.1	.35	.055	.045	
2	120	.035	.035	.045	.035
2	110	.045	.045		
2	100	.35	.045	.035	
2	90	.035	.045	.035	
2	80.1	.035	.045	.06	
2	80	.035	.04		
2	70.1	.035	.04	.035	.035
2	70	.035	.04	.035	
2	65	.035			
2	60.1	.035	.035	.035	.035
2	60	.035	.05	.035	.035
2	50.1	.035	.055		
2	50	.035	.04	.055	
2	40.1	.035	.04	.055	
2	40	.06	.045	.032	.035
2	35	.05	.035	.03	
2	30.1	.035	.055	.035	
2	30	.035	.055		
2	20	.035	.045	.035	
2	15	.032	.032		
2	11	.035	.035	.035	
2	9.1	.045	.045	.045	
2	9	.03	.03	.03	
2	7	.035	.035	.035	
2	5	.035	.045	.035	
2	3	.045			
2	1	.03			

SUMMARY OF REACH LENGTHS

River: PINE CREEK N

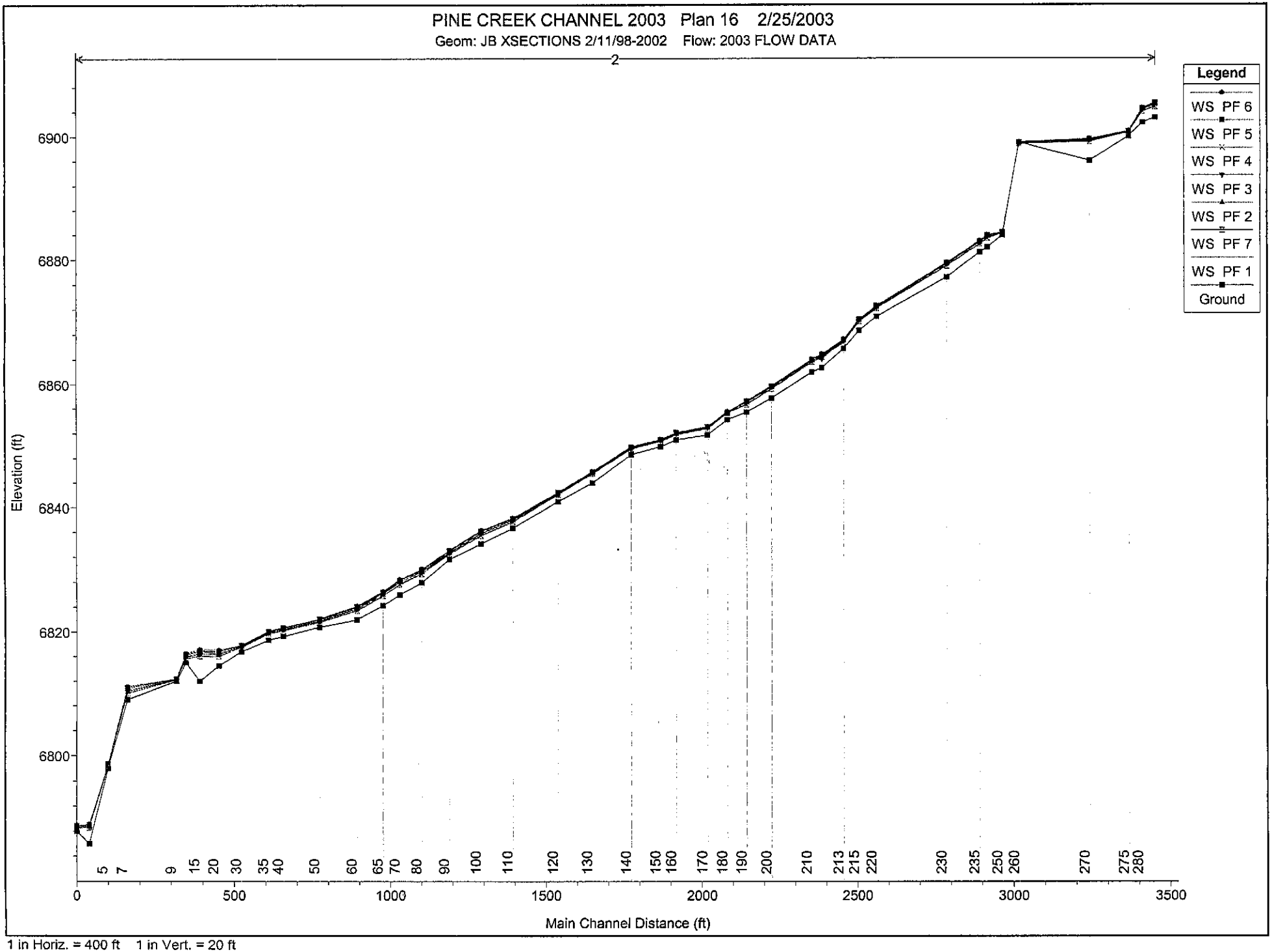
Reach	River Sta.	Left	Channel	Right
2	290	30	40	54
2	280	30	45	55
2	275	100	125	145
2	270	280	225	180
2	260	37	53	68
2	250	48	48	50
2	240	25	25	25
2	235	107	105	102
2	230	220	225	240

2	220	58	56	58
2	215	60	50	45
2	213	73	70	70
2	212	32	32	32
2	210	127	129	135
2	200	66	80	86
2	190	52	62	70
2	180	50	64	78
2	170	88	100	112
2	160	48	50	60
2	150	105	95	80
2	140.1	.1	.1	.1
2	140	138	124	105
2	130.1	.1	.1	.1
2	130	94	110	126
2	120.1	.1	.1	.1
2	120	100	145	160
2	110	110	102	80
2	100	107	102	97
2	90	87	89	95
2	80.1	.1	.1	.1
2	80	58	70	70
2	70.1	.1	.1	.1
2	70	55	55	55
2	65	85	83	60
2	60.1	.1	.1	.1
2	60	123	120	121
2	50.1	.1	.1	.1
2	50	112	116	121
2	40.1	.1	.1	.1
2	40	42	47	52
2	35	91	86	77
2	30.1	.1	.1	.1
2	30	72	72	73
2	20	67	61	50
2	15	48	44	40
2	11	30	30	30
2	9.1	.1	.1	.1
2	9	120	155	195
2	7	62	62	62
2	5	60	60	60
2	3	40	40	40
2	1			

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: PINE CREEK N

Reach	River Sta.	Contr.	Expan.
2	290	.1	.3
2	280	.1	.3
2	275	.1	.3
2	270	.1	.3
2	260	.1	.3
2	250	.1	.3

2	240	.1	.3
2	235	.1	.3
2	230	.1	.3
2	220	.1	.3
2	215	.1	.3
2	213	.1	.3
2	212	.1	.3
2	210	.1	.3
2	200	.1	.3
2	190	.1	.3
2	180	.1	.3
2	170	.1	.3
2	160	.1	.3
2	150	.1	.3
2	140.1	.1	.3
2	140	.1	.3
2	130.1	.1	.3
2	130	.1	.3
2	120.1	.1	.3
2	120	.1	.3
2	110	.1	.3
2	100	.1	.3
2	90	.1	.3
2	80.1	.1	.3
2	80	.1	.3
2	70.1	.1	.3
2	70	.1	.3
2	65	.1	.3
2	60.1	.1	.3
2	60	.1	.3
2	50.1	.1	.3
2	50	.1	.3
2	40.1	.1	.3
2	40	.1	.3
2	35	.1	.3
2	30.1	.1	.3
2	30	.1	.3
2	20	.1	.3
2	15	.1	.3
2	11	.1	.3
2	9.1	.1	.3
2	9	.1	.3
2	7	.1	.3
2	5	.1	.3
2	3	.1	.3
2	1	.1	.3



1 in Horiz. = 400 ft 1 in Vert. = 20 ft

HEC-RAS Plan: Plan 13 River: PINE CREEK N Reach: 2

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
2	290	124.00	6903.00	6904.84	6903.78	6904.88	0.002556	1.64	75.83	50.47	0.24
2	290	157.00	6903.00	6905.08	6903.90	6905.13	0.002617	1.78	88.02	52.28	0.24
2	290	170.00	6903.00	6905.17	6903.95	6905.22	0.002644	1.84	92.52	52.94	0.24
2	290	194.00	6903.00	6905.31	6904.03	6905.37	0.002700	1.93	100.38	54.07	0.25
2	290	208.00	6903.00	6905.40	6904.06	6905.46	0.002719	1.98	104.95	54.71	0.25
2	290	224.00	6903.00	6905.48	6904.11	6905.55	0.002762	2.04	109.76	55.38	0.26
2	290	109.00	6903.00	6904.72	6903.72	6904.76	0.002531	1.56	69.87	49.55	0.23
2	280	124.00	6902.20	6904.08	6904.08	6904.56	0.056317	5.60	22.14	23.50	1.02
2	280	157.00	6902.20	6904.26	6904.26	6904.80	0.054183	5.88	26.70	25.56	1.01
2	280	170.00	6902.20	6904.33	6904.33	6904.88	0.053714	5.99	28.39	26.28	1.02
2	280	194.00	6902.20	6904.46	6904.46	6905.03	0.051193	6.09	31.84	27.70	1.00
2	280	208.00	6902.20	6904.51	6904.51	6905.11	0.051859	6.23	33.36	28.30	1.01
2	280	224.00	6902.20	6904.58	6904.58	6905.20	0.051510	6.34	35.32	29.06	1.01
2	280	109.00	6902.20	6903.98	6903.98	6904.44	0.057100	5.44	20.05	22.46	1.01
2	275	124.00	6900.00	6900.65	6900.76	6901.13	0.109579	5.60	22.16	39.15	1.31
2	275	157.00	6900.00	6900.72	6900.88	6901.33	0.117826	6.25	25.13	39.70	1.38
2	275	170.00	6900.00	6900.75	6900.92	6901.40	0.117693	6.43	26.43	39.94	1.39
2	275	194.00	6900.00	6900.80	6901.00	6901.53	0.123600	6.86	28.29	40.28	1.44
2	275	208.00	6900.00	6900.83	6901.04	6901.60	0.122762	7.02	29.63	40.52	1.45
2	275	224.00	6900.00	6900.86	6901.10	6901.69	0.129940	7.34	30.50	40.67	1.49
2	275	109.00	6900.00	6900.61	6900.70	6901.04	0.102328	5.22	20.88	38.91	1.26
2	270	124.00	6896.00	6899.20	6896.71	6899.21	0.000172	0.76	163.61	67.61	0.09
2	270	157.00	6896.00	6899.36	6896.82	6899.37	0.000235	0.90	174.20	69.23	0.10
2	270	170.00	6896.00	6899.41	6896.86	6899.43	0.000260	0.95	178.17	69.83	0.11
2	270	194.00	6896.00	6899.50	6896.94	6899.52	0.000310	1.05	184.42	70.77	0.11
2	270	208.00	6896.00	6899.55	6896.97	6899.57	0.000340	1.11	187.71	71.25	0.12
2	270	224.00	6896.00	6899.60	6897.02	6899.62	0.000375	1.17	191.45	71.80	0.13
2	270	109.00	6896.00	6899.12	6896.65	6899.13	0.000145	0.69	158.29	66.78	0.08
2	260	124.00	6899.00	6898.80	6898.80	6899.04	0.018624		31.26	69.39	0.00
2	260	157.00	6899.00	6898.90	6898.90	6899.15	0.017163		38.53	77.27	0.00
2	260	170.00	6899.00	6898.93	6898.93	6899.19	0.016787		41.25	80.03	0.00
2	260	194.00	6899.00	6899.04	6899.04	6899.26	0.012788	0.63	52.45	147.94	0.57
2	260	208.00	6899.00	6899.07	6899.07	6899.29	0.012252	0.94	57.56	151.07	0.62
2	260	224.00	6899.00	6899.10	6899.10	6899.33	0.012307	1.17	61.65	153.52	0.66
2	260	109.00	6899.00	6898.76	6898.76	6898.98	0.018136		28.64	66.32	0.00
2	250	124.00	6884.00	6884.34	6885.15	6893.90	7.168877	24.81	5.00	17.29	8.13
2	250	157.00	6884.00	6884.39	6885.31	6895.77	7.386516	27.07	5.80	17.99	8.40
2	250	170.00	6884.00	6884.41	6885.37	6896.32	7.330146	27.70	6.14	18.28	8.43
2	250	194.00	6884.00	6884.45	6885.46	6896.34	6.452669	27.67	7.01	19.01	8.03
2	250	208.00	6884.00	6884.47	6885.52	6896.89	6.442324	28.28	7.36	19.29	8.07
2	250	224.00	6884.00	6884.52	6885.57	6895.66	5.137871	26.78	8.37	20.08	7.31
2	250	109.00	6884.00	6884.30	6885.08	6894.65	9.197214	25.82	4.22	16.58	9.02
2	240	124.00	6882.00	6883.55	6883.05	6883.69	0.017920	2.97	41.80	39.00	0.50
2	240	157.00	6882.00	6883.73	6883.21	6883.89	0.018476	3.20	49.06	41.78	0.52
2	240	170.00	6882.00	6883.79	6883.26	6883.96	0.018691	3.28	51.77	42.78	0.53
2	240	194.00	6882.00	6883.91	6883.36	6884.09	0.018852	3.41	56.82	44.57	0.53
2	240	208.00	6882.00	6883.97	6883.41	6884.16	0.019001	3.49	59.61	45.53	0.54
2	240	224.00	6882.00	6884.04	6883.47	6884.23	0.019074	3.58	62.62	46.19	0.54
2	240	109.00	6882.00	6883.45	6882.99	6883.58	0.017844	2.86	38.14	37.52	0.50
2	235	124.00	6881.20	6882.59		6882.92	0.060383	4.63	26.76	31.79	0.89
2	235	157.00	6881.20	6882.76	6882.66	6883.13	0.055625	4.85	32.38	33.76	0.87
2	235	170.00	6881.20	6882.83		6883.20	0.053866	4.91	34.59	34.51	0.86
2	235	194.00	6881.20	6882.93		6883.33	0.052775	5.08	38.19	35.69	0.87
2	235	208.00	6881.20	6882.99		6883.40	0.051481	5.14	40.44	36.40	0.86
2	235	224.00	6881.20	6883.06		6883.48	0.049713	5.19	43.12	37.24	0.85
2	235	109.00	6881.20	6882.52	6882.44	6882.83	0.059068	4.41	24.69	31.03	0.87
2	230	124.00	6877.20	6879.08		6879.32	0.022225	4.10	33.71	30.99	0.59
2	230	157.00	6877.20	6879.27		6879.55	0.022727	4.48	39.64	33.21	0.61
2	230	170.00	6877.20	6879.33		6879.63	0.023235	4.64	41.65	33.93	0.62
2	230	194.00	6877.20	6879.44		6879.77	0.023722	4.89	45.51	35.26	0.64

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
2	230	208.00	6877.20	6879.50		6879.84	0.024161	5.04	47.56	35.95	0.64
2	230	224.00	6877.20	6879.56		6879.92	0.024662	5.20	49.83	36.70	0.65
2	230	109.00	6877.20	6878.98		6879.20	0.022285	3.92	30.72	29.81	0.59
2	220	124.00	6870.90	6872.26	6872.26	6872.66	0.041029	5.06	24.51	31.62	1.01
2	220	157.00	6870.90	6872.40	6872.40	6872.85	0.039247	5.43	28.93	32.49	1.01
2	220	170.00	6870.90	6872.45	6872.45	6872.93	0.038675	5.55	30.61	32.81	1.01
2	220	194.00	6870.90	6872.54	6872.54	6873.06	0.037749	5.77	33.61	33.38	1.01
2	220	208.00	6870.90	6872.59	6872.59	6873.13	0.037025	5.88	35.40	33.71	1.01
2	220	224.00	6870.90	6872.65	6872.65	6873.21	0.036339	5.99	37.38	34.07	1.01
2	220	109.00	6870.90	6872.20	6872.19	6872.56	0.040647	4.82	22.63	31.25	1.00
2	215	124.00	6868.70	6870.16	6870.18	6870.59	0.035341	5.23	23.69	30.39	1.04
2	215	157.00	6868.70	6870.30	6870.32	6870.79	0.034942	5.65	27.80	31.52	1.06
2	215	170.00	6868.70	6870.34	6870.38	6870.87	0.035657	5.84	29.12	31.87	1.08
2	215	194.00	6868.70	6870.42	6870.47	6871.00	0.035914	6.11	31.73	32.56	1.09
2	215	208.00	6868.70	6870.46	6870.53	6871.07	0.036171	6.27	33.17	32.93	1.10
2	215	224.00	6868.70	6870.50	6870.59	6871.16	0.037916	6.53	34.31	33.23	1.13
2	215	109.00	6868.70	6870.11	6870.11	6870.49	0.033732	4.93	22.10	29.94	1.01
2	213	124.00	6865.80	6866.87	6867.18	6867.87	0.089390	8.03	15.45	20.88	1.64
2	213	157.00	6865.80	6867.01	6867.36	6868.13	0.086338	8.50	18.48	22.32	1.65
2	213	170.00	6865.80	6867.06	6867.42	6868.21	0.083550	8.59	19.78	22.91	1.63
2	213	194.00	6865.80	6867.15	6867.54	6868.38	0.082464	8.88	21.83	23.81	1.64
2	213	208.00	6865.80	6867.22	6867.60	6868.44	0.077855	8.88	23.43	24.49	1.60
2	213	224.00	6865.80	6867.29	6867.67	6868.52	0.074076	8.91	25.15	25.20	1.57
2	213	109.00	6865.80	6866.79	6867.09	6867.76	0.095486	7.90	13.79	20.05	1.68
2	212	124.00	6862.70	6864.48	6864.21	6864.73	0.013549	3.97	31.23	29.42	0.68
2	212	157.00	6862.70	6864.64	6864.36	6864.94	0.014111	4.37	35.94	30.22	0.71
2	212	170.00	6862.70	6864.15	6864.42	6865.10	0.078485	7.82	21.73	27.76	1.56
2	212	194.00	6862.70	6864.80	6864.52	6865.15	0.014765	4.77	40.70	30.99	0.73
2	212	208.00	6862.70	6864.85	6864.58	6865.22	0.015155	4.92	42.25	31.24	0.75
2	212	224.00	6862.70	6864.91	6864.63	6865.31	0.015403	5.08	44.13	31.54	0.76
2	212	109.00	6862.70	6864.40	6864.14	6864.63	0.013393	3.78	28.83	29.01	0.67
2	210	124.00	6862.00	6863.65	6863.65	6864.07	0.032724	5.22	23.75	28.83	1.01
2	210	157.00	6862.00	6863.81	6863.81	6864.28	0.031618	5.47	28.71	31.70	1.01
2	210	170.00	6862.00	6863.87	6863.87	6864.35	0.031239	5.55	30.62	32.74	1.01
2	210	194.00	6862.00	6863.97	6863.97	6864.48	0.030727	5.70	34.02	34.50	1.01
2	210	208.00	6862.00	6864.03	6864.03	6864.55	0.030050	5.78	35.98	35.15	1.01
2	210	224.00	6862.00	6864.08	6864.08	6864.63	0.029969	5.93	37.77	35.43	1.01
2	210	109.00	6862.00	6863.56	6863.56	6863.97	0.033314	5.09	21.42	27.38	1.01
2	200	124.00	6857.80	6859.36	6859.38	6859.87	0.032776	5.72	21.69	22.91	1.04
2	200	157.00	6857.80	6859.53	6859.57	6860.11	0.033168	6.11	25.70	24.77	1.06
2	200	170.00	6857.80	6859.58	6859.63	6860.20	0.033903	6.29	27.03	25.36	1.07
2	200	194.00	6857.80	6859.70	6859.75	6860.35	0.033332	6.47	29.99	26.63	1.07
2	200	208.00	6857.80	6859.76	6859.81	6860.43	0.033161	6.58	31.63	27.30	1.08
2	200	224.00	6857.80	6859.82	6859.88	6860.52	0.033163	6.70	33.42	28.02	1.08
2	200	109.00	6857.80	6859.28	6859.29	6859.75	0.032580	5.51	19.77	21.96	1.02
2	190	124.00	6855.50	6856.84	6856.97	6857.49	0.045707	6.45	19.21	21.73	1.21
2	190	157.00	6855.50	6857.06	6857.16	6857.72	0.037880	6.50	24.17	23.49	1.13
2	190	170.00	6855.50	6857.11	6857.22	6857.81	0.039225	6.73	25.24	23.85	1.15
2	190	194.00	6855.50	6857.24	6857.33	6857.96	0.036596	6.83	28.38	24.88	1.13
2	190	208.00	6855.50	6857.32	6857.40	6858.04	0.034632	6.84	30.40	25.52	1.10
2	190	224.00	6855.50	6857.39	6857.47	6858.14	0.033874	6.94	32.29	26.11	1.10
2	190	109.00	6855.50	6856.70	6856.87	6857.40	0.058434	6.75	16.15	20.58	1.34
2	180	124.00	6854.30	6855.40	6855.40	6855.69	0.036878	4.29	28.93	51.90	1.01
2	180	157.00	6854.30	6855.50	6855.50	6855.83	0.035915	4.61	34.06	53.70	1.02
2	180	170.00	6854.30	6855.54	6855.54	6855.88	0.035083	4.70	36.18	54.42	1.02
2	180	194.00	6854.30	6855.60	6855.60	6855.97	0.034654	4.89	39.64	55.59	1.02
2	180	208.00	6854.30	6855.42	6855.64	6856.18	0.095315	6.99	29.75	52.19	1.63
2	180	224.00	6854.30	6855.56	6855.68	6856.12	0.055540	6.01	37.30	54.80	1.28
2	180	109.00	6854.30	6855.35	6855.35	6855.62	0.037781	4.13	26.40	50.99	1.01

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
2	170	124.00	6851.80	6852.86	6852.48	6852.96	0.006561	2.51	49.31	53.75	0.46
2	170	157.00	6851.80	6852.99	6852.58	6853.11	0.006945	2.80	56.15	54.45	0.49
2	170	170.00	6851.80	6853.03	6852.61	6853.16	0.007170	2.91	58.44	54.68	0.50
2	170	194.00	6851.80	6853.10	6852.68	6853.25	0.007662	3.12	62.19	55.06	0.52
2	170	208.00	6851.80	6853.14	6852.72	6853.30	0.007875	3.23	64.43	55.28	0.53
2	170	224.00	6851.80	6853.19	6852.75	6853.36	0.008038	3.34	67.08	55.54	0.54
2	170	109.00	6851.80	6852.80	6852.43	6852.89	0.006374	2.37	45.91	53.40	0.45
2	160	124.00	6851.00	6851.86		6852.00	0.015512	2.99	41.46	66.83	0.67
2	160	157.00	6851.00	6851.99		6852.14	0.014064	3.09	50.86	72.62	0.65
2	160	170.00	6851.00	6852.04		6852.19	0.013677	3.14	54.15	73.83	0.65
2	160	194.00	6851.00	6852.12		6852.28	0.012579	3.19	60.77	75.86	0.63
2	160	208.00	6851.00	6852.17		6852.33	0.012197	3.23	64.31	76.93	0.62
2	160	224.00	6851.00	6852.22		6852.39	0.012000	3.30	67.94	78.01	0.62
2	160	109.00	6851.00	6851.79		6851.93	0.016121	2.92	37.31	64.10	0.67
2	150	124.00	6849.90	6850.81		6851.09	0.020858	4.24	29.28	41.65	0.89
2	150	157.00	6849.90	6850.92		6851.25	0.021758	4.65	33.79	43.18	0.93
2	150	170.00	6849.90	6850.96		6851.31	0.021926	4.78	35.56	43.76	0.93
2	150	194.00	6849.90	6851.02	6850.99	6851.42	0.022710	5.05	38.41	44.68	0.96
2	150	208.00	6849.90	6851.06	6851.04	6851.48	0.022982	5.19	40.10	45.22	0.97
2	150	224.00	6849.90	6851.10	6851.09	6851.55	0.023303	5.34	41.96	45.81	0.98
2	150	109.00	6849.90	6850.75		6851.01	0.020862	4.06	26.83	40.63	0.88
2	140.1	124.00	6848.60	6849.57		6849.71	0.010191	2.95	42.09	60.36	0.62
2	140.1	157.00	6848.60	6849.71		6849.86	0.009936	3.12	50.29	64.88	0.62
2	140.1	170.00	6848.60	6849.75		6849.91	0.009991	3.22	52.87	65.57	0.63
2	140.1	194.00	6848.60	6849.82		6850.00	0.009811	3.35	57.98	66.91	0.63
2	140.1	208.00	6848.60	6849.86		6850.04	0.009836	3.43	60.64	67.60	0.64
2	140.1	224.00	6848.60	6849.91		6850.10	0.009809	3.52	63.72	68.39	0.64
2	140.1	109.00	6848.60	6849.51		6849.64	0.010123	2.83	38.47	58.21	0.61
2	140	124.00	6848.60	6849.57	6849.35	6849.71	0.026789	2.95	42.00	60.31	0.62
2	140	157.00	6848.60	6849.70	6849.45	6849.86	0.025879	3.13	50.19	64.86	0.63
2	140	170.00	6848.60	6849.74	6849.49	6849.90	0.025925	3.22	52.77	65.54	0.63
2	140	194.00	6848.60	6849.82	6849.56	6850.00	0.025280	3.35	57.88	66.88	0.63
2	140	208.00	6848.60	6849.86	6849.60	6850.04	0.025258	3.44	60.54	67.57	0.64
2	140	224.00	6848.60	6849.91	6849.64	6850.10	0.025089	3.52	63.62	68.36	0.64
2	140	109.00	6848.60	6849.51	6849.29	6849.64	0.026747	2.84	38.38	58.16	0.62
2	130.1	124.00	6844.00	6845.58		6845.81	0.037373	3.84	32.30	47.69	0.82
2	130.1	157.00	6844.00	6845.69		6845.96	0.038663	4.16	37.78	50.84	0.85
2	130.1	170.00	6844.00	6845.74		6846.02	0.038494	4.24	40.07	52.09	0.85
2	130.1	194.00	6844.00	6845.81		6846.11	0.039414	4.44	43.70	54.02	0.87
2	130.1	208.00	6844.00	6845.85		6846.17	0.039260	4.52	46.02	55.22	0.87
2	130.1	224.00	6844.00	6845.89		6846.22	0.039814	4.64	48.31	56.38	0.88
2	130.1	109.00	6844.00	6845.52		6845.73	0.037775	3.71	29.35	45.91	0.82
2	130	124.00	6844.00	6845.58	6845.47	6845.81	0.027455	3.86	32.14	47.60	0.83
2	130	157.00	6844.00	6845.69	6845.59	6845.96	0.028661	4.17	37.61	50.74	0.85
2	130	170.00	6844.00	6845.73	6845.63	6846.02	0.028631	4.26	39.89	52.00	0.86
2	130	194.00	6844.00	6845.80	6845.71	6846.11	0.029456	4.46	43.51	53.93	0.87
2	130	208.00	6844.00	6845.85	6845.75	6846.17	0.029424	4.54	45.83	55.13	0.88
2	130	224.00	6844.00	6845.89	6845.80	6846.22	0.029917	4.66	48.12	56.29	0.89
2	130	109.00	6844.00	6845.52	6845.41	6845.73	0.027594	3.73	29.19	45.82	0.82
2	120.1	124.00	6841.00	6842.16	6842.16	6842.51	0.032838	4.78	25.97	37.24	1.01
2	120.1	157.00	6841.00	6842.29	6842.29	6842.69	0.030722	5.07	30.98	39.07	1.00
2	120.1	170.00	6841.00	6842.34	6842.34	6842.75	0.030523	5.19	32.73	39.70	1.01
2	120.1	194.00	6841.00	6842.42	6842.42	6842.87	0.029235	5.35	36.27	40.93	1.00
2	120.1	208.00	6841.00	6842.47	6842.47	6842.93	0.029127	5.46	38.06	41.54	1.01
2	120.1	224.00	6841.00	6842.52	6842.52	6843.00	0.028553	5.56	40.29	42.28	1.00
2	120.1	109.00	6841.00	6842.10	6842.09	6842.43	0.032894	4.56	23.88	36.44	0.99
2	120	124.00	6841.00	6842.15	6842.16	6842.51	0.033369	4.85	25.59	37.09	1.03
2	120	157.00	6841.00	6842.28	6842.29	6842.69	0.030184	5.12	30.66	38.96	1.02
2	120	170.00	6841.00	6842.32	6842.33	6842.75	0.030869	5.30	32.09	39.47	1.04
2	120	194.00	6841.00	6842.42	6842.42	6842.87	0.027599	5.37	36.15	40.89	1.01

Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
2	120	208.00	6841.00	6842.46	6842.46	6842.93	0.027340	5.48	37.94	41.49	1.01
2	120	224.00	6841.00	6842.50	6842.51	6843.00	0.028000	5.67	39.51	42.02	1.03
2	120	109.00	6841.00	6842.10	6842.10	6842.43	0.032740	4.59	23.76	36.39	1.00
2	110	124.00	6836.70	6837.79	6837.71	6838.08	0.023996	4.29	28.93	37.62	0.86
2	110	157.00	6836.70	6837.96	6837.84	6838.26	0.021229	4.41	35.58	40.38	0.83
2	110	170.00	6836.70	6838.05	6837.88	6838.34	0.018690	4.34	39.16	41.38	0.79
2	110	194.00	6836.70	6838.17	6837.97	6838.47	0.016612	4.38	44.33	42.34	0.75
2	110	208.00	6836.70	6838.26	6838.02	6838.55	0.014731	4.31	48.25	43.05	0.72
2	110	224.00	6836.70	6838.35	6838.07	6838.64	0.013666	4.31	51.91	43.70	0.70
2	110	109.00	6836.70	6837.72	6837.64	6837.99	0.024515	4.15	26.28	36.46	0.86
2	100	130.00	6834.20	6835.59		6835.68	0.022318	2.40	54.06	45.88	0.39
2	100	166.00	6834.20	6835.81		6835.91	0.023945	2.58	64.24	48.05	0.39
2	100	194.00	6834.20	6835.96		6836.07	0.025150	2.71	71.60	49.56	0.40
2	100	241.00	6834.20	6836.15		6836.28	0.026306	2.97	81.21	51.25	0.41
2	100	274.00	6834.20	6836.25		6836.40	0.027799	3.18	86.38	52.10	0.43
2	100	309.00	6834.20	6836.36		6836.53	0.028536	3.36	92.28	53.05	0.44
2	100	119.00	6834.20	6835.52		6835.60	0.021693	2.34	50.86	45.18	0.39
2	90	130.00	6831.70	6832.63	6832.63	6832.98	0.031098	4.76	27.32	39.12	1.00
2	90	166.00	6831.70	6832.77	6832.77	6833.17	0.029263	5.10	32.57	40.61	1.00
2	90	194.00	6831.70	6832.85	6832.85	6833.30	0.028682	5.35	36.25	41.61	1.01
2	90	241.00	6831.70	6833.00	6833.00	6833.50	0.027490	5.70	42.30	43.22	1.02
2	90	274.00	6831.70	6833.10	6833.10	6833.63	0.025924	5.85	46.87	44.39	1.00
2	90	309.00	6831.70	6833.20	6833.20	6833.76	0.025215	6.04	51.17	45.47	1.00
2	90	119.00	6831.70	6832.59	6832.59	6832.92	0.031841	4.64	25.63	38.64	1.00
2	80.1	130.00	6828.00	6829.55	6829.53	6829.98	0.036505	5.27	24.67	28.05	0.99
2	80.1	166.00	6828.00	6829.74	6829.71	6830.20	0.033981	5.44	30.51	31.28	0.97
2	80.1	194.00	6828.00	6829.81	6829.84	6830.36	0.039133	5.96	32.54	32.33	1.05
2	80.1	241.00	6828.00	6829.97	6830.02	6830.59	0.040415	6.36	37.88	34.93	1.08
2	80.1	274.00	6828.00	6830.06	6830.13	6830.74	0.041133	6.63	41.31	36.19	1.09
2	80.1	309.00	6828.00	6830.15	6830.24	6830.90	0.041989	6.92	44.66	37.22	1.11
2	80.1	119.00	6828.00	6829.36	6829.47	6829.93	0.055615	6.05	19.68	24.99	1.20
2	80	130.00	6828.00	6829.54	6829.54	6829.98	0.024344	5.29	24.59	28.00	0.99
2	80	166.00	6828.00	6829.74	6829.71	6830.20	0.022601	5.46	30.42	31.23	0.97
2	80	194.00	6828.00	6829.80	6829.83	6830.36	0.026007	5.98	32.45	32.28	1.05
2	80	241.00	6828.00	6829.96	6830.02	6830.59	0.026847	6.38	37.76	34.87	1.08
2	80	274.00	6828.00	6830.06	6830.13	6830.75	0.027272	6.65	41.18	36.15	1.10
2	80	309.00	6828.00	6830.15	6830.24	6830.90	0.027754	6.94	44.53	37.18	1.12
2	80	119.00	6828.00	6829.35	6829.47	6829.93	0.037408	6.08	19.57	24.92	1.21
2	70.1	130.00	6826.00	6827.78	6827.77	6828.29	0.023911	5.70	22.79	22.59	1.00
2	70.1	166.00	6826.00	6828.08	6828.08	6828.53	0.025494	5.35	31.02	36.06	1.02
2	70.1	194.00	6826.00	6828.09	6828.19	6828.69	0.034699	6.25	31.05	36.07	1.19
2	70.1	241.00	6826.00	6828.30	6828.35	6828.89	0.027001	6.19	38.96	38.72	1.09
2	70.1	274.00	6826.00	6828.42	6828.46	6829.03	0.024699	6.26	43.78	40.24	1.06
2	70.1	309.00	6826.00	6828.52	6828.56	6829.17	0.024014	6.44	47.97	41.52	1.06
2	70.1	119.00	6826.00	6827.71	6827.71	6828.20	0.024621	5.64	21.11	21.76	1.01
2	70	130.00	6826.00	6827.78	6827.78	6828.29	0.022860	5.72	22.74	22.57	1.00
2	70	166.00	6826.00	6828.06	6828.08	6828.53	0.026412	5.49	30.23	35.79	1.05
2	70	194.00	6826.00	6828.08	6828.20	6828.69	0.033777	6.27	30.93	36.03	1.19
2	70	241.00	6826.00	6828.29	6828.34	6828.89	0.026878	6.20	38.87	38.69	1.09
2	70	274.00	6826.00	6828.42	6828.45	6829.03	0.024709	6.27	43.68	40.21	1.06
2	70	309.00	6826.00	6828.52	6828.56	6829.17	0.024059	6.45	47.87	41.49	1.06
2	70	119.00	6826.00	6827.70	6827.71	6828.20	0.023552	5.65	21.05	21.73	1.01
2	65	130.00	6824.30	6825.88	6826.11	6826.66	0.039039	7.11	18.28	23.18	1.41
2	65	166.00	6824.30	6826.08	6826.29	6826.87	0.033792	7.13	23.29	26.42	1.34
2	65	194.00	6824.30	6826.26	6826.42	6826.99	0.027869	6.84	28.38	29.69	1.23
2	65	241.00	6824.30	6826.38	6826.61	6827.26	0.031876	7.56	31.89	31.75	1.33
2	65	274.00	6824.30	6826.46	6826.73	6827.44	0.033663	7.94	34.49	33.19	1.37
2	65	309.00	6824.30	6826.55	6826.84	6827.59	0.033815	8.18	37.79	34.93	1.39
2	65	119.00	6824.30	6825.83	6826.05	6826.57	0.037714	6.87	17.33	22.57	1.38

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
2	60.1	130.00	6822.00	6823.52	6823.10	6823.72	0.005515	3.57	36.42	29.71	0.57
2	60.1	166.00	6822.00	6823.70	6823.26	6823.95	0.005879	3.96	41.88	30.58	0.60
2	60.1	194.00	6822.00	6823.83	6823.38	6824.11	0.006133	4.24	45.78	31.18	0.62
2	60.1	241.00	6822.00	6824.01	6823.57	6824.35	0.006575	4.67	51.64	32.11	0.65
2	60.1	274.00	6822.00	6824.13	6823.68	6824.51	0.006784	4.96	55.31	33.05	0.67
2	60.1	309.00	6822.00	6824.23	6823.80	6824.66	0.007042	5.26	58.93	33.95	0.68
2	60.1	119.00	6822.00	6823.46	6823.05	6823.64	0.005467	3.45	34.47	29.40	0.56
2	60	130.00	6822.00	6823.52	6823.10	6823.72	0.010605	3.57	36.39	29.71	0.57
2	60	166.00	6822.00	6823.70	6823.26	6823.95	0.011235	3.97	41.85	30.57	0.60
2	60	194.00	6822.00	6823.83	6823.37	6824.11	0.011672	4.24	45.75	31.18	0.62
2	60	241.00	6822.00	6824.01	6823.56	6824.35	0.012450	4.67	51.61	32.11	0.65
2	60	274.00	6822.00	6824.13	6823.68	6824.51	0.012841	4.96	55.28	33.05	0.67
2	60	309.00	6822.00	6824.23	6823.81	6824.66	0.013312	5.26	58.91	33.95	0.68
2	60	119.00	6822.00	6823.45	6823.05	6823.64	0.010539	3.46	34.44	29.39	0.56
2	50.1	130.00	6820.80	6821.62	6821.62	6821.97	0.020881	4.78	27.19	38.22	1.00
2	50.1	166.00	6820.80	6821.75	6821.75	6822.16	0.020197	5.16	32.18	39.15	1.00
2	50.1	194.00	6820.80	6821.84	6821.84	6822.29	0.019529	5.39	36.00	39.86	1.00
2	50.1	241.00	6820.80	6821.99	6821.99	6822.50	0.019039	5.76	41.84	40.91	1.00
2	50.1	274.00	6820.80	6822.08	6822.08	6822.64	0.018838	5.97	45.87	41.79	1.00
2	50.1	309.00	6820.80	6822.19	6822.19	6822.78	0.018479	6.15	50.23	42.74	1.00
2	50.1	119.00	6820.80	6821.58	6821.56	6821.91	0.020806	4.63	25.72	37.94	0.99
2	50	130.00	6820.80	6821.59	6821.61	6821.97	0.029556	4.97	26.17	38.02	1.06
2	50	166.00	6820.80	6821.74	6821.74	6822.16	0.025413	5.17	32.08	39.14	1.01
2	50	194.00	6820.80	6821.81	6821.84	6822.30	0.027371	5.60	34.62	39.60	1.06
2	50	241.00	6820.80	6821.99	6821.99	6822.50	0.023627	5.77	41.76	40.89	1.01
2	50	274.00	6820.80	6822.05	6822.08	6822.64	0.025522	6.18	44.35	41.45	1.05
2	50	309.00	6820.80	6822.18	6822.18	6822.78	0.023032	6.20	49.85	42.66	1.01
2	50	119.00	6820.80	6821.58	6821.58	6821.91	0.026442	4.64	25.63	37.92	1.00
2	40.1	130.00	6819.30	6820.27	6819.88	6820.34	0.004824	2.18	59.56	71.80	0.42
2	40.1	166.00	6819.30	6820.40	6819.97	6820.49	0.004967	2.41	68.91	73.16	0.44
2	40.1	194.00	6819.30	6820.48	6820.04	6820.58	0.005157	2.58	75.20	74.06	0.45
2	40.1	241.00	6819.30	6820.61	6820.13	6820.74	0.005452	2.84	84.87	75.41	0.47
2	40.1	274.00	6819.30	6820.69	6820.20	6820.83	0.005648	3.01	91.12	76.28	0.48
2	40.1	309.00	6819.30	6820.78	6820.27	6820.93	0.005805	3.17	97.61	77.17	0.50
2	40.1	119.00	6819.30	6820.22	6819.85	6820.29	0.004773	2.11	56.52	71.36	0.42
2	40	130.00	6819.30	6820.27		6820.34	0.002925	2.18	59.56	72.07	0.42
2	40	166.00	6819.30	6820.40		6820.49	0.003012	2.41	68.95	73.55	0.44
2	40	194.00	6819.30	6820.48		6820.58	0.003122	2.58	75.31	74.54	0.45
2	40	241.00	6819.30	6820.61		6820.74	0.003302	2.83	85.05	76.02	0.47
2	40	274.00	6819.30	6820.69		6820.83	0.003416	3.00	91.40	76.98	0.48
2	40	309.00	6819.30	6820.78		6820.93	0.003510	3.15	97.95	77.95	0.50
2	40	119.00	6819.30	6820.22		6820.29	0.002893	2.11	56.51	71.58	0.42
2	35	130.00	6818.70	6819.75	6819.75	6820.02	0.022575	4.16	31.24	59.23	1.01
2	35	166.00	6818.70	6819.86	6819.86	6820.16	0.022290	4.40	37.70	65.07	1.02
2	35	194.00	6818.70	6819.93	6819.93	6820.25	0.021724	4.53	42.79	69.33	1.02
2	35	241.00	6818.70	6820.04	6820.04	6820.40	0.020952	4.79	50.31	73.59	1.02
2	35	274.00	6818.70	6820.10	6820.10	6820.49	0.019964	4.96	55.19	74.57	1.02
2	35	309.00	6818.70	6820.17	6820.17	6820.58	0.019537	5.17	59.81	75.50	1.02
2	35	119.00	6818.70	6819.72	6819.72	6819.98	0.023193	4.11	28.94	57.01	1.02
2	30.1	130.00	6816.80	6817.55	6817.59	6817.88	0.027596	4.58	28.41	54.31	1.11
2	30.1	166.00	6816.80	6817.64	6817.69	6818.03	0.027424	4.99	33.24	55.43	1.14
2	30.1	194.00	6816.80	6817.69	6817.76	6818.14	0.029813	5.43	35.74	56.00	1.20
2	30.1	241.00	6816.80	6817.78	6817.89	6818.31	0.029151	5.83	41.35	57.26	1.21
2	30.1	274.00	6816.80	6817.84	6817.96	6818.42	0.029284	6.11	44.84	58.03	1.22
2	30.1	309.00	6816.80	6817.91	6818.03	6818.53	0.028482	6.32	48.90	58.91	1.22
2	30.1	119.00	6816.80	6817.52	6817.56	6817.83	0.027917	4.44	26.78	53.93	1.11
2	30	130.00	6816.80	6817.55	6817.59	6817.88	0.069782	4.61	28.20	54.27	1.13
2	30	166.00	6816.80	6817.64	6817.69	6818.03	0.069127	5.03	33.02	55.38	1.15
2	30	194.00	6816.80	6817.68	6817.76	6818.14	0.075233	5.47	35.49	55.95	1.21
2	30	241.00	6816.80	6817.78	6817.88	6818.31	0.073368	5.86	41.10	57.20	1.22

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
2	30	274.00	6816.80	6817.84	6817.96	6818.43	0.073605	6.15	44.59	57.97	1.23
2	30	309.00	6816.80	6817.91	6818.03	6818.54	0.071496	6.35	48.64	58.85	1.23
2	30	119.00	6816.80	6817.52	6817.56	6817.83	0.070912	4.48	26.54	53.87	1.13
2	20	137.00	6814.50	6816.02	6815.36	6816.08	0.003227	2.03	67.62	60.18	0.34
2	20	197.00	6814.50	6816.28	6815.54	6816.36	0.003329	2.35	83.66	63.11	0.36
2	20	244.00	6814.50	6816.46	6815.65	6816.56	0.003358	2.56	95.41	65.17	0.37
2	20	323.00	6814.50	6816.73	6815.84	6816.86	0.003405	2.84	113.55	68.23	0.39
2	20	380.00	6814.50	6816.90	6815.95	6817.05	0.003450	3.03	125.54	70.18	0.40
2	20	437.00	6814.50	6817.07	6816.07	6817.22	0.003487	3.19	137.00	71.99	0.41
2	20	139.00	6814.50	6816.03	6815.37	6816.09	0.003219	2.04	68.27	60.30	0.34
2	15	137.00	6812.00	6816.06		6816.06	0.000011	0.37	385.47	123.48	0.03
2	15	197.00	6812.00	6816.33		6816.33	0.000018	0.49	419.94	128.20	0.04
2	15	244.00	6812.00	6816.52		6816.53	0.000024	0.57	444.86	131.51	0.05
2	15	323.00	6812.00	6816.81		6816.81	0.000032	0.70	482.93	136.41	0.06
2	15	380.00	6812.00	6816.99		6817.00	0.000039	0.79	508.19	139.57	0.07
2	15	437.00	6812.00	6817.16		6817.17	0.000045	0.87	532.16	142.50	0.07
2	15	139.00	6812.00	6816.07		6816.07	0.000012	0.37	386.85	123.67	0.03
2	11	137.00	6815.00	6815.70	6815.70	6816.02	0.020401	4.57	29.97	45.60	0.99
2	11	197.00	6815.00	6815.88	6815.88	6816.29	0.019227	5.13	38.43	47.06	1.00
2	11	244.00	6815.00	6816.01	6816.01	6816.48	0.018888	5.50	44.33	48.12	1.01
2	11	323.00	6815.00	6816.22	6816.22	6816.76	0.017913	5.89	54.86	51.70	1.01
2	11	380.00	6815.00	6816.36	6816.36	6816.94	0.017281	6.11	62.24	54.08	1.00
2	11	437.00	6815.00	6816.49	6816.49	6817.10	0.016805	6.30	69.35	56.27	1.00
2	11	139.00	6815.00	6815.70	6815.70	6816.03	0.021402	4.67	29.79	45.57	1.02
2	9.1	137.00	6812.00	6812.19	6812.49	6813.93	1.014679	10.59	12.94	72.00	4.40
2	9.1	197.00	6812.00	6812.24	6812.62	6814.36	0.897336	11.69	16.85	73.72	4.31
2	9.1	244.00	6812.00	6812.29	6812.71	6814.56	0.777105	12.10	20.16	75.14	4.12
2	9.1	323.00	6812.00	6812.35	6812.83	6814.89	0.666848	12.79	25.26	77.28	3.94
2	9.1	380.00	6812.00	6812.39	6812.93	6815.19	0.645373	13.43	28.30	78.53	3.94
2	9.1	437.00	6812.00	6812.44	6813.01	6815.36	0.591379	13.73	31.82	79.95	3.84
2	9.1	139.00	6812.00	6812.19	6812.49	6813.86	0.925864	10.35	13.43	72.22	4.23
2	9	137.00	6812.00	6812.19	6812.49	6813.89	0.435505	10.48	13.08	72.06	4.33
2	9	197.00	6812.00	6812.25	6812.62	6814.26	0.365312	11.37	17.32	73.92	4.14
2	9	244.00	6812.00	6812.29	6812.70	6814.51	0.333648	11.97	20.38	75.23	4.05
2	9	323.00	6812.00	6812.35	6812.84	6814.97	0.312258	13.00	24.84	77.11	4.04
2	9	380.00	6812.00	6812.39	6812.93	6815.25	0.296803	13.57	27.99	78.41	4.00
2	9	437.00	6812.00	6812.43	6813.02	6815.40	0.267929	13.82	31.63	79.88	3.87
2	9	139.00	6812.00	6812.20	6812.49	6813.82	0.394549	10.22	13.61	72.30	4.15
2	7	137.00	6809.00	6810.04	6810.04	6810.49	0.019177	5.37	25.49	28.93	1.01
2	7	197.00	6809.00	6810.30	6810.30	6810.85	0.017930	5.91	33.34	31.17	1.01
2	7	244.00	6809.00	6810.48	6810.48	6811.09	0.017460	6.26	38.95	32.68	1.01
2	7	323.00	6809.00	6810.75	6810.75	6811.45	0.016445	6.69	48.28	35.04	1.00
2	7	380.00	6809.00	6810.93	6810.93	6811.68	0.016063	6.97	54.52	36.53	1.01
2	7	437.00	6809.00	6811.09	6811.09	6811.90	0.015691	7.21	60.63	37.94	1.00
2	7	139.00	6809.00	6810.06	6810.06	6810.50	0.018824	5.37	25.90	29.05	1.00
2	5	137.00	6798.00	6798.29	6799.04	6805.82	2.536050	22.02	6.22	22.90	7.45
2	5	197.00	6798.00	6798.39	6799.28	6806.43	1.851404	22.76	8.66	23.94	6.67
2	5	244.00	6798.00	6798.47	6799.46	6806.86	1.558128	23.24	10.50	24.70	6.28
2	5	323.00	6798.00	6798.59	6799.72	6807.50	1.262123	23.95	13.49	25.88	5.85
2	5	380.00	6798.00	6798.68	6799.89	6807.57	1.062180	23.93	15.88	26.79	5.48
2	5	437.00	6798.00	6798.76	6800.05	6807.87	0.954669	24.22	18.04	27.58	5.28
2	5	139.00	6798.00	6798.28	6799.04	6806.71	2.984096	23.30	5.96	22.79	8.03
2	3	137.00	6786.00	6788.58	6787.02	6788.62	0.000951	1.50	91.57	50.97	0.20
2	3	197.00	6786.00	6788.72	6787.26	6788.78	0.001596	2.00	98.72	52.63	0.26
2	3	244.00	6786.00	6788.81	6787.42	6788.90	0.002145	2.36	103.58	53.72	0.30
2	3	323.00	6786.00	6788.94	6787.68	6789.07	0.003136	2.92	110.63	55.27	0.36
2	3	380.00	6786.00	6789.02	6787.84	6789.19	0.003870	3.29	115.34	56.29	0.41
2	3	437.00	6786.00	6789.10	6787.99	6789.31	0.004623	3.65	119.69	57.21	0.44
2	3	139.00	6786.00	6788.59	6787.02	6788.62	0.000971	1.51	91.82	51.03	0.20

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
2	1	137.00	6788.00	6788.47	6788.31	6788.54	0.005005	2.08	65.79	143.53	0.54
2	1	197.00	6788.00	6788.58	6788.40	6788.67	0.005006	2.40	82.22	145.35	0.56
2	1	244.00	6788.00	6788.66	6788.46	6788.77	0.005001	2.60	93.84	146.63	0.57
2	1	323.00	6788.00	6788.78	6788.55	6788.91	0.004999	2.89	111.64	148.55	0.59
2	1	380.00	6788.00	6788.86	6788.62	6789.01	0.004997	3.08	123.51	149.83	0.60
2	1	437.00	6788.00	6788.94	6788.67	6789.10	0.004997	3.24	134.75	151.02	0.61
2	1	139.00	6788.00	6788.48	6788.32	6788.54	0.004994	2.09	66.42	143.60	0.54

REACH NO. 2

HEC-RAS IMPROVED CONDITION MODEL

DROPS MODELED AS VERTICAL SECTION

PCCSV.rep

HEC-RAS September 1998 Version 2.2
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

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

PROJECT DATA
Project Title: PINE CREEK CHANNEL 2003
Project File : PCCSV.prj
Run Date and Time: 2/25/2003 1:59:41 PM

Project in English units

PLAN DATA

Plan Title: Plan 18
Plan File : x:\2870000.all\2871611\HYDRO\HECRAS\PCCSV.p18

Geometry Title: IMPROVED-2002
Geometry File : x:\2870000.all\2871611\HYDRO\HECRAS\PCCSV.g02

Flow Title : 2003 FLOW DATA
Flow File : x:\2870000.all\2871611\HYDRO\HECRAS\PCCSV.f01

Plan Summary Information:

Number of:	Cross Sections	= 81	Mulitple Openings	=	0
	Culverts	= 0	Inline Weirs	=	0
	Bridges	= 0			

Computational Information

Water surface calculation tolerance	= 0.01
Critical depth calculaton tolerance	= 0.01
Maximum number of interations	= 20
Maximum difference tolerance	= 0.3
Flow tolerance factor	= 0.001

Computation Options
Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Mixed Flow

FLOW DATA

Flow Title: 2003 FLOW DATA
Flow File : x:\2870000.all\2871611\HYDRO\HECRAS\PCCSV.f01

Flow Data (cfs)

River	Reach	RS	2-YR PF 1	5-YR PF 2	10-YR PF 3	25-YR PF 4	50-YR PF 5	100-YR PF 6	DOM. PF 7
PINE CREEK N	2	290	124	157	170	194	208	224	109
PINE CREEK N	2	100	130	166	194	241	274	309	119
PINE CREEK N	2	20	137	197	244	323	380	437	139

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
PINE CREEK N	2	PF 1	Normal S = .02	Normal S = .005

GEOMETRY DATA

Geometry Title: IMPROVED-2002
Geometry File : x:\2870000.all\2871611\HYDRO\HECRAS\PCCSV.g02

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 290

INPUT
Description: JUST DOWN STREAM OF DF "F" OUTFALL
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
53	6910	79	6904	86	6903	114	6903	123	6904
143	6910								

Manning's n Values num= 1

Sta	n Val
53	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
53	143	30	40	54	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 280

INPUT
Description:
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

30	6908.5	47	6908	57	6906	64	6904	73	6902.2
117	6908								

Manning's n Values num= 1

Sta	n Val
30	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
30	117	30	45	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 275.1

INPUT
Description: TOP OF DROP SECTION
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
55	6906	66	6904	73	6903	95	6903	95.1	6902.5
97.6	6902.5	97.7	6903	122	6903	126	6904	132	6906

Manning's n Values num= 1

Sta	n Val
55	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
55	132	.1	.1	.2	.4

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 275

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
73	6902	82	6900	100	6900	117	6900.2	122	6902

Manning's n Values num= 1

Sta	n Val
73	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
73	122	5	5	.2	.4

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 273

INPUT
Description:
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
66	6904	73	6902	82	6900	100	6900	117	6900.2
122	6902	126	6904						

Manning's n Values num= 1

Sta	n Val
66	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
66	126	95	120	.2	.4

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 270.1

INPUT
Description: TOP OF DROP SECTION
Station Elevation Data num= 13

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
52	6904	70	6898	73	6898	95	6898	95.1	6897.5
97.6	6897.5	97.7	6898	108	6898	125	6898	140	6900
146	6901.5	175	6902	196	6904				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
52	.06	73	.03	108	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
73	196	.1	.1	.2	.4

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 270

INPUT
Description:
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
52	6904	70	6898	73	6896	108	6896	125	6898
140	6900	146	6901.5	175	6902	196	6904		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
52	.06	73	.03	108	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
52	196	280	225	180	.2	.4

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 260

INPUT
Description: EXIST'G POND PROPOSED SPILLWAY
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
72	6902	75	6899	84	6896	100	6896	116	6896
125	6899	128	6902						

Manning's n Values num= 1

Sta	n Val
72	.075

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
75	125	45	60	68	.2	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 250

INPUT
Description: RUN DOWN
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
174	6891	184.5	6888	215.5	6888	236	6891

Manning's n Values num= 1

Sta	n Val
174	.075

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
174	236	48	50	50	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 240

INPUT
Description: THRU CENTER OF SPLASH POOL
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
66	6886	72	6884	78	6882	88	6880	91	6879
117	6879	120	6880	130	6882	136	6884	142	6886

Manning's n Values num= 1

Sta	n Val
66	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
66	142	25	25	25	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 235

INPUT
Description: END OF SPLASH POOL
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
63	6886	75	6884	79	6882	85	6881.2	125	6881.2
129	6882	134	6884	140	6886				

Manning's n Values num= 1

Sta	n Val
63	.07

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
63	140	103	102	100	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 230.1

INPUT
Description: TOP OF DROP SECTION
Station Elevation Data num= 11

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
60	6888	73	6884	78	6880	86	6879	97	6879
97.1	6878.5	99.6	6878.5	100	6879	104	6879	120	6880
138	6888								

Manning's n Values num= 1

Sta	n Val
60	.07

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
78	120	.1 .1	.1	.2	.4

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 230

INPUT
Description:
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
60	6888	73	6884	78	6880	86	6878	100	6877.2
104	6878	120	6880	138	6888				

Manning's n Values num= 1

Sta	n Val
60	.07

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
86	104	5 5	5	.2	.4

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 228

INPUT
Description:
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
60	6888	73	6884	78	6880	86	6878	100	6877.2
104	6878	120	6880	138	6888				

Manning's n Values num= 1

Sta	n Val
60	.07

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
86	104	215 220	235	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 220.1

INPUT
Description: TOP OF DROP SECTION
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
175	6877	183	6873.5	200	6873.5	200.1	6873	202.6	6873
202.7	6873.5	226	6873.5	231	6876	235	6876.9		

Manning's n Values num= 2

Sta	n Val	Sta	n Val
175	.05	235	.032

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
175	235	.1 .1	.1	.2	.4

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 220

INPUT
Description:

Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
175	6877	183	6874	190	6872	200	6870.9	220	6872
231	6876	235	6876.9						

Manning's n Values num= 2

Sta	n Val	Sta	n Val
175	.05	235	.032

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
175	235	5	5	.2	.4

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 219

INPUT
Description:
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
175	6877	183	6874	190	6872	200	6870.9	220	6872
231	6876	235	6876.9						

Manning's n Values num= 2

Sta	n Val	Sta	n Val
175	.05	235	.032

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
175	235	20	20	.2	.4

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 217

INPUT
Description:
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
73	6875	87	6870	96	6869.6	105	6870	118	6874
126	6875								

Manning's n Values num= 1

Sta	n Val
73	.05

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
73	126	33	31	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 215.1

INPUT
Description: TOP OF DROP SECTION
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
70	6874	74	6872	78	6870	95.5	6870	95.6	6869.5
98.1	6869.5	98.2	6870	107	6870	120	6872	138	6874

Manning's n Values num= 1

Sta	n Val
70	.045

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
            70     120                .1      .1      .1             .2      .4

CROSS SECTION          RIVER: PINE CREEK N
REACH: 2                  RS: 215

INPUT
Description: SECTION D
Station Elevation Data    num=       7
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
      70     6874       74     6872       78     6870      100   6868.7      107     6870
     120     6872      138     6874

Manning's n Values        num=       1
     Sta    n Val
      70     .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
            70     120                  5       5       5             .2      .4

CROSS SECTION          RIVER: PINE CREEK N
REACH: 2                  RS: 214

INPUT
Description:
Station Elevation Data    num=       7
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
      70     6874       74     6872       78     6870      100   6868.7      107     6870
     120     6872      138     6874

Manning's n Values        num=       1
     Sta    n Val
      70     .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
            70     120                 55      45      40             .1      .3

CROSS SECTION          RIVER: PINE CREEK N
REACH: 2                  RS: 213.1

INPUT
Description: TOP OF DROP SECTION
Station Elevation Data    num=      10
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
      70     6872       74     6870       79     6868     92.5     6868     92.6   6867.5
    95.1   6867.5     95.2     6868      111     6868      118     6870      125     6872

Manning's n Values        num=       1
     Sta    n Val
      70     .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
            70     125                .1      .1      .1             .2      .4

CROSS SECTION          RIVER: PINE CREEK N
REACH: 2                  RS: 213

INPUT
```

Description:
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
70	6872	74	6870	79	6868	93	6866	100	6865.8
105	6866	118	6870	125	6872				

Manning's n Values num= 1

Sta	n Val
70	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
70	125	5	5	.2	.4

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 212.9

INPUT
Description:
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
70	6872	74	6870	79	6868	93	6866	100	6865.8
105	6866	118	6870	125	6872				

Manning's n Values num= 1

Sta	n Val
70	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
70	125	68	65	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 212.1

INPUT
Description: TOP OF DROP SECTION
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
76	6868	82	6866	89	6864.5	99	6864.5	99.1	6864
101.6	6864	101.7	6864.5	112	6864.5	119	6866	127	6868

Manning's n Values num= 1

Sta	n Val
76	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
82	119	.1	.1	.2	.4

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 212

INPUT
Description:
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
76	6868	82	6866	87	6864	100	6862.7	114	6864
119	6866	127	6868						

Manning's n Values num= 1

Sta	n Val

```
      76     .045

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
            82     119                32      32      32              .2       .4

CROSS SECTION          RIVER: PINE CREEK N
REACH: 2                  RS: 210

INPUT
Description:
Station Elevation Data    num=       9
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
      70     6870       75     6868       80     6866       85     6864      110     6862
     120     6864      126     6866      132     6868      137     6870

Manning's n Values        num=       1
     Sta    n Val
      70     .045

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
            75     132                127     129     135              .1       .3

CROSS SECTION          RIVER: PINE CREEK N
REACH: 2                  RS: 200.1

INPUT
Description: TOP OF DROP SECTION
Station Elevation Data    num=      10
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
     103     6862      109   6860.2      123   6860.2      126     6860      137     6860
   137.1   6859.5    139.6   6859.5    139.7     6860      156     6860      183     6862

Manning's n Values        num=       1
     Sta    n Val
     103     .045

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
            103     183                .1      .1      .1              .2       .4

CROSS SECTION          RIVER: PINE CREEK N
REACH: 2                  RS: 200

INPUT
Description:
Station Elevation Data    num=       8
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
     103     6862      109   6860.2      123   6860.2      126     6860      133     6858
     142     6858      156     6860      183     6862

Manning's n Values        num=       1
     Sta    n Val
     103     .045

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
            103     183                5       5       5              .2       .4

CROSS SECTION          RIVER: PINE CREEK N
REACH: 2                  RS: 199
```

INPUT
Description:
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
103	6862	109	6860.2	123	6860.2	126	6860	133	6858
142	6858	156	6860	183	6862				

Manning's n Values num= 1

Sta	n Val
103	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
103	183	61	75	81	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 190

INPUT
Description:
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
113	6860	116	6858	140	6857.6	150	6858	156	6858
164	6856	172	6855.5	179	6856	187	6858	210	6860

Manning's n Values num= 1

Sta	n Val
113	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
113	187	52	62	70	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 180.1

INPUT
Description: TOP OF DROP SECTION
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
125	6860	133	6858	155	6856	200	6856	200.1	6855.5
202.6	6855.5	202.7	6856	218	6856	243	6858	253	6860

Manning's n Values num= 1

Sta	n Val
125	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
133	243	.1	.1	.1	.2	.4

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 180

INPUT
Description:
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
125	6860	133	6858	155	6856	170	6855	187	6855
212	6854.3	218	6856	243	6858	253	6860		

Manning's n Values num= 1

Sta	n Val
125	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
133	243	5	5	.2	.4

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 179

INPUT
Description:
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
125	6860	133	6858	155	6856	170	6855	187	6855
212	6854.3	218	6856	243	6858	253	6860		

Manning's n Values num= 1

Sta	n Val
125	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
133	243	45	59	73	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 170

INPUT
Description:
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
100	6858	106	6856	113	6854	117	6852	140	6851.8
166	6852	173	6854	200	6856				

Manning's n Values num= 2

Sta	n Val	Sta	n Val
100	.045	173	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
100	200	88	100	112	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 160

INPUT
Description:
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
34	6858	40	6856	62	6852	80	6851	110	6851
135	6852	170	6854	179	6856	184	6858		

Manning's n Values num= 1

Sta	n Val
34	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
40	179	48	50	60	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 150.1

INPUT
Description: TOP OF DROP SECTION
Station Elevation Data num= 13

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
56	6856	68	6854	76	6851.5	80	6851	90	6851
97.5	6851	97.6	6850.5	100.1	6850.5	100.2	6851	117	6851
124	6852	130	6852	149	6856				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
56	.04	90	.04	117	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
56	149	.1	.1	.2	.4

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 150

INPUT
Description:
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
56	6856	68	6854	76	6851.5	90	6850	100	6849.9
117	6850	124	6850.8	130	6852	149	6856		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
56	.04	90	.04	124	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
56	149	5	5	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 149.9

INPUT
Description:
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
56	6856	68	6854	76	6851.5	90	6850	100	6849.9
117	6850	124	6850.8	130	6852	149	6856		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
56	.04	90	.04	124	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
56	149	100	90	75	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 140.1

INPUT
Description: (N CHANGE BNDY)
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
63	6852	71	6850	73	6849.7	100	6848.6	126	6848.6
141	6850	156	6852						

Manning's n Values num= 2

Sta	n Val	Sta	n Val
63	.035	73	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
63	156	.1	.1	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 140

INPUT
Description:
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
63	6852	71	6850	73	6849.7	100	6848.6	126	6848.6
141	6850	156	6852						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
63	.035	71	.07	126	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
63	156	138	124	105	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 130.1

INPUT
Description: TOP OF DROP SECTION
Station Elevation Data num= 11

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
63	6850	68	6848	73	6846	81	6846	90	6846
90.1	6845.5	92.6	6845.5	92.7	6846	130	6846	150	6848
180	6850								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
63	.035	81	.06	92.6	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
68	150	.1	.1	.1	.2	.4

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 130

INPUT
Description:
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
63	6850	68	6848	81	6844	100	6845	119	6845.4
134	6846	150	6848	180	6850				

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
63	.035	81	.05	119	.055	150	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
68	150	5	5	5	.2	.4

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 129

INPUT
Description:
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
63	6850	68	6848	81	6844	100	6845	119	6845.4
134	6846	150	6848	180	6850				

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
63	.035	81	.05	119	.055	150	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
68	150	89	105	121	.1 .3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 120.1

INPUT
Description: TOP OF DROP SECTION
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
30	6845	67	6844	82	6842	95	6842	95.1	6841.5
97.6	6841.5	97.7	6842	117	6842	130	6844	135	6845

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
30	.35	67	.055	82	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
67	130	.1 .1	.1	.2	.4

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 120

INPUT
Description:
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
30	6845	67	6844	82	6842	85	6841.8	100	6841
115	6841.6	117	6842	130	6844	135	6845		

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
30	.035	67	.035	82	.045	117	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
67	130	100	145	160	.2 .4

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 110.1

INPUT
Description: TOP OF DROP SECTION
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

67	6842	80	6838	88	6838	98	6838	98.1	6837.5
100.6	6837.5	100.7	6838	121	6838	130	6840	162	6842

Manning's n Values num= 2

Sta	n Val	Sta	n Val
67	.045	88	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
67	162	.1	.1	.2	.4

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 110

INPUT
Description:
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
67	6842	80	6838	88	6837	100	6836.7	112	6836.9
121	6838	130	6840	162	6842				

Manning's n Values num= 2

Sta	n Val	Sta	n Val
67	.045	88	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
67	162	5	5	.2	.4

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 109

INPUT
Description:
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
67	6842	80	6838	88	6837	100	6836.7	112	6836.9
121	6838	130	6840	162	6842				

Manning's n Values num= 2

Sta	n Val	Sta	n Val
67	.045	88	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
67	162	105	97	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 100

INPUT
Description:
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
69	6840	77	6836	84	6834.2	100	6834.2	116	6834.2
127	6836	140	6838	165	6840				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
69	.35	84	.045	116	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.

77	127	107	102	97	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 90

INPUT
Description:
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
66	6838	69	6836	84	6832	100	6831.7	116	6832
131	6834	147	6836	157	6838				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
66	.035	84	.045	116	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
69	147	87	89	95	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 80.1

INPUT
Description: TOP OF DROP SECTION
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
74	6834	80	6832	97	6830	115	6830	115.1	6829.5
117.6	6829.5	117.7	6830	130	6830	138	6832	144	6834

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
74	.035	80	.045	117.6	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
74	144	.1	.1	.1	.2	.4

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 80

INPUT
Description:
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
74	6834	80	6832	93	6830	100	6829.4	115	6828
119	6828	138	6832	144	6834				

Manning's n Values num= 2

Sta	n Val	Sta	n Val
74	.035	80	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
74	144	5	5	5	.2	.4

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 79

INPUT
Description:
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
68	6836	74	6834	80	6832	93	6830	100	6829.4
115	6828	119	6828	138	6832	144	6834	148	6836

Manning's n Values num= 2

Sta	n Val	Sta	n Val
68	.035	80	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
74	144	53	65	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 70.1

INPUT
Description: (N CHANGE BNDY)
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
32	6834	70	6830	80	6828	90	6828	107	6826
110	6826	115	6828	130	6830	153	6834		

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
32	.035	80	.04	130	.035	153	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
70	130	.1	.1	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 70

INPUT
Description:
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
32	6834	70	6830	80	6828	90	6828	107	6826
110	6826	115	6828	130	6830	153	6834		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
32	.035	70	.04	110	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
70	130	55	55	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 65.1

INPUT
Description: TOP OF DROP SECTION
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
75	6830	80	6828	90	6826	99	6826	99.1	6825.5
101.6	6825.5	101.7	6826	115	6826	141	6828	154	6830

Manning's n Values num= 1

Sta	n Val
75	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
80	141	.1	.1	.2	.4

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 65

INPUT
Description:
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
75	6830	80	6828	90	6826	100	6824.3	115	6826
141	6828	154	6830						

Manning's n Values num= 1

Sta	n Val
75	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
80	141	5	5	.2	.4

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 64

INPUT
Description:
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
67	6832	75	6830	80	6828	90	6826	100	6824.3
115	6826	141	6828	154	6830	165	6832		

Manning's n Values num= 1

Sta	n Val
67	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
80	141	80	78	55	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 60.1

INPUT
Description: (N CHANGE BNDY)
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
72	6830	84	6824	88	6822.5	100	6822	112	6822.1
116	6824	154	6830						

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
72	.035	88	.035	112	.035	154	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
84	116	.1	.1	.1	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 60

INPUT
Description:

Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
72	6830	84	6824	88	6822.5	100	6822	112	6822.1
116	6824	154	6830						

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
72	.035	84	.05	112	.035	154	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
84	116	123	120	121	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 50.1

INPUT
Description: (N CHANGE BNDY)
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
57	6826	76	6822	83	6820.9	100	6820.8	116	6820.9
117	6822	126	6824	134	6826				

Manning's n Values num= 2

Sta	n Val	Sta	n Val
57	.035	116	.055

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
57	126	.1	.1	.1	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 50

INPUT
Description:
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
57	6826	76	6822	83	6820.9	100	6820.8	116	6820.9
117	6822	126	6824	134	6826				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
57	.035	83	.04	116	.055

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
57	126	112	116	121	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 40.1

INPUT
Description: (N CHANGE BNDY)
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
26	6826	54	6822	68	6820	71	6819.3	100	6819.3
129	6819.5	137	6820	151	6824	157	6826		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
26	.035	71	.04	129	.055

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
54	151	.1	.1	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 40

INPUT
Description:
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
26	6826	54	6822	60	6821	68	6820	71	6819.3
100	6819.3	129	6819.5	137	6820	151	6824	157	6826

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
26	.06	54	.045	60	.032	129	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
54	151	42	47	52	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 35

INPUT
Description: SECTION C
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
50	6822	68	6820	100	6818.7	141	6820	153	6822

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
50	.05	68	.035	141	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
50	153	36	27	20	.2	.4

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 34.1

INPUT
Description: TOP OF DROP SECTION
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
25	6824	50	6820	60	6819.7	85	6819.7	85.1	6819.2
87.6	6819.2	87.7	6819.7	120	6819.7	130	6820	143	6824

Manning's n Values num= 2

Sta	n Val	Sta	n Val
25	.05	120	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
25	143	.1	.1	.1	.2	.4

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 34

INPUT
Description:

Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
25	6824	50	6820	63	6818.2	117	6818.4	130	6820
143	6824								

Manning's n Values num= 2

Sta	n Val	Sta	n Val
25	.05	117	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
25	143	5	5	.2	.4

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 33.9

INPUT
Description:
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
25	6824	50	6820	63	6818.2	117	6818.4	130	6820
143	6824								

Manning's n Values num= 2

Sta	n Val	Sta	n Val
25	.05	117	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
25	143	51	51	.2	.4

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 30.1

INPUT
Description: STA. 124+33 +/- (N CHANGE BNDY)
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
51	6822	60	6820	70	6818	75	6817.1	100	6816.8
125	6817.3	130	6818	137	6820	147	6822		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
51	.035	60	.055	70	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
60	137	.1	.1	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 30

INPUT
Description: STA. 124+33 +/-
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
51	6822	60	6820	70	6818	75	6817.1	100	6816.8
125	6817.3	130	6818	137	6820	147	6822		

Manning's n Values num= 2

Sta	n Val	Sta	n Val
51	.035	60	.055

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           51     137               72      72      73            .1       .3

CROSS SECTION          RIVER: PINE CREEK N
REACH: 2                  RS: 20

INPUT
Description: STA. 123+60 +/-
Station Elevation Data    num=       7
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
      49     6820       71     6816       79   6814.6      100   6814.9      121   6814.5
     131     6816      154     6820

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
      49     .035       71     .045      131     .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           49     154               67      61      50            .1       .3

CROSS SECTION          RIVER: PINE CREEK N
REACH: 2                  RS: 15

INPUT
Description: EXISTING SMALL POND
Station Elevation Data    num=       7
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
       0     6818       26     6816       40     6814       44     6812      100     6812
     140     6814      157     6818

Manning's n Values        num=       2
     Sta    n Val      Sta    n Val
       0     .032       26     .032

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           40     140               48      44      40            .2       .4

CROSS SECTION          RIVER: PINE CREEK N
REACH: 2                  RS: 11

INPUT
Description:  AT CONCRETE GRADE CONTROL STRUCTURE 25.5
Station Elevation Data    num=       7
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
      42     6820       50     6818       77     6816       80     6815      120     6815
     125     6816      139     6820

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
      42     .035       42     .035      139     .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           42     139               30      30      30            .2       .4

CROSS SECTION          RIVER: PINE CREEK N
REACH: 2                  RS: 9.1

INPUT
```

Description: END OF RIPRAP RUNDOWN 25.4
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
45	6816	65	6812	131	6812	185	6814	200	6816

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
45	.045	45	.045	185	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
45	185	.1	.1	.2	.4

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 9

INPUT
Description: END OF RIPRAP RUNDOWN 25.4
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
45	6816	65	6812	131	6812	185	6814	200	6816

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
45	.03	45	.03	185	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
45	185	5	5	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 8

INPUT
Description:
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
45	6816	65	6812	131	6812	185	6814	200	6816

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
45	.03	45	.03	185	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
45	185	115	150	190	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 7

INPUT
Description: RUNDOWN 25.3
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
60	6816	90	6809	110	6809	140	6816

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
60	.035	60	.035	140	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
60	140	62	62	62	.2	.4

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 5

INPUT
Description: RUNDOWN 25.2
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
75	6801	90	6798	110	6798	125	6801

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
75	.035	75	.045	125	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
75	125	60	60	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 3

INPUT
Description: DF "E" BOTTOM OF RUNDOWN
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
60	6791	90	6786	110	6786	140	6791

Manning's n Values num= 1

Sta	n Val
60	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
60	140	40	40	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 1

INPUT
Description: BOTTOM OF DF "E"
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
30	6792	48	6788	184	6788	230	6792

Manning's n Values num= 1

Sta	n Val
30	.03

Bank Sta: Left	Right	Coeff Contr.	Expan.
30	230	.1	.3

SUMMARY OF MANNING'S N VALUES

River:PINE CREEK N

Reach	River Sta.	n1	n2	n3	n4
2	290	.06			
2	280	.06			

2	275.1	.06			
2	275	.06			
2	273	.06			
2	270.1	.06	.03	.06	
2	270	.06	.03	.06	
2	260	.075			
2	250	.075			
2	240	.045			
2	235	.07			
2	230.1	.07			
2	230	.07			
2	228	.07			
2	220.1	.05	.032		
2	220	.05	.032		
2	219	.05	.032		
2	217	.05			
2	215.1	.045			
2	215	.045			
2	214	.045			
2	213.1	.045			
2	213	.045			
2	212.9	.045			
2	212.1	.045			
2	212	.045			
2	210	.045			
2	200.1	.045			
2	200	.045			
2	199	.045			
2	190	.045			
2	180.1	.045			
2	180	.045			
2	179	.045			
2	170	.045	.03		
2	160	.045			
2	150.1	.04	.04	.04	
2	150	.04	.04	.04	
2	149.9	.04	.04	.04	
2	140.1	.035	.04		
2	140	.035	.07	.035	
2	130.1	.035	.06	.035	
2	130	.035	.05	.055	.035
2	129	.035	.05	.055	.035
2	120.1	.35	.055	.045	
2	120	.035	.035	.045	.035
2	110.1	.045	.045		
2	110	.045	.045		
2	109	.045	.045		
2	100	.35	.045	.035	
2	90	.035	.045	.035	
2	80.1	.035	.045	.06	
2	80	.035	.04		
2	79	.035	.04		
2	70.1	.035	.04	.035	.035
2	70	.035	.04	.035	
2	65.1	.035			
2	65	.035			
2	64	.035			
2	60.1	.035	.035	.035	.035
2	60	.035	.05	.035	.035

2	50.1	.035	.055		
2	50	.035	.04	.055	
2	40.1	.035	.04	.055	
2	40	.06	.045	.032	.035
2	35	.05	.035	.03	
2	34.1	.05	.035		
2	34	.05	.035		
2	33.9	.05	.035		
2	30.1	.035	.055	.035	
2	30	.035	.055		
2	20	.035	.045	.035	
2	15	.032	.032		
2	11	.035	.035	.035	
2	9.1	.045	.045	.045	
2	9	.03	.03	.03	
2	8	.03	.03	.03	
2	7	.035	.035	.035	
2	5	.035	.045	.035	
2	3	.045			
2	1	.03			

SUMMARY OF REACH LENGTHS

River: PINE CREEK N

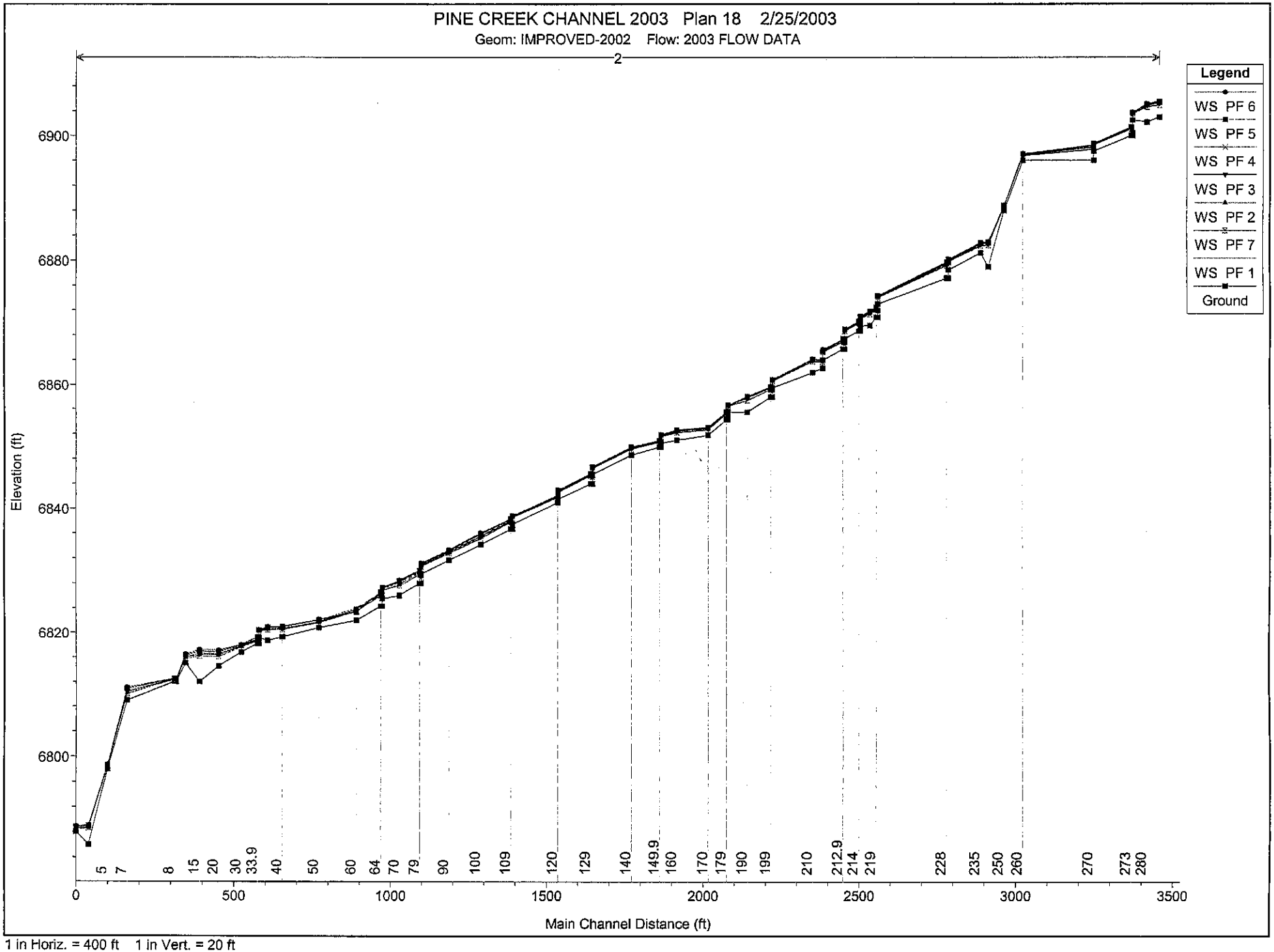
Reach	River Sta.	Left	Channel	Right
2	290	30	40	54
2	280	30	45	55
2	275.1	.1	.1	.1
2	275	5	5	5
2	273	95	120	140
2	270.1	.1	.1	.1
2	270	280	225	180
2	260	45	60	68
2	250	48	50	50
2	240	25	25	25
2	235	103	102	100
2	230.1	.1	.1	.1
2	230	5	5	5
2	228	215	220	235
2	220.1	.1	.1	.1
2	220	5	5	5
2	219	20	20	20
2	217	33	31	30
2	215.1	.1	.1	.1
2	215	5	5	5
2	214	55	45	40
2	213.1	.1	.1	.1
2	213	5	5	5
2	212.9	68	65	65
2	212.1	.1	.1	.1
2	212	32	32	32
2	210	127	129	135
2	200.1	.1	.1	.1
2	200	5	5	5

2	199	61	75	81
2	190	52	62	70
2	180.1	.1	.1	.1
2	180	5	5	5
2	179	45	59	73
2	170	88	100	112
2	160	48	50	60
2	150.1	.1	.1	.1
2	150	5	5	5
2	149.9	100	90	75
2	140.1	.1	.1	.1
2	140	138	124	105
2	130.1	.1	.1	.1
2	130	5	5	5
2	129	89	105	121
2	120.1	.1	.1	.1
2	120	100	145	160
2	110.1	.1	.1	.1
2	110	5	5	5
2	109	105	97	75
2	100	107	102	97
2	90	87	89	95
2	80.1	.1	.1	.1
2	80	5	5	5
2	79	53	65	65
2	70.1	.1	.1	.1
2	70	55	55	55
2	65.1	.1	.1	.1
2	65	5	5	5
2	64	80	78	55
2	60.1	.1	.1	.1
2	60	123	120	121
2	50.1	.1	.1	.1
2	50	112	116	121
2	40.1	.1	.1	.1
2	40	42	47	52
2	35	36	27	20
2	34.1	.1	.1	.1
2	34	5	5	5
2	33.9	51	51	51
2	30.1	.1	.1	.1
2	30	72	72	73
2	20	67	61	50
2	15	48	44	40
2	11	30	30	30
2	9.1	.1	.1	.1
2	9	5	5	5
2	8	115	150	190
2	7	62	62	62
2	5	60	60	60
2	3	40	40	40
2	1			

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: PINE CREEK N

Reach	River Sta.	Contr.	Expan.
2	290	.1	.3
2	280	.1	.3
2	275.1	.2	.4
2	275	.2	.4
2	273	.2	.4
2	270.1	.2	.4
2	270	.2	.4
2	260	.2	.3
2	250	.1	.3
2	240	.1	.3
2	235	.1	.3
2	230.1	.2	.4
2	230	.2	.4
2	228	.1	.3
2	220.1	.2	.4
2	220	.2	.4
2	219	.2	.4
2	217	.1	.3
2	215.1	.2	.4
2	215	.2	.4
2	214	.1	.3
2	213.1	.2	.4
2	213	.2	.4
2	212.9	.1	.3
2	212.1	.2	.4
2	212	.2	.4
2	210	.1	.3
2	200.1	.2	.4
2	200	.2	.4
2	199	.1	.3
2	190	.1	.3
2	180.1	.2	.4
2	180	.2	.4
2	179	.1	.3
2	170	.1	.3
2	160	.1	.3
2	150.1	.2	.4
2	150	.1	.3
2	149.9	.1	.3
2	140.1	.1	.3
2	140	.1	.3
2	130.1	.2	.4
2	130	.2	.4
2	129	.1	.3
2	120.1	.2	.4
2	120	.2	.4
2	110.1	.2	.4
2	110	.2	.4
2	109	.1	.3
2	100	.1	.3
2	90	.1	.3
2	80.1	.2	.4
2	80	.2	.4
2	79	.1	.3
2	70.1	.1	.3
2	70	.1	.3

2	65.1	.2	.4
2	65	.2	.4
2	64	.1	.3
2	60.1	.1	.3
2	60	.1	.3
2	50.1	.1	.3
2	50	.1	.3
2	40.1	.1	.3
2	40	.1	.3
2	35	.2	.4
2	34.1	.2	.4
2	34	.2	.4
2	33.9	.2	.4
2	30.1	.1	.3
2	30	.1	.3
2	20	.1	.3
2	15	.2	.4
2	11	.2	.4
2	9.1	.2	.4
2	9	.1	.3
2	8	.1	.3
2	7	.2	.4
2	5	.1	.3
2	3	.1	.3
2	1	.1	.3



1 in Horiz. = 400 ft 1 in Vert. = 20 ft

HEC-RAS Plan: Plan 13 River: PINE CREEK N Reach: 2

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
2	290	124.00	6903.00	6905.01	6903.78	6905.04	0.001871	1.47	84.11	51.71	0.20
2	290	157.00	6903.00	6905.23	6903.90	6905.27	0.002041	1.64	95.66	53.39	0.22
2	290	170.00	6903.00	6905.31	6903.95	6905.35	0.002094	1.70	100.04	54.02	0.22
2	290	194.00	6903.00	6905.44	6904.03	6905.49	0.002203	1.80	107.49	55.07	0.23
2	290	208.00	6903.00	6905.52	6904.06	6905.57	0.002259	1.86	111.74	55.65	0.23
2	290	224.00	6903.00	6905.60	6904.11	6905.66	0.002331	1.93	116.25	56.27	0.24
2	290	109.00	6903.00	6904.89	6903.72	6904.92	0.001793	1.39	78.30	50.84	0.20
2	280	124.00	6902.20	6904.72	6904.08	6904.87	0.011538	3.13	39.65	30.67	0.48
2	280	157.00	6902.20	6904.90	6904.26	6905.08	0.013006	3.48	45.17	32.60	0.52
2	280	170.00	6902.20	6904.96	6904.33	6905.16	0.013406	3.59	47.37	33.34	0.53
2	280	194.00	6902.20	6905.07	6904.46	6905.29	0.014355	3.81	50.93	34.50	0.55
2	280	208.00	6902.20	6905.13	6904.51	6905.37	0.014790	3.92	53.04	35.18	0.56
2	280	224.00	6902.20	6905.19	6904.58	6905.44	0.015450	4.06	55.14	35.83	0.58
2	280	109.00	6902.20	6904.63	6903.98	6904.77	0.010870	2.96	36.86	29.64	0.47
2	275.1	124.00	6902.50	6903.54	6903.54	6903.82	0.069130	4.23	29.29	54.92	1.02
2	275.1	157.00	6902.50	6903.63	6903.63	6903.95	0.065080	4.54	34.62	55.98	1.02
2	275.1	170.00	6902.50	6903.66	6903.66	6904.01	0.065710	4.68	36.29	56.31	1.03
2	275.1	194.00	6902.50	6903.73	6903.73	6904.10	0.062110	4.83	40.17	57.06	1.01
2	275.1	208.00	6902.50	6903.77	6903.77	6904.15	0.061983	4.95	42.01	57.42	1.02
2	275.1	224.00	6902.50	6903.81	6903.81	6904.20	0.060282	5.04	44.43	57.88	1.01
2	275.11	109.00	6902.50	6903.49	6903.49	6903.75	0.070226	4.05	26.88	54.44	1.02
2	275	124.00	6900.00	6900.29	6900.76	6903.41	2.202747	14.16	8.76	36.58	5.10
2	275	157.00	6900.00	6900.36	6900.88	6903.34	1.517838	13.84	11.35	37.09	4.41
2	275	170.00	6900.00	6900.39	6900.92	6903.28	1.308888	13.63	12.47	37.31	4.15
2	275	194.00	6900.00	6900.43	6900.99	6903.43	1.185145	13.90	13.95	37.60	4.02
2	275	208.00	6900.00	6900.45	6901.05	6903.59	1.168075	14.21	14.63	37.73	4.02
2	275	224.00	6900.00	6900.48	6901.09	6903.58	1.042430	14.11	15.87	37.97	3.85
2	275.1	109.00	6900.00	6900.27	6900.71	6903.30	2.490281	13.98	7.80	36.38	5.32
2	273	124.00	6900.00	6901.09	6900.76	6901.23	0.017011	3.10	40.03	42.34	0.56
2	273	157.00	6900.00	6901.22	6900.88	6901.40	0.018090	3.44	45.70	43.31	0.59
2	273	170.00	6900.00	6901.26	6900.93	6901.46	0.018666	3.57	47.63	43.63	0.60
2	273	194.00	6900.00	6901.35	6901.00	6901.57	0.019197	3.77	51.42	44.26	0.62
2	273	208.00	6900.00	6901.39	6901.04	6901.63	0.019932	3.91	53.16	44.54	0.63
2	273	224.00	6900.00	6901.44	6901.10	6901.69	0.020461	4.05	55.32	44.90	0.64
2	273	109.00	6900.00	6901.03	6900.70	6901.16	0.015891	2.89	37.66	41.94	0.54
2	270.1	124.00	6897.50	6898.51	6898.51	6898.77	0.024342	4.16	30.73	60.36	1.02
2	270.1	157.00	6897.50	6898.60	6898.60	6898.90	0.023861	4.51	35.90	61.25	1.03
2	270.1	170.00	6897.50	6898.63	6898.63	6898.95	0.023264	4.61	38.06	61.62	1.03
2	270.1	194.00	6897.50	6898.69	6898.69	6899.04	0.022952	4.82	41.56	62.21	1.03
2	270.1	208.00	6897.50	6898.72	6898.72	6899.09	0.022251	4.90	43.88	62.60	1.02
2	270.1	224.00	6897.50	6898.76	6898.76	6899.14	0.021849	5.01	46.27	63.00	1.02
2	270.1	109.00	6897.50	6898.46	6898.46	6898.71	0.025868	4.04	27.80	59.84	1.04
2	270	124.00	6896.00	6897.88	6896.71	6897.92	0.000994	1.48	83.52	53.81	0.21
2	270	157.00	6896.00	6898.12	6896.82	6898.16	0.001092	1.63	96.41	56.21	0.22
2	270	170.00	6896.00	6898.20	6896.86	6898.25	0.001121	1.68	101.42	57.14	0.22
2	270	194.00	6896.00	6898.36	6896.94	6898.40	0.001174	1.76	110.24	58.74	0.23
2	270	208.00	6896.00	6898.44	6896.98	6898.49	0.001201	1.80	115.30	59.63	0.23
2	270	224.00	6896.00	6898.53	6897.03	6898.59	0.001232	1.85	120.88	60.61	0.23
2	270	109.00	6896.00	6897.76	6896.64	6897.79	0.000951	1.41	77.10	52.60	0.21
2	260	124.00	6896.00	6896.75	6896.75	6897.11	0.094840	4.81	25.76	36.51	1.01
2	260	157.00	6896.00	6896.88	6896.88	6897.29	0.089159	5.15	30.50	37.28	1.00
2	260	170.00	6896.00	6896.93	6896.93	6897.36	0.088142	5.28	32.20	37.55	1.00
2	260	194.00	6896.00	6897.01	6897.01	6897.48	0.084491	5.46	35.50	38.08	1.00
2	260	208.00	6896.00	6897.06	6897.06	6897.54	0.083668	5.59	37.24	38.35	1.00
2	260	224.00	6896.00	6897.11	6897.11	6897.62	0.082599	5.71	39.21	38.66	1.00
2	260	109.00	6896.00	6896.70	6896.70	6897.02	0.094353	4.58	23.79	36.19	1.00
2	250	124.00	6888.00	6888.62	6888.76	6889.16	0.191506	5.90	21.03	37.36	1.39
2	250	157.00	6888.00	6888.69	6888.88	6889.36	0.209017	6.60	23.79	38.11	1.47
2	250	170.00	6888.00	6888.72	6888.92	6889.44	0.212462	6.82	24.91	38.42	1.49
2	250	194.00	6888.00	6888.78	6889.00	6889.57	0.211816	7.14	27.16	39.02	1.51

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
2	250	208.00	6888.00	6888.80	6889.04	6889.65	0.217513	7.38	28.18	39.28	1.54
2	250	224.00	6888.00	6888.83	6889.10	6889.74	0.227515	7.69	29.14	39.54	1.58
2	250	109.00	6888.00	6888.56	6888.69	6889.07	0.201435	5.72	19.05	36.81	1.40
2	240	124.00	6879.00	6882.48	6879.86	6882.49	0.000217	0.89	138.70	54.89	0.10
2	240	157.00	6879.00	6882.67	6880.00	6882.68	0.000283	1.05	148.96	56.00	0.11
2	240	170.00	6879.00	6882.73	6880.05	6882.75	0.000309	1.11	152.56	56.38	0.12
2	240	194.00	6879.00	6882.84	6880.14	6882.87	0.000356	1.22	159.04	57.07	0.13
2	240	208.00	6879.00	6882.91	6880.20	6882.94	0.000382	1.28	162.87	57.47	0.13
2	240	224.00	6879.00	6882.98	6880.26	6883.01	0.000411	1.34	167.07	57.90	0.14
2	240	109.00	6879.00	6882.39	6879.79	6882.40	0.000186	0.81	133.96	54.36	0.09
2	235	124.00	6881.20	6882.39		6882.47	0.009837	2.21	56.07	51.78	0.37
2	235	157.00	6881.20	6882.56		6882.65	0.009889	2.42	64.91	52.54	0.38
2	235	170.00	6881.20	6882.62		6882.72	0.010016	2.50	67.97	52.80	0.39
2	235	194.00	6881.20	6882.73		6882.83	0.010208	2.64	73.43	53.26	0.40
2	235	208.00	6881.20	6882.79		6882.90	0.010218	2.71	76.71	53.54	0.40
2	235	224.00	6881.20	6882.85		6882.97	0.010278	2.79	80.25	53.84	0.40
2	235	109.00	6881.20	6882.32		6882.38	0.009666	2.10	52.01	51.42	0.37
2	230.1	124.00	6878.50	6879.87	6879.87	6880.22	0.087125	4.75	26.12	38.88	1.02
2	230.1	157.00	6878.50	6880.00	6880.00	6880.39	0.082300	4.97	31.56	42.02	1.01
2	230.1	170.00	6878.50	6880.05	6880.05	6880.45	0.080660	5.10	33.31	42.16	1.01
2	230.1	194.00	6878.50	6880.11	6880.11	6880.56	0.080328	5.37	36.11	42.39	1.02
2	230.1	208.00	6878.50	6880.15	6880.15	6880.62	0.078889	5.50	37.88	42.54	1.02
2	230.1	224.00	6878.50	6880.20	6880.20	6880.69	0.076441	5.61	40.00	42.71	1.01
2	230.1	109.00	6878.50	6879.81	6879.81	6880.13	0.087379	4.58	23.79	37.42	1.01
2	230	124.00	6877.20	6879.38	6878.73	6879.52	0.011069	3.26	43.36	34.52	0.43
2	230	157.00	6877.20	6879.57	6878.91	6879.75	0.011776	3.61	50.35	36.87	0.45
2	230	170.00	6877.20	6879.65	6878.98	6879.83	0.011928	3.72	53.12	37.76	0.46
2	230	194.00	6877.20	6879.77	6879.09	6879.98	0.012222	3.92	58.01	39.29	0.47
2	230	208.00	6877.20	6879.84	6879.15	6880.06	0.012430	4.04	60.68	40.10	0.48
2	230	224.00	6877.20	6879.92	6879.22	6880.15	0.012516	4.15	63.93	41.06	0.48
2	230	109.00	6877.20	6879.27	6878.64	6879.40	0.010979	3.11	39.61	33.19	0.43
2	228	124.00	6877.20	6879.29	6878.73	6879.46	0.013432	3.48	40.42	33.49	0.47
2	228	157.00	6877.20	6879.48	6878.91	6879.68	0.014337	3.85	46.86	35.72	0.50
2	228	170.00	6877.20	6879.55	6878.98	6879.76	0.014545	3.98	49.40	36.56	0.50
2	228	194.00	6877.20	6879.67	6879.09	6879.90	0.014889	4.19	53.95	38.03	0.51
2	228	208.00	6877.20	6879.73	6879.15	6879.98	0.015147	4.31	56.43	38.80	0.52
2	228	224.00	6877.20	6879.81	6879.22	6880.07	0.015212	4.43	59.50	39.74	0.52
2	228	109.00	6877.20	6879.18	6878.65	6879.34	0.013429	3.33	36.83	32.17	0.47
2	220.1	124.00	6873.00	6874.09	6874.09	6874.41	0.047164	4.53	27.39	45.53	1.03
2	220.1	157.00	6873.00	6874.20	6874.20	6874.56	0.043362	4.83	32.50	46.01	1.01
2	220.1	170.00	6873.00	6874.24	6874.24	6874.62	0.042792	4.96	34.28	46.17	1.01
2	220.1	194.00	6873.00	6874.31	6874.31	6874.72	0.041566	5.17	37.54	46.47	1.01
2	220.1	208.00	6873.00	6874.35	6874.35	6874.78	0.040945	5.28	39.38	46.64	1.01
2	220.1	224.00	6873.00	6874.39	6874.39	6874.85	0.041188	5.44	41.16	46.80	1.02
2	220.1	109.00	6873.00	6874.05	6874.05	6874.33	0.045969	4.27	25.50	45.35	1.00
2	220	124.00	6870.90	6871.77	6872.26	6874.00	0.494590	11.98	10.35	23.75	3.20
2	220	157.00	6870.90	6871.88	6872.40	6874.14	0.431003	12.07	13.00	26.63	3.04
2	220	170.00	6870.90	6871.92	6872.45	6874.16	0.403704	12.02	14.15	27.78	2.97
2	220	194.00	6870.90	6871.98	6872.54	6874.32	0.392977	12.30	15.78	29.33	2.95
2	220	208.00	6870.90	6872.01	6872.60	6874.38	0.374828	12.34	16.85	30.07	2.91
2	220	224.00	6870.90	6872.05	6872.65	6874.42	0.343705	12.34	18.15	30.34	2.81
2	220	109.00	6870.90	6871.72	6872.19	6873.95	0.540050	11.99	9.09	22.26	3.31
2	219	124.00	6870.90	6872.18	6872.26	6872.67	0.057423	5.63	22.01	31.13	1.18
2	219	157.00	6870.90	6872.31	6872.40	6872.87	0.054424	6.03	26.04	31.93	1.18
2	219	170.00	6870.90	6872.37	6872.45	6872.94	0.051113	6.08	27.97	32.30	1.15
2	219	194.00	6870.90	6872.43	6872.54	6873.08	0.053231	6.45	30.06	32.70	1.19
2	219	208.00	6870.90	6872.48	6872.60	6873.15	0.051718	6.55	31.75	33.02	1.18
2	219	224.00	6870.90	6872.54	6872.65	6873.23	0.049731	6.64	33.74	33.40	1.16
2	219	109.00	6870.90	6872.12	6872.19	6872.58	0.059090	5.43	20.09	30.74	1.18

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
2	217	124.00	6869.60	6871.45	6870.90	6871.64	0.009130	3.43	36.18	26.80	0.52
2	217	157.00	6869.60	6871.62	6871.08	6871.85	0.010409	3.86	40.69	27.80	0.56
2	217	170.00	6869.60	6871.68	6871.14	6871.93	0.010796	4.00	42.45	28.18	0.57
2	217	194.00	6869.60	6871.79	6871.26	6872.07	0.011481	4.26	45.54	28.84	0.60
2	217	208.00	6869.60	6871.84	6871.32	6872.15	0.011982	4.42	47.10	29.16	0.61
2	217	224.00	6869.60	6871.91	6871.38	6872.23	0.012496	4.58	48.87	29.53	0.63
2	217	109.00	6869.60	6871.36	6870.82	6871.53	0.008616	3.23	33.79	26.25	0.50
2	215.1	124.00	6869.50	6870.75	6870.75	6871.12	0.035538	4.89	25.35	35.35	1.02
2	215.1	157.00	6869.50	6870.88	6870.88	6871.30	0.033451	5.21	30.12	36.48	1.01
2	215.1	170.00	6869.50	6870.93	6870.93	6871.37	0.033303	5.35	31.77	36.86	1.02
2	215.1	194.00	6869.50	6871.01	6871.01	6871.49	0.032863	5.58	34.79	37.55	1.02
2	215.1	208.00	6869.50	6871.06	6871.06	6871.56	0.031930	5.66	36.76	38.00	1.01
2	215.1	224.00	6869.50	6871.11	6871.11	6871.63	0.031302	5.77	38.85	38.46	1.01
2	215.1	109.00	6869.50	6870.69	6870.69	6871.03	0.035317	4.66	23.38	34.88	1.00
2	215	124.00	6868.70	6869.85	6870.18	6870.96	0.138421	8.45	14.68	25.59	1.97
2	215	157.00	6868.70	6869.97	6870.32	6871.15	0.127547	8.69	18.06	28.39	1.92
2	215	170.00	6868.70	6870.03	6870.38	6871.19	0.118121	8.67	19.61	29.22	1.86
2	215	194.00	6868.70	6870.11	6870.47	6871.32	0.108816	8.83	21.97	29.90	1.82
2	215	208.00	6868.70	6870.15	6870.53	6871.39	0.105323	8.95	23.25	30.26	1.80
2	215	224.00	6868.70	6870.20	6870.58	6871.47	0.100835	9.05	24.76	30.69	1.77
2	215	109.00	6868.70	6869.78	6870.11	6870.88	0.150606	8.44	12.91	24.00	2.03
2	214	124.00	6868.70	6869.96	6870.18	6870.72	0.082730	6.97	17.80	28.18	1.54
2	214	157.00	6868.70	6870.12	6870.33	6870.89	0.068317	7.05	22.27	29.99	1.44
2	214	170.00	6868.70	6870.16	6870.38	6870.97	0.067061	7.20	23.62	30.37	1.44
2	214	194.00	6868.70	6870.26	6870.47	6871.08	0.060369	7.27	26.68	31.21	1.39
2	214	208.00	6868.70	6870.31	6870.52	6871.15	0.057791	7.34	28.36	31.66	1.37
2	214	224.00	6868.70	6870.38	6870.59	6871.22	0.054661	7.38	30.35	32.20	1.34
2	214	109.00	6868.70	6869.90	6870.11	6870.62	0.085448	6.83	15.96	26.69	1.56
2	213.1	124.00	6867.50	6868.71	6868.71	6869.08	0.035338	4.83	25.65	36.28	1.01
2	213.1	157.00	6867.50	6868.84	6868.84	6869.26	0.033878	5.20	30.18	37.02	1.02
2	213.1	170.00	6867.50	6868.89	6868.89	6869.32	0.032990	5.31	32.02	37.32	1.01
2	213.1	194.00	6867.50	6868.97	6868.97	6869.44	0.032040	5.52	35.15	37.82	1.01
2	213.1	208.00	6867.50	6869.01	6869.01	6869.51	0.031910	5.65	36.80	38.08	1.01
2	213.1	224.00	6867.50	6868.78	6869.07	6869.77	0.086125	7.96	28.13	36.69	1.60
2	213.1	109.00	6867.50	6868.65	6868.65	6868.99	0.036412	4.65	23.43	35.91	1.01
2	213	124.00	6865.80	6866.62	6867.18	6868.75	0.264564	11.71	10.59	18.34	2.72
2	213	157.00	6865.80	6866.77	6867.35	6868.90	0.215027	11.71	13.40	19.85	2.51
2	213	170.00	6865.80	6866.83	6867.42	6868.92	0.196152	11.62	14.63	20.48	2.42
2	213	194.00	6865.80	6866.91	6867.54	6869.09	0.185752	11.85	16.37	21.33	2.38
2	213	208.00	6865.80	6866.97	6867.60	6869.11	0.170827	11.74	17.71	21.96	2.30
2	213	224.00	6865.80	6866.97	6867.67	6869.45	0.197105	12.62	17.74	21.98	2.48
2	213	109.00	6865.80	6866.56	6867.09	6868.62	0.284986	11.54	9.44	17.69	2.78
2	212.9	124.00	6865.80	6867.03	6867.18	6867.69	0.050334	6.55	18.93	22.53	1.26
2	212.9	157.00	6865.80	6867.22	6867.36	6867.91	0.043729	6.67	23.55	24.54	1.20
2	212.9	170.00	6865.80	6867.32	6867.42	6867.99	0.039502	6.58	25.85	25.48	1.15
2	212.9	194.00	6865.80	6867.39	6867.54	6868.15	0.042047	6.98	27.80	26.25	1.20
2	212.9	208.00	6865.80	6867.50	6867.60	6868.21	0.036779	6.78	30.68	27.35	1.13
2	212.9	224.00	6865.80	6867.40	6867.67	6868.39	0.054783	7.99	28.03	26.34	1.37
2	212.9	109.00	6865.80	6866.97	6867.09	6867.56	0.046752	6.15	17.73	21.97	1.21
2	212.1	124.00	6864.00	6865.35	6865.35	6865.76	0.034280	5.10	24.33	30.97	1.01
2	212.1	157.00	6864.00	6865.49	6865.49	6865.96	0.033121	5.45	28.79	32.28	1.02
2	212.1	170.00	6864.00	6865.55	6865.55	6866.03	0.032161	5.54	30.67	32.82	1.01
2	212.1	194.00	6864.00	6865.64	6865.64	6866.16	0.031677	5.76	33.69	33.67	1.01
2	212.1	208.00	6864.00	6865.42	6865.70	6866.38	0.074046	7.83	26.56	31.63	1.51
2	212.1	224.00	6864.00	6865.76	6865.76	6866.31	0.030282	5.94	37.70	34.76	1.01
2	212.1	109.00	6864.00	6865.28	6865.28	6865.66	0.035575	4.94	22.07	30.28	1.02
2	212	124.00	6862.70	6863.75	6864.22	6865.55	0.250746	10.75	11.53	21.89	2.61
2	212	157.00	6862.70	6863.89	6864.36	6865.68	0.213887	10.75	14.61	24.64	2.46
2	212	170.00	6862.70	6863.93	6864.42	6865.75	0.206544	10.82	15.71	25.55	2.43
2	212	194.00	6862.70	6864.00	6864.52	6865.88	0.196142	10.98	17.67	27.02	2.39

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
2	212	208.00	6862.70	6864.02	6864.58	6866.08	0.210697	11.52	18.05	27.09	2.49
2	212	224.00	6862.70	6864.09	6864.64	6866.02	0.173348	11.13	20.13	27.47	2.29
2	212	109.00	6862.70	6863.69	6864.15	6865.45	0.264263	10.62	10.26	20.65	2.65
2	210	124.00	6862.00	6863.85	6863.65	6864.12	0.017627	4.14	29.95	32.38	0.76
2	210	157.00	6862.00	6864.00	6863.81	6864.31	0.018481	4.47	35.10	35.02	0.79
2	210	170.00	6862.00	6864.04	6863.87	6864.38	0.019177	4.66	36.51	35.24	0.81
2	210	194.00	6862.00	6864.12	6863.97	6864.50	0.019800	4.93	39.35	35.68	0.83
2	210	208.00	6862.00	6864.17	6864.02	6864.57	0.020057	5.07	40.99	35.93	0.84
2	210	224.00	6862.00	6864.21	6864.07	6864.64	0.020693	5.26	42.58	36.17	0.85
2	210	109.00	6862.00	6863.76	6863.56	6864.01	0.017736	4.02	27.13	30.81	0.75
2	200.1	124.00	6859.50	6860.61	6860.61	6860.88	0.038126	4.16	29.82	56.65	1.01
2	200.1	157.00	6859.50	6860.70	6860.70	6861.02	0.037375	4.50	34.92	58.14	1.02
2	200.1	170.00	6859.50	6860.74	6860.74	6861.06	0.036532	4.59	37.03	58.75	1.02
2	200.1	194.00	6859.50	6860.80	6860.80	6861.15	0.035367	4.76	40.76	59.81	1.02
2	200.1	208.00	6859.50	6860.83	6860.83	6861.20	0.035474	4.88	42.61	60.33	1.02
2	200.1	224.00	6859.50	6860.88	6860.88	6861.26	0.034220	4.95	45.25	61.06	1.01
2	200.1	109.00	6859.50	6860.58	6860.58	6860.82	0.036311	3.91	27.89	56.07	0.98
2	200	124.00	6858.00	6858.88	6859.37	6860.54	0.174627	10.36	11.97	18.23	2.25
2	200	157.00	6858.00	6859.04	6859.55	6860.73	0.147536	10.44	15.04	19.92	2.12
2	200	170.00	6858.00	6859.10	6859.62	6860.78	0.137084	10.40	16.34	20.60	2.06
2	200	194.00	6858.00	6859.21	6859.74	6860.89	0.123278	10.39	18.67	21.75	1.98
2	200	208.00	6858.00	6859.28	6859.81	6860.94	0.114720	10.32	20.15	22.45	1.92
2	200	224.00	6858.00	6859.35	6859.87	6861.00	0.107328	10.29	21.78	23.20	1.87
2	200	109.00	6858.00	6858.79	6859.28	6860.51	0.204228	10.54	10.35	17.27	2.40
2	199	124.00	6858.00	6859.28	6859.37	6859.87	0.040771	6.15	20.15	22.45	1.14
2	199	157.00	6858.00	6859.45	6859.56	6860.11	0.039682	6.50	24.14	24.25	1.15
2	199	170.00	6858.00	6859.50	6859.62	6860.20	0.041156	6.74	25.24	24.72	1.17
2	199	194.00	6858.00	6859.60	6859.74	6860.35	0.040779	6.96	27.88	25.82	1.18
2	199	208.00	6858.00	6859.64	6859.81	6860.45	0.042648	7.21	28.86	26.21	1.21
2	199	224.00	6858.00	6859.71	6859.87	6860.53	0.041602	7.29	30.74	26.95	1.20
2	199	109.00	6858.00	6859.23	6859.29	6859.74	0.036952	5.73	19.02	21.92	1.08
2	190	124.00	6855.50	6857.48	6856.97	6857.68	0.008516	3.58	34.65	26.82	0.55
2	190	157.00	6855.50	6857.79	6857.15	6857.98	0.011513	3.49	45.00	45.56	0.62
2	190	170.00	6855.50	6857.89	6857.21	6858.07	0.012198	3.41	49.81	54.51	0.63
2	190	194.00	6855.50	6858.03	6857.33	6858.20	0.013131	3.31	58.60	71.37	0.64
2	190	208.00	6855.50	6858.07	6857.40	6858.25	0.013025	3.39	61.29	71.86	0.64
2	190	224.00	6855.50	6858.10	6857.46	6858.29	0.013451	3.53	63.51	72.26	0.66
2	190	109.00	6855.50	6857.40	6856.87	6857.57	0.007827	3.35	32.57	26.20	0.53
2	180.1	124.00	6855.50	6856.46	6856.46	6856.68	0.040229	3.81	32.55	73.74	1.01
2	180.1	157.00	6855.50	6856.54	6856.54	6856.79	0.037214	4.05	38.79	75.70	1.00
2	180.1	170.00	6855.50	6856.57	6856.57	6856.84	0.037287	4.17	40.79	76.32	1.00
2	180.1	194.00	6855.50	6856.61	6856.61	6856.91	0.037818	4.39	44.20	77.37	1.02
2	180.1	208.00	6855.50	6856.64	6856.64	6856.95	0.037395	4.48	46.41	78.03	1.02
2	180.1	224.00	6855.50	6856.67	6856.67	6857.00	0.036368	4.56	49.12	78.85	1.02
2	180.1	109.00	6855.50	6856.42	6856.42	6856.63	0.041871	3.68	29.61	72.80	1.02
2	180	124.00	6854.30	6855.09	6855.40	6856.37	0.385745	9.09	13.64	46.12	2.94
2	180	157.00	6854.30	6855.15	6855.50	6856.52	0.324926	9.39	16.72	47.34	2.78
2	180	170.00	6854.30	6855.18	6855.54	6856.56	0.299803	9.42	18.05	47.85	2.70
2	180	194.00	6854.30	6855.23	6855.60	6856.65	0.270746	9.56	20.29	48.71	2.61
2	180	208.00	6854.30	6855.26	6855.64	6856.68	0.252402	9.59	21.70	49.25	2.54
2	180	224.00	6854.30	6855.29	6855.68	6856.74	0.239418	9.68	23.15	49.79	2.50
2	180	109.00	6854.30	6855.05	6855.35	6856.32	0.441814	9.04	12.06	45.48	3.09
2	179	124.00	6854.30	6855.25	6855.40	6855.78	0.094832	5.82	21.31	49.10	1.56
2	179	157.00	6854.30	6855.38	6855.50	6855.87	0.065026	5.60	28.05	51.58	1.34
2	179	170.00	6854.30	6855.43	6855.54	6855.92	0.060439	5.62	30.26	52.37	1.30
2	179	194.00	6854.30	6855.48	6855.60	6856.01	0.058585	5.82	33.33	53.45	1.30
2	179	208.00	6854.30	6855.53	6855.64	6856.06	0.055423	5.85	35.54	54.21	1.27
2	179	224.00	6854.30	6855.56	6855.68	6856.11	0.054001	5.95	37.64	54.92	1.27
2	179	109.00	6854.30	6855.20	6855.35	6855.71	0.103136	5.71	19.10	48.26	1.60

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
2	170	124.00	6851.80	6852.73	6852.48	6852.87	0.010670	2.93	42.37	53.04	0.58
2	170	157.00	6851.80	6852.87	6852.58	6853.02	0.010358	3.17	49.54	53.78	0.58
2	170	170.00	6851.80	6852.92	6852.61	6853.08	0.010225	3.25	52.28	54.06	0.58
2	170	194.00	6851.80	6853.01	6852.68	6853.19	0.010094	3.40	57.03	54.54	0.59
2	170	208.00	6851.80	6853.06	6852.71	6853.24	0.010031	3.48	59.70	54.81	0.59
2	170	224.00	6851.80	6853.11	6852.76	6853.31	0.009954	3.57	62.70	55.11	0.59
2	170	109.00	6851.80	6852.66	6852.43	6852.79	0.011056	2.82	38.68	52.66	0.58
2	160	124.00	6851.00	6852.27		6852.32	0.003091	1.72	72.01	79.20	0.32
2	160	157.00	6851.00	6852.42		6852.47	0.003136	1.87	84.02	82.61	0.33
2	160	170.00	6851.00	6852.47		6852.53	0.003134	1.92	88.70	83.90	0.33
2	160	194.00	6851.00	6852.57		6852.63	0.003150	2.00	96.87	86.12	0.33
2	160	208.00	6851.00	6852.62		6852.69	0.003159	2.05	101.49	87.34	0.34
2	160	224.00	6851.00	6852.69		6852.75	0.003133	2.09	107.08	88.80	0.34
2	160	109.00	6851.00	6852.20		6852.24	0.003072	1.65	66.20	77.49	0.31
2	150.1	124.00	6850.50	6851.63	6851.63	6851.94	0.028620	4.50	27.56	45.83	1.02
2	150.1	157.00	6850.50	6851.74	6851.74	6852.10	0.026556	4.79	32.77	46.98	1.01
2	150.1	170.00	6850.50	6851.78	6851.78	6852.16	0.026382	4.92	34.55	47.36	1.02
2	150.1	194.00	6850.50	6851.85	6851.85	6852.26	0.025348	5.10	38.07	48.11	1.01
2	150.1	208.00	6850.50	6851.90	6851.90	6852.31	0.024682	5.18	40.14	48.55	1.00
2	150.1	224.00	6850.50	6851.93	6851.93	6852.38	0.025127	5.35	41.86	48.91	1.02
2	150.1	109.00	6850.50	6851.58	6851.58	6851.87	0.029043	4.31	25.29	45.32	1.02
2	150	124.00	6849.90	6850.39	6850.75	6851.76	0.225777	9.39	13.21	34.03	2.65
2	150	157.00	6849.90	6850.48	6850.87	6851.90	0.186625	9.56	16.43	35.70	2.48
2	150	170.00	6849.90	6850.52	6850.92	6851.95	0.174927	9.61	17.70	36.33	2.43
2	150	194.00	6849.90	6850.59	6850.99	6851.99	0.148237	9.50	20.42	37.67	2.27
2	150	208.00	6849.90	6850.62	6851.04	6852.06	0.144392	9.63	21.59	38.22	2.26
2	150	224.00	6849.90	6850.66	6851.09	6852.14	0.140106	9.77	22.93	38.85	2.24
2	150	109.00	6849.90	6850.35	6850.69	6851.67	0.245737	9.23	11.81	33.28	2.73
2	149.9	124.00	6849.90	6850.67	6850.75	6851.10	0.039628	5.26	23.55	39.14	1.20
2	149.9	157.00	6849.90	6850.78	6850.87	6851.27	0.038151	5.61	28.00	41.15	1.20
2	149.9	170.00	6849.90	6850.82	6850.92	6851.33	0.037531	5.72	29.71	41.80	1.20
2	149.9	194.00	6849.90	6850.92	6850.99	6851.43	0.032611	5.71	34.00	43.25	1.13
2	149.9	208.00	6849.90	6850.95	6851.04	6851.49	0.033902	5.91	35.17	43.63	1.16
2	149.9	224.00	6849.90	6850.98	6851.09	6851.57	0.035401	6.15	36.43	44.05	1.19
2	149.9	109.00	6849.90	6850.64	6850.69	6851.01	0.035915	4.88	22.32	38.57	1.13
2	140.1	124.00	6848.60	6849.65	6849.34	6849.76	0.007686	2.66	46.57	62.93	0.55
2	140.1	157.00	6848.60	6849.76	6849.45	6849.89	0.008167	2.93	53.60	65.76	0.57
2	140.1	170.00	6848.60	6849.79	6849.49	6849.93	0.008454	3.05	55.83	66.35	0.59
2	140.1	194.00	6848.60	6849.86	6849.56	6850.02	0.008472	3.19	60.83	67.65	0.59
2	140.1	208.00	6848.60	6849.90	6849.59	6850.07	0.008649	3.29	63.26	68.27	0.60
2	140.1	224.00	6848.60	6849.93	6849.64	6850.11	0.009052	3.42	65.43	68.82	0.62
2	140.1	109.00	6848.60	6849.58	6849.29	6849.68	0.007618	2.56	42.59	60.66	0.54
2	140	124.00	6848.60	6849.65		6849.76	0.020056	2.67	46.51	62.89	0.55
2	140	157.00	6848.60	6849.75		6849.89	0.021171	2.93	53.51	65.74	0.57
2	140	170.00	6848.60	6849.79		6849.93	0.021848	3.05	55.73	66.32	0.59
2	140	194.00	6848.60	6849.86		6850.02	0.021750	3.19	60.73	67.62	0.59
2	140	208.00	6848.60	6849.90		6850.07	0.022134	3.29	63.16	68.24	0.60
2	140	224.00	6848.60	6849.93		6850.11	0.023104	3.43	65.33	68.79	0.62
2	140	109.00	6848.60	6849.58		6849.68	0.019973	2.56	42.53	60.62	0.54
2	130.1	124.00	6845.50	6846.49	6846.49	6846.74	0.029756	4.03	30.75	63.13	1.02
2	130.1	157.00	6845.50	6846.58	6846.58	6846.87	0.028066	4.34	36.22	64.20	1.02
2	130.1	170.00	6845.50	6846.61	6846.61	6846.91	0.026992	4.41	38.51	64.65	1.01
2	130.1	194.00	6845.50	6846.66	6846.66	6847.00	0.027393	4.66	41.62	65.25	1.03
2	130.1	208.00	6845.50	6846.69	6846.69	6847.04	0.026626	4.74	43.86	65.67	1.02
2	130.1	224.00	6845.50	6846.73	6846.73	6847.09	0.025505	4.81	46.56	66.19	1.01
2	130.1	109.00	6845.50	6846.45	6846.45	6846.68	0.029418	3.82	28.50	62.68	1.00
2	130	124.00	6844.00	6845.07	6845.47	6846.51	0.248589	9.62	12.89	25.97	2.41
2	130	157.00	6844.00	6845.18	6845.59	6846.68	0.251987	9.81	16.00	31.47	2.42
2	130	170.00	6844.00	6845.23	6845.63	6846.69	0.240635	9.69	17.53	33.85	2.37
2	130	194.00	6844.00	6845.29	6845.71	6846.77	0.234082	9.75	19.89	37.22	2.35

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
2	130	208.00	6844.00	6845.33	6845.75	6846.81	0.229293	9.77	21.29	39.08	2.33
2	130	224.00	6844.00	6845.37	6845.80	6846.88	0.229291	9.89	22.66	40.81	2.34
2	130	109.00	6844.00	6845.00	6845.41	6846.47	0.249494	9.70	11.23	22.50	2.42
2	129	124.00	6844.00	6845.32	6845.48	6845.87	0.085216	5.93	20.89	38.56	1.42
2	129	157.00	6844.00	6845.45	6845.59	6846.01	0.078188	6.02	26.06	43.85	1.38
2	129	170.00	6844.00	6845.47	6845.64	6846.08	0.081093	6.24	27.25	44.60	1.41
2	129	194.00	6844.00	6845.54	6845.71	6846.18	0.079440	6.42	30.23	46.45	1.40
2	129	208.00	6844.00	6845.58	6845.75	6846.23	0.078019	6.50	32.02	47.53	1.39
2	129	224.00	6844.00	6845.63	6845.80	6846.28	0.074263	6.51	34.42	48.94	1.37
2	129	109.00	6844.00	6845.27	6845.41	6845.79	0.083677	5.78	18.86	35.78	1.40
2	120.1	124.00	6841.50	6842.66	6842.66	6842.98	0.036064	4.53	27.37	44.21	1.01
2	120.1	157.00	6841.50	6842.77	6842.77	6843.13	0.034554	4.85	32.38	45.77	1.02
2	120.1	170.00	6841.50	6842.82	6842.82	6843.19	0.033218	4.92	34.56	46.44	1.00
2	120.1	194.00	6841.50	6842.88	6842.88	6843.29	0.033189	5.14	37.72	47.38	1.02
2	120.1	208.00	6841.50	6842.93	6842.93	6843.35	0.032585	5.23	39.75	47.97	1.01
2	120.1	224.00	6841.50	6842.97	6842.97	6843.42	0.032321	5.35	41.87	48.59	1.02
2	120.1	109.00	6841.50	6842.60	6842.60	6842.90	0.037165	4.37	24.93	43.44	1.02
2	120	124.00	6841.00	6841.87	6842.16	6842.83	0.147702	7.85	15.79	32.38	1.98
2	120	157.00	6841.00	6841.98	6842.29	6842.99	0.129939	8.09	19.40	34.54	1.90
2	120	170.00	6841.00	6842.02	6842.33	6843.05	0.121334	8.14	20.89	35.27	1.86
2	120	194.00	6841.00	6842.09	6842.42	6843.17	0.111330	8.35	23.24	36.20	1.84
2	120	208.00	6841.00	6842.12	6842.47	6843.23	0.105840	8.44	24.65	36.74	1.82
2	120	224.00	6841.00	6842.17	6842.52	6843.30	0.100450	8.54	26.24	37.34	1.79
2	120	109.00	6841.00	6841.81	6842.09	6842.75	0.161928	7.77	14.02	31.27	2.05
2	110.1	124.00	6837.50	6838.61	6838.61	6838.92	0.037365	4.50	27.57	45.70	1.02
2	110.1	157.00	6837.50	6838.71	6838.71	6839.08	0.035537	4.83	32.48	46.52	1.02
2	110.1	170.00	6837.50	6838.75	6838.75	6839.13	0.034594	4.94	34.44	46.85	1.01
2	110.1	194.00	6837.50	6838.83	6838.83	6839.23	0.033621	5.14	37.77	47.40	1.01
2	110.1	208.00	6837.50	6838.87	6838.87	6839.29	0.032972	5.24	39.72	47.71	1.01
2	110.1	224.00	6837.50	6838.91	6838.91	6839.36	0.032503	5.36	41.83	48.05	1.01
2	110.1	109.00	6837.50	6838.55	6838.55	6838.84	0.038421	4.32	25.21	45.30	1.02
2	110	124.00	6836.70	6837.33	6837.71	6838.70	0.243731	9.40	13.20	30.10	2.50
2	110	157.00	6836.70	6837.44	6837.84	6838.83	0.196901	9.47	16.58	31.87	2.31
2	110	170.00	6836.70	6837.47	6837.88	6838.90	0.190262	9.61	17.70	32.43	2.29
2	110	194.00	6836.70	6837.55	6837.97	6838.98	0.167617	9.60	20.20	33.65	2.18
2	110	208.00	6836.70	6837.58	6838.01	6839.07	0.166924	9.81	21.21	34.13	2.19
2	110	224.00	6836.70	6837.62	6838.07	6839.13	0.158111	9.86	22.72	34.85	2.15
2	110	109.00	6836.70	6837.27	6837.64	6838.64	0.275984	9.37	11.63	29.24	2.62
2	109	124.00	6836.70	6837.89	6837.71	6838.11	0.017061	3.81	32.57	39.15	0.74
2	109	157.00	6836.70	6838.03	6837.84	6838.29	0.016728	4.07	38.55	41.26	0.74
2	109	170.00	6836.70	6838.10	6837.88	6838.37	0.015655	4.10	41.48	41.81	0.73
2	109	194.00	6836.70	6838.23	6837.98	6838.50	0.014161	4.15	46.70	42.77	0.70
2	109	208.00	6836.70	6838.32	6838.02	6838.58	0.012712	4.11	50.64	43.47	0.67
2	109	224.00	6836.70	6838.40	6838.07	6838.67	0.011997	4.13	54.19	44.10	0.66
2	109	109.00	6836.70	6837.82	6837.64	6838.02	0.016813	3.64	29.93	38.05	0.72
2	100	130.00	6834.20	6835.24		6835.41	0.051189	3.38	38.48	42.35	0.62
2	100	166.00	6834.20	6835.44		6835.63	0.050728	3.52	47.16	44.35	0.60
2	100	194.00	6834.20	6835.59		6835.79	0.049552	3.58	54.13	45.90	0.58
2	100	241.00	6834.20	6835.83		6836.04	0.048427	3.69	65.35	48.28	0.56
2	100	274.00	6834.20	6835.96		6836.19	0.049478	3.80	72.02	49.64	0.56
2	100	309.00	6834.20	6836.09		6836.33	0.048759	3.95	78.29	50.76	0.56
2	100	119.00	6834.20	6835.17		6835.34	0.051197	3.32	35.82	41.72	0.63
2	90	130.00	6831.70	6832.85		6833.05	0.013220	3.62	35.94	41.53	0.69
2	90	166.00	6831.70	6832.99		6833.23	0.013451	3.96	41.87	43.11	0.71
2	90	194.00	6831.70	6833.08		6833.36	0.013918	4.23	45.84	44.13	0.73
2	90	241.00	6831.70	6833.22		6833.55	0.014572	4.63	52.04	45.68	0.76
2	90	274.00	6831.70	6833.32		6833.68	0.014537	4.84	56.67	46.81	0.77
2	90	309.00	6831.70	6833.41		6833.81	0.014799	5.07	60.99	47.84	0.79
2	90	119.00	6831.70	6832.80		6832.99	0.013056	3.49	34.09	41.03	0.67

Reach	River Sta.	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
2	80.1	130.00	6829.50	6830.70	6830.70	6831.05	0.046646	4.72	27.55	41.78	1.02
2	80.1	166.00	6829.50	6830.83	6830.83	6831.22	0.044549	5.06	32.81	43.32	1.02
2	80.1	194.00	6829.50	6830.92	6830.92	6831.35	0.041879	5.23	37.10	44.54	1.01
2	80.1	241.00	6829.50	6831.07	6831.07	6831.54	0.039836	5.53	43.55	46.32	1.01
2	80.1	274.00	6829.50	6831.15	6831.15	6831.67	0.039509	5.76	47.58	47.39	1.01
2	80.1	309.00	6829.50	6831.25	6831.25	6831.79	0.038385	5.93	52.08	48.56	1.01
2	80.1	119.00	6829.50	6830.66	6830.66	6830.99	0.048041	4.62	25.77	41.24	1.03
2	80	130.00	6828.00	6829.03	6829.54	6830.77	0.156463	10.59	12.27	19.89	2.38
2	80	166.00	6828.00	6829.17	6829.71	6830.99	0.139701	10.81	15.35	22.15	2.29
2	80	194.00	6828.00	6829.29	6829.83	6831.07	0.121945	10.70	18.13	24.02	2.17
2	80	241.00	6828.00	6829.45	6830.02	6831.29	0.109911	10.87	22.18	26.55	2.09
2	80	274.00	6828.00	6829.56	6830.13	6831.40	0.101256	10.87	25.21	28.36	2.03
2	80	309.00	6828.00	6829.68	6830.24	6831.51	0.093588	10.87	28.44	30.17	1.97
2	80	119.00	6828.00	6828.98	6829.47	6830.68	0.161187	10.47	11.36	19.17	2.40
2	79	130.00	6828.00	6829.44	6829.53	6829.99	0.033820	5.99	21.72	26.26	1.16
2	79	166.00	6828.00	6829.62	6829.71	6830.22	0.031655	6.20	26.79	29.26	1.14
2	79	194.00	6828.00	6829.81	6829.83	6830.36	0.025283	5.92	32.80	32.45	1.04
2	79	241.00	6828.00	6829.99	6830.02	6830.59	0.024793	6.19	38.91	35.41	1.04
2	79	274.00	6828.00	6830.06	6830.13	6830.75	0.027406	6.66	41.11	36.13	1.10
2	79	309.00	6828.00	6830.15	6830.24	6830.90	0.027883	6.95	44.46	37.16	1.12
2	79	119.00	6828.00	6829.40	6829.47	6829.91	0.032313	5.76	20.67	25.60	1.13
2	70.1	130.00	6826.00	6827.60	6827.77	6828.34	0.039701	6.89	18.86	20.59	1.27
2	70.1	166.00	6826.00	6827.88	6828.09	6828.56	0.029832	6.59	25.19	23.73	1.13
2	70.1	194.00	6826.00	6828.17	6828.19	6828.67	0.026249	5.70	34.04	37.09	1.05
2	70.1	241.00	6826.00	6828.29	6828.35	6828.89	0.027635	6.23	38.66	38.62	1.10
2	70.1	274.00	6826.00	6828.40	6828.46	6829.03	0.025705	6.34	43.19	40.06	1.08
2	70.1	309.00	6826.00	6828.51	6828.55	6829.17	0.024770	6.51	47.47	41.37	1.07
2	70.1	119.00	6826.00	6827.59	6827.71	6828.22	0.033843	6.35	18.74	20.53	1.17
2	70	130.00	6826.00	6827.60	6827.78	6828.34	0.038170	6.92	18.78	20.55	1.28
2	70	166.00	6826.00	6827.88	6828.08	6828.56	0.028538	6.61	25.12	23.70	1.13
2	70	194.00	6826.00	6828.17	6828.19	6828.67	0.025820	5.71	33.95	37.06	1.05
2	70	241.00	6826.00	6828.29	6828.34	6828.89	0.027535	6.25	38.55	38.58	1.10
2	70	274.00	6826.00	6828.40	6828.45	6829.03	0.025705	6.36	43.09	40.03	1.08
2	70	309.00	6826.00	6828.51	6828.57	6829.17	0.024816	6.52	47.36	41.34	1.07
2	70	119.00	6826.00	6827.59	6827.71	6828.22	0.032493	6.37	18.67	20.49	1.18
2	65.1	130.00	6825.50	6826.80	6826.80	6827.16	0.021414	4.77	27.23	39.48	1.01
2	65.1	166.00	6825.50	6826.74	6826.94	6827.44	0.045718	6.69	24.83	38.37	1.46
2	65.1	194.00	6825.50	6826.97	6827.03	6827.48	0.025090	5.71	33.97	42.44	1.13
2	65.1	241.00	6825.50	6827.12	6827.18	6827.67	0.023227	5.94	40.57	45.15	1.10
2	65.1	274.00	6825.50	6827.27	6827.27	6827.79	0.019157	5.77	47.50	47.83	1.02
2	65.1	309.00	6825.50	6827.32	6827.37	6827.91	0.021091	6.18	49.97	48.76	1.08
2	65.1	119.00	6825.50	6826.76	6826.76	6827.10	0.021712	4.67	25.51	38.68	1.01
2	65	130.00	6824.30	6825.70	6826.11	6826.98	0.074851	9.08	14.32	20.52	1.92
2	65	166.00	6824.30	6825.83	6826.29	6827.28	0.075027	9.66	17.18	22.48	1.95
2	65	194.00	6824.30	6825.98	6826.42	6827.34	0.061838	9.34	20.77	24.71	1.80
2	65	241.00	6824.30	6826.17	6826.61	6827.53	0.055552	9.39	25.68	28.01	1.73
2	65	274.00	6824.30	6826.30	6826.73	6827.63	0.049977	9.26	29.59	30.41	1.65
2	65	309.00	6824.30	6826.41	6826.84	6827.77	0.048093	9.37	32.97	32.36	1.64
2	65	119.00	6824.30	6825.63	6826.04	6826.94	0.081826	9.18	12.96	19.52	1.99
2	64	130.00	6824.30	6826.02	6826.11	6826.58	0.024966	6.01	21.63	25.27	1.14
2	64	166.00	6824.30	6826.19	6826.29	6826.81	0.024601	6.29	26.38	28.45	1.15
2	64	194.00	6824.30	6826.26	6826.42	6826.99	0.027796	6.83	28.41	29.71	1.23
2	64	241.00	6824.30	6826.42	6826.61	6827.23	0.028578	7.24	33.27	32.52	1.26
2	64	274.00	6824.30	6826.52	6826.72	6827.38	0.028499	7.45	36.79	34.41	1.27
2	64	309.00	6824.30	6826.61	6826.84	6827.54	0.029265	7.73	39.95	36.03	1.29
2	64	119.00	6824.30	6825.98	6826.05	6826.49	0.023558	5.76	20.67	24.66	1.11
2	60.1	130.00	6822.00	6823.52	6823.10	6823.72	0.005555	3.58	36.33	29.70	0.57
2	60.1	166.00	6822.00	6823.70	6823.26	6823.95	0.005879	3.96	41.88	30.58	0.60
2	60.1	194.00	6822.00	6823.83	6823.38	6824.11	0.006170	4.25	45.69	31.17	0.62
2	60.1	241.00	6822.00	6824.01	6823.56	6824.35	0.006615	4.68	51.54	32.09	0.65

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
2	60.1	274.00	6822.00	6823.30	6823.69	6824.59	0.044273	9.12	30.03	28.67	1.57
2	60.1	309.00	6822.00	6823.40	6823.80	6824.77	0.042424	9.38	32.93	29.15	1.56
2	60.1	119.00	6822.00	6823.46	6823.05	6823.65	0.005357	3.43	34.70	29.44	0.56
2	60	130.00	6822.00	6823.52	6823.10	6823.72	0.010684	3.58	36.30	29.70	0.57
2	60	166.00	6822.00	6823.70	6823.26	6823.95	0.011235	3.97	41.85	30.57	0.60
2	60	194.00	6822.00	6823.82	6823.38	6824.10	0.011744	4.25	45.66	31.16	0.62
2	60	241.00	6822.00	6824.01	6823.56	6824.35	0.012526	4.68	51.51	32.08	0.65
2	60	274.00	6822.00	6823.30	6823.68	6824.60	0.087090	9.17	29.86	28.64	1.58
2	60	309.00	6822.00	6823.40	6823.80	6824.78	0.083044	9.43	32.76	29.12	1.57
2	60	119.00	6822.00	6823.46	6823.05	6823.65	0.010310	3.43	34.69	29.43	0.56
2	50.1	130.00	6820.80	6821.62	6821.62	6821.97	0.020660	4.76	27.29	38.23	0.99
2	50.1	166.00	6820.80	6821.75	6821.75	6822.16	0.020234	5.16	32.16	39.15	1.00
2	50.1	194.00	6820.80	6821.84	6821.84	6822.29	0.019400	5.38	36.08	39.87	1.00
2	50.1	241.00	6820.80	6821.99	6821.98	6822.50	0.018874	5.74	41.96	40.93	1.00
2	50.1	274.00	6820.80	6822.09	6822.09	6822.64	0.018718	5.96	45.97	41.81	1.00
2	50.1	309.00	6820.80	6822.19	6822.19	6822.78	0.018501	6.15	50.21	42.73	1.00
2	50.1	119.00	6820.80	6821.57	6821.56	6821.91	0.021671	4.69	25.39	37.87	1.01
2	50	130.00	6820.80	6821.62	6821.62	6821.97	0.026189	4.78	27.19	38.22	1.00
2	50	166.00	6820.80	6821.71	6821.74	6822.16	0.028633	5.38	30.88	38.91	1.06
2	50	194.00	6820.80	6821.81	6821.84	6822.30	0.027040	5.58	34.76	39.63	1.05
2	50	241.00	6820.80	6821.99	6821.99	6822.50	0.023419	5.76	41.88	40.91	1.00
2	50	274.00	6820.80	6822.09	6822.09	6822.64	0.023078	5.97	45.89	41.79	1.00
2	50	309.00	6820.80	6822.14	6822.18	6822.78	0.025302	6.40	48.27	42.31	1.06
2	50	119.00	6820.80	6821.57	6821.57	6821.91	0.027557	4.70	25.30	37.85	1.01
2	40.1	130.00	6819.30	6820.52	6819.88	6820.56	0.002075	1.67	77.88	74.43	0.29
2	40.1	166.00	6819.30	6820.65	6819.97	6820.70	0.002350	1.90	87.52	75.78	0.31
2	40.1	194.00	6819.30	6820.74	6820.04	6820.80	0.002537	2.05	94.41	76.73	0.33
2	40.1	241.00	6819.30	6820.87	6820.13	6820.96	0.002815	2.29	105.04	78.17	0.35
2	40.1	274.00	6819.30	6820.96	6820.20	6821.06	0.002981	2.44	112.07	79.11	0.36
2	40.1	309.00	6819.30	6821.05	6820.26	6821.16	0.003149	2.60	119.06	80.03	0.37
2	40.1	119.00	6819.30	6820.48	6819.85	6820.52	0.001964	1.59	74.91	74.01	0.28
2	40	130.00	6819.30	6820.52		6820.56	0.001256	1.67	78.01	74.95	0.29
2	40	166.00	6819.30	6820.65		6820.70	0.001423	1.89	87.73	76.43	0.31
2	40	194.00	6819.30	6820.74		6820.80	0.001536	2.05	94.68	77.47	0.33
2	40	241.00	6819.30	6820.87		6820.95	0.001704	2.29	105.42	79.05	0.35
2	40	274.00	6819.30	6820.96		6821.06	0.001802	2.43	112.57	80.08	0.36
2	40	309.00	6819.30	6821.05		6821.15	0.001906	2.58	119.65	80.99	0.37
2	40	119.00	6819.30	6820.48		6820.52	0.001189	1.59	75.02	74.49	0.28
2	35	130.00	6818.70	6820.46		6820.50	0.001218	1.57	82.84	79.94	0.27
2	35	166.00	6818.70	6820.58		6820.63	0.001398	1.79	92.63	81.76	0.30
2	35	194.00	6818.70	6820.67		6820.73	0.001521	1.95	99.63	83.03	0.31
2	35	241.00	6818.70	6820.80		6820.87	0.001703	2.18	110.50	84.98	0.34
2	35	274.00	6818.70	6820.88		6820.97	0.001807	2.33	117.82	86.26	0.35
2	35	309.00	6818.70	6820.97		6821.06	0.001911	2.47	125.11	87.52	0.36
2	35	119.00	6818.70	6820.43		6820.46	0.001143	1.49	79.92	79.39	0.26
2	34.1	130.00	6819.20	6820.17	6820.17	6820.37	0.042394	3.64	35.74	81.58	0.97
2	34.1	166.00	6819.20	6820.23	6820.23	6820.49	0.043590	4.04	41.14	82.21	1.01
2	34.1	194.00	6819.20	6820.29	6820.29	6820.57	0.042363	4.25	45.65	82.73	1.01
2	34.1	241.00	6819.20	6820.37	6820.37	6820.70	0.040478	4.56	52.87	83.55	1.01
2	34.1	274.00	6819.20	6820.43	6820.43	6820.78	0.039738	4.76	57.54	84.08	1.01
2	34.1	309.00	6819.20	6820.49	6820.49	6820.87	0.038512	4.94	62.56	84.65	1.01
2	34.1	119.00	6819.20	6820.13	6820.13	6820.33	0.047659	3.64	32.68	81.22	1.01
2	34	130.00	6818.20	6818.53	6818.84	6820.08	0.812195	9.99	13.01	57.47	3.70
2	34	166.00	6818.20	6818.59	6818.94	6820.20	0.635846	10.19	16.29	58.34	3.40
2	34	194.00	6818.20	6818.63	6819.01	6820.29	0.549416	10.35	18.75	58.99	3.23
2	34	241.00	6818.20	6818.70	6819.11	6820.43	0.447121	10.55	22.85	60.04	3.01
2	34	274.00	6818.20	6818.75	6819.19	6820.52	0.398025	10.68	25.65	60.76	2.90
2	34	309.00	6818.20	6818.79	6819.25	6820.62	0.361401	10.85	28.48	61.47	2.81
2	34	119.00	6818.20	6818.52	6818.82	6819.95	0.791841	9.58	12.42	57.32	3.63

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
2	33.9	130.00	6818.20	6818.71	6818.84	6819.19	0.121829	5.58	23.32	60.16	1.58
2	33.9	166.00	6818.20	6818.84	6818.94	6819.27	0.075058	5.26	31.56	62.23	1.30
2	33.9	194.00	6818.20	6818.93	6819.01	6819.36	0.061749	5.24	37.00	63.56	1.21
2	33.9	241.00	6818.20	6819.04	6819.11	6819.50	0.053234	5.42	44.46	65.33	1.16
2	33.9	274.00	6818.20	6819.26	6819.19	6819.60	0.028868	4.67	58.61	68.58	0.89
2	33.9	309.00	6818.20	6819.32	6819.25	6819.69	0.029170	4.90	63.10	69.58	0.91
2	33.9	119.00	6818.20	6818.65	6818.82	6819.21	0.176873	6.05	19.67	59.23	1.85
2	30.1	130.00	6816.80	6817.60	6817.59	6817.87	0.021354	4.22	30.81	54.87	0.99
2	30.1	166.00	6816.80	6817.69	6817.69	6818.02	0.021110	4.60	36.12	56.09	1.01
2	30.1	194.00	6816.80	6817.76	6817.76	6818.13	0.020751	4.83	40.13	56.99	1.02
2	30.1	241.00	6816.80	6817.89	6817.89	6818.29	0.019284	5.10	47.23	58.55	1.00
2	30.1	274.00	6816.80	6817.96	6817.96	6818.40	0.018918	5.31	51.64	59.50	1.00
2	30.1	309.00	6816.80	6818.04	6818.03	6818.51	0.018467	5.50	56.15	60.30	1.01
2	30.1	119.00	6816.80	6817.56	6817.56	6817.82	0.022518	4.15	28.65	54.37	1.01
2	30	130.00	6816.80	6817.59	6817.59	6817.87	0.053758	4.24	30.63	54.83	1.00
2	30	166.00	6816.80	6817.69	6817.69	6818.02	0.052879	4.62	35.96	56.05	1.02
2	30	194.00	6816.80	6817.76	6817.76	6818.13	0.051914	4.86	39.96	56.95	1.02
2	30	241.00	6816.80	6817.85	6817.88	6818.29	0.055834	5.37	44.87	58.03	1.08
2	30	274.00	6816.80	6817.96	6817.96	6818.40	0.047204	5.32	51.47	59.46	1.01
2	30	309.00	6816.80	6818.03	6818.03	6818.51	0.046234	5.52	55.97	60.28	1.01
2	30	119.00	6816.80	6817.55	6817.56	6817.82	0.056764	4.18	28.47	54.33	1.02
2	20	137.00	6814.50	6816.05	6815.36	6816.11	0.002921	1.97	69.68	60.57	0.32
2	20	197.00	6814.50	6816.32	6815.54	6816.40	0.002987	2.28	86.54	63.62	0.34
2	20	244.00	6814.50	6816.51	6815.65	6816.61	0.003004	2.47	98.83	65.76	0.35
2	20	323.00	6814.50	6816.79	6815.84	6816.91	0.003056	2.75	117.56	68.89	0.37
2	20	380.00	6814.50	6816.97	6815.95	6817.10	0.003096	2.92	130.02	70.89	0.38
2	20	437.00	6814.50	6817.13	6816.07	6817.28	0.003134	3.08	141.84	72.74	0.39
2	20	139.00	6814.50	6816.06	6815.37	6816.12	0.002904	1.97	70.42	60.70	0.32
2	15	137.00	6812.00	6816.09		6816.09	0.000011	0.36	389.45	124.03	0.03
2	15	197.00	6812.00	6816.37		6816.37	0.000018	0.48	425.15	128.90	0.04
2	15	244.00	6812.00	6816.57		6816.57	0.000023	0.57	451.04	132.32	0.05
2	15	323.00	6812.00	6816.86		6816.87	0.000031	0.69	490.28	137.34	0.06
2	15	380.00	6812.00	6817.05		6817.06	0.000037	0.78	516.26	140.57	0.06
2	15	437.00	6812.00	6817.22		6817.23	0.000043	0.86	540.75	143.54	0.07
2	15	139.00	6812.00	6816.10		6816.10	0.000011	0.37	390.97	124.24	0.03
2	11	137.00	6815.00	6815.70	6815.70	6816.02	0.020401	4.57	29.97	45.60	0.99
2	11	197.00	6815.00	6815.88	6815.88	6816.29	0.019227	5.13	38.43	47.06	1.00
2	11	244.00	6815.00	6816.01	6816.01	6816.48	0.018888	5.50	44.33	48.12	1.01
2	11	323.00	6815.00	6816.22	6816.22	6816.76	0.017913	5.89	54.86	51.70	1.01
2	11	380.00	6815.00	6816.36	6816.36	6816.94	0.017281	6.11	62.24	54.08	1.00
2	11	437.00	6815.00	6816.49	6816.49	6817.10	0.016805	6.30	69.35	56.27	1.00
2	11	139.00	6815.00	6815.70	6815.70	6816.03	0.021402	4.67	29.79	45.57	1.02
2	9.1	137.00	6812.00	6812.19	6812.49	6813.91	0.997086	10.53	13.01	72.03	4.37
2	9.1	197.00	6812.00	6812.25	6812.62	6814.23	0.805730	11.30	17.43	73.97	4.10
2	9.1	244.00	6812.00	6812.30	6812.71	6814.35	0.659615	11.50	21.23	75.59	3.82
2	9.1	323.00	6812.00	6812.36	6812.83	6814.82	0.633421	12.58	25.67	77.45	3.85
2	9.1	380.00	6812.00	6812.40	6812.93	6815.06	0.595849	13.09	29.03	78.83	3.80
2	9.1	437.00	6812.00	6812.45	6813.01	6815.16	0.522352	13.20	33.11	80.47	3.63
2	9.1	139.00	6812.00	6812.20	6812.49	6813.83	0.902739	10.27	13.54	72.27	4.18
2	9	137.00	6812.00	6812.19	6812.49	6813.83	0.410056	10.28	13.32	72.17	4.22
2	9	197.00	6812.00	6812.26	6812.62	6814.12	0.322601	10.94	18.01	74.22	3.91
2	9	244.00	6812.00	6812.30	6812.70	6814.29	0.277539	11.30	21.59	75.75	3.73
2	9	323.00	6812.00	6812.36	6812.84	6814.78	0.273820	12.47	25.90	77.55	3.80
2	9	380.00	6812.00	6812.41	6812.93	6815.00	0.255153	12.94	29.38	78.97	3.74
2	9	437.00	6812.00	6812.45	6813.01	6815.24	0.243663	13.40	32.60	80.27	3.71
2	9	139.00	6812.00	6812.20	6812.50	6813.76	0.372311	10.03	13.85	72.41	4.04
2	8	137.00	6812.00	6812.32	6812.49	6812.87	0.070506	5.93	23.12	76.39	1.90
2	8	197.00	6812.00	6812.40	6812.62	6813.12	0.072672	6.83	28.84	78.75	1.99
2	8	244.00	6812.00	6812.45	6812.70	6813.31	0.075397	7.47	32.68	80.30	2.06
2	8	323.00	6812.00	6812.49	6812.84	6813.73	0.096464	8.93	36.16	81.67	2.37

Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
2	8	380.00	6812.00	6812.54	6812.93	6813.94	0.097531	9.49	40.02	83.17	2.41
2	8	437.00	6812.00	6812.58	6813.01	6814.15	0.100661	10.07	43.38	84.45	2.48
2	8	139.00	6812.00	6812.34	6812.49	6812.86	0.064030	5.78	24.05	76.78	1.82
2	7	137.00	6809.00	6810.04	6810.04	6810.49	0.019177	5.37	25.49	28.93	1.01
2	7	197.00	6809.00	6810.30	6810.30	6810.85	0.017930	5.91	33.34	31.17	1.01
2	7	244.00	6809.00	6810.48	6810.48	6811.09	0.017460	6.26	38.95	32.68	1.01
2	7	323.00	6809.00	6810.75	6810.75	6811.45	0.016445	6.69	48.28	35.04	1.00
2	7	380.00	6809.00	6810.93	6810.93	6811.68	0.016063	6.97	54.52	36.53	1.01
2	7	437.00	6809.00	6811.09	6811.09	6811.90	0.015691	7.21	60.63	37.94	1.00
2	7	139.00	6809.00	6810.06	6810.06	6810.50	0.018824	5.37	25.90	29.05	1.00
2	5	137.00	6798.00	6798.30	6799.04	6805.44	2.330594	21.44	6.39	22.97	7.17
2	5	197.00	6798.00	6798.40	6799.28	6806.17	1.753217	22.36	8.81	24.00	6.51
2	5	244.00	6798.00	6798.50	6799.46	6805.88	1.279023	21.81	11.19	24.98	5.74
2	5	323.00	6798.00	6798.62	6799.72	6806.51	1.049509	22.55	14.33	26.20	5.37
2	5	380.00	6798.00	6798.69	6799.89	6807.20	0.993479	23.41	16.23	26.92	5.31
2	5	437.00	6798.00	6798.78	6800.05	6807.40	0.879256	23.57	18.54	27.76	5.08
2	5	139.00	6798.00	6798.31	6799.04	6805.10	2.115841	20.91	6.65	23.09	6.87
2	3	137.00	6786.00	6788.58	6787.02	6788.62	0.000951	1.50	91.57	50.97	0.20
2	3	197.00	6786.00	6788.72	6787.26	6788.78	0.001596	2.00	98.72	52.63	0.26
2	3	244.00	6786.00	6788.81	6787.42	6788.90	0.002145	2.36	103.58	53.72	0.30
2	3	323.00	6786.00	6788.94	6787.68	6789.07	0.003136	2.92	110.63	55.27	0.36
2	3	380.00	6786.00	6789.02	6787.84	6789.19	0.003870	3.29	115.34	56.29	0.41
2	3	437.00	6786.00	6789.10	6787.99	6789.31	0.004623	3.65	119.69	57.21	0.44
2	3	139.00	6786.00	6788.59	6787.02	6788.62	0.000971	1.51	91.82	51.03	0.20
2	1	137.00	6788.00	6788.47	6788.31	6788.54	0.005005	2.08	65.79	143.53	0.54
2	1	197.00	6788.00	6788.58	6788.40	6788.67	0.005006	2.40	82.22	145.35	0.56
2	1	244.00	6788.00	6788.66	6788.46	6788.77	0.005001	2.60	93.84	146.63	0.57
2	1	323.00	6788.00	6788.78	6788.55	6788.91	0.004999	2.89	111.64	148.55	0.59
2	1	380.00	6788.00	6788.86	6788.62	6789.01	0.004997	3.08	123.51	149.83	0.60
2	1	437.00	6788.00	6788.94	6788.67	6789.10	0.004997	3.24	134.75	151.02	0.61
2	1	139.00	6788.00	6788.48	6788.32	6788.54	0.004994	2.09	66.42	143.60	0.54

REACH NO. 2

HEC-RAS IMPROVED CONDITION MODEL

DROPS MODELED AS WEIRS

PCCSV.rep

HEC-RAS September 1998 Version 2.2
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

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

PROJECT DATA
Project Title: PINE CREEK CHANNEL 2003
Project File : PCCSV.prj
Run Date and Time: 2/25/2003 1:40:22 PM

Project in English units

PLAN DATA

Plan Title: Plan 17
Plan File : x:\2870000.all\2871611\HYDRO\HECRAS\PCCSV.p17

Geometry Title: WEIR SECTIONS 2002
Geometry File : x:\2870000.all\2871611\HYDRO\HECRAS\PCCSV.g03

Flow Title : 2003 FLOW DATA
Flow File : x:\2870000.all\2871611\HYDRO\HECRAS\PCCSV.f01

Plan Summary Information:
Number of: Cross Sections = 54 Mulitple Openings = 0
Culverts = 0 Inline Weirs = 16
Bridges = 0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculaton tolerance = 0.01
Maximum number of interations = 20
Maximum difference tolerance = 0.3
Flow tolerance factor = 0.001

Computation Options
Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Mixed Flow

FLOW DATA

Flow Title: 2003 FLOW DATA
Flow File : x:\2870000.all\2871611\HYDRO\HECRAS\PCCSV.f01

Flow Data (cfs)

River	Reach	RS	2-yr PF 1	5-yr PF 2	10-yr PF 3	25-yr PF 4	50-yr PF 5	100-yr PF 6	DOM. PF 7
PINE CREEK N	2	290	124	157	170	194	208	224	109
PINE CREEK N	2	100	130	166	194	241	274	309	119
PINE CREEK N	2	20	137	197	244	323	380	437	139

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
PINE CREEK N	2	PF 1	Normal S = .02	Normal S = .005

GEOMETRY DATA

Geometry Title: WEIR SECTIONS 2002
Geometry File : x:\2870000.all\2871611\HYDRO\HECRAS\PCCSV.g03

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 290

INPUT
Description: JUST DOWN STREAM OF DF "F" OUTFALL
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
53	6910	79	6904	86	6903	114	6903	123	6904
143	6910								

Manning's n Values num= 1

Sta	n Val
53	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
53	143	30	40	54	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 280

INPUT

Description:
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
30	6908.5	47	6908	57	6906	64	6904	73	6902.2
117	6908								

Manning's n Values num= 1

Sta	n Val
30	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
30	117	30	45	55	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 275

INPUT
Description:
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
55	6906	66	6904	73	6902	82	6900	100	6900
117	6900.2	122	6902	126	6904	132	6906		

Manning's n Values num= 1

Sta	n Val
55	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
55	132	100	125	145	.1	.3

INLINE WEIR RIVER: PINE CREEK N
REACH: 2 RS: 274

INPUT
Description:
Distance from Upstream XS = .1
Deck/Roadway Width = 2
Weir Coefficient = 3
Bridge Deck/Roadway Skew =
Weir Embankment Coordinates num = 2

Sta	Elev	Sta	Elev
72	6902	123	6902

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins = 6902
Weir crest shape = Broad Crested

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 270

INPUT
Description:
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
46	6906	70	6898	73	6896	108	6896	125	6898
140	6900	146	6901.5	175	6902	196	6904	215	6906

```
Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
      46     .06       73     .03      108     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
            46     215               280     225     180             .1       .3

INLINE WEIR             RIVER: PINE CREEK N
REACH: 2                   RS: 269.9

INPUT
Description:
Distance from Upstream XS =       .1
Deck/Roadway Width        =        2
Weir Coefficient          =        3
Bridge Deck/Roadway Skew  =
 Weir Embankment Coordinates    num =         2
     Sta     Elev      Sta     Elev
      70     6898      125     6898

Upstream Embankment side slope                =       0 horiz. to 1.0 vertical
Downstream Embankment side slope              =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =      .95
Elevation at which weir flow begins           =    6898
Weir crest shape                              = Broad Crested


CROSS SECTION           RIVER: PINE CREEK N
REACH: 2                   RS: 260

INPUT
Description: EXIST'G POND  PROPOSED SPILLWAY
Station Elevation Data    num=        7
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
      72     6902       75     6899       84     6896      100     6896      116     6896
     125     6899      128     6902

Manning's n Values          num=        1
     Sta   n Val
      72     .075

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
            72     125               45      60      68             .1       .3

CROSS SECTION           RIVER: PINE CREEK N
REACH: 2                   RS: 250

INPUT
Description: IN RUN DOWN
Station Elevation Data    num=        4
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
     174     6891    184.5     6888    215.5     6888      236     6891

Manning's n Values          num=        1
     Sta   n Val
     174     .075

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
```

	174	236		48	50	50		.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 240

INPUT
Description: SPLASH POOL
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
66	6886	72	6884	78	6882	88	6880	91	6879
117	6879	120	6880	130	6882	136	6884	142	6886

Manning's n Values num= 1

Sta	n Val
66	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
66	142	25	25	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 235

INPUT
Description: END OF SPLASH POOL
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
63	6886	75	6884	79	6882	85	6881.2	125	6881.2
129	6882	134	6884	140	6886				

Manning's n Values num= 1

Sta	n Val
63	.07

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
63	140	103	102	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 230

INPUT
Description:
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
60	6888	73	6884	78	6880	86	6878	100	6877.2
104	6878	120	6880	138	6888				

Manning's n Values num= 1

Sta	n Val
60	.07

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
86	104	220	225	240	.1	.3

INLINE WEIR RIVER: PINE CREEK N
REACH: 2 RS: 229

INPUT
Description:
Distance from Upstream XS = .1

```
Deck/Roadway Width          =        2
Weir Coefficient            =        3
Bridge Deck/Roadway Skew    =
 Weir Embankment Coordinates    num =         2
     Sta     Elev      Sta     Elev
      78     6879      113     6879

Upstream Embankment side slope               =        0 horiz. to 1.0 vertical
Downstream Embankment side slope             =        0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow  =      .95
Elevation at which weir flow begins          =     6879
Weir crest shape                             = Broad Crested


CROSS SECTION           RIVER: PINE CREEK N
REACH: 2                   RS: 220

INPUT
Description:
Station Elevation Data     num=       10
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
      95     6880      170     6880      183     6874      190     6872      200   6870.9
     220     6872      231     6876      235   6876.9      252     6876      281     6880

Manning's n Values         num=        3
     Sta    n Val      Sta    n Val      Sta    n Val
      95     .032      170      .05      235     .032

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.    Expan.
           183     252                  25       25       25              .1       .3

INLINE WEIR             RIVER: PINE CREEK N
REACH: 2                   RS: 219

INPUT
Description:
Distance from Upstream XS =       .1
Deck/Roadway Width        =        2
Weir Coefficient          =        3
Bridge Deck/Roadway Skew  =
 Weir Embankment Coordinates    num =         2
     Sta     Elev      Sta     Elev
     181     6874      227     6874

Upstream Embankment side slope               =        0 horiz. to 1.0 vertical
Downstream Embankment side slope             =        0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow  =      .95
Elevation at which weir flow begins          =     6874
Weir crest shape                             = Broad Crested


CROSS SECTION           RIVER: PINE CREEK N
REACH: 2                   RS: 217

INPUT
Description:
Station Elevation Data     num=        6
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
      73     6875       87     6870       96   6869.6      105     6870      118     6874
```

```
    126    6875

Manning's n Values        num=       1
     Sta   n Val
      73     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           73     126               33      31      23            .1        .3

CROSS SECTION          RIVER: PINE CREEK N
REACH: 2                  RS: 215

INPUT
Description: SECTION D
Station Elevation Data    num=       7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
      70    6874      74    6872      78    6870     100  6868.7     107    6870
     120    6872     138    6874

Manning's n Values        num=       1
     Sta   n Val
      70    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           70     120               60      50      45            .1        .3

INLINE WEIR            RIVER: PINE CREEK N
REACH: 2                  RS: 214

INPUT
Description:
Distance from Upstream XS =       .1
Deck/Roadway Width        =       2
Weir Coefficient          =       3
Bridge Deck/Roadway Skew  =
 Weir Embankment Coordinates    num =        2
     Sta    Elev     Sta    Elev
      74    6871     115    6871

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =    6871
Weir crest shape                            = Broad Crested


CROSS SECTION          RIVER: PINE CREEK N
REACH: 2                  RS: 213

INPUT
Description:
Station Elevation Data    num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
      68    6874      70    6872      74    6870      79    6868      93    6866
     100  6865.8     105    6866     118    6870     125    6872     139    6874

Manning's n Values        num=       1
     Sta   n Val
      68    .045
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
            68     139                73      70      70             .1      .3

INLINE WEIR            RIVER: PINE CREEK N
REACH: 2                  RS: 212.9

INPUT
Description:
Distance from Upstream XS =       .1
Deck/Roadway Width        =       2
Weir Coefficient          =       3
Bridge Deck/Roadway Skew  =
 Weir Embankment Coordinates    num =        2
     Sta     Elev      Sta     Elev
      77     6868      113     6868

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =    6868
Weir crest shape                            = Broad Crested


CROSS SECTION          RIVER: PINE CREEK N
REACH: 2                  RS: 212

INPUT
Description:
Station Elevation Data    num=      11
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
      68     6872       73     6870       76     6868       82     6866       87     6864
     100   6862.7      114     6864      119     6866      127     6868      134     6870
     143     6872

Manning's n Values        num=       1
     Sta    n Val
      68     .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
            68     143                32      32      32             .1      .3

INLINE WEIR            RIVER: PINE CREEK N
REACH: 2                  RS: 211.9

INPUT
Description:
Distance from Upstream XS =       .1
Deck/Roadway Width        =       2
Weir Coefficient          =       3
Bridge Deck/Roadway Skew  =
 Weir Embankment Coordinates    num =        2
     Sta     Elev      Sta     Elev
      84   6864.5      117   6864.5

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =  6864.5
```

Weir crest shape = Broad Crested

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 210

INPUT
Description:
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
70	6870	75	6868	80	6866	85	6864	110	6862
120	6864	126	6866	132	6868	137	6870		

Manning's n Values num= 1

Sta	n Val
70	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
75	132	127	129	135	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 200

INPUT
Description:
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
103	6862	109	6860.2	123	6860.2	126	6860	135	6857.8
142	6858	156	6860	183	6862				

Manning's n Values num= 1

Sta	n Val
103	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
103	183	66	80	86	.1	.3

INLINE WEIR RIVER: PINE CREEK N
REACH: 2 RS: 199.9

INPUT
Description:
Distance from Upstream XS = .1
Deck/Roadway Width = 2
Weir Coefficient = 3
Bridge Deck/Roadway Skew =
Weir Embankment Coordinates num = 2

Sta	Elev	Sta	Elev
123	6860	158	6860

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins = 6860
Weir crest shape = Broad Crested

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 190

```
INPUT
Description:
Station Elevation Data    num=      10
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
     113     6860      116     6858      140   6857.6      150     6858      156     6858
     164     6856      172   6855.5      179     6856      187     6858      210     6860

Manning's n Values        num=      1
     Sta    n Val
     113     .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.    Expan.
           113     187                52      62      70             .1       .3

CROSS SECTION          RIVER: PINE CREEK N
REACH: 2                  RS: 180

INPUT
Description:
Station Elevation Data    num=      9
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
     125     6860      133     6858      155     6856      170     6855      187     6855
     212   6854.3      218     6856      243     6858      253     6860

Manning's n Values        num=      1
     Sta    n Val
     125     .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.    Expan.
           133     243                50      64      78             .1       .3

INLINE WEIR            RIVER: PINE CREEK N
REACH: 2                  RS: 179.9

INPUT
Description:
Distance from Upstream XS =       .1
Deck/Roadway Width        =       2
Weir Coefficient          =       3
Bridge Deck/Roadway Skew  =
 Weir Embankment Coordinates    num =        2
     Sta     Elev      Sta     Elev
     153     6856      222     6856

Upstream Embankment side slope             =       0 horiz. to 1.0 vertical
Downstream Embankment side slope           =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins        =    6856
Weir crest shape                           = Broad Crested


CROSS SECTION          RIVER: PINE CREEK N
REACH: 2                  RS: 170

INPUT
Description:
Station Elevation Data    num=      8
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
```

100	6858	106	6856	113	6854	117	6852	140	6851.8
166	6852	173	6854	200	6856				

Manning's n Values num= 2

Sta	n Val	Sta	n Val
100	.045	173	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
100	200	88	100	112	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 160

INPUT
Description:
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
34	6858	40	6856	62	6852	80	6851	110	6851
135	6852	170	6854	179	6856	184	6858		

Manning's n Values num= 1

Sta	n Val
34	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
40	179	48	50	60	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 150

INPUT
Description:
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
56	6856	68	6854	76	6851.5	90	6850	100	6849.9
117	6850	124	6850.8	130	6852	149	6856		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
56	.04	90	.04	124	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
56	149	105	95	80	.1	.3

INLINE WEIR RIVER: PINE CREEK N
REACH: 2 RS: 149.9

INPUT
Description:
Distance from Upstream XS = .1
Deck/Roadway Width = 2
Weir Coefficient = 3
Bridge Deck/Roadway Skew =
Weir Embankment Coordinates num = 2

Sta	Elev	Sta	Elev
79	6851	127	6851

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical

Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins = 6851
Weir crest shape = Broad Crested

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 140.1

INPUT
Description: (N CHANGE BNDY)
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
63	6852	71	6850	73	6849.7	100	6848.6	126	6848.6
141	6850	156	6852						

Manning's n Values num= 2

Sta	n Val	Sta	n Val
63	.035	73	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
63	156	.1	.1	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 140

INPUT
Description:
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
63	6852	71	6850	73	6849.7	100	6848.6	126	6848.6
141	6850	156	6852						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
63	.035	71	.07	126	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
63	156	138	124	105	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 130.1

INPUT
Description: (N CHANGE BNDY)
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
63	6850	68	6848	81	6844	100	6845	119	6845.4
134	6846	150	6848	180	6850				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
63	.035	81	.06	134	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
68	150	.1	.1	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 130

INPUT
Description:
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
63	6850	68	6848	81	6844	100	6845	119	6845.4
134	6846	150	6848	180	6850				

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
63	.035	81	.05	119	.055	150	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
68	150	94	110	126	.1	.3

INLINE WEIR RIVER: PINE CREEK N
REACH: 2 RS: 129

INPUT
Description:
Distance from Upstream XS = .1
Deck/Roadway Width = 2
Weir Coefficient = 3
Bridge Deck/Roadway Skew =
Weir Embankment Coordinates num = 2

Sta	Elev	Sta	Elev
71	6846	136	6846

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins = 6846
Weir crest shape = Broad Crested

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 120.1

INPUT
Description: (N CHANGE BNDY)
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
30	6845	67	6844	82	6842	85	6841.8	100	6841
115	6841.6	117	6842	130	6844	135	6845		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
30	.35	67	.055	82	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
67	130	.1	.1	.1	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 120

INPUT
Description:
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
30	6845	67	6844	82	6842	85	6841.8	100	6841

115	6841.6	117	6842	130	6844	135	6845

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
30	.035	67	.035	82	.045	117	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
67	130	100	145	160	.1	.3

INLINE WEIR RIVER: PINE CREEK N
REACH: 2 RS: 119

INPUT
Description:
Distance from Upstream XS = .1
Deck/Roadway Width = 2
Weir Coefficient = 3
Bridge Deck/Roadway Skew =
Weir Embankment Coordinates num = 2

Sta	Elev	Sta	Elev
80	6842	119	6842

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins = 6842
Weir crest shape = Broad Crested

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 110

INPUT
Description:
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
67	6842	80	6838	88	6837	100	6836.7	112	6836.9
121	6838	130	6840	162	6842				

Manning's n Values num= 2

Sta	n Val	Sta	n Val
67	.045	88	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
67	162	110	102	80	.1	.3

INLINE WEIR RIVER: PINE CREEK N
REACH: 2 RS: 109.9

INPUT
Description:
Distance from Upstream XS = .1
Deck/Roadway Width = 2
Weir Coefficient = 3
Bridge Deck/Roadway Skew =
Weir Embankment Coordinates num = 2

Sta	Elev	Sta	Elev
74	6838	124	6838

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins = 6838
Weir crest shape = Broad Crested

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 100

INPUT
Description:
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
65	6842	77	6836	84	6834.2	100	6834.2	116	6834.2
127	6836	140	6838	165	6840	187	6842		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
65	.35	84	.045	116	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
77	127	107	102	97	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 90

INPUT
Description:
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
63	6840	69	6836	84	6832	100	6831.7	116	6832
131	6834	147	6836	157	6838	170	6840		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
63	.035	84	.045	116	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
69	147	87	89	95	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 80.1

INPUT
Description: (N CHANGE BNDY)
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
68	6836	74	6834	80	6832	93	6830	100	6829.4
115	6828	119	6828	138	6832	144	6834	148	6836

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
68	.035	80	.045	119	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
74	144	.1	.1	.1	.1	.3

CROSS SECTION RIVER: PINE CREEK N

REACH: 2 RS: 80

INPUT
Description:
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
68	6836	74	6834	80	6832	93	6830	100	6829.4
115	6828	119	6828	138	6832	144	6834	148	6836

Manning's n Values num= 2

Sta	n Val	Sta	n Val
68	.035	80	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
74	144	58	70	70	.1	.3

INLINE WEIR RIVER: PINE CREEK N
REACH: 2 RS: 79.9

INPUT
Description:
Distance from Upstream XS = .1
Deck/Roadway Width = 2
Weir Coefficient = 3
Bridge Deck/Roadway Skew =
Weir Embankment Coordinates num = 2

Sta	Elev	Sta	Elev
90	6830	132	6830

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins = 6830
Weir crest shape = Broad Crested

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 70.1

INPUT
Description: (N CHANGE BNDY)
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
32	6834	70	6830	80	6828	90	6828	107	6826
110	6826	115	6828	130	6830	153	6834		

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
32	.035	80	.04	130	.035	153	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
70	130	.1	.1	.1	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 70

INPUT
Description:
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
32	6834	70	6830	80	6828	90	6828	107	6826
110	6826	115	6828	130	6830	153	6834		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
32	.035	70	.04	110	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
70	130	55	55	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 65

INPUT
Description:
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
67	6832	75	6830	80	6828	90	6826	100	6824.3
115	6826	141	6828	154	6830	165	6832		

Manning's n Values num= 1

Sta	n Val
67	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
80	141	85	83	.1	.3

INLINE WEIR RIVER: PINE CREEK N
REACH: 2 RS: 64.9

INPUT
Description:
Distance from Upstream XS = .1
Deck/Roadway Width = 2
Weir Coefficient = 3
Bridge Deck/Roadway Skew =
Weir Embankment Coordinates num = 2

Sta	Elev	Sta	Elev
88	6826	116	6826

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins = 6826
Weir crest shape = Broad Crested

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 60.1

INPUT
Description: (N CHANGE BNDY)
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
72	6830	84	6824	88	6822.5	100	6822	112	6822.1
116	6824	154	6830						

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
72	.035	88	.035	112	.035	154	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
84	116	.1	.1	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 60

INPUT
Description:
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
72	6830	84	6824	88	6822.5	100	6822	112	6822.1
116	6824	154	6830						

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
72	.035	84	.05	112	.035	154	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
84	116	123	120	121	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 50.1

INPUT
Description: (N CHANGE BNDY)
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
57	6826	76	6822	83	6820.9	100	6820.8	116	6820.9
117	6822	126	6824	134	6826				

Manning's n Values num= 2

Sta	n Val	Sta	n Val
57	.035	116	.055

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
57	126	.1	.1	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 50

INPUT
Description:
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
57	6826	76	6822	83	6820.9	100	6820.8	116	6820.9
117	6822	126	6824	134	6826				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
57	.035	83	.04	116	.055

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
57	126	112	116	121	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 40.1

INPUT
Description: (N CHANGE BNDY)
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
26	6826	54	6822	68	6820	71	6819.3	100	6819.3
129	6819.5	137	6820	151	6824	157	6826		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
26	.035	71	.04	129	.055

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
54	151	.1	.1	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 40

INPUT
Description:
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
26	6826	54	6822	60	6821	68	6820	71	6819.3
100	6819.3	129	6819.5	137	6820	151	6824	157	6826

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
26	.06	54	.045	60	.032	129	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
54	151	42	47	52	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 35

INPUT
Description: SECTION C
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
50	6822	68	6820	100	6818.7	141	6820	153	6822

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
50	.05	68	.035	141	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
50	153	36	33	25	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 34

INPUT
Description:
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
25	6824	50	6820	63	6818.2	117	6818.4	130	6820
143	6824								

Manning's n Values num= 2

Sta	n Val	Sta	n Val
25	.05	63	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
25	143	56	56	.1	.3

INLINE WEIR RIVER: PINE CREEK N
REACH: 2 RS: 33

INPUT
Description:
Distance from Upstream XS = .1
Deck/Roadway Width = 2
Weir Coefficient = 3
Bridge Deck/Roadway Skew =
Weir Embankment Coordinates num = 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
50	6820	60	6819.7	85	6819.7	120	6819.7	130	6820

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins = 6819.7
Weir crest shape = Broad Crested

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 30.1

INPUT
Description: (N CHANGE BNDY)
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
51	6822	60	6820	70	6818	75	6817.1	100	6816.8
125	6817.3	130	6818	137	6820	147	6822		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
51	.035	60	.055	70	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
60	137	.1	.1	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 30

INPUT
Description:
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
51	6822	60	6820	70	6818	75	6817.1	100	6816.8
125	6817.3	130	6818	137	6820	147	6822		

Manning's n Values num= 2

Sta	n Val	Sta	n Val
51	.035	60	.055

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
51	137	72	72	73	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 20

INPUT
Description:
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
49	6820	71	6816	79	6814.6	100	6814.9	121	6814.5
131	6816	154	6820						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
49	.035	71	.045	131	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
49	154	67	61	50	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 15

INPUT
Description: EXISTING SMALL POND
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	6818	26	6816	40	6814	44	6812	100	6812
140	6814	157	6818						

Manning's n Values num= 2

Sta	n Val	Sta	n Val
0	.032	26	.032

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
40	140	48	44	40	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 11

INPUT
Description: CONCRETE GRADE CONTROL STRUCTURE 25.5
Station Elevation Data num= 7

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
42	6820	50	6818	77	6816	80	6815	120	6815
125	6816	139	6820						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
42	.035	42	.035	139	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
42	139	30	30	30	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 9.1

INPUT
Description: END OF RIPRAP RUNDOWN 25.4
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

28	6820	37	6818	45	6816	65	6812	131	6812
185	6814	200	6816	205	6818	210	6820		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
28	.045	45	.045	185	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
45	185	.1	.1	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 9

INPUT
Description: END OF RIPRAP RUNDOWN 25.4
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
28	6820	37	6818	45	6816	65	6812	131	6812
185	6814	200	6816	210	6820				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
28	.03	45	.03	185	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
45	185	120	155	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 7

INPUT
Description: RUNDOWN 25.3
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
60	6816	90	6809	110	6809	140	6816

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
60	.035	60	.035	140	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
60	140	62	62	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 5

INPUT
Description: RUNDOWN 25.2
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
75	6801	90	6798	110	6798	125	6801

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
75	.035	75	.045	125	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
75	125	60	60	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 3

INPUT
Description: DF "E" BOTTOM OF RUNDOWN
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
60	6791	90	6786	110	6786	140	6791

Manning's n Values num= 1

Sta	n Val
60	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
60	140	40	40	.1	.3

CROSS SECTION RIVER: PINE CREEK N
REACH: 2 RS: 1

INPUT
Description: BOTTOM OF DF "E"
Station Elevation Data num= 4

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
30	6792	48	6788	184	6788	230	6792

Manning's n Values num= 1

Sta	n Val
30	.03

Bank Sta: Left	Right	Coeff Contr.	Expan.
30	230	.1	.3

SUMMARY OF MANNING'S N VALUES

River:PINE CREEK N

Reach	River Sta.	n1	n2	n3	n4
2	290	.06			
2	280	.06			
2	275	.06			
2	274	Inline Weir			
2	270	.06	.03	.06	
2	269.9	Inline Weir			
2	260	.075			
2	250	.075			
2	240	.045			
2	235	.07			
2	230	.07			
2	229	Inline Weir			
2	220	.032	.05	.032	
2	219	Inline Weir			
2	217	.05			
2	215	.045			
2	214	Inline Weir			
2	213	.045			
2	212.9	Inline Weir			

2	212	.045			
2	211.9	Inline Weir			
2	210	.045			
2	200	.045			
2	199.9	Inline Weir			
2	190	.045			
2	180	.045			
2	179.9	Inline Weir			
2	170	.045	.03		
2	160	.045			
2	150	.04	.04	.04	
2	149.9	Inline Weir			
2	140.1	.035	.04		
2	140	.035	.07	.035	
2	130.1	.035	.06	.035	
2	130	.035	.05	.055	.035
2	129	Inline Weir			
2	120.1	.35	.055	.045	
2	120	.035	.035	.045	.035
2	119	Inline Weir			
2	110	.045	.045		
2	109.9	Inline Weir			
2	100	.35	.045	.035	
2	90	.035	.045	.035	
2	80.1	.035	.045	.06	
2	80	.035	.04		
2	79.9	Inline Weir			
2	70.1	.035	.04	.035	.035
2	70	.035	.04	.035	
2	65	.035			
2	64.9	Inline Weir			
2	60.1	.035	.035	.035	.035
2	60	.035	.05	.035	.035
2	50.1	.035	.055		
2	50	.035	.04	.055	
2	40.1	.035	.04	.055	
2	40	.06	.045	.032	.035
2	35	.05	.035	.03	
2	34	.05	.035		
2	33	Inline Weir			
2	30.1	.035	.055	.035	
2	30	.035	.055		
2	20	.035	.045	.035	
2	15	.032	.032		
2	11	.035	.035	.035	
2	9.1	.045	.045	.045	
2	9	.03	.03	.03	
2	7	.035	.035	.035	
2	5	.035	.045	.035	
2	3	.045			
2	1	.03			

SUMMARY OF REACH LENGTHS

River: PINE CREEK N

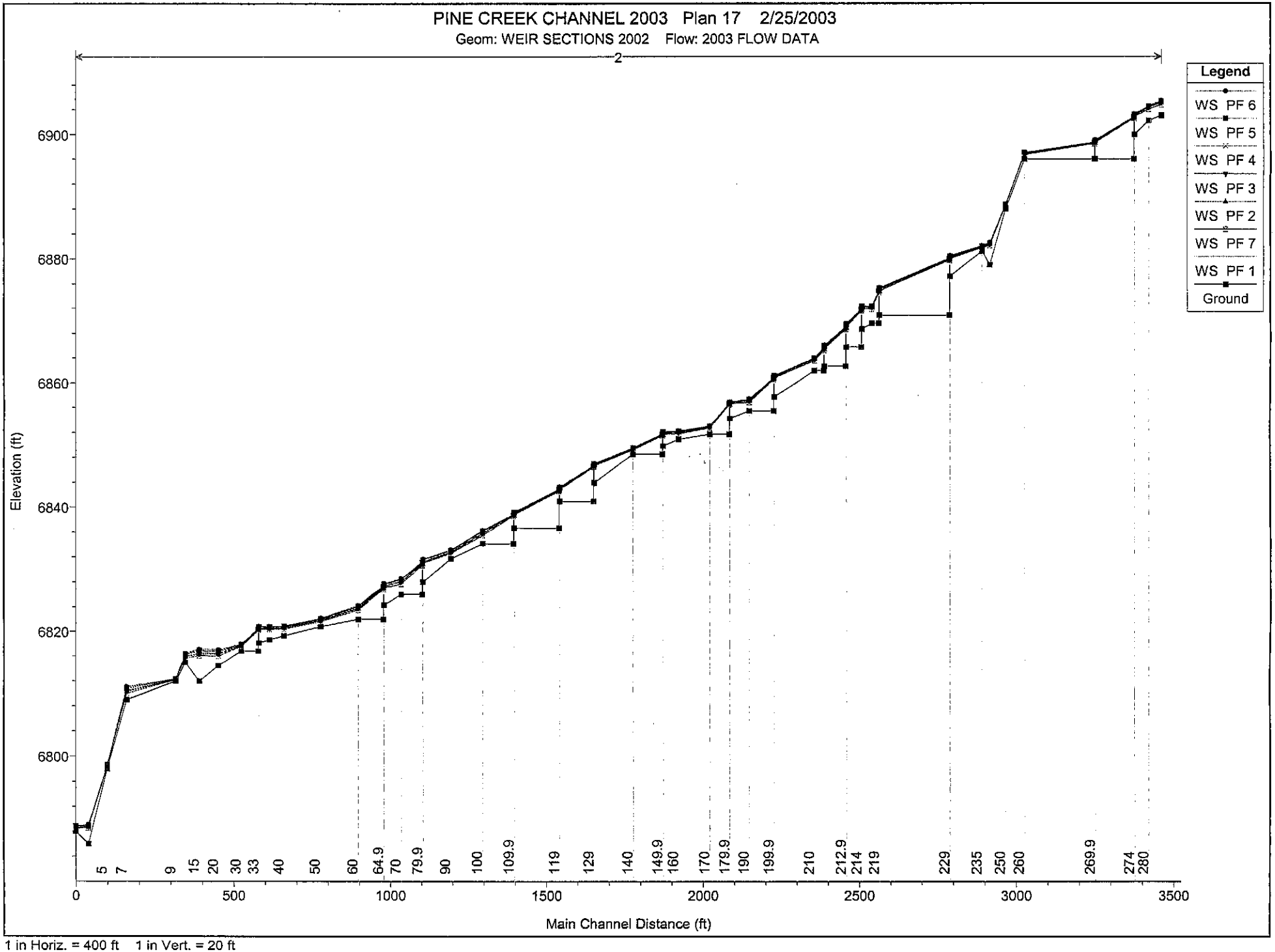
Reach	River Sta.	Left	Channel	Right
2	290	30	40	54
2	280	30	45	55
2	275	100	125	145
2	274	Inline Weir		
2	270	280	225	180
2	269.9	Inline Weir		
2	260	45	60	68
2	250	48	50	50
2	240	25	25	25
2	235	103	102	100
2	230	220	225	240
2	229	Inline Weir		
2	220	25	25	25
2	219	Inline Weir		
2	217	33	31	23
2	215	60	50	45
2	214	Inline Weir		
2	213	73	70	70
2	212.9	Inline Weir		
2	212	32	32	32
2	211.9	Inline Weir		
2	210	127	129	135
2	200	66	80	86
2	199.9	Inline Weir		
2	190	52	62	70
2	180	50	64	78
2	179.9	Inline Weir		
2	170	88	100	112
2	160	48	50	60
2	150	105	95	80
2	149.9	Inline Weir		
2	140.1	.1	.1	.1
2	140	138	124	105
2	130.1	.1	.1	.1
2	130	94	110	126
2	129	Inline Weir		
2	120.1	.1	.1	.1
2	120	100	145	160
2	119	Inline Weir		
2	110	110	102	80
2	109.9	Inline Weir		
2	100	107	102	97
2	90	87	89	95
2	80.1	.1	.1	.1
2	80	58	70	70
2	79.9	Inline Weir		
2	70.1	.1	.1	.1
2	70	55	55	55
2	65	85	83	60
2	64.9	Inline Weir		
2	60.1	.1	.1	.1
2	60	123	120	121
2	50.1	.1	.1	.1
2	50	112	116	121
2	40.1	.1	.1	.1
2	40	42	47	52
2	35	36	33	25

2	34	56	56	56
2	33	Inline Weir		
2	30.1	.1	.1	.1
2	30	72	72	73
2	20	67	61	50
2	15	48	44	40
2	11	30	30	30
2	9.1	.1	.1	.1
2	9	120	155	195
2	7	62	62	62
2	5	60	60	60
2	3	40	40	40
2	1			

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: PINE CREEK N

Reach	River Sta.	Contr.	Expan.
2	290	.1	.3
2	280	.1	.3
2	275	.1	.3
2	274	Inline Weir	
2	270	.1	.3
2	269.9	Inline Weir	
2	260	.1	.3
2	250	.1	.3
2	240	.1	.3
2	235	.1	.3
2	230	.1	.3
2	229	Inline Weir	
2	220	.1	.3
2	219	Inline Weir	
2	217	.1	.3
2	215	.1	.3
2	214	Inline Weir	
2	213	.1	.3
2	212.9	Inline Weir	
2	212	.1	.3
2	211.9	Inline Weir	
2	210	.1	.3
2	200	.1	.3
2	199.9	Inline Weir	
2	190	.1	.3
2	180	.1	.3
2	179.9	Inline Weir	
2	170	.1	.3
2	160	.1	.3
2	150	.1	.3
2	149.9	Inline Weir	
2	140.1	.1	.3
2	140	.1	.3
2	130.1	.1	.3
2	130	.1	.3
2	129	Inline Weir	

2	120.1	.1	.3
2	120	.1	.3
2	119	Inline Weir	
2	110	.1	.3
2	109.9	Inline Weir	
2	100	.1	.3
2	90	.1	.3
2	80.1	.1	.3
2	80	.1	.3
2	79.9	Inline Weir	
2	70.1	.1	.3
2	70	.1	.3
2	65	.1	.3
2	64.9	Inline Weir	
2	60.1	.1	.3
2	60	.1	.3
2	50.1	.1	.3
2	50	.1	.3
2	40.1	.1	.3
2	40	.1	.3
2	35	.1	.3
2	34	.1	.3
2	33	Inline Weir	
2	30.1	.1	.3
2	30	.1	.3
2	20	.1	.3
2	15	.1	.3
2	11	.1	.3
2	9.1	.1	.3
2	9	.1	.3
2	7	.1	.3
2	5	.1	.3
2	3	.1	.3
2	1	.1	.3



1 in Horiz. = 400 ft 1 in Vert. = 20 ft

HEC-RAS Plan: Plan 13 River: PINE CREEK N Reach: 2

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
2	290	124.00	6903.00	6904.84	6903.78	6904.88	0.002556	1.64	75.83	50.47	0.24
2	290	157.00	6903.00	6905.08	6903.90	6905.13	0.002617	1.78	88.02	52.28	0.24
2	290	170.00	6903.00	6905.17	6903.95	6905.22	0.002644	1.84	92.52	52.94	0.24
2	290	194.00	6903.00	6905.31	6904.03	6905.37	0.002700	1.93	100.38	54.07	0.25
2	290	208.00	6903.00	6905.40	6904.06	6905.46	0.002719	1.98	104.95	54.71	0.25
2	290	224.00	6903.00	6905.48	6904.11	6905.55	0.002762	2.04	109.76	55.38	0.26
2	290	109.00	6903.00	6904.72	6903.72	6904.76	0.002531	1.56	69.87	49.55	0.23
2	280	124.00	6902.20	6904.08	6904.08	6904.56	0.056317	5.60	22.14	23.50	1.02
2	280	157.00	6902.20	6904.26	6904.26	6904.80	0.054183	5.88	26.70	25.56	1.01
2	280	170.00	6902.20	6904.33	6904.33	6904.88	0.053714	5.99	28.39	26.28	1.02
2	280	194.00	6902.20	6904.46	6904.46	6905.03	0.051193	6.09	31.84	27.70	1.00
2	280	208.00	6902.20	6904.51	6904.51	6905.11	0.051859	6.23	33.36	28.30	1.01
2	280	224.00	6902.20	6904.58	6904.58	6905.20	0.051510	6.34	35.32	29.06	1.01
2	280	109.00	6902.20	6903.98	6903.98	6904.44	0.057100	5.44	20.05	22.46	1.01
2	275	124.00	6900.00	6902.86	6900.76	6902.87	0.000521	0.99	125.73	53.71	0.11
2	275	157.00	6900.00	6902.99	6900.88	6903.01	0.000705	1.18	133.07	54.45	0.13
2	275	170.00	6900.00	6903.05	6900.92	6903.07	0.000773	1.25	136.06	54.75	0.14
2	275	194.00	6900.00	6903.14	6901.00	6903.17	0.000905	1.38	141.05	55.25	0.15
2	275	208.00	6900.00	6903.19	6901.04	6903.22	0.000981	1.45	143.84	55.53	0.16
2	275	224.00	6900.00	6903.24	6901.09	6903.28	0.001069	1.52	146.91	55.83	0.17
2	275	109.00	6900.00	6902.79	6900.70	6902.80	0.000439	0.89	122.17	53.34	0.10
2	274	Inline Weir									
2	270	124.00	6896.00	6898.79	6896.71	6898.80	0.000275	0.91	136.48	63.25	0.11
2	270	157.00	6896.00	6898.91	6896.82	6898.93	0.000382	1.09	144.28	64.54	0.13
2	270	170.00	6896.00	6898.96	6896.86	6898.98	0.000424	1.15	147.38	65.04	0.14
2	270	194.00	6896.00	6899.04	6896.94	6899.06	0.000505	1.27	152.62	65.88	0.15
2	270	208.00	6896.00	6899.09	6896.97	6899.11	0.000549	1.33	155.95	66.41	0.15
2	270	224.00	6896.00	6899.13	6897.02	6899.16	0.000605	1.41	159.11	66.90	0.16
2	270	109.00	6896.00	6898.72	6896.65	6898.73	0.000230	0.82	132.49	62.59	0.10
2	269.8	Inline Weir									
2	260	124.00	6896.00	6896.75	6896.75	6897.11	0.094840	4.81	25.76	36.51	1.01
2	260	157.00	6896.00	6896.88	6896.88	6897.29	0.089159	5.15	30.50	37.28	1.00
2	260	170.00	6896.00	6896.93	6896.93	6897.36	0.088142	5.28	32.20	37.55	1.00
2	260	194.00	6896.00	6897.01	6897.01	6897.48	0.086031	5.50	35.30	38.05	1.01
2	260	208.00	6896.00	6897.06	6897.06	6897.54	0.083144	5.57	37.31	38.36	1.00
2	260	224.00	6896.00	6897.11	6897.11	6897.62	0.082599	5.71	39.21	38.66	1.00
2	260	109.00	6896.00	6896.70	6896.70	6897.02	0.094353	4.58	23.79	36.19	1.00
2	250	124.00	6888.00	6888.61	6888.76	6889.16	0.193071	5.91	20.97	37.34	1.39
2	250	157.00	6888.00	6888.69	6888.88	6889.36	0.207501	6.58	23.85	38.13	1.47
2	250	170.00	6888.00	6888.72	6888.92	6889.44	0.208063	6.78	25.08	38.46	1.48
2	250	194.00	6888.00	6888.77	6889.01	6889.57	0.215991	7.19	26.99	38.97	1.52
2	250	208.00	6888.00	6888.79	6889.05	6889.66	0.224965	7.46	27.87	39.20	1.56
2	250	224.00	6888.00	6888.82	6889.10	6889.75	0.231259	7.73	28.98	39.50	1.59
2	250	109.00	6888.00	6888.57	6888.69	6889.06	0.192747	5.64	19.32	36.88	1.37
2	240	124.00	6879.00	6882.18	6879.86	6882.20	0.000314	1.01	122.54	53.09	0.12
2	240	157.00	6879.00	6882.34	6880.00	6882.36	0.000414	1.20	130.86	54.02	0.14
2	240	170.00	6879.00	6882.39	6880.05	6882.42	0.000453	1.27	133.93	54.36	0.14
2	240	194.00	6879.00	6882.50	6880.14	6882.53	0.000524	1.39	139.48	54.97	0.15
2	240	208.00	6879.00	6882.55	6880.20	6882.58	0.000564	1.46	142.60	55.31	0.16
2	240	224.00	6879.00	6882.61	6880.26	6882.65	0.000609	1.53	146.07	55.69	0.17
2	240	109.00	6879.00	6882.11	6879.79	6882.12	0.000268	0.92	118.52	52.63	0.11
2	235	124.00	6881.20	6881.84	6881.84	6882.14	0.085784	4.37	28.38	48.06	1.00
2	235	157.00	6881.20	6881.95	6881.95	6882.29	0.082453	4.69	33.44	49.36	1.01
2	235	170.00	6881.20	6881.99	6881.99	6882.35	0.080852	4.80	35.43	49.86	1.00
2	235	194.00	6881.20	6882.05	6882.05	6882.44	0.079748	5.02	38.63	50.24	1.01
2	235	208.00	6881.20	6882.09	6882.09	6882.50	0.078092	5.12	40.60	50.41	1.01
2	235	224.00	6881.20	6882.14	6882.14	6882.56	0.075993	5.23	42.87	50.62	1.00
2	235	109.00	6881.20	6881.79	6881.79	6882.07	0.089928	4.23	25.75	47.37	1.01

Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
2	230	124.00	6877.20	6880.06	6878.73	6880.12	0.003014	2.12	69.73	42.21	0.24
2	230	157.00	6877.20	6880.21	6878.91	6880.29	0.003739	2.45	76.18	42.74	0.27
2	230	170.00	6877.20	6880.27	6878.98	6880.35	0.004014	2.58	78.52	42.93	0.28
2	230	194.00	6877.20	6880.37	6879.09	6880.46	0.004481	2.79	82.77	43.28	0.30
2	230	208.00	6877.20	6880.42	6879.15	6880.53	0.004743	2.91	85.14	43.47	0.31
2	230	224.00	6877.20	6880.55	6879.21	6880.66	0.004573	2.94	90.67	43.91	0.30
2	230	109.00	6877.20	6879.98	6878.64	6880.03	0.002659	1.95	66.54	41.81	0.22
2	229	Inline Weir									
2	220	124.00	6870.90	6874.94	6872.27	6874.95	0.000256	0.95	131.07	47.12	0.10
2	220	157.00	6870.90	6875.09	6872.40	6875.11	0.000348	1.14	138.40	47.88	0.12
2	220	170.00	6870.90	6875.15	6872.45	6875.17	0.000386	1.21	141.05	48.15	0.12
2	220	194.00	6870.90	6875.25	6872.54	6875.28	0.000453	1.34	146.04	48.65	0.13
2	220	208.00	6870.90	6875.30	6872.59	6875.33	0.000495	1.41	148.61	48.91	0.14
2	220	224.00	6870.90	6875.37	6872.65	6875.40	0.000541	1.49	151.63	49.21	0.15
2	220	109.00	6870.90	6874.87	6872.19	6874.88	0.000214	0.86	127.73	46.77	0.09
2	219	Inline Weir									
2	217	124.00	6869.60	6871.98		6872.07	0.003391	2.43	51.00	29.96	0.33
2	217	157.00	6869.60	6872.12		6872.25	0.004296	2.84	55.37	30.83	0.37
2	217	170.00	6869.60	6872.17		6872.31	0.004630	2.98	57.04	31.15	0.39
2	217	194.00	6869.60	6872.27		6872.43	0.005248	3.24	59.89	31.70	0.42
2	217	208.00	6869.60	6872.32		6872.49	0.005590	3.38	61.53	32.01	0.43
2	217	224.00	6869.60	6872.37		6872.57	0.005976	3.54	63.32	32.35	0.45
2	217	109.00	6869.60	6871.90		6871.98	0.002966	2.23	48.83	29.52	0.31
2	215	124.00	6868.70	6871.98	6870.18	6872.01	0.000649	1.33	93.04	45.85	0.16
2	215	157.00	6868.70	6872.13	6870.32	6872.17	0.000831	1.57	99.96	47.44	0.19
2	215	170.00	6868.70	6872.19	6870.38	6872.23	0.000898	1.66	102.62	48.05	0.20
2	215	194.00	6868.70	6872.28	6870.47	6872.33	0.001020	1.81	107.29	49.11	0.21
2	215	208.00	6868.70	6872.34	6870.52	6872.39	0.001088	1.90	109.95	49.70	0.22
2	215	224.00	6868.70	6872.40	6870.59	6872.46	0.001165	1.99	112.90	50.35	0.23
2	215	109.00	6868.70	6871.91	6870.11	6871.93	0.000557	1.22	89.64	45.22	0.15
2	214	Inline Weir									
2	213	124.00	6865.80	6869.09	6867.18	6869.12	0.000720	1.47	84.44	38.75	0.18
2	213	157.00	6865.80	6869.26	6867.36	6869.31	0.000924	1.72	91.21	39.74	0.20
2	213	170.00	6865.80	6869.32	6867.42	6869.37	0.001008	1.82	93.53	40.08	0.21
2	213	194.00	6865.80	6869.43	6867.54	6869.49	0.001147	1.98	98.04	40.72	0.22
2	213	208.00	6865.80	6869.49	6867.60	6869.56	0.001228	2.07	100.52	41.07	0.23
2	213	224.00	6865.80	6869.56	6867.67	6869.63	0.001315	2.17	103.36	41.46	0.24
2	213	109.00	6865.80	6869.00	6867.09	6869.03	0.000623	1.34	81.21	38.27	0.16
2	212.9	Inline Weir									
2	212	124.00	6862.70	6865.64	6864.21	6865.70	0.001261	1.80	68.71	35.22	0.23
2	212	157.00	6862.70	6865.82	6864.36	6865.89	0.001562	2.09	75.01	36.11	0.26
2	212	170.00	6862.70	6865.89	6864.42	6865.96	0.001674	2.20	77.35	36.43	0.27
2	212	194.00	6862.70	6866.00	6864.52	6866.08	0.001876	2.38	81.44	36.99	0.28
2	212	208.00	6862.70	6866.06	6864.58	6866.15	0.001995	2.48	83.75	37.41	0.29
2	212	224.00	6862.70	6866.13	6864.63	6866.24	0.002117	2.59	86.49	37.92	0.30
2	212	109.00	6862.70	6865.56	6864.14	6865.60	0.001112	1.66	65.69	34.79	0.21
2	211.9	Inline Weir									
2	210	124.00	6862.00	6863.65	6863.65	6864.07	0.032672	5.22	23.76	28.84	1.01
2	210	157.00	6862.00	6863.81	6863.81	6864.28	0.031709	5.47	28.68	31.68	1.01
2	210	170.00	6862.00	6863.87	6863.87	6864.35	0.030979	5.53	30.71	32.79	1.01
2	210	194.00	6862.00	6863.97	6863.97	6864.48	0.030767	5.71	34.00	34.50	1.01
2	210	208.00	6862.00	6864.02	6864.02	6864.55	0.030959	5.84	35.63	35.10	1.02
2	210	224.00	6862.00	6864.07	6864.07	6864.63	0.030399	5.96	37.60	35.41	1.02
2	210	109.00	6862.00	6863.56	6863.56	6863.97	0.033314	5.09	21.42	27.38	1.01

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
2	200	124.00	6857.80	6860.88	6859.38	6860.91	0.001391	1.50	82.76	61.12	0.23
2	200	157.00	6857.80	6861.00	6859.57	6861.05	0.001736	1.74	90.41	63.19	0.26
2	200	170.00	6857.80	6861.05	6859.64	6861.10	0.001863	1.82	93.29	63.96	0.27
2	200	194.00	6857.80	6861.13	6859.76	6861.19	0.002080	1.97	98.53	65.32	0.28
2	200	208.00	6857.80	6861.17	6859.82	6861.24	0.002197	2.05	101.55	66.09	0.29
2	200	224.00	6857.80	6861.22	6859.89	6861.29	0.002340	2.14	104.67	66.88	0.30
2	200	109.00	6857.80	6860.82	6859.28	6860.85	0.001221	1.38	79.12	60.11	0.21
2	199.9	Inline Weir									
2	190	124.00	6855.50	6856.97	6856.97	6857.46	0.030790	5.63	22.04	22.75	1.01
2	190	157.00	6855.50	6857.15	6857.15	6857.70	0.029960	5.98	26.24	24.18	1.01
2	190	170.00	6855.50	6857.22	6857.22	6857.79	0.029435	6.09	27.92	24.73	1.01
2	190	194.00	6855.50	6857.33	6857.33	6857.95	0.028968	6.29	30.83	25.66	1.01
2	190	208.00	6855.50	6857.40	6857.40	6858.03	0.028159	6.36	32.72	26.24	1.00
2	190	224.00	6855.50	6857.46	6857.46	6858.13	0.028572	6.53	34.31	26.72	1.02
2	190	109.00	6855.50	6856.87	6856.87	6857.34	0.031828	5.47	19.92	21.99	1.01
2	180	124.00	6854.30	6856.69	6855.40	6856.71	0.000702	1.10	112.49	79.24	0.16
2	180	157.00	6854.30	6856.80	6855.50	6856.82	0.000921	1.30	120.98	81.72	0.19
2	180	170.00	6854.30	6856.84	6855.54	6856.87	0.001002	1.37	124.27	82.66	0.20
2	180	194.00	6854.30	6856.90	6855.60	6856.94	0.001154	1.49	129.93	84.25	0.21
2	180	208.00	6854.30	6856.94	6855.64	6856.98	0.001235	1.56	133.32	85.19	0.22
2	180	224.00	6854.30	6856.99	6855.68	6857.03	0.001322	1.63	137.26	86.27	0.23
2	180	109.00	6854.30	6856.64	6855.35	6856.65	0.000603	1.01	108.31	77.99	0.15
2	179.9	Inline Weir									
2	170	124.00	6851.80	6852.84		6852.94	0.007265	2.60	47.76	53.59	0.48
2	170	157.00	6851.80	6852.95		6853.08	0.008003	2.92	53.71	54.20	0.52
2	170	170.00	6851.80	6852.99		6853.13	0.008217	3.04	55.99	54.43	0.53
2	170	194.00	6851.80	6853.06		6853.22	0.008579	3.23	60.02	54.84	0.54
2	170	208.00	6851.80	6853.10		6853.28	0.008760	3.34	62.30	55.07	0.55
2	170	224.00	6851.80	6853.15		6853.34	0.008871	3.45	65.02	55.34	0.56
2	170	109.00	6851.80	6852.78		6852.87	0.006900	2.43	44.79	53.29	0.47
2	160	124.00	6851.00	6851.93		6852.04	0.011371	2.68	46.34	69.89	0.58
2	160	157.00	6851.00	6852.08		6852.20	0.009791	2.74	57.38	74.83	0.55
2	160	170.00	6851.00	6852.14		6852.25	0.009279	2.76	61.58	76.11	0.54
2	160	194.00	6851.00	6852.23		6852.35	0.008605	2.81	68.97	78.31	0.53
2	160	208.00	6851.00	6852.28		6852.41	0.008293	2.84	73.17	79.54	0.52
2	160	224.00	6851.00	6852.34		6852.47	0.007970	2.87	77.95	80.91	0.52
2	160	109.00	6851.00	6851.85		6851.96	0.012254	2.65	41.14	66.62	0.59
2	150	124.00	6849.90	6851.86	6850.75	6851.89	0.001042	1.55	80.16	54.42	0.22
2	150	157.00	6849.90	6851.99	6850.87	6852.04	0.001291	1.80	87.29	55.49	0.25
2	150	170.00	6849.90	6852.04	6850.92	6852.09	0.001380	1.89	90.01	55.88	0.26
2	150	194.00	6849.90	6852.12	6850.99	6852.18	0.001540	2.05	94.73	56.55	0.28
2	150	208.00	6849.90	6852.17	6851.04	6852.24	0.001629	2.14	97.39	56.92	0.29
2	150	224.00	6849.90	6852.22	6851.09	6852.30	0.001724	2.23	100.41	57.34	0.30
2	150	109.00	6849.90	6851.79	6850.69	6851.82	0.000923	1.42	76.64	53.89	0.21
2	149.9	Inline Weir									
2	140.1	124.00	6848.60	6849.35	6849.34	6849.63	0.028217	4.23	29.29	52.36	1.00
2	140.1	157.00	6848.60	6849.46	6849.45	6849.77	0.026939	4.46	35.20	56.20	0.99
2	140.1	170.00	6848.60	6849.49	6849.48	6849.82	0.027574	4.60	36.94	57.28	1.01
2	140.1	194.00	6848.60	6849.56	6849.56	6849.90	0.026303	4.70	41.29	59.90	1.00
2	140.1	208.00	6848.60	6849.60	6849.60	6849.95	0.025834	4.76	43.69	61.29	0.99
2	140.1	224.00	6848.60	6849.64	6849.63	6850.01	0.025501	4.84	46.29	62.77	0.99
2	140.1	109.00	6848.60	6849.29	6849.29	6849.56	0.029182	4.12	26.43	50.40	1.00
2	140	124.00	6848.60	6849.34	6849.34	6849.63	0.076902	4.27	29.06	52.20	1.01
2	140	157.00	6848.60	6849.45	6849.45	6849.77	0.072506	4.49	34.95	56.04	1.00
2	140	170.00	6848.60	6849.48	6849.48	6849.82	0.073978	4.63	36.69	57.13	1.02
2	140	194.00	6848.60	6849.56	6849.56	6849.90	0.069921	4.72	41.06	59.76	1.00
2	140	208.00	6848.60	6849.60	6849.60	6849.95	0.068436	4.79	43.45	61.16	1.00

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
2	140	224.00	6848.60	6849.64	6849.64	6850.01	0.067316	4.86	46.05	62.64	1.00
2	140	109.00	6848.60	6849.29	6849.29	6849.56	0.080112	4.16	26.21	50.24	1.01
2	130.1	124.00	6844.00	6846.74	6845.47	6846.76	0.001203	1.22	101.50	67.77	0.18
2	130.1	157.00	6844.00	6846.85	6845.59	6846.88	0.001516	1.43	109.52	69.09	0.20
2	130.1	170.00	6844.00	6846.89	6845.64	6846.93	0.001640	1.51	112.36	69.55	0.21
2	130.1	194.00	6844.00	6846.97	6845.71	6847.02	0.001834	1.65	117.93	70.45	0.22
2	130.1	208.00	6844.00	6847.01	6845.75	6847.06	0.001960	1.72	120.69	70.89	0.23
2	130.1	224.00	6844.00	6847.06	6845.80	6847.11	0.002081	1.80	124.13	71.43	0.24
2	130.1	109.00	6844.00	6846.68	6845.41	6846.70	0.001053	1.12	97.58	67.12	0.16
2	130	124.00	6844.00	6846.74	6845.47	6846.76	0.000984	1.22	101.50	67.77	0.18
2	130	157.00	6844.00	6846.85	6845.59	6846.88	0.001256	1.43	109.52	69.09	0.20
2	130	170.00	6844.00	6846.89	6845.64	6846.93	0.001364	1.51	112.36	69.55	0.21
2	130	194.00	6844.00	6846.97	6845.71	6847.02	0.001538	1.65	117.93	70.45	0.22
2	130	208.00	6844.00	6847.01	6845.75	6847.06	0.001650	1.72	120.69	70.89	0.23
2	130	224.00	6844.00	6847.06	6845.80	6847.11	0.001761	1.80	124.13	71.43	0.24
2	130	109.00	6844.00	6846.68	6845.41	6846.70	0.000856	1.12	97.58	67.12	0.16
2	129	Inline Weir									
2	120.1	124.00	6841.00	6842.96		6843.03	0.002735	2.06	60.23	48.43	0.33
2	120.1	157.00	6841.00	6843.12		6843.20	0.003071	2.30	68.29	50.71	0.35
2	120.1	170.00	6841.00	6843.16		6843.25	0.003307	2.42	70.38	51.28	0.36
2	120.1	194.00	6841.00	6843.24		6843.34	0.003723	2.62	74.12	52.29	0.39
2	120.1	208.00	6841.00	6843.29		6843.40	0.003836	2.70	77.08	53.08	0.39
2	120.1	224.00	6841.00	6843.33		6843.46	0.004094	2.82	79.40	53.69	0.41
2	120.1	109.00	6841.00	6842.89		6842.95	0.002490	1.92	56.86	47.45	0.31
2	120	124.00	6841.00	6842.96	6842.15	6843.02	0.002409	2.06	60.20	48.43	0.33
2	120	157.00	6841.00	6843.12	6842.29	6843.20	0.002661	2.30	68.26	50.70	0.35
2	120	170.00	6841.00	6843.16	6842.33	6843.25	0.002854	2.42	70.35	51.28	0.36
2	120	194.00	6841.00	6843.23	6842.42	6843.34	0.003191	2.62	74.10	52.29	0.39
2	120	208.00	6841.00	6843.29	6842.47	6843.40	0.003270	2.70	77.05	53.07	0.39
2	120	224.00	6841.00	6843.33	6842.52	6843.46	0.003476	2.82	79.37	53.68	0.41
2	120	109.00	6841.00	6842.89	6842.09	6842.95	0.002208	1.92	56.86	47.45	0.31
2	119	Inline Weir									
2	110	124.00	6836.70	6838.93	6837.71	6838.96	0.001211	1.58	78.40	48.17	0.22
2	110	157.00	6836.70	6839.07	6837.84	6839.13	0.001494	1.83	85.64	49.32	0.25
2	110	170.00	6836.70	6839.12	6837.88	6839.18	0.001618	1.93	87.96	49.68	0.26
2	110	194.00	6836.70	6839.21	6837.98	6839.28	0.001806	2.09	92.68	50.42	0.27
2	110	208.00	6836.70	6839.27	6838.02	6839.34	0.001915	2.18	95.25	50.81	0.28
2	110	224.00	6836.70	6839.32	6838.07	6839.41	0.002027	2.28	98.26	51.27	0.29
2	110	109.00	6836.70	6838.85	6837.64	6838.89	0.001067	1.45	75.01	47.62	0.20
2	109.9	Inline Weir									
2	100	130.00	6834.20	6835.59		6835.68	0.022183	2.40	54.19	45.91	0.39
2	100	166.00	6834.20	6835.80		6835.90	0.024222	2.60	63.94	47.99	0.40
2	100	194.00	6834.20	6835.95		6836.07	0.025212	2.71	71.53	49.55	0.40
2	100	241.00	6834.20	6836.14		6836.28	0.026817	2.99	80.73	51.17	0.41
2	100	274.00	6834.20	6836.25		6836.40	0.027799	3.18	86.38	52.10	0.43
2	100	309.00	6834.20	6836.36		6836.53	0.028562	3.36	92.26	53.05	0.44
2	100	119.00	6834.20	6835.53		6835.61	0.021131	2.31	51.41	45.30	0.38
2	90	130.00	6831.70	6832.63	6832.63	6832.98	0.031580	4.78	27.18	39.09	1.01
2	90	166.00	6831.70	6832.76	6832.76	6833.17	0.029486	5.11	32.50	40.59	1.01
2	90	194.00	6831.70	6832.85	6832.85	6833.30	0.028632	5.35	36.27	41.62	1.01
2	90	241.00	6831.70	6833.00	6833.00	6833.50	0.026908	5.66	42.59	43.29	1.01
2	90	274.00	6831.70	6833.10	6833.10	6833.63	0.025924	5.85	46.87	44.39	1.00
2	90	309.00	6831.70	6833.20	6833.20	6833.76	0.025248	6.04	51.15	45.46	1.00
2	90	119.00	6831.70	6832.59	6832.59	6832.92	0.032438	4.67	25.48	38.59	1.01
2	80.1	130.00	6828.00	6831.02	6829.54	6831.06	0.001416	1.60	81.10	46.96	0.21
2	80.1	166.00	6828.00	6831.18	6829.71	6831.23	0.001800	1.87	88.81	48.77	0.24

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
2	80.1	194.00	6828.00	6831.29	6829.83	6831.36	0.002088	2.06	94.26	50.01	0.26
2	80.1	241.00	6828.00	6831.46	6830.02	6831.55	0.002517	2.34	103.17	51.98	0.29
2	80.1	274.00	6828.00	6831.58	6830.13	6831.68	0.002789	2.51	109.16	53.26	0.31
2	80.1	309.00	6828.00	6831.69	6830.24	6831.80	0.003072	2.69	115.08	54.50	0.33
2	80.1	119.00	6828.00	6830.96	6829.47	6831.00	0.001294	1.51	78.59	46.35	0.20
2	80	130.00	6828.00	6831.02	6829.53	6831.06	0.000911	1.60	81.10	46.96	0.21
2	80	166.00	6828.00	6831.18	6829.71	6831.23	0.001155	1.87	88.81	48.77	0.24
2	80	194.00	6828.00	6831.29	6829.83	6831.36	0.001337	2.06	94.26	50.01	0.26
2	80	241.00	6828.00	6831.46	6830.02	6831.55	0.001608	2.34	103.17	51.98	0.29
2	80	274.00	6828.00	6831.58	6830.13	6831.68	0.001779	2.51	109.16	53.26	0.31
2	80	309.00	6828.00	6831.69	6830.24	6831.80	0.001957	2.69	115.08	54.50	0.33
2	80	119.00	6828.00	6830.96	6829.47	6831.00	0.000833	1.51	78.59	46.35	0.20
2	79.9	Inline Weir									
2	70.1	130.00	6826.00	6827.78	6827.77	6828.29	0.023973	5.71	22.77	22.58	1.00
2	70.1	166.00	6826.00	6828.09	6828.09	6828.53	0.025230	5.33	31.12	36.10	1.01
2	70.1	194.00	6826.00	6828.19	6828.19	6828.67	0.024509	5.57	34.82	37.36	1.02
2	70.1	241.00	6826.00	6828.36	6828.35	6828.89	0.022440	5.81	41.46	39.52	1.00
2	70.1	274.00	6826.00	6828.47	6828.45	6829.02	0.021796	6.00	45.68	40.83	1.00
2	70.1	309.00	6826.00	6828.57	6828.56	6829.16	0.021337	6.19	49.95	42.12	1.00
2	70.1	119.00	6826.00	6827.71	6827.71	6828.20	0.024423	5.62	21.17	21.79	1.01
2	70	130.00	6826.00	6827.78	6827.78	6828.29	0.022920	5.72	22.72	22.56	1.00
2	70	166.00	6826.00	6828.08	6828.08	6828.53	0.025221	5.40	30.72	35.96	1.03
2	70	194.00	6826.00	6828.19	6828.19	6828.67	0.024171	5.59	34.73	37.33	1.02
2	70	241.00	6826.00	6828.36	6828.36	6828.89	0.022408	5.83	41.37	39.49	1.00
2	70	274.00	6826.00	6828.46	6828.46	6829.02	0.021797	6.01	45.60	40.80	1.00
2	70	309.00	6826.00	6828.57	6828.57	6829.16	0.021356	6.20	49.87	42.09	1.00
2	70	119.00	6826.00	6827.69	6827.70	6828.20	0.024697	5.75	20.68	21.54	1.03
2	65	130.00	6824.30	6827.14	6826.11	6827.21	0.001699	2.12	61.23	45.43	0.32
2	65	166.00	6824.30	6827.30	6826.29	6827.39	0.002044	2.41	68.76	48.33	0.36
2	65	194.00	6824.30	6827.41	6826.42	6827.52	0.002271	2.61	74.38	50.37	0.38
2	65	241.00	6824.30	6827.58	6826.62	6827.71	0.002600	2.89	83.30	53.47	0.41
2	65	274.00	6824.30	6827.69	6826.73	6827.84	0.002806	3.07	89.20	55.42	0.43
2	65	309.00	6824.30	6827.80	6826.85	6827.96	0.002997	3.24	95.32	57.37	0.44
2	65	119.00	6824.30	6827.08	6826.04	6827.15	0.001579	2.02	58.86	44.49	0.31
2	64.9	Inline Weir									
2	60.1	130.00	6822.00	6823.52		6823.72	0.005515	3.57	36.42	29.71	0.57
2	60.1	166.00	6822.00	6823.70		6823.95	0.005898	3.97	41.83	30.57	0.60
2	60.1	194.00	6822.00	6823.83		6824.11	0.006151	4.24	45.74	31.18	0.62
2	60.1	241.00	6822.00	6824.01		6824.35	0.006615	4.68	51.54	32.09	0.65
2	60.1	274.00	6822.00	6824.13		6824.51	0.006784	4.96	55.31	33.05	0.67
2	60.1	309.00	6822.00	6824.23		6824.66	0.007042	5.26	58.93	33.95	0.68
2	60.1	119.00	6822.00	6823.47		6823.65	0.005317	3.42	34.79	29.45	0.55
2	60	130.00	6822.00	6823.52	6823.10	6823.72	0.010605	3.57	36.39	29.71	0.57
2	60	166.00	6822.00	6823.70	6823.26	6823.94	0.011272	3.97	41.81	30.57	0.60
2	60	194.00	6822.00	6823.83	6823.38	6824.11	0.011708	4.24	45.71	31.17	0.62
2	60	241.00	6822.00	6824.01	6823.57	6824.35	0.012526	4.68	51.51	32.08	0.65
2	60	274.00	6822.00	6824.13	6823.68	6824.51	0.012841	4.96	55.28	33.05	0.67
2	60	309.00	6822.00	6824.23	6823.80	6824.66	0.013312	5.26	58.91	33.95	0.68
2	60	119.00	6822.00	6823.47	6823.05	6823.65	0.010231	3.42	34.77	29.45	0.56
2	50.1	130.00	6820.80	6821.62	6821.62	6821.97	0.020881	4.78	27.19	38.22	1.00
2	50.1	166.00	6820.80	6821.75	6821.75	6822.16	0.020160	5.16	32.20	39.16	1.00
2	50.1	194.00	6820.80	6821.84	6821.84	6822.29	0.019465	5.38	36.04	39.86	1.00
2	50.1	241.00	6820.80	6821.99	6821.99	6822.50	0.018874	5.74	41.96	40.93	1.00
2	50.1	274.00	6820.80	6822.08	6822.08	6822.64	0.018838	5.97	45.87	41.79	1.00
2	50.1	309.00	6820.80	6822.19	6822.19	6822.78	0.018501	6.15	50.21	42.73	1.00
2	50.1	119.00	6820.80	6821.57	6821.56	6821.91	0.022070	4.71	25.24	37.84	1.02
2	50	130.00	6820.80	6821.57	6821.61	6821.98	0.032660	5.13	25.35	37.86	1.10

Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
2	50	166.00	6820.80	6821.74	6821.74	6822.16	0.025366	5.17	32.10	39.14	1.01
2	50	194.00	6820.80	6821.84	6821.84	6822.29	0.024323	5.39	35.96	39.85	1.00
2	50	241.00	6820.80	6821.98	6821.98	6822.50	0.024086	5.81	41.50	40.85	1.02
2	50	274.00	6820.80	6822.05	6822.08	6822.64	0.025522	6.18	44.35	41.45	1.05
2	50	309.00	6820.80	6822.14	6822.18	6822.78	0.025302	6.40	48.27	42.31	1.06
2	50	119.00	6820.80	6821.56	6821.56	6821.91	0.028071	4.73	25.15	37.83	1.02
2	40.1	130.00	6819.30	6820.45	6819.88	6820.50	0.002581	1.79	72.63	73.69	0.32
2	40.1	166.00	6819.30	6820.56	6819.97	6820.63	0.002944	2.04	81.42	74.93	0.34
2	40.1	194.00	6819.30	6820.65	6820.04	6820.73	0.003164	2.21	87.93	75.84	0.36
2	40.1	241.00	6819.30	6820.78	6820.13	6820.88	0.003498	2.46	97.91	77.21	0.39
2	40.1	274.00	6819.30	6820.87	6820.20	6820.98	0.003680	2.62	104.66	78.12	0.40
2	40.1	309.00	6819.30	6820.96	6820.27	6821.07	0.003852	2.77	111.49	79.03	0.41
2	40.1	119.00	6819.30	6820.41	6819.85	6820.45	0.002455	1.71	69.76	73.28	0.31
2	40	130.00	6819.30	6820.45		6820.50	0.001563	1.79	72.73	74.14	0.32
2	40	166.00	6819.30	6820.56		6820.63	0.001783	2.03	81.57	75.50	0.34
2	40	194.00	6819.30	6820.65		6820.73	0.001916	2.20	88.14	76.49	0.36
2	40	241.00	6819.30	6820.78		6820.88	0.002118	2.45	98.21	77.99	0.39
2	40	274.00	6819.30	6820.87		6820.97	0.002225	2.61	105.07	79.00	0.40
2	40	309.00	6819.30	6820.96		6821.07	0.002328	2.76	111.98	79.99	0.41
2	40	119.00	6819.30	6820.41		6820.45	0.001486	1.70	69.85	73.69	0.31
2	35	130.00	6818.70	6820.37		6820.42	0.001612	1.71	75.83	78.62	0.31
2	35	166.00	6818.70	6820.48		6820.54	0.001875	1.97	84.37	80.23	0.34
2	35	194.00	6818.70	6820.56		6820.63	0.002030	2.14	90.84	81.43	0.36
2	35	241.00	6818.70	6820.68		6820.77	0.002269	2.39	100.73	83.23	0.38
2	35	274.00	6818.70	6820.76		6820.87	0.002387	2.55	107.65	84.47	0.40
2	35	309.00	6818.70	6820.85		6820.96	0.002503	2.70	114.59	85.69	0.41
2	35	119.00	6818.70	6820.34		6820.38	0.001517	1.63	73.12	78.10	0.30
2	34	130.00	6818.20	6820.38	6818.84	6820.39	0.000218	0.90	145.14	83.63	0.12
2	34	166.00	6818.20	6820.49	6818.94	6820.51	0.000295	1.08	154.34	84.67	0.14
2	34	194.00	6818.20	6820.57	6819.01	6820.59	0.000353	1.20	161.23	85.44	0.15
2	34	241.00	6818.20	6820.69	6819.11	6820.73	0.000450	1.40	171.73	86.60	0.18
2	34	274.00	6818.20	6820.78	6819.19	6820.81	0.000514	1.53	179.00	87.39	0.19
2	34	309.00	6818.20	6820.86	6819.25	6820.90	0.000580	1.66	186.20	88.17	0.20
2	34	119.00	6818.20	6820.35	6818.82	6820.36	0.000195	0.84	142.20	83.29	0.11
2	33	Inline Weir									
2	30.1	130.00	6816.80	6817.60	6817.59	6817.87	0.021354	4.22	30.81	54.87	0.99
2	30.1	166.00	6816.80	6817.69	6817.69	6818.02	0.020811	4.57	36.29	56.13	1.00
2	30.1	194.00	6816.80	6817.77	6817.76	6818.13	0.020308	4.80	40.40	57.05	1.01
2	30.1	241.00	6816.80	6817.89	6817.89	6818.29	0.019284	5.10	47.23	58.55	1.00
2	30.1	274.00	6816.80	6817.96	6817.96	6818.40	0.018918	5.31	51.64	59.50	1.00
2	30.1	309.00	6816.80	6818.04	6818.03	6818.51	0.018467	5.50	56.15	60.30	1.01
2	30.1	119.00	6816.80	6817.56	6817.56	6817.82	0.022062	4.13	28.84	54.41	1.00
2	30	130.00	6816.80	6817.59	6817.59	6817.87	0.053758	4.24	30.63	54.83	1.00
2	30	166.00	6816.80	6817.69	6817.69	6818.02	0.052128	4.60	36.12	56.09	1.01
2	30	194.00	6816.80	6817.76	6817.76	6818.13	0.050801	4.82	40.24	57.01	1.01
2	30	241.00	6816.80	6817.85	6817.88	6818.29	0.055834	5.37	44.87	58.03	1.08
2	30	274.00	6816.80	6817.96	6817.96	6818.40	0.047204	5.32	51.47	59.46	1.01
2	30	309.00	6816.80	6818.03	6818.03	6818.51	0.046234	5.52	55.97	60.28	1.01
2	30	119.00	6816.80	6817.56	6817.56	6817.82	0.055607	4.15	28.65	54.37	1.01
2	20	137.00	6814.50	6816.02	6815.36	6816.08	0.003227	2.03	67.62	60.18	0.34
2	20	197.00	6814.50	6816.28	6815.54	6816.36	0.003329	2.35	83.66	63.11	0.36
2	20	244.00	6814.50	6816.46	6815.65	6816.56	0.003358	2.56	95.41	65.17	0.37
2	20	323.00	6814.50	6816.73	6815.84	6816.86	0.003405	2.84	113.55	68.23	0.39
2	20	380.00	6814.50	6816.90	6815.95	6817.05	0.003450	3.03	125.54	70.18	0.40
2	20	437.00	6814.50	6817.07	6816.07	6817.22	0.003487	3.19	137.00	71.99	0.41
2	20	139.00	6814.50	6816.03	6815.37	6816.09	0.003219	2.04	68.27	60.30	0.34
2	15	137.00	6812.00	6816.06		6816.06	0.000011	0.37	385.47	123.48	0.03
2	15	197.00	6812.00	6816.33		6816.33	0.000018	0.49	419.94	128.20	0.04

Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
2	15	244.00	6812.00	6816.52		6816.53	0.000024	0.57	444.86	131.51	0.05
2	15	323.00	6812.00	6816.81		6816.81	0.000032	0.70	482.93	136.41	0.06
2	15	380.00	6812.00	6816.99		6817.00	0.000039	0.79	508.19	139.57	0.07
2	15	437.00	6812.00	6817.16		6817.17	0.000045	0.87	532.16	142.50	0.07
2	15	139.00	6812.00	6816.07		6816.07	0.000012	0.37	386.85	123.67	0.03
2	11	137.00	6815.00	6815.70	6815.70	6816.02	0.020401	4.57	29.97	45.60	0.99
2	11	197.00	6815.00	6815.88	6815.88	6816.29	0.019227	5.13	38.43	47.06	1.00
2	11	244.00	6815.00	6816.01	6816.01	6816.48	0.018888	5.50	44.33	48.12	1.01
2	11	323.00	6815.00	6816.22	6816.22	6816.76	0.017913	5.89	54.86	51.70	1.01
2	11	380.00	6815.00	6816.36	6816.36	6816.94	0.017281	6.11	62.24	54.08	1.00
2	11	437.00	6815.00	6816.49	6816.49	6817.10	0.016805	6.30	69.35	56.27	1.00
2	11	139.00	6815.00	6815.70	6815.70	6816.03	0.021402	4.67	29.79	45.57	1.02
2	9.1	137.00	6812.00	6812.19	6812.49	6813.93	1.014679	10.59	12.94	72.00	4.40
2	9.1	197.00	6812.00	6812.24	6812.62	6814.36	0.897336	11.69	16.85	73.72	4.31
2	9.1	244.00	6812.00	6812.29	6812.71	6814.56	0.777105	12.10	20.16	75.14	4.12
2	9.1	323.00	6812.00	6812.35	6812.83	6814.89	0.666848	12.79	25.26	77.28	3.94
2	9.1	380.00	6812.00	6812.39	6812.93	6815.19	0.645373	13.43	28.30	78.53	3.94
2	9.1	437.00	6812.00	6812.44	6813.01	6815.33	0.580198	13.65	32.02	80.03	3.80
2	9.1	139.00	6812.00	6812.19	6812.49	6813.86	0.925864	10.35	13.43	72.22	4.23
2	9	137.00	6812.00	6812.19	6812.49	6813.89	0.435505	10.48	13.08	72.06	4.33
2	9	197.00	6812.00	6812.25	6812.62	6814.26	0.365312	11.37	17.32	73.92	4.14
2	9	244.00	6812.00	6812.29	6812.70	6814.51	0.333648	11.97	20.38	75.23	4.05
2	9	323.00	6812.00	6812.35	6812.84	6814.97	0.312258	13.00	24.84	77.11	4.04
2	9	380.00	6812.00	6812.39	6812.93	6815.25	0.296803	13.57	27.99	78.41	4.00
2	9	437.00	6812.00	6812.44	6813.01	6815.36	0.262835	13.73	31.82	79.95	3.84
2	9	139.00	6812.00	6812.20	6812.49	6813.82	0.394549	10.22	13.61	72.30	4.15
2	7	137.00	6809.00	6810.04	6810.04	6810.49	0.019177	5.37	25.49	28.93	1.01
2	7	197.00	6809.00	6810.30	6810.30	6810.85	0.017930	5.91	33.34	31.17	1.01
2	7	244.00	6809.00	6810.48	6810.48	6811.09	0.017460	6.26	38.95	32.68	1.01
2	7	323.00	6809.00	6810.75	6810.75	6811.45	0.016445	6.69	48.28	35.04	1.00
2	7	380.00	6809.00	6810.93	6810.93	6811.68	0.016063	6.97	54.52	36.53	1.01
2	7	437.00	6809.00	6811.09	6811.09	6811.90	0.015691	7.21	60.63	37.94	1.00
2	7	139.00	6809.00	6810.06	6810.06	6810.50	0.018824	5.37	25.90	29.05	1.00
2	5	137.00	6798.00	6798.29	6799.04	6805.82	2.536050	22.02	6.22	22.90	7.45
2	5	197.00	6798.00	6798.39	6799.28	6806.43	1.851404	22.76	8.66	23.94	6.67
2	5	244.00	6798.00	6798.47	6799.46	6806.86	1.558128	23.24	10.50	24.70	6.28
2	5	323.00	6798.00	6798.59	6799.72	6807.50	1.262123	23.95	13.49	25.88	5.85
2	5	380.00	6798.00	6798.68	6799.89	6807.57	1.062180	23.93	15.88	26.79	5.48
2	5	437.00	6798.00	6798.76	6800.05	6807.87	0.954669	24.22	18.04	27.58	5.28
2	5	139.00	6798.00	6798.28	6799.04	6806.71	2.984096	23.30	5.96	22.79	8.03
2	3	137.00	6786.00	6788.58	6787.02	6788.62	0.000951	1.50	91.57	50.97	0.20
2	3	197.00	6786.00	6788.72	6787.26	6788.78	0.001596	2.00	98.72	52.63	0.26
2	3	244.00	6786.00	6788.81	6787.42	6788.90	0.002145	2.36	103.58	53.72	0.30
2	3	323.00	6786.00	6788.94	6787.68	6789.07	0.003136	2.92	110.63	55.27	0.36
2	3	380.00	6786.00	6789.02	6787.84	6789.19	0.003870	3.29	115.34	56.29	0.41
2	3	437.00	6786.00	6789.10	6787.99	6789.31	0.004623	3.65	119.69	57.21	0.44
2	3	139.00	6786.00	6788.59	6787.02	6788.62	0.000971	1.51	91.82	51.03	0.20
2	1	137.00	6788.00	6788.47	6788.31	6788.54	0.005005	2.08	65.79	143.53	0.54
2	1	197.00	6788.00	6788.58	6788.40	6788.67	0.005006	2.40	82.22	145.35	0.56
2	1	244.00	6788.00	6788.66	6788.46	6788.77	0.005001	2.60	93.84	146.63	0.57
2	1	323.00	6788.00	6788.78	6788.55	6788.91	0.004999	2.89	111.64	148.55	0.59
2	1	380.00	6788.00	6788.86	6788.62	6789.01	0.004997	3.08	123.51	149.83	0.60
2	1	437.00	6788.00	6788.94	6788.67	6789.10	0.004997	3.24	134.75	151.02	0.61
2	1	139.00	6788.00	6788.48	6788.32	6788.54	0.004994	2.09	66.42	143.60	0.54

REACH NO. 2

FLOWMASTER CHANNEL ANALYSIS

Table
Rating Table for Trapezoidal Channel

Project Description	
Project File	h:\fmw\project9.fm2
Worksheet	Pine Creek
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Constant Data	
Channel Slope	0.010000 ft/ft
Left Side Slope	3.000000 H : V
Right Side Slope	3.000000 H : V
Bottom Width	24.00 ft

Input Data

	Minimum	Maximum	Increment
Mannings Coefficient	0.035	0.050	0.005
Discharge	600.00	1,200.00	100.00 cfs

Rating Table

Discharge (cfs)	Mannings Coefficient	Depth (ft)	Velocity (ft/s)
600.00	0.035	2.69	6.97
600.00	0.040	2.89	6.35
600.00	0.045	3.08	5.85
600.00	0.050	3.27	5.43
700.00	0.035	2.92	7.30
700.00	0.040	3.15	6.65
700.00	0.045	3.35	6.13
700.00	0.050	3.55	5.69
800.00	0.035	3.15	7.60
800.00	0.040	3.38	6.92
800.00	0.045	3.61	6.37
800.00	0.050	3.81	5.92
900.00	0.035	3.35	7.88
900.00	0.040	3.61	7.17
900.00	0.045	3.84	6.60
900.00	0.050	4.06	6.12
1,000.00	0.035	3.55	8.13
1,000.00	0.040	3.81	7.40
1,000.00	0.045	4.06	6.80
1,000.00	0.050	4.29	6.31
1,100.00	0.035	3.74	8.36
1,100.00	0.040	4.01	7.60
1,100.00	0.045	4.27	6.99

Table
Rating Table for Trapezoidal Channel

Rating Table

Discharge (cfs)	Mannings Coefficient	Depth (ft)	Velocity (ft/s)
1,100.00	0.050	4.52	6.49
1,200.00	0.035	3.92	8.57
1,200.00	0.040	4.20	7.80
1,200.00	0.045	4.47	7.17
1,200.00	0.050	4.73	6.65

Reach #3

UPPER PINE CREEK NORTH BRANCH REACH NO. 3,
FROM PROPOSED DETENTION FACILITY "F" UPSTREAM
2600 lf TO A PROPOSED STORM DRAIN OUTFALL

UPPER PINE CREEK NORTH BRANCH REACH NO. 3, FROM PROPOSED DETENTION FACILITY "F" UPSTREAM 2600 lf TO A PROPOSED STORM DRAIN OUTFALL

EXISTING CONDITION

In the present condition this reach of channel is fairly well vegetated with trees, brush and grass cover. This reach has far less wetlands vegetation than the previous two. Photographs were taken to document the present condition and are included as part of this report. Vegetative cover varies from sparse to dense brush and trees.

The channel has an average slope of 3.1% in the 2,100 L.F. from the top of the proposed Detention Facility "F" riprap rundown to the east end of the reach. The actual channel invert slope varies from 1.7% to 5.4% over its length. The channel is relatively straight with no abrupt bends.

The existing channel has a flat to parabolic section over the bottom width except in areas where sloping head-cuts were noted at approximate Stations 7+00, 9+00 and 16+00. The channel bottom width varies from 10 to 36 feet and averages between 19 and 23 feet in width.

Side slopes for the most part are stable at 2.5:1. More than half the side slope area is vegetated with brush and trees.

PROPOSED CONDITION

Pine Creek D.B.P.S. Amendment No. 3 proposes diverting a portion the storm water flow at APE4 to a parallel storm drain. The proposed storm drain will convey runoff from upstream of

this reach of channel parallel to the channel discharging to the proposed Detention Facility "F" riprap rundown. Trickle-frequent flows would be directed to the channel to promote vegetative cover.

HYDRAULIC ANALYSIS

The following tabulated peak flow data developed from the Pine Creek D.B.P.S. Amendment NO. 3 for HEC-RAS analysis of this study reach.

Peak Flow Data (Cfs)

Section	DBPS	Frequency (Years)						
No.	AP No.	2	5	10	25	50	100	Dominant
600	E4a	1	90	162	249	304	370	51
570	3a	8	110	185	294	361	437	64
530	DF "F" in	312	470	648	878	1027	1178	339

A HEC-RAS model was developed based on the previously tabulated flow data, cross section at the locations shown on the plan/profile sheets included as part of this study, and "n" values estimated from field observation. A copy of the HEC-RAS model and results are included as part of this report. The channel water velocities indicated by the model can be summarized as follows:

Section Numbered 600: 2 and 5-year frequency channel velocities are approximately 2.55 fps based on the diverted flows. Velocities though the 100-yr peak flow rate are less than 4 fps.

Sections Numbered 595 And 590: 2 and 5-year frequency channel velocities are less than 5 fps based on the diverted flows. Velocities though the 100-yr peak flow rate are less than 8.5 fps.

Section Numbered 580: 2-year frequency channel velocities are approximately 2.6 fps based on the diverted flows. Velocities for the 5-year though 100-yr peak flow rate are 8.9 to 11.3fps.

Sections Numbered 570, And 560: 2 and 5-year frequency channel velocities are between 3.4 and 6.2 fps. 10-year frequency channel velocities are 6.8 fps. 100-year frequency channel velocities are approximately 8.5 fps.

Sections Numbered 539 through 490: are protected in the proposed Detention Facility "F" riprap rundown.

The results indicate that the channel segment in the area of Sections 550 and 580 have the greatest potential for degradation. Two tables follow which compare the Historic and Developed flow peak rates and duration intervals in which the hydrograph flow rates create velocities greater than 8 fps. Copies of the Historic and Developed hydrographs are included as part of this report.

COMPARISON OF HISTORIC AND DEVELOPED FLOW RATES IN
CHANNEL REACH NO. 3
DBPS APE4 AT BLUE ROAD

Storm Freq Years	Developed			Historic
	Total Peak cfs	To Storm Drain cfs	To Channel cfs	Peak Rate cfs
2	129	129	0	12
5	238	148	90	47
10	318	157	162	85
25	413	165	249	166
50	473	169	304	218
100	543	173	370	287

COMPARISON OF HISTORIC AND DEVELOPED FLOW RATE DURATIONS CREATING CHANNEL VELOCITIES GREATER THAN 8fps

SECTION 550

Storm Freq Years	Developed		Historic	
	Peak cfs	Duration Minutes	Peak cfs	Duration Minutes
2	8[1]	0	12	0
5	110	15	47	0
10	185	33	85	30
25	294	53	166	54
50	361	70	218	66
100	437	81	287	78

[1] Runoff from the containing Basin Area.

SECTION 580

Storm Freq Years	Developed		Historic	
	Peak cfs	Duration Minutes	Peak cfs	Duration Minutes
2	1	0	12	0
5	90	19	47	5
10	162	40	85	45
25	249	58	166	75
50	304	76	218	88
100	370	88	287	93

As shown in the tables the duration of flows causing erosive flows rate are quite similar for the Historic and Developed hydrographs, however the flow the peak rates are considerably higher in the developed condition. There will likely be some erosion in the area of these sections in major storm events. The required setbacks provide protection for the planed infrastructure.

A second hydraulic analysis was made based on the assumption that the introduction of frequent low-tickle flows to the channel will promote the growth of additional wetlands vegetation. Consist with that assumption; a trapezoidal channel section with an "n" value of 0.05 was modeled in FlowMaster V5.15. The model includes runs for an approximate 5-year frequency flow rate of 90 cfs and an approximate 100-year frequency flow rate of 370 cfs; a channel bottom widths of 10 and 23 feet, side slopes assumed at 3:1. Copies of this analysis are included in this report. The results can be summarized as follows:

TRAPEZOIDAL CHANNEL ANALYSIS

In conclusion with an "n" value of 0.05 in a vegetated trapezoidal channel with a flat bottom width of ten feet or greater velocities generated by the 5-year frequency storm peak flow will not be excessive. In addition, velocities generated by the 100-year frequency storm peak flow will not be excessive except in the narrowest channel with the steepest slopes.

REACH NO. 3, SUMMARY AND RECOMMENDATIONS

Field observations and the analysis presented in this report leads to the conclusion that the North Pine Creek channel reach from proposed Detention Facility "F" east to the proposed future storm drain outfall is relatively stable.

The proposed developed condition, which will protect the channel from frequent developed condition flows by diverting these flows to a proposed parallel storm drain, as well as providing frequent tickle flows to the channel to promote the growth of vegetation, will potentially further stabilize the channel.

Based on the above evaluation, no improvements to the channel reach are proposed.

It is recommended that the channel be monitored at least on an annual basis. As previously noted the channel segments at Sections numbered 550 and 580 have the greatest potential for erosion. The potential danger to the channel stability is the development of a V shaped incision in the channel bottom that would lower the water surface taking water from the stabilizing vegetation.

Monitoring and timely maintenance are the key to managing channel stability. Due to the dynamic nature of natural channels, monitoring should be done at a minimum on an annual basis and after runoff events that produce either long runoff durations or high peak flows. La Plata Investments proposes to monitor the stability of the channel on an annual basis and after significant rainfall events through the year 2006 and mitigate stability problems if needed. The monitoring will be done in conjunction with the annual monitoring of the habitat vegetation within the channel corridor as required by the "Final Environmental Assessment and Habitat Conservation Plan for the Briargate Development, Located Along Upper Pine Creek", dated February 2003 (Pine Creek HCP). La Plata expects that the Pine Creek HCP success criteria for the habitat vegetation will be met and the ownership of the channel corridor will be transferred to a public entity in the year 2006. The perpetual monitoring and maintenance of the channel stability is then expected to become the obligation of the either the City or the new owner of the corridor.

REACH NO. 3

HYDROGRAPHS

HEC-RAS ANALYSIS

FLOWMASTER CHANNEL ANALYSIS

REACH NO. 3

HYDROGRAPHS

SECTION 5550

DEVELOPED CONDITION

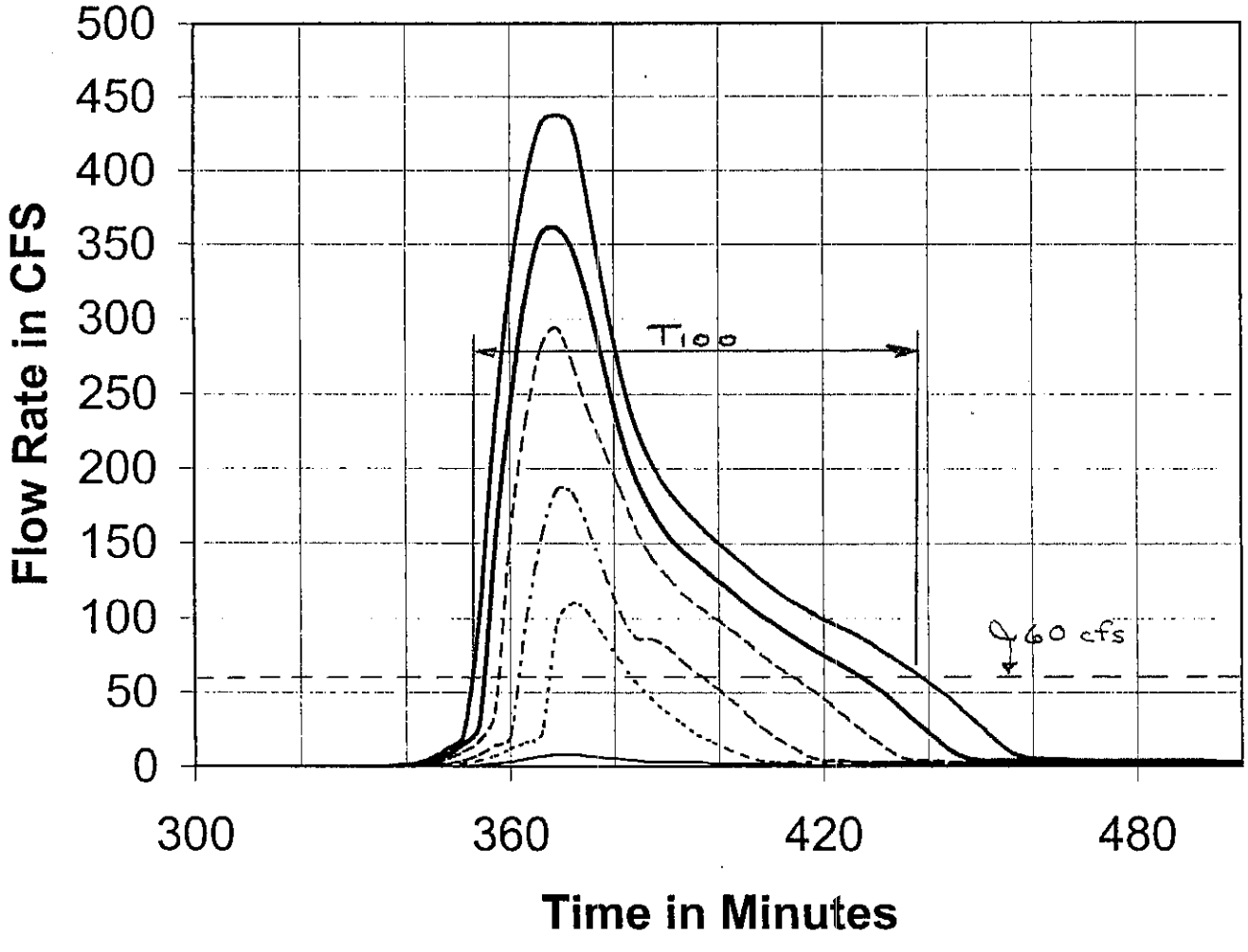
HISTORIC CONDITION

SECTION 580

DEVELOPED CONDITION

HISTORIC CONDITION

Pine Creek Above DF-F



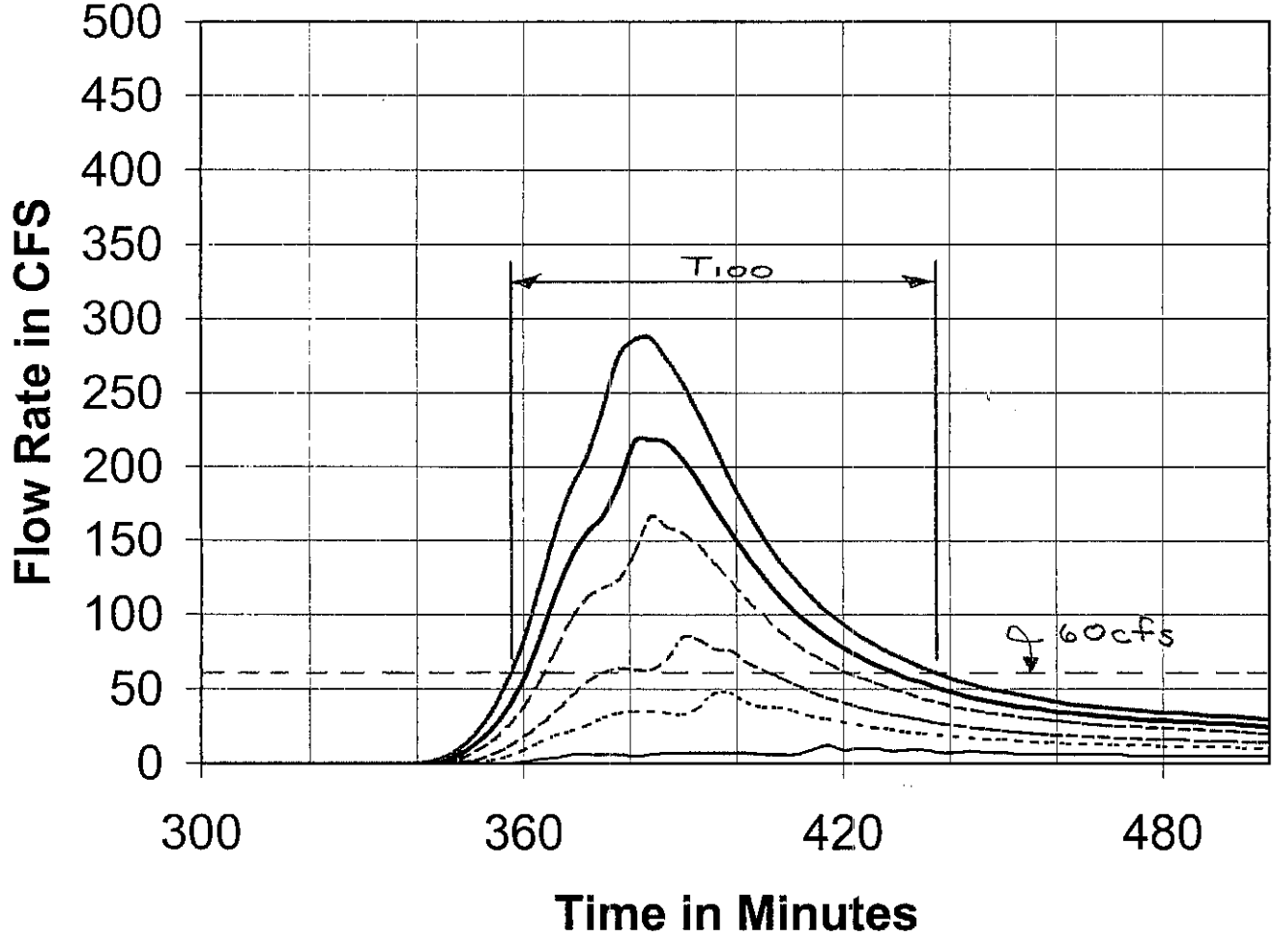
SECTION 550

Q > 60 cfs
V > 8 fps

- 2 Year Flow
- 5 year Flow
- 10 Year Flow
- 25 Year Flow
- 50 Year Flow
- 100 Year Flow

	HR : MIN
T_2	0 : 0
T_5	0 : 15
T_{10}	0 : 33
T_{25}	0 : 53
T_{50}	1 : 10
T_{100}	1 : 21

Pine Creek Historic Above DF-F

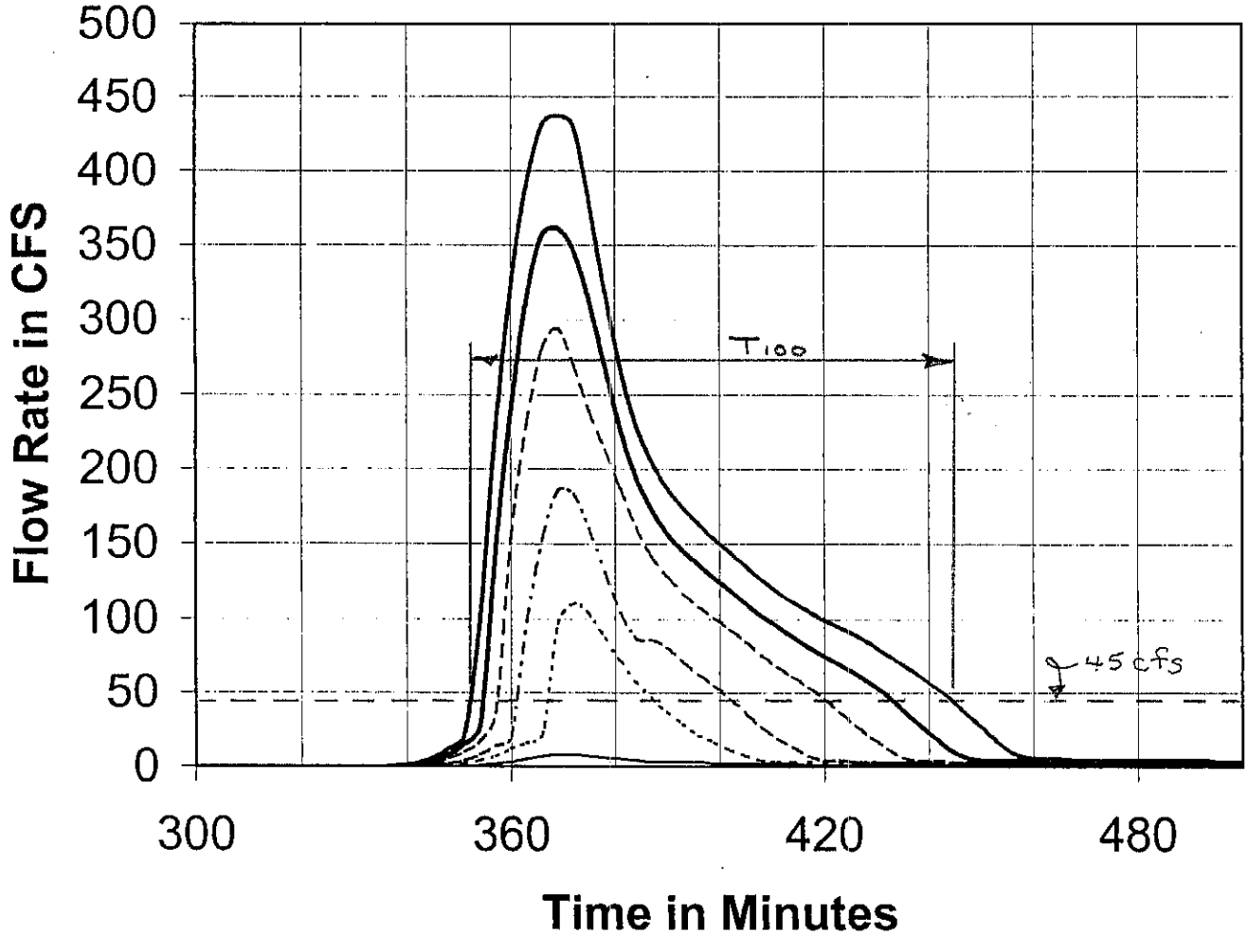


SECTION 550
Q > 60 cfs
V > 8 fps

- 2 Year Flow
- 5 year Flow
- 10 Year Flow
- 25 Year Flow
- 50 Year Flow
- 100 Year Flow

	HR:MIN
T_2	0:0
T_5	0:0
T_{10}	0:30
T_{25}	0:54
T_{50}	1:6
T_{100}	1:18

Pine Creek Above DF-F



SECTION 580

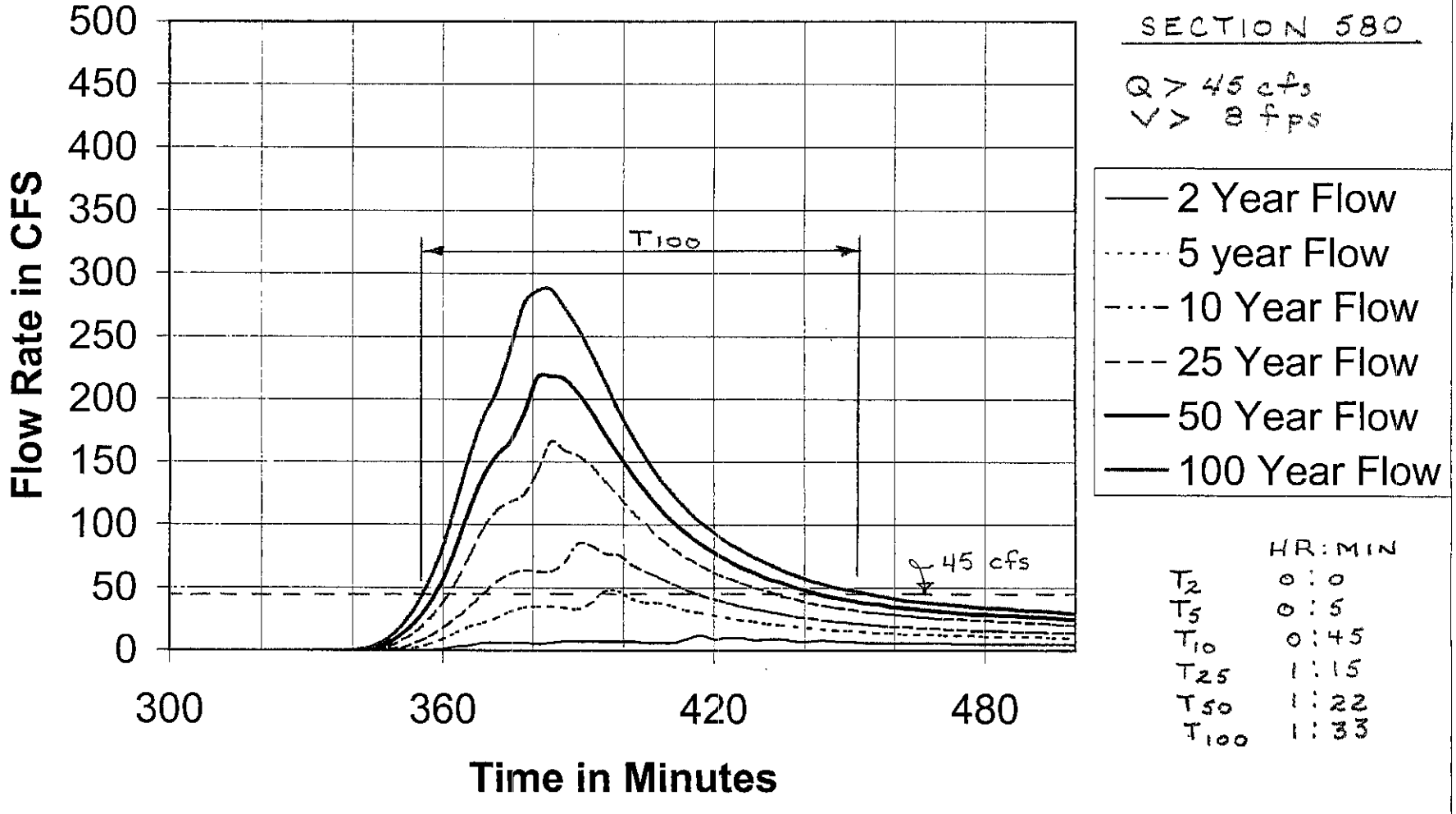
Q > 45 cfs

V > 8 fps

- 2 Year Flow
- 5 year Flow
- 10 Year Flow
- 25 Year Flow
- 50 Year Flow
- 100 Year Flow

	HR.	MIN
T_2	0	0
T_5	0	19
T_{10}	0	40
T_{25}	0	58
T_{50}	1	16
T_{100}	1	28

Pine Creek Historic Above DF-F



REACH NO. 3

HEC-RAS PROPOSED CONDITION

(NO IMPROVEMENTS)

HEC-RAS September 1998 Version 2.2
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

```
X     X  XXXXXX    XXXX         XXXX        XX       XXXX
X     X  X        X    X       X   X      X  X     X
X     X  X        X            X   X     X    X    X
XXXXXXX  XXXX     X       XXX  XXXX      XXXXXX    XXXX
X     X  X        X            X  X      X    X        X
X     X  X        X    X       X   X     X    X        X
X     X  XXXXXX    XXXX        X    X    X    X   XXXXX
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PROJECT DATA
Project Title: PINE CREEK, North
Project File : PCNE.prj
Run Date and Time: 2/20/2003 3:55:26 PM

Project in English units

PLAN DATA

Plan Title: Plan 05
Plan File : x:\2870000.all\2871745\hydro\hec-ras\PCNE.p05

Geometry Title: DEV. COND DF F AND EAST 2-2003
Geometry File : x:\2870000.all\2871745\hydro\hec-ras\PCNE.g03

Flow Title : 2-13-03
Flow File : x:\2870000.all\2871745\hydro\hec-ras\PCNE.f01

Plan Summary Information:

Number of:	Cross Sections	= 17	Mulitple Openings	=	0
	Culverts	= 0	Inline Weirs	=	0
	Bridges	= 0			

Computational Information

Water surface calculation tolerance	= 0.01
Critical depth calculaton tolerance	= 0.01
Maximum number of interations	= 20
Maximum difference tolerance	= 0.3
Flow tolerance factor	= 0.001

Computation Options
Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Mixed Flow

FLOW DATA

Flow Title: 2-13-03
Flow File : x:\2870000.all\2871745\hydro\hec-ras\PCNE.f01

Flow Data (cfs)

River	Reach	RS	2-yr PF 1	5-yr PF 2	10-yr PF 3	25-yr PF 4	50-yr PF 5	100-yr PF 6	DOM. PF 7
PINE CREEK N.	3	600	1	90	162	249	304	370	51
PINE CREEK N.	3	570	8	110	185	294	361	437	64
PINE CREEK N.	3	535	312	470	648	878	1027	1178	339

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
PINE CREEK N.	3	PF 1	Critical	Normal S = .005
PINE CREEK N.	3	PF 2	Critical	Normal S = .005
PINE CREEK N.	3	PF 3	Critical	Normal S = .005
PINE CREEK N.	3	PF 4	Critical	Normal S = .005
PINE CREEK N.	3	PF 5	Critical	Normal S = .005
PINE CREEK N.	3	PF 6	Critical	Normal S = .005
PINE CREEK N.	3	PF 7	Critical	Normal S = .005

GEOMETRY DATA

Geometry Title: DEV. COND DF F AND EAST 2-2003
Geometry File : x:\2870000.all\2871745\hydro\hec-ras\PCNE.g03

CROSS SECTION RIVER: PINE CREEK NORTH
REACH: THREE RS: 600

INPUT
Description: MOST EASTERLY SECTION
Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
58	7010	62	7008	66	7006	73	7004	85	7002
97	7000	103	7000	108	7002	114	7004	120	7006
126	7008	132	7010						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
58	.03	66	.08	120	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
73	114	300	300	.1	.3

CROSS SECTION RIVER: PINE CREEK NORTH
REACH: THREE RS: 595

INPUT
Description:
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
74	7002	80	7000	88	6996	97	6992	102	6992
116	6996	130	7000	137	7002				

Manning's n Values num= 2

Sta	n Val	Sta	n Val
74	.08	130	.03

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
88	116	300	291	285	.1	.3

CROSS SECTION RIVER: PINE CREEK NORTH
REACH: THREE RS: 590

INPUT
Description:
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
60	6994	64	6992	68	6990	76	6986	85	6982
100	6981.1	114	6982	126	6986	136	6990	142	6992

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
60	.045	76	.032	114	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
76	126	285	285	285	.1	.3

CROSS SECTION RIVER: PINE CREEK NORTH
REACH: THREE RS: 580

INPUT
Description:
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
60	6980	65	6978	69	6976	76	6972	98	6970
103	6970	112	6976	127	6980				

Manning's n Values num= 1

Sta	n Val
60	.032

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
69	112	295	290	285	.1	.3

CROSS SECTION RIVER: PINE CREEK NORTH
REACH: THREE RS: 570

INPUT
Description:
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
71	6968	77	6966	83	6964	95	6960	100	6958.4

107	6960	116	6961	121	6964	129	6966	155	6968

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
71	.07	95	.032	116	.07

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
83	121	300	305	312	.1	.3

CROSS SECTION RIVER: PINE CREEK NORTH
REACH: THREE RS: 560

INPUT
Description:
Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
30	6964	56	6962	65	6960	72	6959	78	6958
90	6954	99	6952	102	6952	120	6958	127	6960
138	6962	157	6964						

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
30	.035	72	.05	78	.032	90	.04	99	.032

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
78	120	273	285	290	.1	.3

CROSS SECTION RIVER: PINE CREEK NORTH
REACH: THREE RS: 550

INPUT
Description:
Station Elevation Data num= 9

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
81	6946	85	6944	89	6942	95	6940	100	6939.95
105	6940	110	6942	113	6944	117	6946		

Manning's n Values num= 1

Sta	n Val
81	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
81	117	270	274	285	.1	.3

CROSS SECTION RIVER: PINE CREEK NORTH
REACH: THREE RS: 540

INPUT
Description: Upstream of rundown
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
73	6940	79	6938	87	6936	95	6934	105	6934
113	6936	117	6938	123	6940				

Manning's n Values num= 1

Sta	n Val
73	.032

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.	
73	123	7	7	7	.1	.3

CROSS SECTION RIVER: PINE CREEK NORTH
REACH: THREE RS: 539

INPUT
Description: AT PROPOSED CUTOFF WALL
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
71	6940	79	6938	87	6936	95	6934	105	6934
113	6936	117	6938	125	6940				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
71	.032	79	.045	117	.032

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
71	125	34	34	.1	.3

CROSS SECTION RIVER: PINE CREEK NORTH
REACH: THREE RS: 535

INPUT
Description: UPPER STILLING BASIN AT SD OUTLETS
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
52	6936	62	6934	71	6932	80	6930	83.5	6929
117	6929	121	6930	129	6932	134	6934	140	6936

Manning's n Values num= 1

Sta	n Val
52	.045

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
52	140	18	18	.1	.3

CROSS SECTION RIVER: PINE CREEK NORTH
REACH: THREE RS: 530

INPUT
Description: UPPER STILLING BASIN
Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
46	6938	52	6936	57	6934	64	6932	70	6930
73.5	6929	126	6929	130	6930	136	6932	142	6934
148	6936	154	6938						

Manning's n Values num= 2

Sta	n Val	Sta	n Val
46	.04	136	.032

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
46	148	9.5	9.5	.1	.3

CROSS SECTION RIVER: PINE CREEK NORTH
REACH: THREE RS: 520

INPUT
Description: TOP OF RUNDOWN

Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
50	6938	64	6934	70	6932	130	6932	149	6938

Manning's n Values num= 1

Sta	n Val
50	.04

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
50	149	20	20	.1	.3

CROSS SECTION RIVER: PINE CREEK NORTH
REACH: THREE RS: 510

INPUT
Description: TOP OF RUNDOWN
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
50	6938	68	6934	70	6932	130	6932	150	6938

Manning's n Values num= 1

Sta	n Val
50	.075

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
50	150	40	40	.1	.3

CROSS SECTION RIVER: PINE CREEK NORTH
REACH: THREE RS: 505

INPUT
Description: IN RUNDOWN
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
31	6930	49	6928	65	6926	71	6924	129	6924
136	6926	151	6928	170	6930				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
31	.032	65	.075	136	.032

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
31	170	45	45	.1	.3

CROSS SECTION RIVER: PINE CREEK NORTH
REACH: THREE RS: 500

INPUT
Description: LOWER STILLING BASIN
Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
19	6924	31	6922	56	6920	62	6918	68	6916
71	6915	129	6915	132	6916	138	6918	144	6920
159	6922	168	6924						

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
19	.032	31	.032	56	.04	144	.032

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
31	168	11	11	.1	.3

CROSS SECTION RIVER: PINE CREEK NORTH
REACH: THREE RS: 495

INPUT
Description: LOWER STILLING BASIN
Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9	6924	31	6920	54	6920	60	6918	66	6916
68	6915	131	6915	134	6916	140	6918	146	6920
150	6920	172	6924						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9	.032	54	.04	146	.032

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
9	172	11	11	.1	.3

CROSS SECTION RIVER: PINE CREEK NORTH
REACH: THREE RS: 490

INPUT
Description: BOTTOM OF DF "F"
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
88	6924	111	6918	243	6918	269	6920	286	6924

Manning's n Values num= 1

Sta	n Val
88	.032

Bank Sta: Left	Right	Coeff Contr.	Expan.
88	286	.1	.3

SUMMARY OF MANNING'S N VALUES

River:PINE CREEK NORTH

Reach	River Sta.	n1	n2	n3	n4	n5
THREE	600	.03	.08	.03		
THREE	595	.08	.03			
THREE	590	.045	.032	.045		
THREE	580	.032				
THREE	570	.07	.032	.07		
THREE	560	.035	.05	.032	.04	.032
THREE	550	.04				
THREE	540	.032				
THREE	539	.032	.045	.032		
THREE	535	.045				
THREE	530	.04	.032			
THREE	520	.04				
THREE	510	.075				
THREE	505	.032	.075	.032		

THREE	500	.032	.032	.04	.032
THREE	495	.032	.04	.032	
THREE	490	.032			

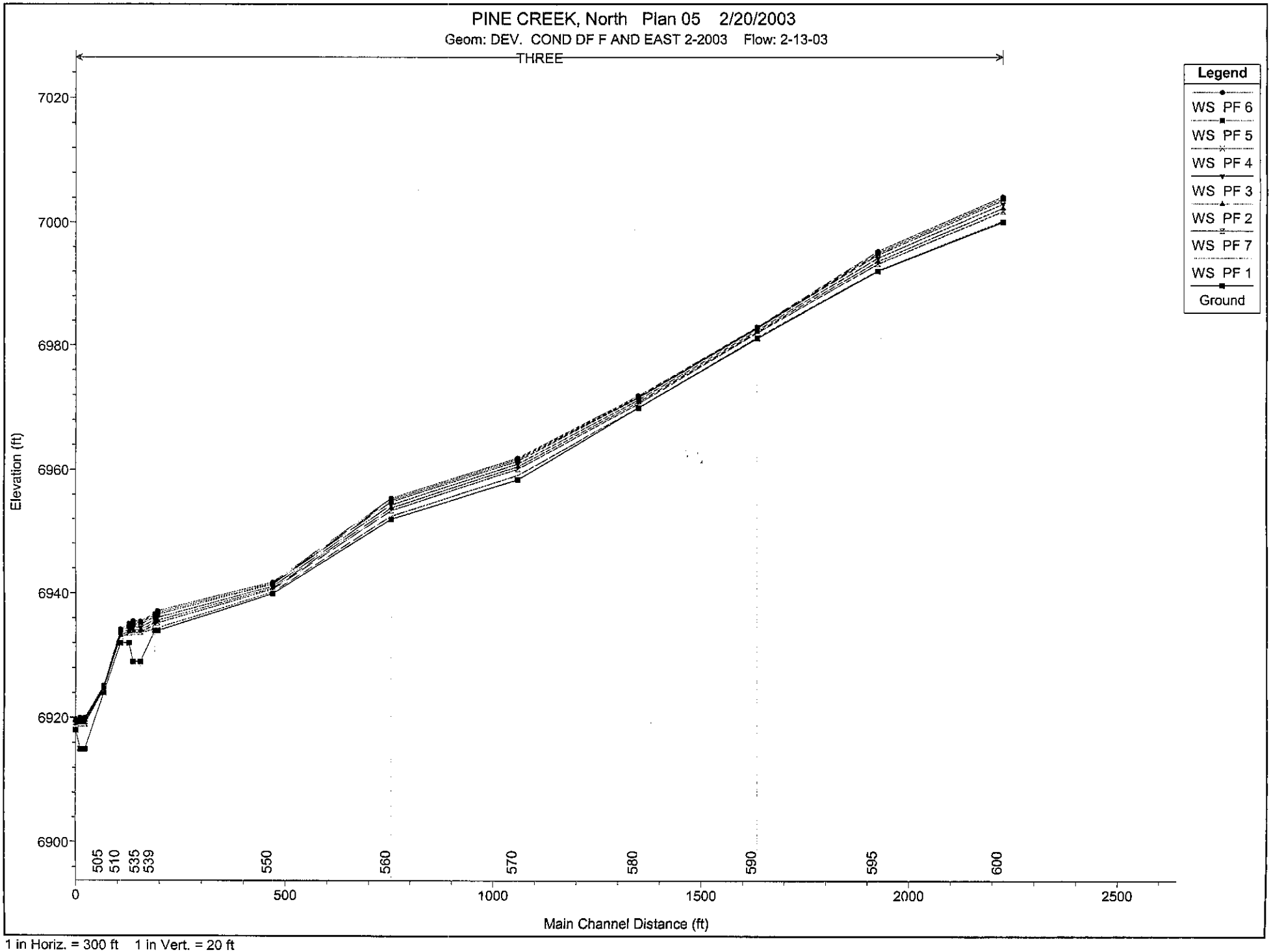
SUMMARY OF REACH LENGTHS

River: PINE CREEK NORTH

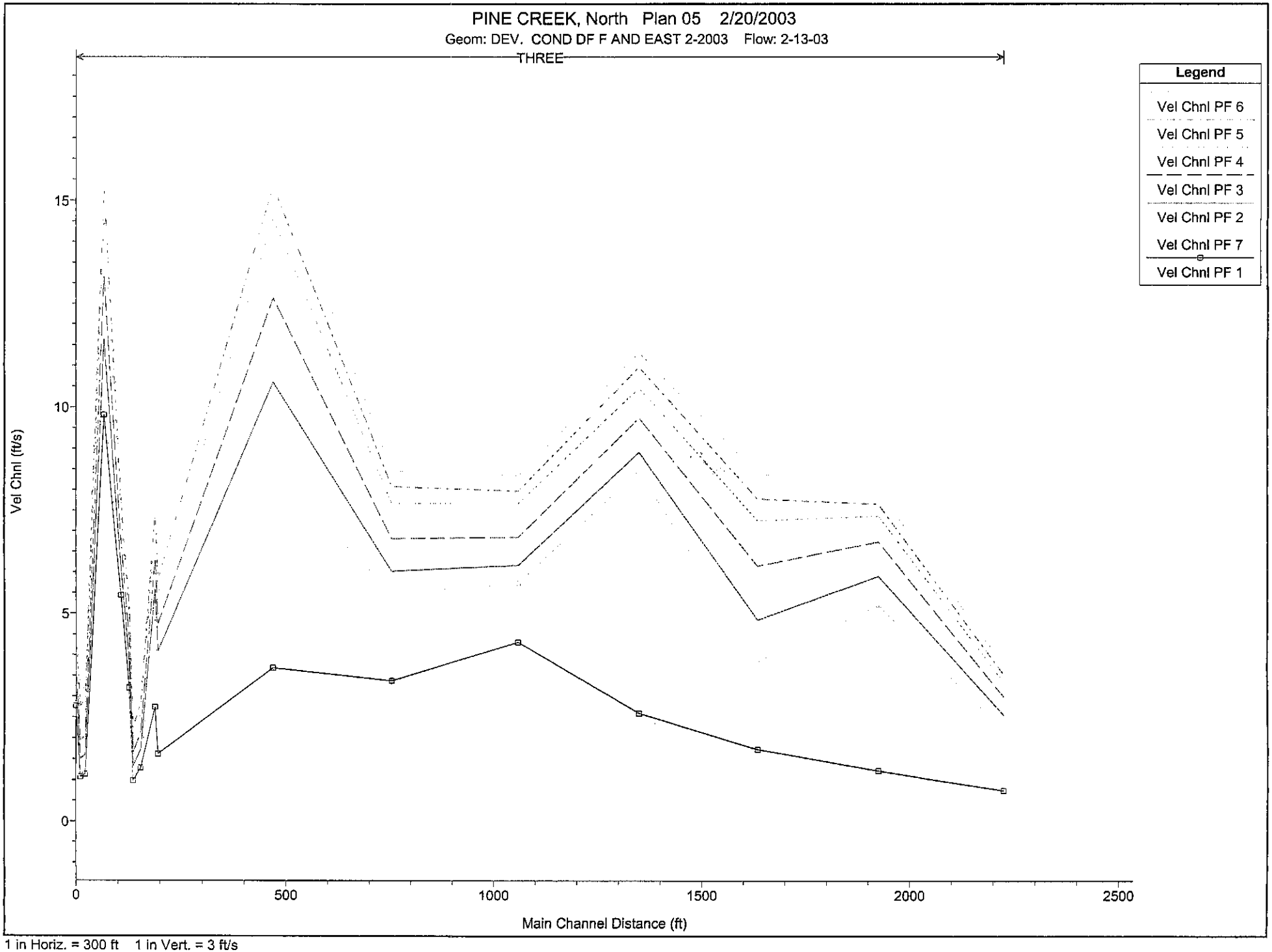
Reach	River Sta.	Left	Channel	Right
THREE	600	300	300	300
THREE	595	300	291	285
THREE	590	285	285	285
THREE	580	295	290	285
THREE	570	300	305	312
THREE	560	273	285	290
THREE	550	270	274	285
THREE	540	7	7	7
THREE	539	34	34	34
THREE	535	18	18	18
THREE	530	9.5	9.5	9.5
THREE	520	20	20	20
THREE	510	40	40	40
THREE	505	45	45	45
THREE	500	11	11	11
THREE	495	11	11	11
THREE	490			

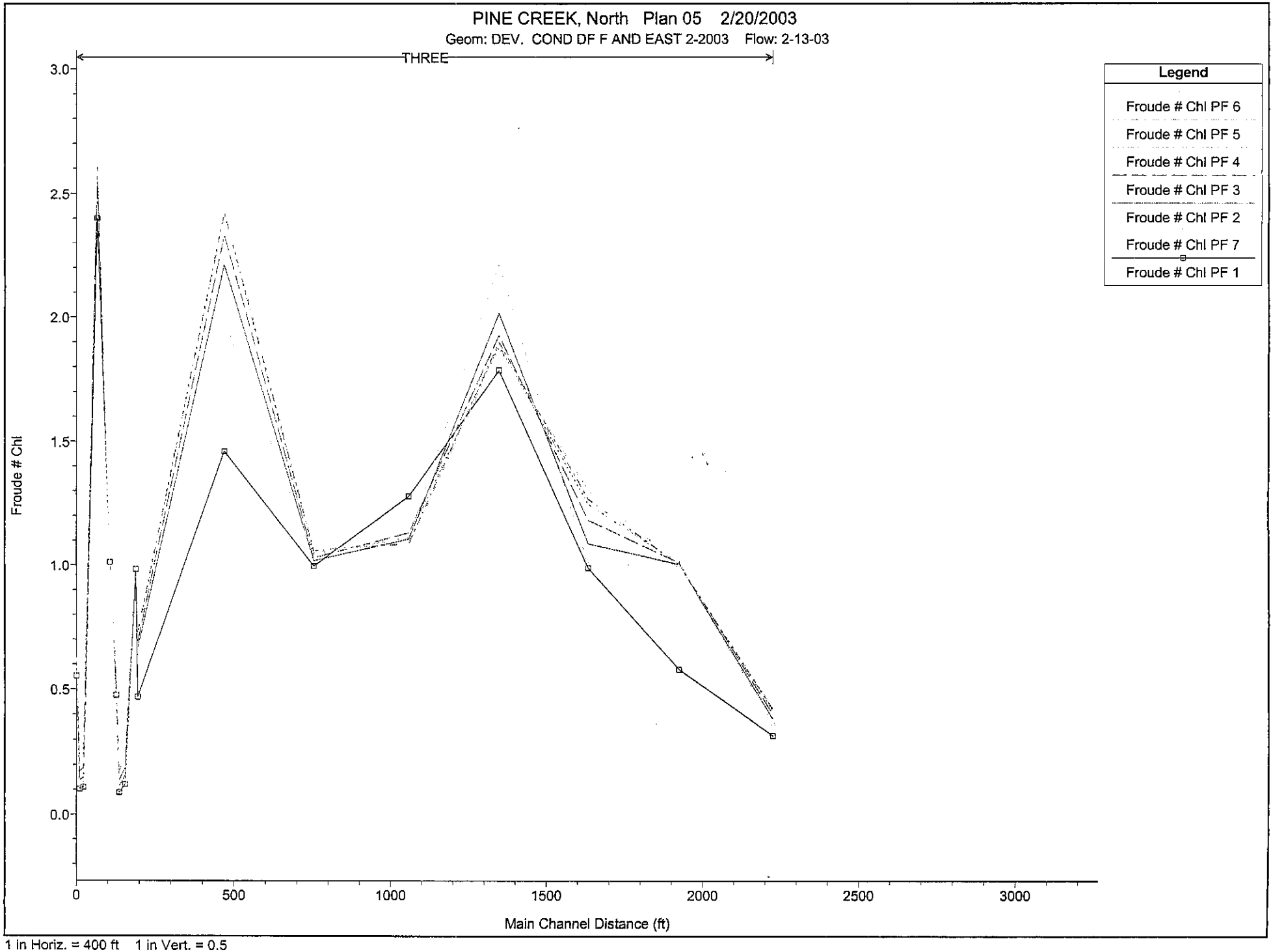
SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: PINE CREEK NORTH

Reach	River Sta.	Contr.	Expan.
THREE	600	.1	.3
THREE	595	.1	.3
THREE	590	.1	.3
THREE	580	.1	.3
THREE	570	.1	.3
THREE	560	.1	.3
THREE	550	.1	.3
THREE	540	.1	.3
THREE	539	.1	.3
THREE	535	.1	.3
THREE	530	.1	.3
THREE	520	.1	.3
THREE	510	.1	.3
THREE	505	.1	.3
THREE	500	.1	.3
THREE	495	.1	.3
THREE	490	.1	.3



1 in Horiz. = 300 ft 1 in Vert. = 20 ft


PINE CREEK, North Plan 05 2/20/2003
Geom: DEV. COND DF F AND EAST 2-2003 Flow: 2-13-03
THREE
Legend
Vel Chnl PF 6
Vel Chnl PF 5
Vel Chnl PF 4
Vel Chnl PF 3
Vel Chnl PF 2
Vel Chnl PF 7
Vel Chnl PF 1
Vel Chnl (ft/s)
0
5
10
15
0
500
1000
1500
2000
2500
Main Channel Distance (ft)
1 in Horiz. = 300 ft 1 in Vert. = 3 ft/s


PINE CREEK, North Plan 05 2/20/2003
Geom: DEV. COND DF F AND EAST 2-2003 Flow: 2-13-03
THREE
Legend
Froude # Chl PF 6
Froude # Chl PF 5
Froude # Chl PF 4
Froude # Chl PF 3
Froude # Chl PF 2
Froude # Chl PF 7
Froude # Chl PF 1
Froude # Chl
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0
500
1000
1500
2000
2500
3000
Main Channel Distance (ft)
1 in Horiz. = 400 ft 1 in Vert. = 0.5

HEC-RAS Plan: DEVDCDFFEAST River: PINE CREEK NORTH Reach: THREE

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
THREE	600	1.00	7000.00	7000.20	7000.10	7000.20	0.016761	0.75	1.34	7.66	0.32
THREE	600	90.00	7000.00	7002.26	7001.38	7002.36	0.012563	2.55	35.24	25.32	0.38
THREE	600	162.00	7000.00	7002.93	7001.87	7003.06	0.012924	2.99	54.15	31.33	0.40
THREE	600	249.00	7000.00	7003.52	7002.31	7003.69	0.013088	3.35	74.38	36.68	0.41
THREE	600	304.00	7000.00	7003.83	7002.54	7004.02	0.013221	3.53	86.05	39.44	0.42
THREE	600	370.00	7000.00	7004.14	7002.79	7004.36	0.013095	3.75	98.67	41.89	0.43
THREE	600	51.00	7000.00	7001.74	7001.01	7001.81	0.012380	2.19	23.24	20.76	0.37
THREE	595	1.00	6992.00	6992.15	6992.10	6992.17	0.061539	1.23	0.81	5.86	0.58
THREE	595	90.00	6992.00	6993.59	6993.59	6994.13	0.096862	5.91	15.22	14.14	1.00
THREE	595	162.00	6992.00	6994.15	6994.15	6994.85	0.090572	6.75	24.01	17.35	1.01
THREE	595	249.00	6992.00	6994.67	6994.67	6995.51	0.085189	7.38	33.75	20.33	1.01
THREE	595	304.00	6992.00	6994.95	6994.95	6995.86	0.082187	7.66	39.67	21.94	1.00
THREE	595	370.00	6992.00	6995.23	6995.23	6996.23	0.080824	8.01	46.19	23.58	1.01
THREE	595	51.00	6992.00	6993.17	6993.17	6993.59	0.104807	5.21	9.79	11.73	1.00
THREE	590	1.00	6981.10	6981.29	6981.29	6981.34	0.032194	1.73	0.58	6.11	0.99
THREE	590	90.00	6981.10	6982.19	6982.21	6982.55	0.021241	4.86	18.53	29.98	1.09
THREE	590	162.00	6981.10	6982.44	6982.54	6983.03	0.023293	6.16	26.30	31.31	1.18
THREE	590	249.00	6981.10	6982.69	6982.86	6983.51	0.024583	7.26	34.27	32.62	1.25
THREE	590	304.00	6981.10	6982.83	6983.04	6983.78	0.024801	7.79	39.03	33.37	1.27
THREE	590	370.00	6981.10	6982.98	6983.23	6984.08	0.025596	8.40	44.06	34.16	1.30
THREE	590	51.00	6981.10	6982.01	6982.01	6982.24	0.019505	3.84	13.28	29.04	1.00
THREE	580	1.00	6970.00	6970.07	6970.10	6970.18	0.119015	2.60	0.39	5.89	1.79
THREE	580	90.00	6970.00	6970.93	6971.32	6972.17	0.073650	8.91	10.10	16.66	2.02
THREE	580	162.00	6970.00	6971.28	6971.75	6972.75	0.061697	9.74	16.64	21.00	1.93
THREE	580	249.00	6970.00	6971.59	6972.11	6973.29	0.055627	10.47	23.78	24.89	1.89
THREE	580	304.00	6970.00	6971.74	6972.30	6973.61	0.054927	10.97	27.72	26.80	1.90
THREE	580	370.00	6970.00	6971.92	6972.52	6973.91	0.052179	11.31	32.71	29.03	1.88
THREE	580	51.00	6970.00	6970.66	6971.00	6971.77	0.097569	8.47	6.02	13.25	2.22
THREE	570	8.00	6958.40	6959.10	6959.17	6959.39	0.036348	4.31	1.86	5.28	1.28
THREE	570	110.00	6958.40	6960.54	6960.61	6961.13	0.024562	6.17	17.83	18.48	1.11
THREE	570	185.00	6958.40	6960.97	6961.07	6961.70	0.026476	6.86	26.98	23.69	1.13
THREE	570	294.00	6958.40	6961.43	6961.53	6962.34	0.027736	7.67	38.33	26.00	1.11
THREE	570	361.00	6958.40	6961.69	6961.79	6962.68	0.027615	7.97	45.28	27.22	1.09
THREE	570	437.00	6958.40	6961.94	6962.06	6963.03	0.028251	8.35	52.35	28.41	1.08
THREE	570	64.00	6958.40	6960.12	6960.19	6960.63	0.022202	5.73	11.16	13.47	1.11
THREE	560	8.00	6952.00	6952.49	6952.49	6952.67	0.025396	3.37	2.37	6.68	1.00
THREE	560	110.00	6952.00	6953.84	6953.85	6954.41	0.019883	6.02	18.26	16.82	1.02
THREE	560	185.00	6952.00	6954.32	6954.34	6955.05	0.018568	6.82	27.13	19.94	1.03
THREE	560	294.00	6952.00	6954.84	6954.90	6955.76	0.017574	7.67	38.32	23.06	1.05
THREE	560	361.00	6952.00	6955.11	6955.19	6956.12	0.017228	8.09	44.65	24.65	1.06
THREE	560	437.00	6952.00	6955.38	6955.47	6956.50	0.016789	8.46	51.64	26.30	1.06
THREE	560	64.00	6952.00	6953.41	6953.43	6953.88	0.022237	5.49	11.66	13.56	1.04
THREE	550	8.00	6939.95	6940.18	6940.24	6940.39	0.086216	3.68	2.17	11.01	1.46
THREE	550	110.00	6939.95	6940.83	6941.34	6942.57	0.131245	10.60	10.37	14.54	2.21
THREE	550	185.00	6939.95	6941.10	6941.82	6943.58	0.135094	12.63	14.65	16.07	2.33
THREE	550	294.00	6939.95	6941.43	6942.35	6944.72	0.135164	14.55	20.21	17.88	2.41
THREE	550	361.00	6939.95	6941.61	6942.63	6945.27	0.132260	15.34	23.53	18.87	2.42
THREE	550	437.00	6939.95	6941.80	6942.93	6945.83	0.129712	16.11	27.13	19.89	2.43
THREE	550	64.00	6939.95	6940.62	6940.97	6941.74	0.113922	8.46	7.57	13.43	1.99
THREE	540	8.00	6934.00	6934.42	6934.26	6934.46	0.004629	1.62	4.94	13.38	0.47
THREE	540	110.00	6934.00	6935.63	6935.30	6935.89	0.006450	4.09	26.90	23.03	0.67
THREE	540	185.00	6934.00	6936.11	6935.73	6936.46	0.006492	4.75	38.93	26.67	0.69
THREE	540	294.00	6934.00	6936.63	6936.21	6937.10	0.006577	5.48	53.61	29.79	0.72
THREE	540	361.00	6934.00	6936.90	6936.46	6937.43	0.006616	5.83	61.87	31.41	0.73
THREE	540	437.00	6934.00	6937.18	6936.71	6937.77	0.006654	6.18	70.75	33.06	0.74
THREE	540	64.00	6934.00	6935.23	6934.95	6935.42	0.006292	3.47	18.45	19.88	0.63
THREE	539	8.00	6934.00	6934.26	6934.26	6934.38	0.046177	2.74	2.92	12.11	0.98
THREE	539	110.00	6934.00	6935.29	6935.29	6935.78	0.030905	5.61	19.62	20.34	1.01
THREE	539	185.00	6934.00	6935.72	6935.72	6936.35	0.028943	6.35	29.12	23.79	1.01
THREE	539	294.00	6934.00	6936.21	6936.21	6936.99	0.026917	7.08	41.54	27.25	1.01

HEC-RAS Plan: DEVDCDFFEAST River: PINE CREEK NORTH Reach: THREE (Continued)

Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
THREE	539	361.00	6934.00	6936.46	6936.46	6937.32	0.026093	7.45	48.48	28.74	1.01
THREE	539	437.00	6934.00	6936.71	6936.71	6937.66	0.025399	7.80	56.00	30.27	1.01
THREE	539	64.00	6934.00	6934.95	6934.95	6935.32	0.033357	4.90	13.05	17.57	1.00
THREE	535	312.00	6929.00	6933.66	6930.32	6933.69	0.000295	1.29	242.42	69.65	0.12
THREE	535	470.00	6929.00	6934.09	6930.71	6934.14	0.000478	1.72	273.04	72.75	0.16
THREE	535	648.00	6929.00	6934.51	6931.08	6934.58	0.000675	2.13	303.92	76.07	0.19
THREE	535	878.00	6929.00	6934.98	6931.50	6935.08	0.000905	2.58	340.53	79.83	0.22
THREE	535	1027.00	6929.00	6935.25	6931.75	6935.38	0.001039	2.83	362.86	82.04	0.24
THREE	535	1178.00	6929.00	6935.52	6931.98	6935.66	0.001166	3.06	384.52	84.12	0.25
THREE	535	339.00	6929.00	6933.74	6930.39	6933.77	0.000326	1.37	247.99	70.20	0.13
THREE	530	312.00	6929.00	6933.67		6933.68	0.000117	0.98	317.39	82.84	0.09
THREE	530	470.00	6929.00	6934.10		6934.13	0.000191	1.33	353.91	85.56	0.12
THREE	530	648.00	6929.00	6934.52		6934.56	0.000271	1.66	390.28	87.87	0.14
THREE	530	878.00	6929.00	6935.00		6935.06	0.000366	2.03	432.65	90.48	0.16
THREE	530	1027.00	6929.00	6935.28		6935.35	0.000422	2.24	458.13	92.01	0.18
THREE	530	1178.00	6929.00	6935.54		6935.63	0.000476	2.44	482.63	93.47	0.19
THREE	530	339.00	6929.00	6933.75		6933.76	0.000130	1.05	324.00	83.36	0.09
THREE	520	312.00	6932.00	6933.51		6933.67	0.004774	3.21	97.34	69.29	0.48
THREE	520	470.00	6932.00	6933.88		6934.10	0.005103	3.80	123.69	71.59	0.51
THREE	520	648.00	6932.00	6934.24		6934.53	0.005324	4.32	150.08	73.95	0.53
THREE	520	878.00	6932.00	6934.66		6935.02	0.005472	4.84	181.35	76.72	0.55
THREE	520	1027.00	6932.00	6934.90		6935.31	0.005532	5.13	200.32	78.35	0.57
THREE	520	1178.00	6932.00	6935.14		6935.59	0.005576	5.39	218.75	79.90	0.57
THREE	520	339.00	6932.00	6933.57		6933.75	0.004849	3.32	102.09	69.71	0.48
THREE	510	312.00	6932.00	6932.93	6932.93	6933.38	0.088124	5.44	57.37	64.01	1.01
THREE	510	470.00	6932.00	6933.22	6933.22	6933.81	0.079679	6.16	76.28	65.28	1.00
THREE	510	648.00	6932.00	6933.51	6933.51	6934.22	0.074267	6.80	95.26	66.53	1.00
THREE	510	878.00	6932.00	6933.83	6933.83	6934.70	0.070201	7.48	117.36	67.95	1.00
THREE	510	1027.00	6932.00	6934.03	6934.03	6934.99	0.067894	7.84	131.05	68.94	1.00
THREE	510	1178.00	6932.00	6934.23	6934.23	6935.26	0.066480	8.15	144.46	70.45	1.00
THREE	510	339.00	6932.00	6932.98	6932.98	6933.46	0.085555	5.56	60.94	64.25	1.01
THREE	505	312.00	6924.00	6924.53	6924.95	6926.03	0.591265	9.81	31.82	61.46	2.40
THREE	505	470.00	6924.00	6924.67	6925.23	6926.77	0.617529	11.63	40.41	62.36	2.55
THREE	505	648.00	6924.00	6924.81	6925.52	6927.50	0.618399	13.15	49.27	63.28	2.63
THREE	505	878.00	6924.00	6924.98	6925.85	6928.29	0.599115	14.60	60.12	64.39	2.66
THREE	505	1027.00	6924.00	6925.09	6926.05	6928.73	0.578585	15.32	67.04	65.08	2.66
THREE	505	1178.00	6924.00	6925.19	6926.25	6929.15	0.561841	15.97	73.75	65.75	2.66
THREE	505	339.00	6924.00	6924.55	6924.99	6926.18	0.615012	10.25	33.08	61.60	2.46
THREE	500	312.00	6915.00	6918.93	6915.94	6918.95	0.000190	1.14	274.17	81.57	0.11
THREE	500	470.00	6915.00	6919.18	6916.24	6919.22	0.000346	1.59	295.16	83.10	0.15
THREE	500	648.00	6915.00	6919.43	6916.52	6919.49	0.000541	2.05	315.42	84.55	0.19
THREE	500	878.00	6915.00	6919.69	6916.86	6919.80	0.000808	2.60	338.09	86.15	0.23
THREE	500	1027.00	6915.00	6919.84	6917.05	6919.98	0.000987	2.92	351.32	87.06	0.26
THREE	500	1178.00	6915.00	6919.99	6917.25	6920.15	0.001173	3.24	363.71	87.91	0.28
THREE	500	339.00	6915.00	6918.98	6916.00	6919.00	0.000215	1.22	278.04	81.86	0.12
THREE	495	312.00	6915.00	6918.93		6918.95	0.000168	1.07	290.34	85.57	0.10
THREE	495	470.00	6915.00	6919.18		6919.22	0.000305	1.50	312.35	87.10	0.14
THREE	495	648.00	6915.00	6919.42		6919.48	0.000477	1.94	333.53	88.55	0.18
THREE	495	878.00	6915.00	6919.69		6919.78	0.000714	2.46	357.31	90.14	0.22
THREE	495	1027.00	6915.00	6919.84		6919.96	0.000873	2.77	371.15	91.06	0.24
THREE	495	1178.00	6915.00	6919.99		6920.13	0.001037	3.07	384.15	91.91	0.26
THREE	495	339.00	6915.00	6918.98		6919.00	0.000190	1.15	294.40	85.85	0.11
THREE	490	312.00	6918.00	6918.81	6918.55	6918.93	0.005005	2.77	112.74	145.67	0.55
THREE	490	470.00	6918.00	6919.04	6918.72	6919.20	0.005004	3.23	145.66	149.43	0.58
THREE	490	648.00	6918.00	6919.25	6918.89	6919.46	0.005000	3.63	178.38	153.07	0.59
THREE	490	878.00	6918.00	6919.50	6919.08	6919.75	0.005001	4.06	216.32	157.18	0.61
THREE	490	1027.00	6918.00	6919.64	6919.20	6919.93	0.005006	4.30	239.06	159.60	0.62
THREE	490	1178.00	6918.00	6919.78	6919.31	6920.09	0.005003	4.51	261.12	161.91	0.63
THREE	490	339.00	6918.00	6918.85	6918.58	6918.98	0.005005	2.86	118.72	146.36	0.56

REACH NO. 3

FLOWMASTER CHANNEL ANALYSIS

Table
Rating Table for Trapezoidal Channel

Project Description	
Project File	x:\2870000.all\2871745\hydro\flowmast.fm2
Worksheet	UPPER PINE CREEK
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Constant Data		
Left Side Slope	3.000000 H : V	
Right Side Slope	3.000000 H : V	
Bottom Width	10.00	ft
Discharge	90.00	cfs

Input Data	Minimum	Maximum	Increment
Mannings Coefficient	0.040	0.060	0.010
Channel Slope	0.014000	0.056000	0.003000 ft/ft

Rating Table

Channel Slope (ft/ft)	Mannings Coefficient	Depth (ft)	Velocity (ft/s)
0.014000	0.040	1.40	4.55
0.014000	0.050	1.57	3.88
0.014000	0.060	1.73	3.41
0.017000	0.040	1.32	4.87
0.017000	0.050	1.49	4.16
0.017000	0.060	1.65	3.66
0.020000	0.040	1.27	5.15
0.020000	0.050	1.43	4.40
0.020000	0.060	1.58	3.87
0.023000	0.040	1.22	5.41
0.023000	0.050	1.38	4.63
0.023000	0.060	1.52	4.07
0.026000	0.040	1.18	5.64
0.026000	0.050	1.33	4.83
0.026000	0.060	1.47	4.25
0.029000	0.040	1.14	5.86
0.029000	0.050	1.29	5.02
0.029000	0.060	1.43	4.42
0.032000	0.040	1.11	6.06
0.032000	0.050	1.26	5.19
0.032000	0.060	1.39	4.57
0.035000	0.040	1.09	6.25
0.035000	0.050	1.23	5.36

Table
Rating Table for Trapezoidal Channel

Rating Table			
Channel Slope (ft/ft)	Mannings Coefficient	Depth (ft)	Velocity (ft/s)
0.035000	0.060	1.36	4.72
0.038000	0.040	1.06	6.43
0.038000	0.050	1.20	5.51
0.038000	0.060	1.33	4.85
0.041000	0.040	1.04	6.60
0.041000	0.050	1.18	5.66
0.041000	0.060	1.30	4.98
0.044000	0.040	1.02	6.77
0.044000	0.050	1.15	5.80
0.044000	0.060	1.27	5.11
0.047000	0.040	1.00	6.92
0.047000	0.050	1.13	5.93
0.047000	0.060	1.25	5.23
0.050000	0.040	0.98	7.07
0.050000	0.050	1.11	6.06
0.050000	0.060	1.23	5.34
0.053000	0.040	0.97	7.21
0.053000	0.050	1.10	6.19
0.053000	0.060	1.21	5.45
0.056000	0.040	0.95	7.35
0.056000	0.050	1.08	6.30
0.056000	0.060	1.19	5.56

Table
Rating Table for Trapezoidal Channel

Project Description	
Project File	x:\2870000.all\2871745\hydro\flowmast.fm2
Worksheet	UPPER PINE CREEK
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Constant Data		
Left Side Slope	3.000000 H : V	
Right Side Slope	3.000000 H : V	
Bottom Width	23.00	ft
Discharge	90.00	cfs

Input Data			
	Minimum	Maximum	Increment
Mannings Coefficient	0.040	0.060	0.010
Channel Slope	0.014000	0.056000	0.003000 ft/ft

Rating Table

Channel Slope (ft/ft)	Mannings Coefficient	Depth (ft)	Velocity (ft/s)
0.014000	0.040	0.91	3.84
0.014000	0.050	1.04	3.32
0.014000	0.060	1.15	2.95
0.017000	0.040	0.86	4.08
0.017000	0.050	0.98	3.54
0.017000	0.060	1.09	3.14
0.020000	0.040	0.82	4.30
0.020000	0.050	0.94	3.73
0.020000	0.060	1.04	3.31
0.023000	0.040	0.79	4.50
0.023000	0.050	0.90	3.90
0.023000	0.060	1.00	3.46
0.026000	0.040	0.76	4.68
0.026000	0.050	0.87	4.06
0.026000	0.060	0.96	3.61
0.029000	0.040	0.74	4.85
0.029000	0.050	0.84	4.20
0.029000	0.060	0.93	3.74
0.032000	0.040	0.72	5.00
0.032000	0.050	0.82	4.34
0.032000	0.060	0.91	3.86
0.035000	0.040	0.70	5.15
0.035000	0.050	0.79	4.46

Table
Rating Table for Trapezoidal Channel

Rating Table			
Channel Slope (ft/ft)	Mannings Coefficient	Depth (ft)	Velocity (ft/s)
0.035000	0.060	0.88	3.97
0.038000	0.040	0.68	5.29
0.038000	0.050	0.78	4.58
0.038000	0.060	0.86	4.08
0.041000	0.040	0.66	5.42
0.041000	0.050	0.76	4.70
0.041000	0.060	0.84	4.18
0.044000	0.040	0.65	5.54
0.044000	0.050	0.74	4.80
0.044000	0.060	0.83	4.27
0.047000	0.040	0.64	5.66
0.047000	0.050	0.73	4.91
0.047000	0.060	0.81	4.36
0.050000	0.040	0.63	5.77
0.050000	0.050	0.72	5.00
0.050000	0.060	0.80	4.45
0.053000	0.040	0.62	5.88
0.053000	0.050	0.70	5.10
0.053000	0.060	0.78	4.54
0.056000	0.040	0.61	5.98
0.056000	0.050	0.69	5.19
0.056000	0.060	0.77	4.62

Table
Rating Table for Trapezoidal Channel

Project Description	
Project File	x:\2870000.all\2871745\hydro\flowmast.fm2
Worksheet	UPPER PINE CREEK
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Constant Data		
Left Side Slope	3.000000	H : V
Right Side Slope	3.000000	H : V
Bottom Width	10.00	ft
Discharge	370.00	cfs

Input Data			
	Minimum	Maximum	Increment
Mannings Coefficient	0.040	0.060	0.010
Channel Slope	0.014000	0.056000	0.003000 ft/ft

Rating Table

Channel Slope (ft/ft)	Mannings Coefficient	Depth (ft)	Velocity (ft/s)
0.014000	0.040	2.91	6.79
0.014000	0.050	3.25	5.77
0.014000	0.060	3.55	5.05
0.017000	0.040	2.77	7.28
0.017000	0.050	3.10	6.19
0.017000	0.060	3.39	5.42
0.020000	0.040	2.66	7.73
0.020000	0.050	2.98	6.57
0.020000	0.060	3.26	5.75
0.023000	0.040	2.57	8.13
0.023000	0.050	2.87	6.91
0.023000	0.060	3.15	6.05
0.026000	0.040	2.49	8.50
0.026000	0.050	2.79	7.23
0.026000	0.060	3.05	6.33
0.029000	0.040	2.42	8.84
0.029000	0.050	2.71	7.52
0.029000	0.060	2.97	6.59
0.032000	0.040	2.36	9.16
0.032000	0.050	2.65	7.79
0.032000	0.060	2.90	6.83
0.035000	0.040	2.31	9.46
0.035000	0.050	2.59	8.05

Table
Rating Table for Trapezoidal Channel

Rating Table			
Channel Slope (ft/ft)	Mannings Coefficient	Depth (ft)	Velocity (ft/s)
0.035000	0.060	2.83	7.05
0.038000	0.040	2.26	9.75
0.038000	0.050	2.53	8.30
0.038000	0.060	2.78	7.27
0.041000	0.040	2.22	10.02
0.041000	0.050	2.49	8.53
0.041000	0.060	2.72	7.47
0.044000	0.040	2.18	10.28
0.044000	0.050	2.44	8.75
0.044000	0.060	2.68	7.67
0.047000	0.040	2.14	10.52
0.047000	0.050	2.40	8.96
0.047000	0.060	2.63	7.85
0.050000	0.040	2.11	10.76
0.050000	0.050	2.36	9.16
0.050000	0.060	2.59	8.03
0.053000	0.040	2.08	10.99
0.053000	0.050	2.33	9.36
0.053000	0.060	2.55	8.20
0.056000	0.040	2.05	11.21
0.056000	0.050	2.30	9.54
0.056000	0.060	2.52	8.37

Table
Rating Table for Trapezoidal Channel

Project Description	
Project File	x:\2870000.all\2871745\hydro\flowmast.fm2
Worksheet	UPPER PINE CREEK
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Constant Data		
Left Side Slope	3.000000	H : V
Right Side Slope	3.000000	H : V
Bottom Width	23.00	ft
Discharge	370.00	cfs

Input Data			
	Minimum	Maximum	Increment
Mannings Coefficient	0.040	0.060	0.010
Channel Slope	0.014000	0.056000	0.003000 ft/ft

Rating Table

Channel Slope (ft/ft)	Mannings Coefficient	Depth (ft)	Velocity (ft/s)
0.014000	0.040	2.05	6.17
0.014000	0.050	2.33	5.30
0.014000	0.060	2.58	4.67
0.017000	0.040	1.95	6.60
0.017000	0.050	2.21	5.66
0.017000	0.060	2.44	5.00
0.020000	0.040	1.86	6.97
0.020000	0.050	2.11	5.99
0.020000	0.060	2.33	5.29
0.023000	0.040	1.79	7.31
0.023000	0.050	2.03	6.28
0.023000	0.060	2.24	5.55
0.026000	0.040	1.72	7.61
0.026000	0.050	1.96	6.55
0.026000	0.060	2.17	5.78
0.029000	0.040	1.67	7.90
0.029000	0.050	1.90	6.79
0.029000	0.060	2.10	6.00
0.032000	0.040	1.63	8.16
0.032000	0.050	1.85	7.02
0.032000	0.060	2.05	6.21
0.035000	0.040	1.58	8.41
0.035000	0.050	1.80	7.24

Table
Rating Table for Trapezoidal Channel

Rating Table			
Channel Slope (ft/ft)	Mannings Coefficient	Depth (ft)	Velocity (ft/s)
0.035000	0.060	1.99	6.40
0.038000	0.040	1.55	8.65
0.038000	0.050	1.76	7.44
0.038000	0.060	1.95	6.58
0.041000	0.040	1.51	8.87
0.041000	0.050	1.72	7.64
0.041000	0.060	1.91	6.75
0.044000	0.040	1.48	9.08
0.044000	0.050	1.69	7.82
0.044000	0.060	1.87	6.92
0.047000	0.040	1.46	9.28
0.047000	0.050	1.65	8.00
0.047000	0.060	1.84	7.07
0.050000	0.040	1.43	9.48
0.050000	0.050	1.63	8.16
0.050000	0.060	1.80	7.22
0.053000	0.040	1.41	9.66
0.053000	0.050	1.60	8.32
0.053000	0.060	1.77	7.36
0.056000	0.040	1.38	9.84
0.056000	0.050	1.57	8.48
0.056000	0.060	1.75	7.50

REFERENCES

REFERENCES

1. "City of Colorado Springs/County of El Paso Drainage Criteria Manual," latest edition.

2. Soils Survey of El Paso County Area, Colorado Soil Conservation Service.

3. "Pine Creek D.B.P.S. Amendment No. 3" in progress by JR Engineering.

4. "Design of Road Channels with Flexible Linings", Publication No. FHWA-IP-87-7, April 1988.

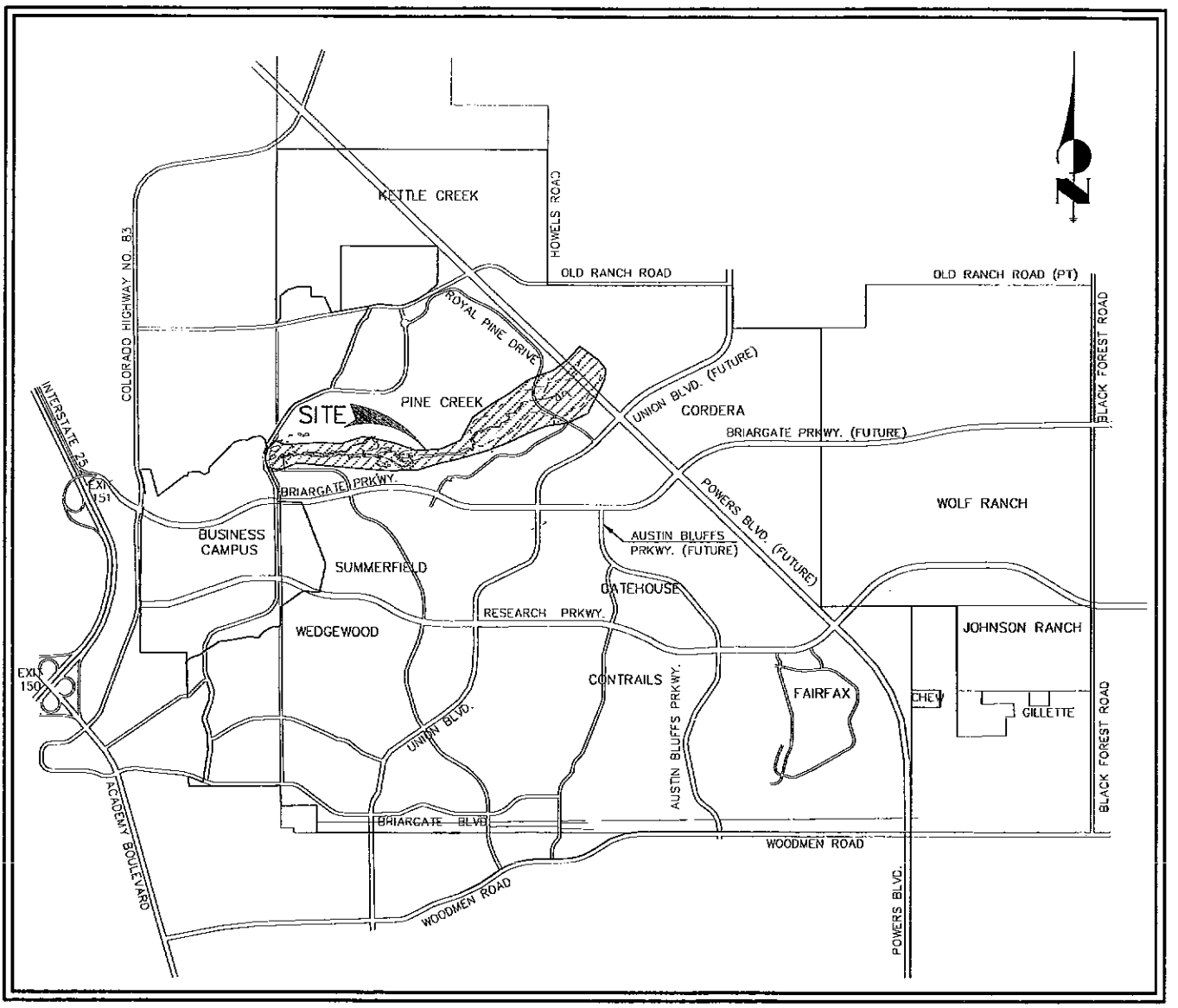
5. U.S. Army Corps of Engineers HEC-RAS River Analysis System User's Manual and Hydraulic Reference Manual.

6. "Roughness Coefficients for Densely Vegetated Flood Plains", By George J. Arcement, Jr. and Verne Schneider, U.S. Geological Survey Water Resources Investigations Report 83-4247.

7. "Sediment and Erosion Design Guide" for Albuquerque Metropolitan Arroyo Flood Control Authority, by RCE, November 1994.

APPENDIX

VICINITY MAP



VICINITY MAP

N.T.S.

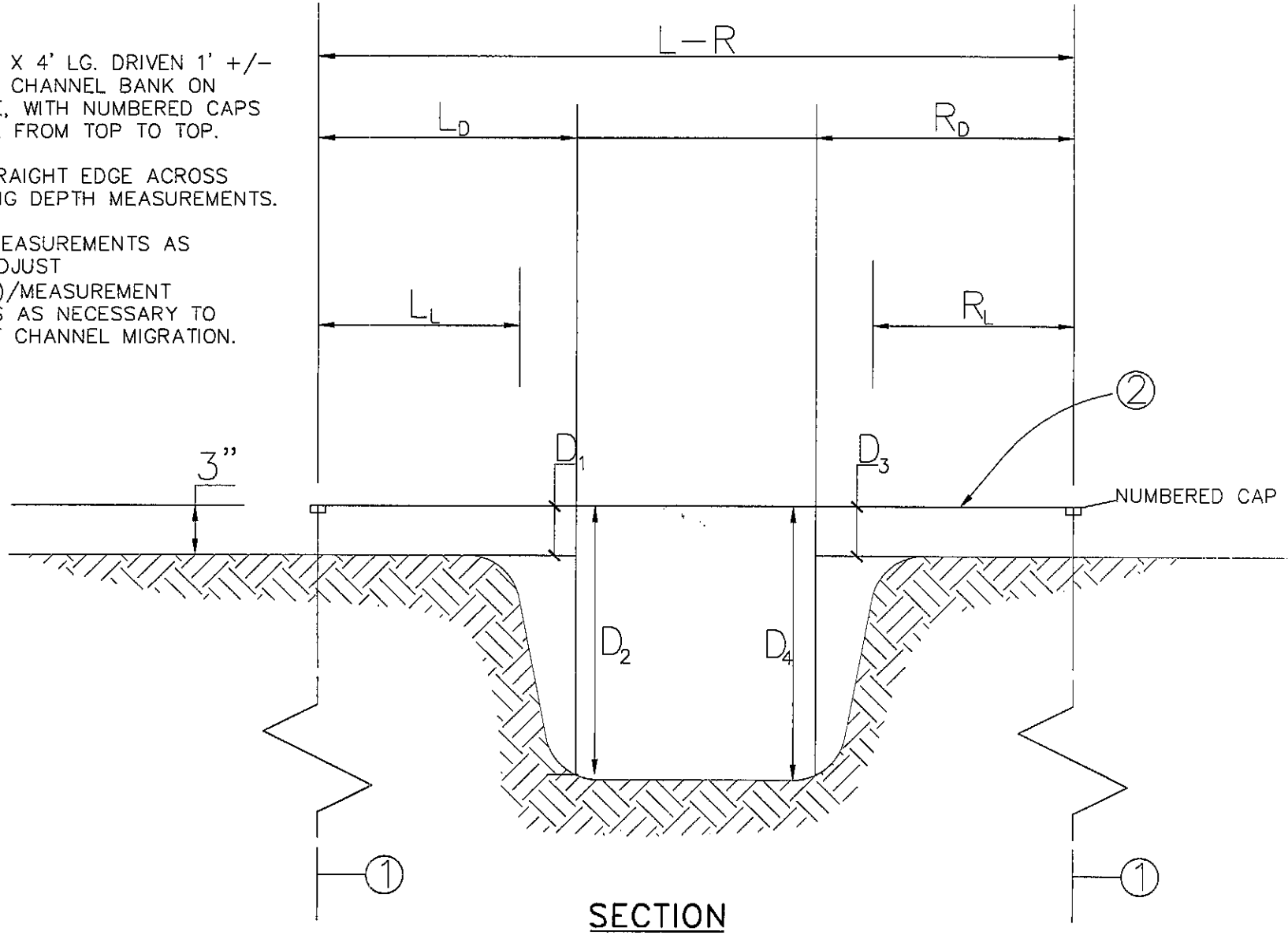
SUGGESTED

LOW FLOW CHANNEL DOCUMENTATION

① #4 REBAR X 4' LG. DRIVEN 1' +/- FROM THE CHANNEL BANK ON EACH SIDE, WITH NUMBERED CAPS SET LEVEL FROM TOP TO TOP.

② LAY A STRAIGHT EDGE ACROSS FOR TAKING DEPTH MEASUREMENTS.

③ RECORD MEASUREMENTS AS SHOWN, ADJUST METHOD(S)/MEASUREMENT LOCATIONS AS NECESSARY TO DOCUMENT CHANNEL MIGRATION.



SECTION
LOW FLOW CHANNEL

LOW FLOW CHANNEL DOCUMENTATION

ROLLED PLANS

(SEPARATE)

UPPER PINE CREEK ANALYSIS

SHEETS 1 THROUGH 11